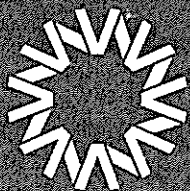


N O V A

**1987-88  
CATALOG**



**NORTHERN  
VIRGINIA  
COMMUNITY  
COLLEGE**



# Application for Admission

Alexandria Campus, Admissions and Records, 3001 N. Beauregard St., Alexandria, VA 22311  
Annandale Campus, Admissions and Records, 8333 Little River Tpke., Annandale, VA 22003  
Loudoun Campus, Admissions and Records, 1000 Harry Flood Byrd Hwy., Sterling, VA 22170  
Manassas Campus, Admissions and Records, 6901 Sudley Road, Manassas, VA 22110  
Woodbridge Campus, Admissions and Records, 15200 Neabsco Mills Rd., Woodbridge, VA 22191  
Extended Learning Institute, 8333 Little River Tpke., Annandale, VA 22003

**NORTHERN  
VIRGINIA  
COMMUNITY  
COLLEGE**



Complete all items and return to the campus of your choice: PLEASE PRINT  
Quarter and Year of Entry: (Circle one) 1—Winter 2—Spring 3—Summer 4—Fall 19\_\_\_\_  
Campus Location: (Circle one) Alexandria Annandale Loudoun Manassas Woodbridge

**This institution maintains and promotes equal employment and educational opportunity without regard to race, color, sex, age (except where sex or age is a bona fide occupational qualification), religion, handicap, national origin, or other non merit factors.**

**A. Social Security Number (Optional)** A. \_\_\_\_\_

**B. Last Name** ..... B. \_\_\_\_\_

**C. First Name** ..... C. \_\_\_\_\_

**D. Middle Initial/Suffix** ..... D.  MI  Jr.  III

**E. Former Name** ..... E. \_\_\_\_\_

**F. Mailing Address** ..... F. \_\_\_\_\_  
Number and Street

**G. City/State/Zip Code** ..... G. \_\_\_\_\_  
City State Zip Code

**H. Home Phone/Work Phone** ..... H. \_\_\_\_\_  
Area Code Area Code

**I. Birthdate** ..... I. \_\_\_\_\_  
Month Day Year

**J. Sex** (Write number in space provided at right) Male (1) Female (2) ..... J. \_\_\_\_\_

**K. Ethnic Group/Race** (Write number in space provided at right) White (1) Black (2) American Indian or Alaskan Native (3) Asian or Pacific Islander (4) Hispanic (5) Other (6) ..... K. \_\_\_\_\_

**L. Educational Objective** (See back of form and write number in space provided at right) ..... L. \_\_\_\_\_

**M. Curriculum Code** (See back of form and write code in space provided at right) ..... M. \_\_\_\_\_

**N. Length of Enrollment** (Write number in space provided at right) ..... N. \_\_\_\_\_  
How many quarters do you expect it will take you to complete your educational objective? (If you expect to enroll for nine or more quarters, write "9".

**O. High School/GED Information**

I have received a high school diploma from \_\_\_\_\_ located in \_\_\_\_\_ in 19\_\_\_\_  
Name of School City and State

I am currently enrolled in high school \_\_\_\_\_ and I plan to graduate in 19\_\_\_\_  
Name of School

I received a General Equivalency Diploma (GED) in \_\_\_\_\_ in 19\_\_\_\_  
City and State

**P. College Information** (Write numbers in spaces provided at right)

Have you ever attended NVCC? Yes (1) No (2) ..... P. \_\_\_\_\_

Have you ever attended any other college? Yes (1) No (2) ..... \_\_\_\_\_

Last college attended \_\_\_\_\_ located in \_\_\_\_\_ in 19\_\_\_\_  
Name of School State

Highest degree received. (Write number in space provided at right)  
Associate (1) Bachelors (2) Masters (3) Professional (4) Doctorate (5) ..... \_\_\_\_\_

**Q. Student Benefits** (Write number in space provided at right) Veteran Receiving Benefits (1) Veteran Not Receiving Benefits (2) Active Duty With Benefits (3) Active Duty Without Benefits (4) Not Applicable (5) ..... Q. \_\_\_\_\_

If you are eligible for financial support as noted below, write number in space provided at right.  
Veterans Dependent (1) Social Security (2) State Voc. Rehab. (3) Veterans Voc. Rehab. (4)  
War Orphan Act (5) Other (6) ..... \_\_\_\_\_

**R. Citizen of U.S.** (Write letter in space provided at right) Yes (Y) No (N) ..... R. \_\_\_\_\_

If No, give Country \_\_\_\_\_  
Visa Type \_\_\_\_\_ Visa Expiration Date \_\_\_\_\_

**S. Emergency Contact Person:** \_\_\_\_\_  
Last Name F.I. Area Code

**T. Domicile:** In-State Tuition charges for a Virginia resident are available only to a person who has been domiciled in, and is and has been an actual bona fide resident of Virginia, for a period of at least one year prior to the commencement of the term or quarter for which any such In-State Tuition charge is sought. (Code of Virginia Section 23-7.4)

Are you legally domiciled in Virginia?  
 If yes, the *Application for Virginia In-State Tuition Rates* must be completed.  
 If no, presently domiciled in \_\_\_\_\_

For Office Use Only  
Data Entry \_\_\_\_\_ / \_\_\_\_\_  
Date Initials

For Office Use Only  
\_\_\_\_\_

For Office Use Only  
\_\_\_\_\_

For Office Use Only  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

For Office Use Only  
\_\_\_\_\_

I certify that the above statements are true and correct to the best of my knowledge. I will abide by the rules and regulations of the college.

Signature of Applicant \_\_\_\_\_ Signature of Parent (If applicant is under 18 years of age) \_\_\_\_\_ Date \_\_\_\_\_

## Educational Objective

Each applicant for admission to NVCC is asked to identify his/her educational objective at the time of admission. You are asked to review the items below and identify that which best represents your reason for attending NVCC.

- I. What is your educational objective? Place number in item L on the other side of this form.
1. for later transfer to a four year college or university
  2. to obtain a job
  3. for advancement in my present job
  4. to explore career possibilities
  5. for self-improvement not job related

- II. Do you wish to be admitted to a degree or certificate curriculum at NVCC?      Yes       No

- III. If your response to item II is "yes" then select the curriculum that you now plan to pursue. Place the curriculum code number in item M on the other side of this form. Your chosen curriculum must be at the campus location you have chosen on side 1 of this form. Campus abbreviations follow each curriculum listed below.

Codes	Codes	
<b>Associate in Arts:</b>		
15290 Fine Arts, AL, AN, LO, MA, WO	62511 Marketing/Fashion, AL, AN, WO	
15291 Fine Arts/Art-Fine Art Photography, AL, LO, WO	62512 Marketing/Retail, AL, AN, WO	
15292 Fine Arts/Art History, AL, AN, LO, WO	69560 Mechanical Engineering, AN	
16480 Liberal Arts, AL, AN, LO, MA, WO	69562 Mech. Engin./Computer Aided Design & Manufacturing, AN	
16486 Liberal Arts/International Studies, AL, AN, LO, MA, WO	69561 Mechanical Engin./Electro-Mechanical Techn., AN	
16482 Liberal Arts/Speech Communication, AL, AN, LO, MA, WO	61510 Medical Laboratory Technology, AN	
16485 Liberal Arts/Philosophy-Religion, AL, AN, WO	61520 Medical Record Technology, AN	
15551 Music/Entertainment, AL, AN, LO	61560 Nursing, AN	
15552 Music/Fine Arts, AL, AN, LO	62250 Office Admin. & Mgt., AL, AN, LO, MA, WO	
15553 Music/Liberal Arts, AL, AN, LO	62941 Office Systems Tech./Admin. Asst., AL, AN, LO, MA, WO	
15554 Music/Religion, AL, AN, LO	62942 Office Systems Tech./Exec. Sec., AL, AN, LO, MA, WO	
<b>Associate in Science:</b>		
16980 Art Education, AL, AN, LO, MA, WO	62944 Office Systems Tech./Word Proc., AL, AN, LO, MA, WO	
12130 Business Administration, AL, AN, LO, MA, WO	61800 Physical Therapist Assistant, AN	
12460 Computer Science, AL, AN, LO, MA, WO	64640 Police Science, AL, AN, WO	
16250 Education, AL, AN, LO, MA, WO	61720 Radiography, AN	
16251 Education/Industrial Education, AL, AN, LO, MA, WO	62720 Real Estate, AN, MA	
18310 Engineering, AL, AN	64600 Recreation & Parks, AN	
18311 Engineering/Electrical Engineering, AN	61810 Respiratory Therapy, AN	
16990 General Studies, AL, AN, LO, MA, WO	64700 Security Administration, AL, AN, WO	
18800 Science, AL, AN, LO, MA, WO	<b>Certificate:</b>	
<b>Associate in Applied Science:</b>		
62030 Accounting, AL, AN, LO, MA, WO	49030 Air Conditioning & Refrigeration, WO	
69040 Air Conditioning & Refrigeration, WO	49080 Automotive Body Reconditioning, AL, MA	
61880 Animal Science Technology, LO	49100 Automotive Diagnosis & Tune-Up, AL, MA	
69010 Architecture, AL, AN, MA	49840 Automotive Electrical Technician, AL	
69091 Automotive Technology/Diagnostician, AL, MA	49860 Automotive Machinist, AL	
69092 Automotive Technology/Mechanics, AL, MA	49830 Automotive Transmissions and Power Trains, AL	
69050 Aviation Technology, MA	42830 Aviation Technology/Flight Attendant, MA	
69051 Aviation Technology/Career Pilot, MA	4221A Career Studies/Occupational Safety Assistant, AL	
62120 Business Management, AL, AN, LO, MA, WO	4221B Career Studies/Cardiac Care Technician, AN	
69150 Civil Engineering, AL, AN	4221C Career Studies/Automotive Maint., and Tune-Up, AL	
69151 Civil Engineering/Land Surveying, AN	4221M Career Studies/Complete Dentures, AN	
65131 Commercial Art/Advertising Design, AL, LO	4221N Career Studies/Medical Office Assisting, AN	
65132 Commercial Art/Commercial Photography, AL, LO	4221L Career Studies/Phlebotomy, AN	
65133 Commercial Art/Illustration, AL, LO	4221K Career Studies/Physical Security, AL	
62340 Computer Information Systems, AL, AN, LO, MA, WO	4221D Career Studies/Recreational Vehicle/Marine Mech., AL	
69170 Construction Management Technology, AL, MA	4221E Career Studies/Recreational Vehicle/Motorcycle Mech., AL	
64620 Corrections Science, AL, AN, WO	4221F Career Studies/Planning, AL	
61180 Dental Hygiene, AN	4221I Career Studies/Technical Illustration, AL	
61170 Dental Laboratory Technology, AN	4221J Career Studies/Turf & Grounds Management, LO	
61190 Dietetic Technician, AN	4221G Career Studies/Welding, WO	
61191 Dietetic Technician/Nutritional Care, AN	4221H Career Studies/Woodworking, WO	
66281 Educational Assoc./Early Childhood Ed. Dev., AL	49180 Construction Inspection, AL, MA	
69810 Electronics, AN, WO	44610 Corrections Science, AL, AN, WO	
61460 Emergency Medical Services Technology, AN	41160 Dietary Manager, AN	
64271 Fire Science/Administration, AL, AN	44810 Drug Abuse Rehabilitation Counselor, AL	
64272 Fire Science/Investigation, AL, AN	46320 Early Childhood Development Assistant, AL	
64273 Fire Science/Management, AL, AN	46330 Early Childhood Education/Child Home Care (Nanny), AL	
64274 Fire Science/Transfer, AL, AN	49250 Electronics Technician, AN, WO	
63351 Horticulture Tech./Floriculture, LO	41450 Emergency Med. Serv. Technology, AN	
63352 Horticulture Tech./Landscape Grower, LO	49220 Engineering Drafting, AL, AN, MA	
62351 Hotel, Rest. & Instit. Mgt./Food Service Mgt., AN	44280 Fire Science, AL, AN	
62352 Hotel, Rest. & Instit. Mgt./Hotel-Motel Mgt., AN	42410 Hotel, Rest. & Inst. Mgt./Food Serv. Mgt., AN	
64801 Human Services Assoc./Alcohol Rehabilitation, AL	42400 Hotel, Rest. & Inst. Mgt./Hotel-Motel Mgt., AN	
64802 Human Services Assoc./Gerontology, AL	42430 Hotel, Rest. & Inst. Mgt./Travel & Tourism, AN	
64803 Human Services Assoc./Mental Health, AL	49520 Machine Tool Operation, AN	
64804 Human Services Assoc./Social & Community Serv., AL	45560 Music Recording Technology, LO	
64805 Human Services Assoc./Transfer, AL	42180 Office Systems Technology, AL, AN, LO, MA, WO	
65200 Interior Design, LO	44630 Police Science, AL, AN, WO	
62600 Legal Assisting, AL	42730 Real Estate, AN, MA	
	44990 Safety Technician, AL	
	42320 Small Business Management, AL, AN, MA, WO	
	49950 Welding, MA	

Alexandria: AL      Annandale: AN      Loudoun: LO      Manassas: MA      Woodbridge: WO



# Application for Virginia In-State Tuition Rates

This form should be completed if you are claiming entitlement to Virginia in-state tuition rates pursuant to section 23-7.4, Code of Virginia. All questions must be answered. Section A must be completed by the applicant. Section B of this form must be completed by the parent or legal guardian if the applicant is under the age of 19 and is not married or if the applicant is a dependent. Supporting documents and additional information may be requested.

## Section A - APPLICANT

1. Name \_\_\_\_\_

2. Social Security No. \_\_\_\_\_ 3. Date of Birth \_\_\_\_\_  
(Requested) (mo/day/yr)

4. Citizenship  U.S.  Non-U.S. If Non-U.S., Give Visa Type \_\_\_\_\_

5. How long have you lived in Virginia? \_\_\_\_\_

6. Where have you lived for the past two years? List current address first:  
From (mo/yr) To (mo/yr) Street Address City State Zip  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. Do your parents or legal guardian provide over half of your financial support or claim you as a tax dependent? If yes, Section B must also be completed by parent or legal guardian?	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
8. Will you have filed a tax return or paid income taxes to any state other than Virginia during the past year?	<input type="checkbox"/>	<input type="checkbox"/>
9. For at least one year prior to the term in which you will enroll, will you have		
a. filed a tax return or paid income taxes to Virginia on all earned income?	<input type="checkbox"/>	<input type="checkbox"/>
b. been a registered voter in Virginia?	<input type="checkbox"/>	<input type="checkbox"/>
c. held a valid Virginia driver's license?	<input type="checkbox"/>	<input type="checkbox"/>
10. Do you own or operate a motor vehicle? If yes, has it been registered in any state other than Virginia during the past year?	<input type="checkbox"/>	<input type="checkbox"/>
11. Are you or any member of your immediate family presently in the military? <b>IF NO, GO TO QUESTION 12.</b> If yes, check: <input type="checkbox"/> self <input type="checkbox"/> spouse <input type="checkbox"/> parent/legal guardian	<input type="checkbox"/>	<input type="checkbox"/>
a. Will Virginia income taxes have been paid on all military income for one year prior to the term in which you will enroll?	<input type="checkbox"/>	<input type="checkbox"/>
b. If your spouse is in the military, will you have resided in Virginia, been employed, earned at least \$6,700, and paid income taxes to Virginia for at least one year prior to the term in which you will enroll?	<input type="checkbox"/>	<input type="checkbox"/>
12. Answer this question only if you live outside Virginia but work in Virginia: Will you have lived outside Virginia, worked in Virginia, earned at least \$6,700, and paid Virginia income taxes on all taxable income earned in this Commonwealth for at least one year prior to the term in which you will enroll?	<input type="checkbox"/>	<input type="checkbox"/>

## Section B - PARENT OR LEGAL GUARDIAN

1. Name of parent or legal guardian \_\_\_\_\_

2. Relationship to applicant \_\_\_\_\_

3. Citizenship  U.S.  Non-U.S. If Non-U.S., Give Visa Type \_\_\_\_\_

4. How long have you lived in Virginia? \_\_\_\_\_

5. Where have you lived for the past two years? List current address first:  
From (mo/yr) To (mo/yr) Street Address City State Zip  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. Will you have filed a tax return or paid income taxes to any state other than Virginia during the past year?	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
7. Will you have claimed the applicant as a dependent on your federal and Virginia income tax returns for the tax year prior to the term in which the applicant will enroll?	<input type="checkbox"/>	<input type="checkbox"/>
8. Will you have provided over half of the applicant's financial support for at least one year prior to the term in which the applicant will enroll?	<input type="checkbox"/>	<input type="checkbox"/>
9. For at least one year prior to the term in which the applicant will enroll, will you have		
a. filed a tax return or paid income taxes to Virginia on all earned income?	<input type="checkbox"/>	<input type="checkbox"/>
b. been a registered voter in Virginia?	<input type="checkbox"/>	<input type="checkbox"/>
c. held a valid Virginia driver's license?	<input type="checkbox"/>	<input type="checkbox"/>
10. Do you own or operate a motor vehicle? If yes, has it been registered in any state other than Virginia during the past year?	<input type="checkbox"/>	<input type="checkbox"/>
11. Are you or any member of your immediate family presently in the military? <b>IF NO, GO TO QUESTION 12.</b> If yes, check: <input type="checkbox"/> self <input type="checkbox"/> spouse <input type="checkbox"/> parent/legal guardian	<input type="checkbox"/>	<input type="checkbox"/>
a. Will Virginia income taxes have been paid on all military income for one year prior to the term in which the applicant will enroll?	<input type="checkbox"/>	<input type="checkbox"/>
b. If the answer to (a) is NO, will the applicant's non-military parent have resided in Virginia, been employed, earned at least \$6,700, paid Virginia income taxes and claimed the applicant as a dependent for federal and Virginia income tax purposes for at least one year prior to the term in which the applicant will enroll?	<input type="checkbox"/>	<input type="checkbox"/>

12. Answer this question only if you or your spouse live outside Virginia but work in Virginia:

a. Will you or your spouse have lived outside Virginia, been employed in Virginia, earned at least \$6,700, and paid Virginia income taxes on all taxable income earned in this Commonwealth for at least one year prior to the term in which the applicant will enroll?	<input type="checkbox"/>	<input type="checkbox"/>
b. If the answer to (a) is YES, will the parent employed in Virginia have claimed the applicant as a dependent for federal and Virginia income tax purposes for at least one year prior to the term in which the applicant will enroll?	<input type="checkbox"/>	<input type="checkbox"/>

I certify under penalty of disciplinary action that the information I have provided is true.

\_\_\_\_\_  
Signature of Applicant Date

<b>FOR OFFICE USE ONLY</b>	
<input type="checkbox"/> Approved	<input type="checkbox"/> Disapproved
_____ Signature	_____ Date

I certify that all the information provided is true.

\_\_\_\_\_  
Signature of Parent or Legal Guardian Date





*The Honorable Vivian E. Watts, 1986 Commencement Speaker and Dr. Richard J. Ernst, College President*

## PRESIDENT OF THE COLLEGE

Richard J. Ernst

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*Secretary to the State Board*

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## Administrative Offices

Brault Building

4001 Wakefield Chapel Road

Annandale, Virginia 22003

Telephone: (703) 323-3000

## Alexandria Campus

3001 North Beauregard Street

Alexandria, Virginia 22311

Telephone: (703) 845-6200

## Annandale Campus

8333 Little River Turnpike

Annandale, Virginia 22003

Telephone: (703) 323-3000

## Loudoun Campus

1000 Harry Flood Byrd Highway

Sterling, Virginia 22170

Telephone: (703) 450-2500

## Manassas Campus

6901 Sudley Road

Manassas, Virginia 22110

Telephone: (703) 368-0184

## Woodbridge Campus

17200 Neabsco Mills Road

Woodbridge, Virginia 22191

Telephone: (703) 670-2191

## Extended Learning Institute

(Mailing Address)

8333 Little River Turnpike

Annandale, Virginia 22003

Telephone: (703) 323-3368

For those who live in the Metropolitan area, where Loudoun, Manassas, or Woodbridge may be a long distance call, a Metro number is provided—323-3000. Ask for the campus and extension.

Loudoun	ext. 500
Manassas	ext. 216
Woodbridge	ext. 212

For application information by mail:  
Contact the campus of your choice.

It is the policy of the Virginia Community College System to maintain and promote equal employment and educational opportunity without regard to race, color, sex or age (except where sex or age is a bona fide occupational qualification), religion, handicap, national origin, or other non-discriminatory factors.

The mission of the Virginia Community College System is to function within the total educational community, in those areas assigned to it by law, to assure that all individuals in the Commonwealth of Virginia are given a continuing, lifelong opportunity for the development and extension of their skills and knowledge.

# COLLEGE CALENDAR

## Fall Quarter 1987

August							September							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	
						1				1	2	3	4	5
2	3	4	5	6	7	8	6	7	8	9	10	11	12	
9	10	11	12	13	14	15	13	14	15	16	17	18	19	
16	17	18	19	20	21	22	20	21	22	23	24	25	26	
23	24	25	26	27	28	29	27	28	29	30				
30	31													

October							November						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2	3	1	2	3	4	5	6	7
4	5	6	7	8	9	10	8	9	10	11	12	13	14
11	12	13	14	15	16	17	15	16	17	18	19	20	21
18	19	20	21	22	23	24	22	23	24	25	26	27	28
25	26	27	28	29	30	31	29	30					

December							
S	M	T	W	T	F	S	
			1	2	3	4	5
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	
27	28	29	30	31			

Registration Begins ..... August 17  
 Registration Ends ..... September 28  
 Classes Begin ..... September 30  
 Last Day to Apply for Graduation ..... October 9  
 Last Day to Withdraw Without Grade Penalty ..... November 10  
 Holiday for Students (Faculty In-Service Day) ..... November 25  
 Thanksgiving Recess ..... November 26-29  
 Classes and Examinations End ..... December 18

## Winter Quarter 1988

November							December							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	
1	2	3	4	5	6	7				1	2	3	4	5
8	9	10	11	12	13	14	6	7	8	9	10	11	12	
15	16	17	18	19	20	21	13	14	15	16	17	18	19	
22	23	24	25	26	27	28	20	21	22	23	24	25	26	
29	30						27	28	29	30	31			

January							February						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2		1	2	3	4	5	6	
3	4	5	6	7	8	9	7	8	9	10	11	12	13
10	11	12	13	14	15	16	14	15	16	17	18	19	20
17	18	19	20	21	22	23	21	22	23	24	25	26	27
24	25	26	27	28	29	30	28	29					
31													

March							
S	M	T	W	T	F	S	
			1	2	3	4	5
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	
27	28	29	30	31			

Registration Begins ..... November 23, 1987  
 Registration Ends ..... January 9  
 Classes Begin ..... January 11  
 Last Day to Apply for Graduation ..... January 22  
 Martin Luther King's Birthday Holiday ..... January 18  
 Last Day to Withdraw Without Grade Penalty ..... February 19  
 Classes and Examinations End ..... March 25

## Spring Quarter 1988

March							April							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	
			1	2	3	4	5							
6	7	8	9	10	11	12	3	4	5	6	7	8	9	
13	14	15	16	17	18	19	10	11	12	13	14	15	16	
20	21	22	23	24	25	26	17	18	19	20	21	22	23	
27	28	29	30	31			24	25	26	27	28	29	30	

May							June						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	7	1	2	3	4			
8	9	10	11	12	13	14	5	6	7	8	9	10	11
15	16	17	18	19	20	21	12	13	14	15	16	17	18
22	23	24	25	26	27	28	19	20	21	22	23	24	25
29	30	31					26	27	28	29	30		

Registration Begins ..... March 1  
 Registration Ends ..... March 29  
 Classes Begin ..... March 31  
 Last Day to Apply for Graduation ..... April 8  
 Last Day to Withdraw Without Grade Penalty ..... May 11  
 Memorial Day Holiday ..... May 30  
 Classes and Examinations End ..... June 15  
 Commencement ..... June 17

## Summer Term 1988 (Semester Calendar)

June							July						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
			1	2	3	4							
5	6	7	8	9	10	11	3	4	5	6	7	8	9
12	13	14	15	16	17	18	10	11	12	13	14	15	16
19	20	21	22	23	24	25	17	18	19	20	21	22	23
26	27	28	29	30			24	25	26	27	28	29	30
							31						

Semester Calendar Begins  
 Consult the 1988-89 *Catalog*  
 for Semester Curricula and Courses  
 Classes Begin ..... June 20  
 Classes and Examinations End ..... August 15



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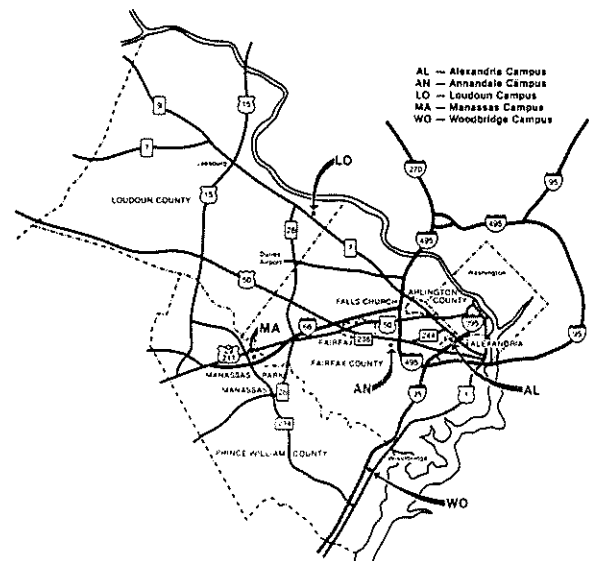
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**A Multi-Campus Institution**

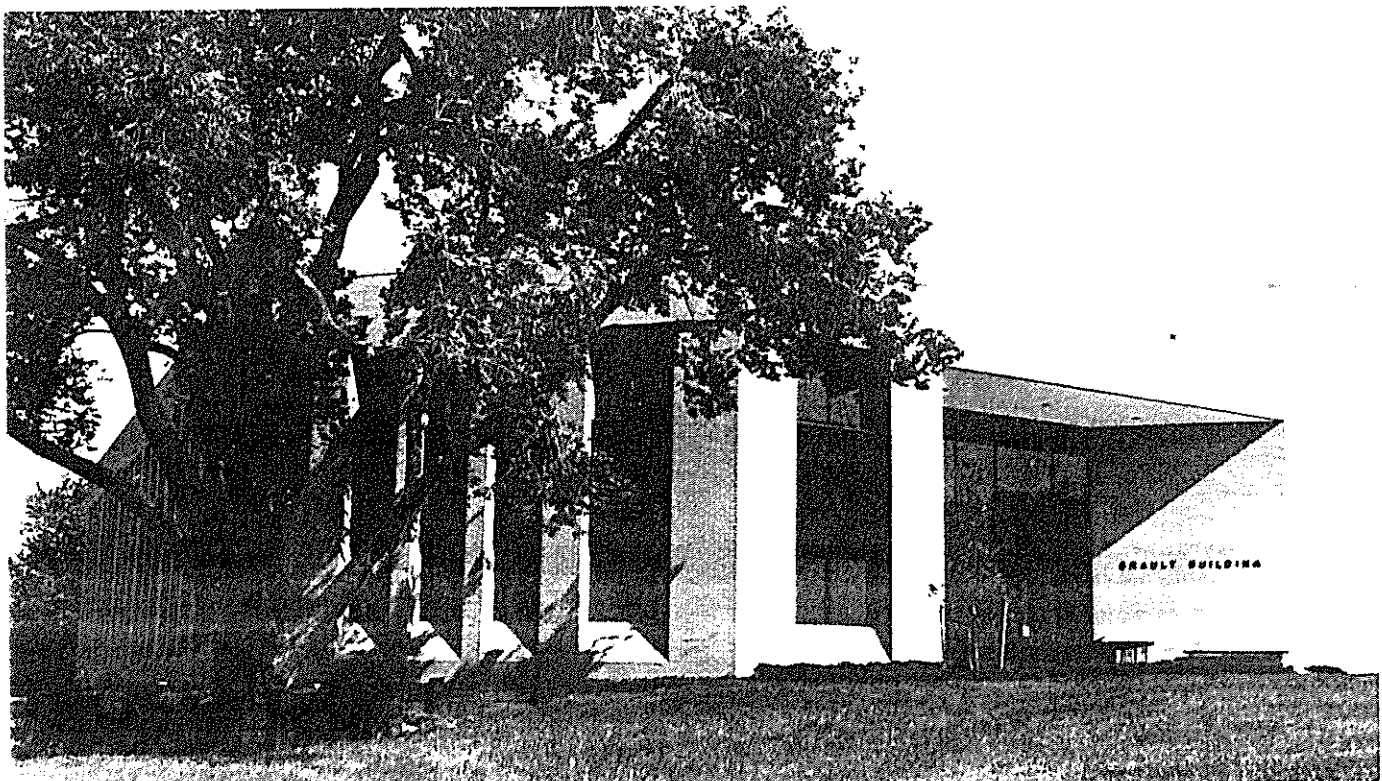
- A— Alexandria Campus—3001 North Beauregard Street, Alexandria; 51.4 acres.
- N— Annandale Campus—8333 Little River Turnpike, Annandale; 76.4 acres; one mile west of Interstate Route 495 on Route 236.
- L— Loudoun Campus—1000 Harry Flood Byrd Highway, Sterling; 91.4 acres, on Route 7 at State Route 637, midway between Tysons Corner and Leesburg.
- M— Manassas Campus—6901 Sudley Road, Manassas; 100.4 acres, on Route 234 between Interstate Route 66 and Route 29/211.
- W— Woodbridge Campus—15200 Neabsco Mills Road, Woodbridge; 109 acres, adjacent to Interstate Route 95 at State Route 642 in Prince William County.



The Brault Building, 4001 Wakefield Chapel Road, is located on the northwest corner of the Annandale Campus at the intersection of Wakefield Chapel Road and Little River Turnpike (Route 236). College staff are housed in this facility, as well as in other locations on the Annandale Campus and off campus.

College Staff	Room	Telephone
President Dr. Richard J. Ernst	CH305	323-3101 /3102
Dean, Academic and Student Services Dr. Max L. Bassett	CH310	323-3195
Dean, Financial and Administrative Services Cecil W. Shuler	CH305	323-3122
Associate Dean, Curriculum Services Dr. Barbara A. Wyles	CH310	323-3198
Associate Dean, Instructional Technologies and Extended Learning Dr. Frank G. Nelson	ELI200	323-3371
Associate Dean, Planning and Management Services Dr. Frank H. Friedman	CH316-D	323-3273
Director, Budget Gail L. Heasley	CH214	323-3125
Director, Center for Business and Government Services Dianne S. Long	CH307	323-4293
Director, College Relations and Development M. Charlotte Wilhelmi	CH312	323-3753
Director, Computing and Information Systems Richard W. Bratcher	CT228	323-3278

Director, Facilities Planning, Development and Services Dr. William B. Mckinney	CW307	323-3120
Director, Fiscal and Support Services Michelle Hannahs	CH214	323-3125
Director, Personnel Services John L. Kennedy	CH203	323-3361
Executive Director, NVCC Educational Foundation, Inc. Elizabeth A. Murphy	CH312	323-3023
Coordinator, Affirmative Action and Grants Development Pamela G. Arrington	CH210	323-3266
Coordinator, Information Systems Development Anne H. Anderson	CT228	323-3106
Coordinator, Institutional Research Dr. Henry M. Doan	CH316-B	323-3129
Coordinator, Instructional Development Dr. C. Edward Cavert	ELI	323-3350
Coordinator, Instructional Services Dr. Steven G. Sachs	ELI	323-3379
Coordinator, Media Processing Services Sandra J. Beeson	CG112	323-3096
Coordinator, Public Relations James L. Bradley, III	CH210	323-3196
Coordinator, Student Aid and Benefits Marie A. Bennett	CH310	323-3199
College Registrar Michael A. Di Salvo	CG102	323-3499

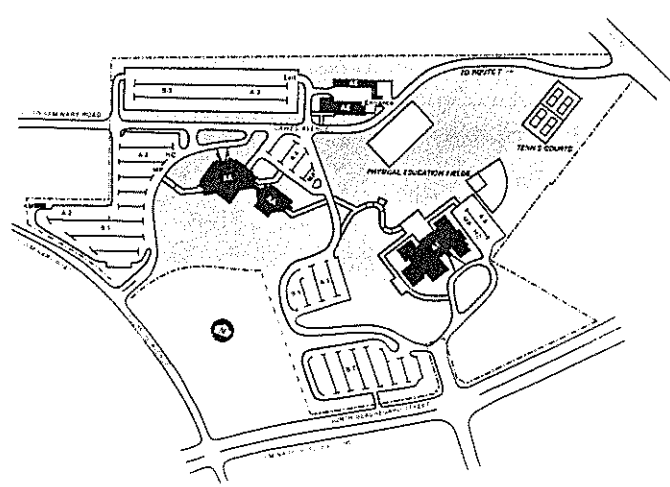
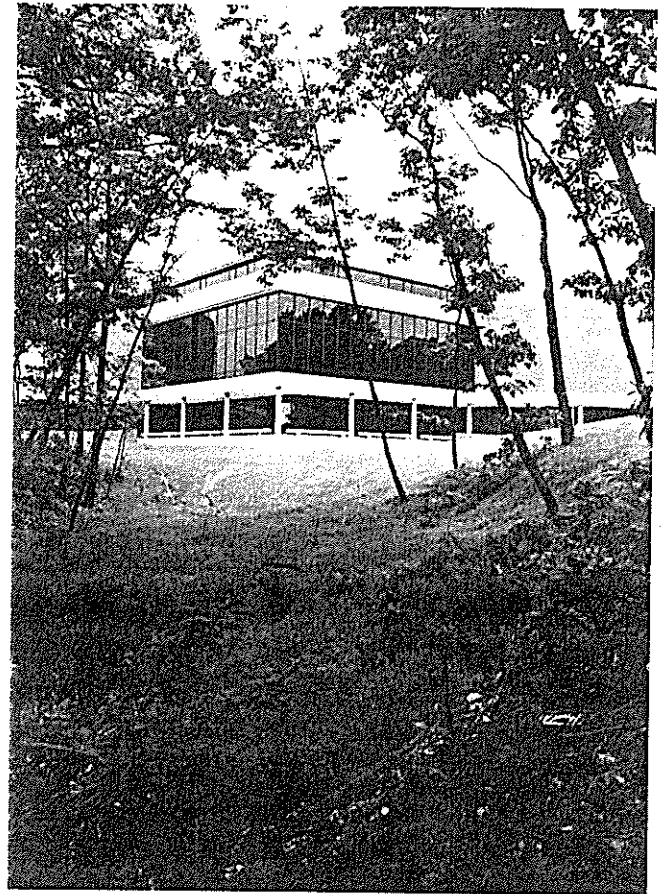


# Alexandria Campus

The Alexandria campus is located at 3001 North Beauregard Street on a 51.4 acre site, just off Interstate Route 395 and Route 7. A major addition to the main building and an engineering building were completed for the fall of 1980. The John Tyler School was purchased from the City of Alexandria in 1980. The campus also maintains classrooms in leased, temporary facilities at other off-campus locations.

- A — Staff/Faculty Parking
- AA — Donald L. Bisdorf Building
- AE — Engineering Building
- AM — Maintenance Building
- AT — Tyler Building
- B — Student Parking
- MP — Motorcycle Parking
- O — Official (State Vehicle) Parking
- SH — Severely Handicapped Parking
- V — Visitor Parking

Campus Staff	Room	Telephone
Provost		
Dr. Jean C. Netherton	AA210	845-6222
Dean of Student Development		
Dr. John H. Popeck	AA216	845-6219
Chairman, Division of Automotive, Engineering and Public Services Technologies		
Dr. Craig S. Washington	AE209	845-6263
Chairman, Division of Business		
Fay R. Avery	AA373	845-6314
Chairman, Division of Humanities		
Dr. Elaine C. Niner	AA263	845-6206
Chairman, Division of Natural Sciences and Mathematics		
Dr. J. Clarence Sasscer	AA363	845-6341
Chairman, Division of Social Sciences		
Dr. Elizabeth L. Johns	AA273	845-6214
Chairman, Division of Visual and Performing Arts		
Dr. Rudolph J. Fiorillo	AT232	845-6244
Admissions and Records		
Suzanne H. Fuller	AA220	845-6217
Bookstore		
Virginia Durbeck	AT144	845-6221
Business Office		
James B. Trent	AA225	845-6281
Community Services		
Rebecca W. Gates	AA106	845-6280
Continuing Education		
Dr. Nancy McNamara	AA239	845-6212
Cooperative Education		
Patricia A. Rheams	AA366	845-6354
Counseling Services		
Dr. Fred J. Hecklinger	AA232	845-6301
Financial Aid		
Dr. Chalmers Archer, Jr.	AA170	845-6350
Job Counseling Services		
Bernadette M. Curtin	AA232	845-6245
Learning Resource Center		
Dr. Gloria P. Terwilliger	AA318	845-6254
Learning Laboratory	AA344	845-6215
Library	AA232	845-6231
Public Information Officer		
Mary Ann Strawn	AA215	845-6348
Security		
Clifford H. Shelley	AA225	845-6270
Student Activities		
Amy D. Goss	AT241	845-6207
Student Health Service		
Lois M. Carroll, R.N.	AA115	845-6208



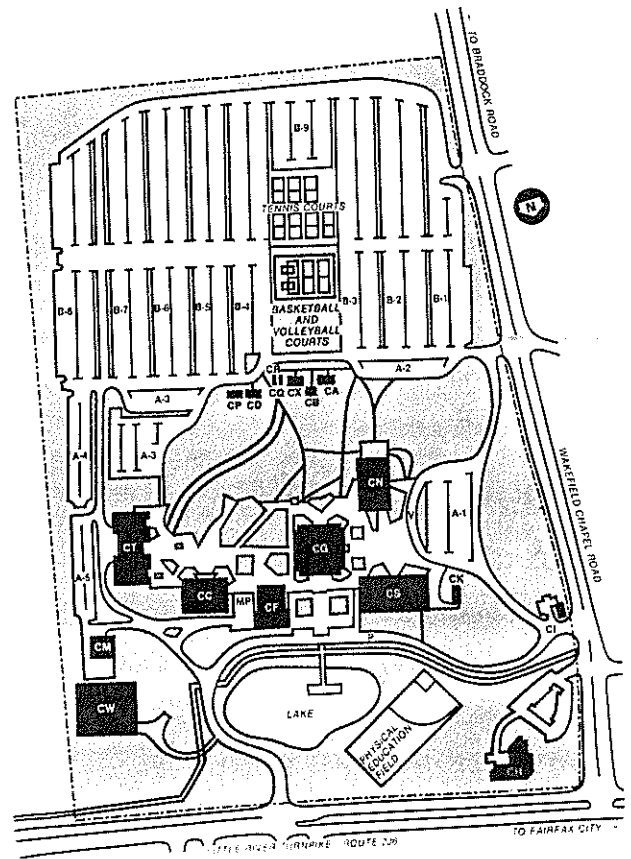
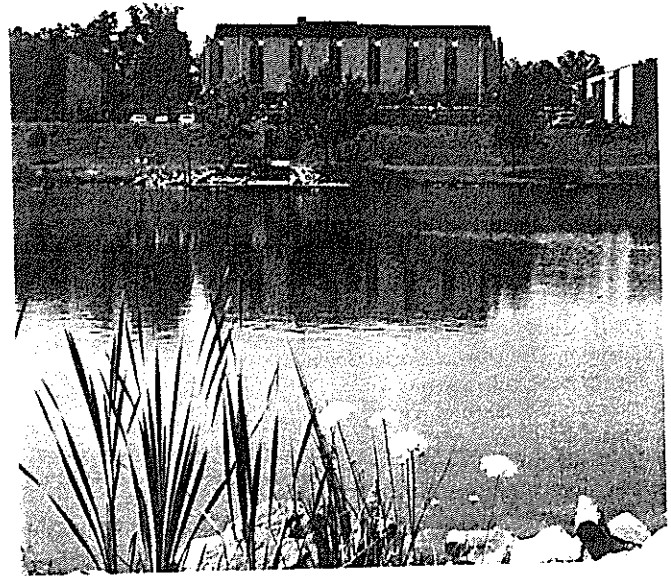


# Annandale Campus

The Annandale campus is located at 8333 Little River Turnpike on a 76.4 acre site in central Fairfax County, one mile west of the Capital Beltway, Interstate Route 495, on Route 236. This campus has the College Services Building, a Classroom Building, Science Building, Library Building, TV/Technical Building, Nursing Building, temporary Music Buildings, temporary EMDT Buildings, and three temporary faculty office buildings.

- A — Faculty Parking
- B — Student Parking
- CA — Temporary Building A
- CB — Temporary Building B
- CC — Classroom Building
- CD — Temporary Music Building D
- CF — Food Services Building
- CG — Godwin Building
- CH — College Services Building
- CI — Security and Information Building
- CK — Greenhouse
- CM — Maintenance Building
- CN — Nursing Building
- CP — Parcos Building
- CQ — EMDT Trailer
- CR — Radiographic Trailer
- CS — Science Building
- CT — TV—Tech Building
- CW — Warehouse
- CX — Temporary Building C
- MP — Motorcycle Parking
- P — Open Parking—Right Hand Side of Road
- V — Visitor Parking—30 Minutes

Campus Staff	Room	Telephone
Provost		
Dr. Barbara D. Holmes	CG214	323-3222
Dean of Student Development		
Dr. Elizabeth S. Grizzard	CG205A	323-3382
Chairman, Division of Business		
Mr. William C. Hill	CC223A	323-3157
Chairman, Division of Communications and Humanities		
Dr. Jonathan A. Yoder	CC103F	323-3189
Chairman, Division of Engineering Technologies		
Dr. Josef R. Horowitz	CT305B	323-3109
Chairman, Division of Health Technologies		
Dr. Robert M. Gertz	CN214D	323-3426
Chairman, Division of Natural Sciences and Mathematics		
Mr. George E. Taylor	CS122A	323-3228
Chairman, Division of Social Sciences and Public Services		
Dr. John F. Burgess, Jr.	CS203	323-3260
Admissions and Records		
Lang W. Fields, Jr.	CG211C	323-3400
Bookstore		
John Gnall	CG124	323-3185
Business Office		
Bob Roark	CG204A	323-3131
Community Services		
Diane Harris	CG203A	323-3168
Continuing Education		
William B. McCampbell	CG203	323-3159
Cooperative Education		
Martha E. Kossoff	CG203	323-3146
Counseling Services		
Dr. Fred H. Billups	CG216I	323-3200
Financial Aid		
Jane Z. Mazzola	CG206	323-3427
Job Counseling Services		
Wyatt McGinnis, Jr.	CG206	323-3144
Learning Resource Center		
Dr. Lois H. Smith	CG302A	323-3216
Learning Laboratory	CG407	323-3221
Library	CG300	323-3128
Public Information Officer		
Sallie S. Burch	CG411	323-3288
Security		
Roger C. Simond	CI103	323-3111
Student Activities		
Terry A. Johnson	CG103	323-3147
Student Health Service		
Judith E. Molseed, R.N.	CG214K	323-3219

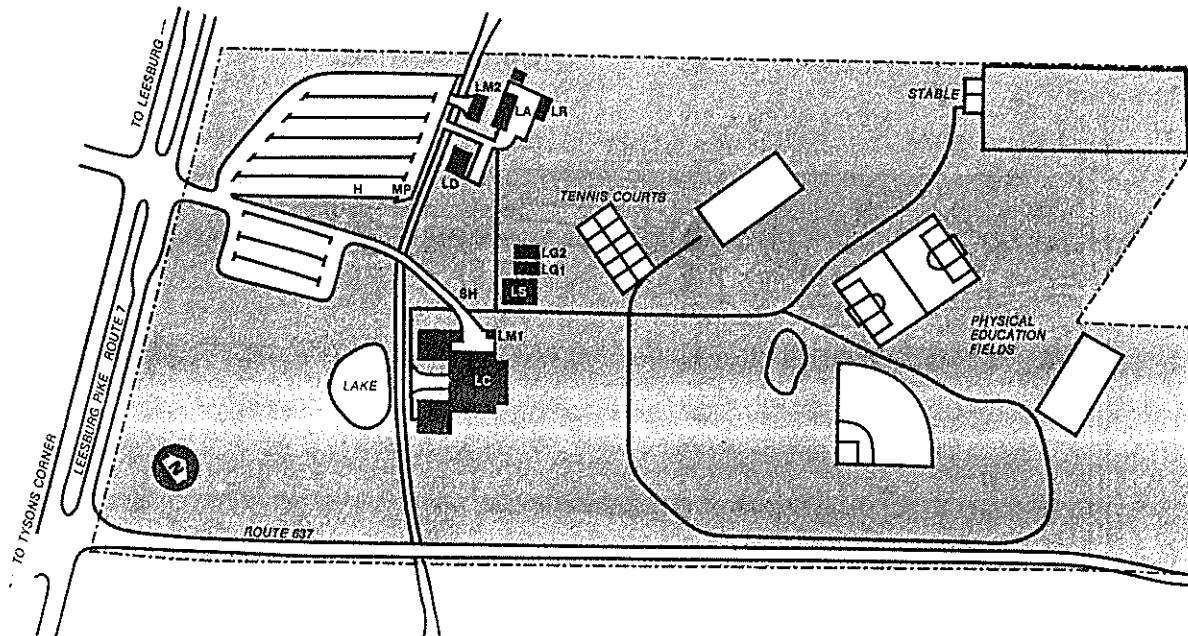


# Loudoun Campus

The Loudoun campus is located at 1000 Harry Flood Byrd Highway at Sterling on a 91.4 acre site at the intersection of Route 7 and State Route 637 in Loudoun County. There are four permanent buildings, plus a temporary Interior Design Building and greenhouse/laboratories. The Loudoun campus also supplements limited on-campus space with off-campus rentals for off-campus instruction.

- A — Faculty Parking
- B — Student Parking
- H — Handicapped Parking
- LA — Animal Science Building
- LC — Classroom and Administrative Building
- LD — Temporary Interior Design Building
- LG1 — Greenhouse 1
- LG2 — Greenhouse 2
- LMI — Volatile Storage Building
- LM2 — Maintenance Building
- LR — Dog Runs
- LS — Natural Science Building
- MP — Motorcycle Parking
- SH — Severely Handicapped Parking

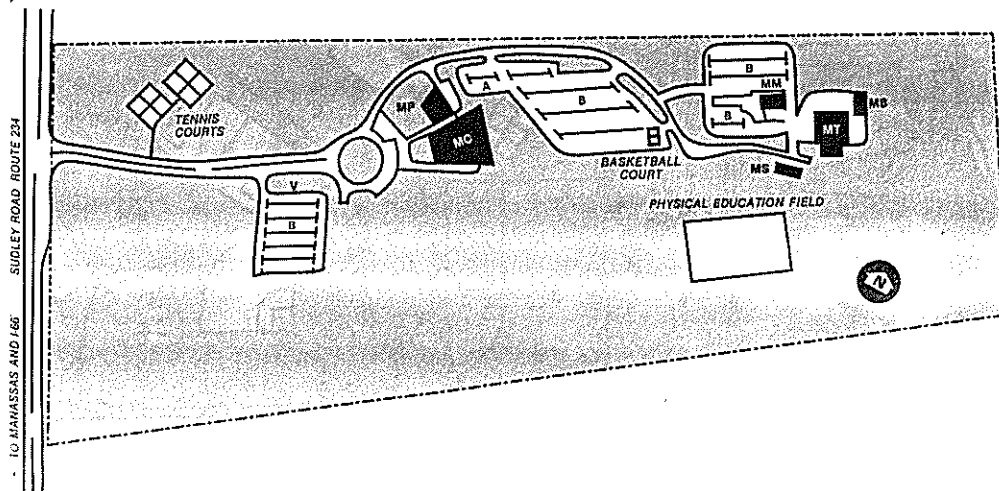
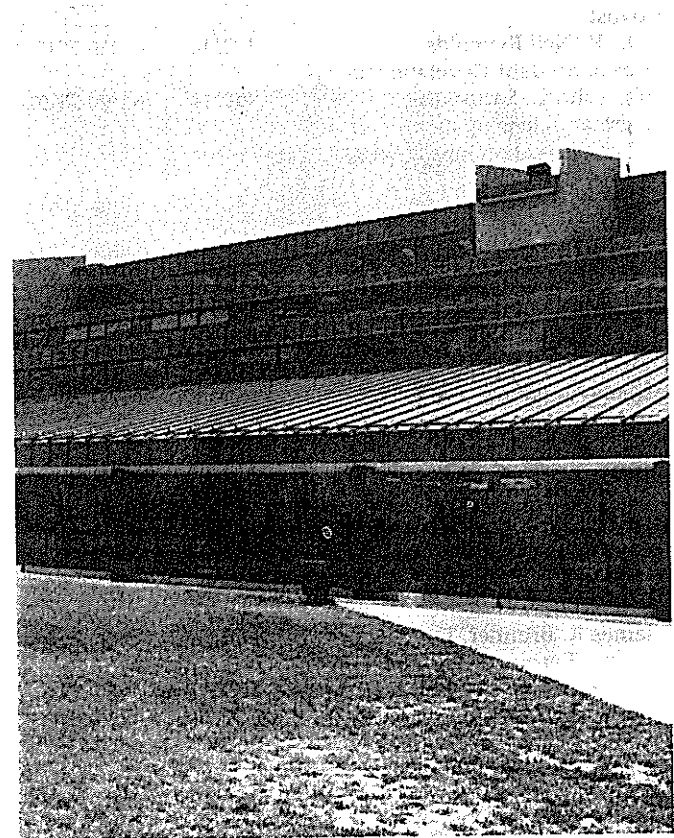
Campus Staff	Room	Telephone
Provost		
Dr. R. Neil Reynolds	LC214	450-2517
Dean of Student Development		
Dr. John C. Sartorius	LC214	450-2512
Chairman, Division of Communication and Human Studies		
Dee Wayne White		450-2527
Chairman, Division of Natural and Applied Sciences		
Dr. Nancy C. Aiello	LO303	450-2575
Admissions and Records		
Barbara B. Lowe	LC220	450-2501
Bookstore		
Maureen Farrar	LC111	450-2589
Business Office		
Robert M. Thompson	LC222	450-2562
Continuing Education		
Betty J. Beyer	LC214A	450-2551
Cooperative Education		
Shirley C. Coles	LC220D	450-2506
Counseling Services	LC216	450-2571
Financial Aid and Job Counseling	LC220	450-2537
James R. Brunner, Jr.	LC220H	450-2537
Learning Resource Center		
Dr. Bernadine C. Thomas	LC217B	450-2566
Learning Laboratory	LC217A	450-2508
Library	LC217	450-2567
Public Information Officer		
Christine Hofmeister	LC218	450-2555
Security		
William D. Collins	LC222	450-2540
Student Activities		
Lloyd L. Wells	LC216E	450-2571
Student Health Service		
Isabel McMahon, R.N.	LC112	450-2541



The Manassas campus is located in western Prince William County on a 100.4 acre site at 6901 Sudley Road. The campus is just north of Interstate Route 66 on State Route 234. In addition to the main building, a power technology building provides laboratories for highly specialized programs. There is also a permanent maintenance building and a temporary Art Laboratory Building. Off-campus instruction is offered at several locations including a local high school.

- A — Faculty Parking
- B — Student Parking
- MB — Paint Spray Building
- MC — Classroom and Administration Building
- MM — Maintenance Building
- MP — Central Plant
- MS — Temporary Art Studio A
- MT — Power Tech Building
- V — Visitor Parking

Campus Staff	Room	Telephone
Campus Telephone	Metro (703)	323-3000 368-0184
Provost		
Dr. Wilfred B. Howsmon, Jr.	MC317	ext. 220
Dean of Student Development		
Dr. Calvin E. Woodland	MC318	ext. 244
Chairman, Division of Communications and Human Studies		
Dr. Arnold J. Bradford	MC404	ext. 237
Chairman, Division of Natural and Applied Sciences		
Marilou S. Giacofci	MC404	ext. 236
Admissions and Records		
Donna M. Vandevender	MC321	ext. 239, 216
Bookstore		
Virginia Smith	MC131	ext. 241
Business Office		
Nancy V. Wyatt	MC328	ext. 238, 215
Continuing Education		
M'Kean M. Tredway	MC330	ext. 242 231
Cooperative Education		
Dr. Verna M. Smith	MC330	ext. 265
Counseling Services	MC404	ext. 218
Financial Aid		
Guy Gibbs	MC129	ext. 233
Learning Resource Center		
Cathy E. Sabol	MC101	ext. 245
Learning Laboratory	MC102	ext. 228
Library	MC101	ext. 222
Public Information Officer		
Vicki Simons	MC330	ext. 214
Security		
Candido Alicia	MC322	ext. 234
Student Activities	MC119	ext. 246
Student Health Service		
Lois M. Carroll, R.N.	MC124	ext. 219



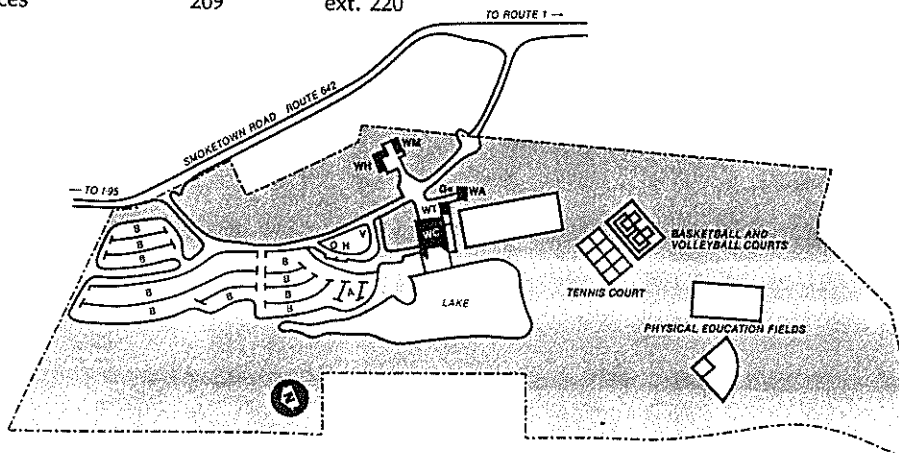
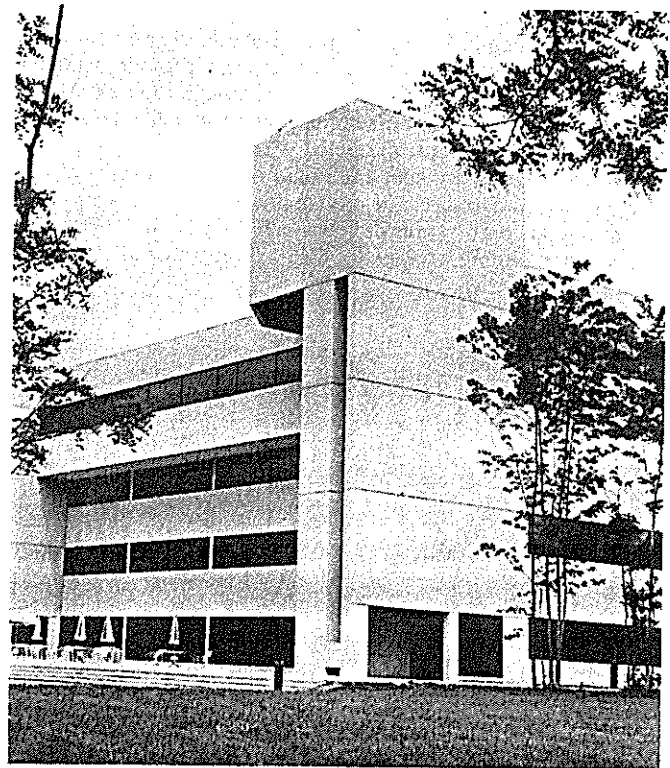


# Woodbridge Campus

The Woodbridge campus is adjacent to Interstate Route 95 on State Route 642 on a 109 acre site in Prince William County. There are two permanent buildings and two temporary buildings at 15200 Neabsco Mills Road. There is a main building and the newly constructed Heating, Ventilation and Air Conditioning building, plus a temporary photography and design building, and a temporary laboratory and classroom building.

- A — Faculty Parking
- B — Student Parking
- G — Greenhouse
- H — Handicapped Parking
- O — Official Parking
- V — Visitor Parking
- WA — Temporary Photo Lab Building A
- WC — Classroom and Administrative Building
- WH — HVAC Lab Building
- WM — Maintenance Building
- WT — HVAC Trailer

Campus Staff	Room	Telephone
Campus Telephone	Metro (703)	323-3000 670-2191
Provost		
Dr. Lionel B. Sylvas	210	ext. 254
Dean of Student Development		
Dr. Thomas R. Niles, II	203	ext. 220
Chairman, Division of Business and Social Science		
Dr. Mary B. NeSmith	314	ext. 255
Chairman, Division of Communications and Humanities		
Dr. Donald H. Frantz, Jr.	330	ext. 256
Chairman, Division of Environmental and Natural Sciences		
Dr. Alan R. Clarke	233	ext. 252
Admissions and Records		
Carolyn A. Fortune	217	ext. 212
Bookstore		
Gail Pender	115	ext. 258
Sylvia Knehans		
Business Office		
Edward K. Yellman	215	ext. 215
Continuing Education		
Dr. James A. Mustachio	230	ext. 242
Cooperative Education		
Thomas L. Henry	124	ext. 219
Counseling Services	221	ext. 218
Financial Aid		
Thomas F. Musso	424	ext. 250
Job Counseling Services		
Janet K. Vitalis	221	ext. 218
Learning Resource Center		
Dr. Gordon M. Cook	409	ext. 217
Learning Laboratory	419	ext. 217
Library	402	ext. 217
Public Information Officer		
Linda Coates	253	ext. 234
Security		
Irvin H. Duncan	229	ext. 231
Student Activities		
Ervinia H. Miller	221	ext. 218
Student Health Services	209	ext. 220



The Extended Learning Institute (ELI) provides courses for those who prefer not to attend regular classes on campus. You may be eager to learn, but find it difficult or impossible to attend regular classes when they are scheduled. Instruction for ELI courses utilizes television and radio programs, audio and video cassette tapes, and printed materials designed especially for independent study.

Most ELI courses are self-paced. The maximum time allowed for completing most ELI courses is usually twice as long as for on-campus courses. Even when lectures are on television or radio, you may decide how much time you will take to complete other course requirements within certain time limits.

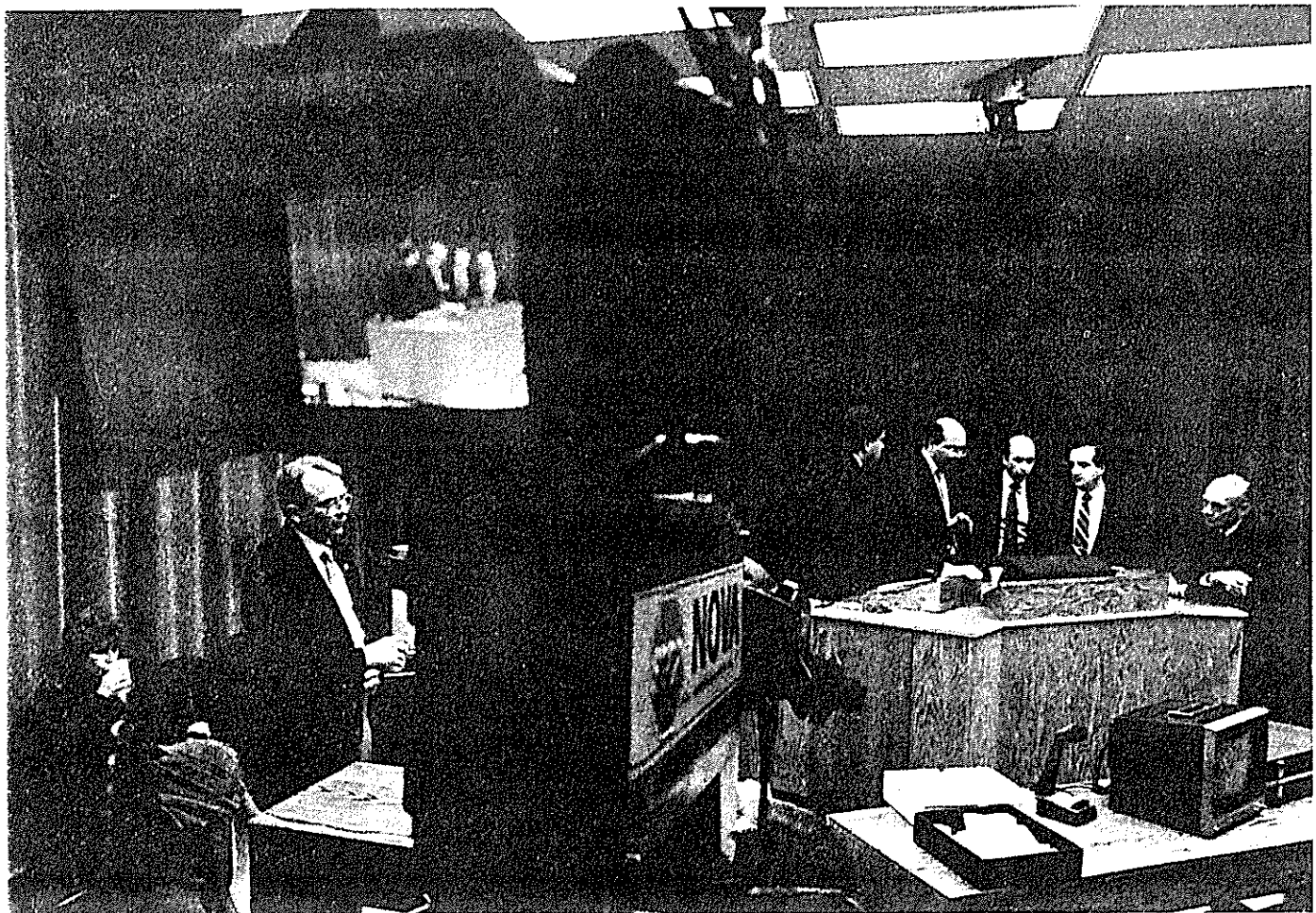
When taking an ELI course, you are not entirely on your own. Faculty members assigned to each course provide valuable assistance by telephone, office visits, or through the mail. When on-campus examinations are required, you may take them at any one of the five NVCC campuses.

You may register by mail and begin most ELI courses at any time, or you can register at any of the five NVCC campuses during regular registration periods each quarter. It is necessary to designate a home campus for College records and any other on-campus activities.

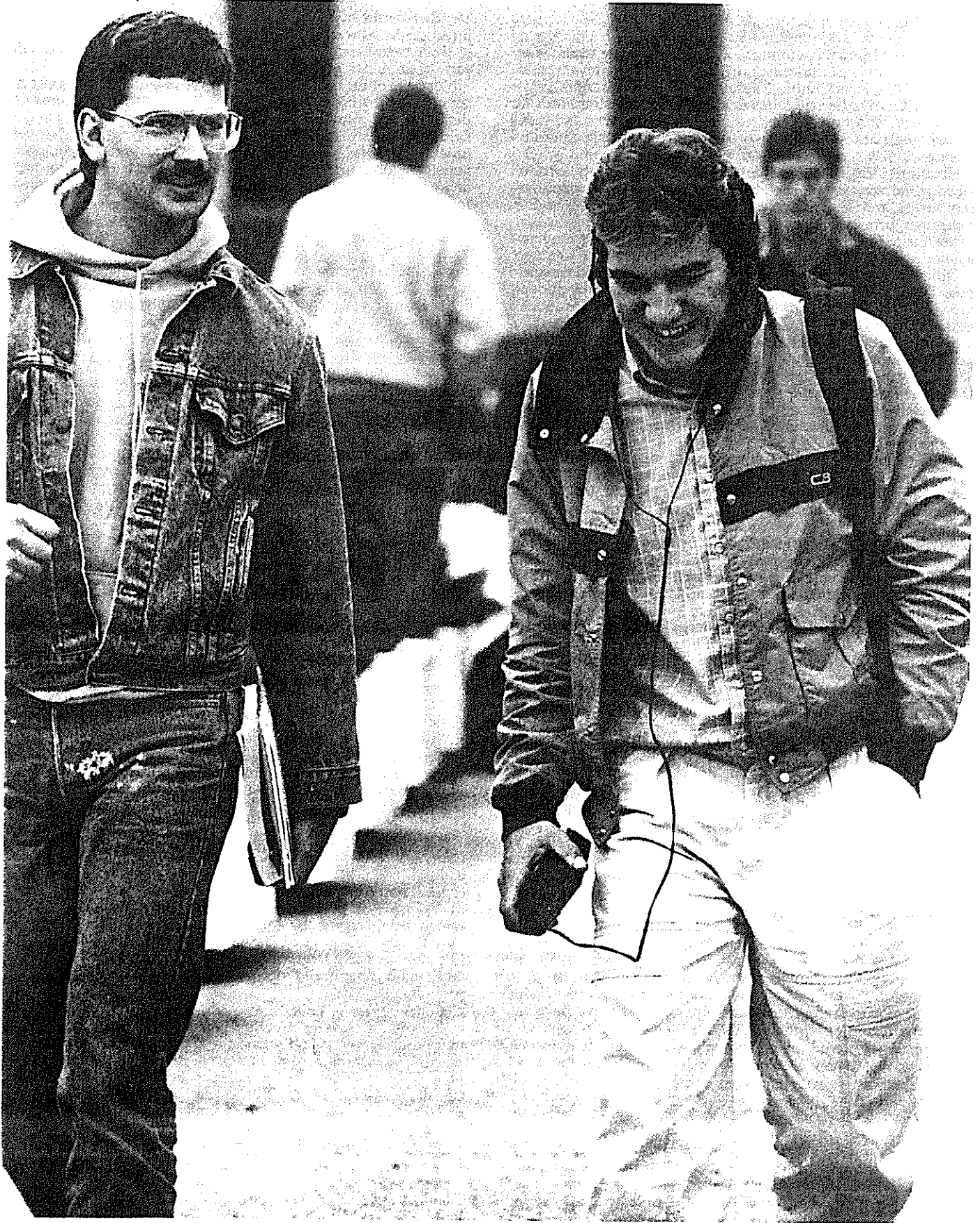
The Extended Learning Institute has no classrooms or laboratories. Student services and faculty are provided by the campuses. Offices are located on Forbes Place, off Port Royal Road, behind the Ravensworth Shopping Center in Springfield.

For additional information or assistance, see the "Extended Learning Institute Course Requirements" section of this catalog or write to the Extended Learning Institute, Northern Virginia Community College, 8333 Little River Turnpike, Annandale, Virginia, 22003. You may also telephone (703) 323-3368.

ELI Staff	Telephone
Associate Dean, Instructional Technologies and Extended Learning Dr. Frank G. Nelson	323-3371
Coordinator of Instructional Development Dr. C. Edward Cavert	323-3350
Coordinator of Instructional Services Dr. Steven G. Sach	323-3379
Manager of Records and Registration Jayne Townend	323-3379



Telecommunications



*Between Classes*



## The College

Northern Virginia Community College serves the counties of Arlington, Fairfax, Loudoun and Prince William, and the cities of Alexandria, Falls Church, Fairfax, Manassas Park and Manassas. NVCC strives to meet the educational and training needs of people with differing abilities, education, experiences and individual goals through a variety of curricula and community services.

Northern Virginia Community College consists of the Alexandria, Annandale, Loudoun, Manassas and Woodbridge campuses, and the Extended Learning Institute. All of the campuses provide classrooms, laboratories, student services, counseling, faculty and administrative offices, a learning resource center, a cafeteria, and a student lounge.

Offices for college-wide services are on the Annandale campus. These include the president's office, academic and student services, financial and administrative services, public relations, personnel, accounting, office of the college registrar, affirmative action and grants development, institutional research, facilities planning and development, veterans programs, and others. These offices provide services to all five campuses and the Extended Learning Institute.

The College operates on the quarter system with 11 weeks of instruction and examinations each fall, winter, spring and summer quarter.

Credit, non-credit and community service courses of the College are designed to help meet the requirements for trained manpower in Northern Virginia by cooperating with local industry, business, professions and government. Certificate and associate degree programs in occupational and technical curricula are designed to help meet this need by preparing you for the types of employment generally available in Northern Virginia.

College transfer curricula are designed for those planning to work toward a bachelor's degree. These associate degree programs offer freshman and sophomore courses in the arts and sciences for transfer to four-year colleges and universities. The developmental studies program offers courses to meet the prerequisites needed for admission to certificate and degree curricula.

Many of the curricula at NVCC are available on any campus. Some of the highly specialized programs are offered on only one or two campuses.

NVCC provides a strong counseling program to assist you in making sound decisions regarding occupational, educational and personal goals. A counselor will help you find the curriculum best suited to your interests and needs. The College also provides services in pre-college and freshman orientation, job placement, financial aid, student health, testing, veterans affairs, and student activities.

## Virginia Community College System

Northern Virginia Community College is one of 23 two-year colleges that make up the Virginia Community College System (VCCS). The VCCS was established in 1966 with a mission which complements the missions of the secondary schools and the senior colleges and universities in the Commonwealth. This mission is to ensure that all individuals in the Commonwealth are given a continuing, low cost opportunity for the development and extension of their skills and knowledge.

Emphasis is placed on occupational-technical education and student development services. Transfer, developmental, continuing education and community service programs are an integral part of the mission.

## Administration

The governing board for all 23 colleges in the Virginia Community College System is the State Board for Community Colleges. Members of this Board are appointed by the Governor of the Commonwealth of Virginia. The Northern Virginia Community College Board provides local leadership and approves items to be recommended to the State Board for consideration.

Members of the NVCC Board are appointed by the nine political jurisdictions served by the College. The local board is composed of three members from Fairfax County and one member from each of the other jurisdictions.

Members of the community also serve on curriculum advisory committees for occupational and technical curricula offered at the College. Committee members are selected from occupational fields which are directly related to the career objectives of programs at NVCC. These committees provide the guidance necessary for planning new programs and insuring that courses and programs continue to provide instruction in the skills suited for the jobmarket in Northern Virginia.

The maintenance and operating budget for the College is provided through appropriations made by the Virginia General Assembly. The nine political jurisdictions of Northern Virginia provide local funding for the purchase of sites and site development. The General Assembly approves capital outlay funding for building construction and the initial equipment.

## College Mission

The mission of NVCC, in keeping with the mission of the Virginia Community College System, is to function within the total educational community, in those areas assigned to it, to ensure that all individuals in the Northern Virginia area are given an opportunity for the continuing development and extension of their skills and knowledge. This is accomplished through programs and courses of instruction, not extending beyond the associate degree level and encompassing post-secondary occupational-technical education, college transfer education, general education, developmental instruction, continuing education, specialized training, community services, and cooperative education, complemented by a full program of student development services. NVCC seeks to carry out its mission using the most effective and appropriate instructional methods and materials available, stressing educational excellence, and providing full accountability to its constituents.

## Programs

Northern Virginia Community College is a comprehensive institution of higher education, offering programs of instruction generally extending not more than two years beyond the high school level.

### 1. Occupational Technical Education

The occupational and technical education programs are designed to meet the increasing demand for technicians, clerical workers, para-professionals, and skilled craftsmen for employment in industry, business, the professions, and government. These programs, which normally require two years or less of training beyond high school, may include preparation for agricultural, business, engineering, health and medical, industrial, service, and other technical and occupational fields. The curricula are planned primarily to meet the needs for workers in the region being served by the College, but the State Board for Community Colleges may designate certain community colleges as centers to serve larger areas of the state in offering expensive and highly specialized occupational and technical education programs.

### 2. College Transfer Education

The college transfer program includes freshman and sophomore courses in arts and sciences and preprofessional programs meeting standards acceptable for transfer to baccalaureate degree programs in four-year colleges and universities. NVCC transfer courses closely parallel courses at four-year institutions. Since requirements vary among four-year schools, if you are planning to transfer, you should check the requirements of the receiving institution before you plan your course of study at NVCC.

### 3. General Education

The courses in general education encompass the common knowledge, skills, and attitudes needed by each individual to be effective as a person, an employee, a consumer, and a citizen. These include the basic courses required of all students in the

occupational and technical education program and in the college transfer program.

#### 4. Continuing Education

Continuing Education programs are offered to enable you to continue your learning experiences. This work may include credit and non-credit work offered during the day and evening hours.

#### 5. Community Services

The College provides specialized services to help meet the cultural and educational needs of the citizens of the Northern Virginia area. These services include non-classroom and non-credit cultural events, workshops, meetings, lectures, conferences, seminars, short courses, and special community projects which are designed to provide needed cultural and educational opportunities for the citizens of the region. The College works cooperatively with other local and state agencies interested in developing such services. The College facilities also are available insofar as possible to four-year colleges and universities desiring to offer extension programs at the level of the third and fourth year of college and of graduate education in the region, subject to the prior approval of the State Council of Higher Education for Virginia.

#### 6. Special Training Program

Special training may be provided where specific job opportunities are available. This special training is coordinated with Virginia's economic expansion efforts and with the needs of prospective or established employers. Instruction is designed to assist Virginia residents in gaining skills necessary for entering employment and/or to retrain persons displaced from other jobs so that they may obtain gainful employment. Such special training programs shall be terminated at that point where the learning of skills ends and the development of speed in these skills begins. These programs, which are usually of a short-term nature, are tailored to fit the exact needs of a company and shall terminate when known new employment needs are met and when the primary objective stated above has been met. The training sites for these programs may be any suitable space within the Commonwealth of Virginia approved by the Virginia Community College System.

#### 7. Developmental Studies

Developmental or preparatory courses are offered to prepare you for admission to the college transfer and occupational technical programs in the College. These developmental courses are designed to develop the basic skills and understandings necessary to succeed in other courses and curricula.

#### 8. Cooperative Education

Cooperative Education is a unique educational program that provides the opportunity for you to explore and develop careers in actual work situations. Your participation in this program extends the concepts, skills and theories learned in class to practical job applications. You earn both salaries and college credit. Students and employers participating in the Cooperative Education program engage in an evaluation of the work experience so that both can learn and benefit.

## Learning Resource Centers

A Learning Resource Center at each campus provides library services, audiovisual services, and Learning Laboratory facilities. The materials, systems and services in the Learning Resource Center are designed to support the programs of the College and to create an environment conducive to learning. While the primary emphasis is directed towards supporting instructional programs at each campus, appropriate services are provided to citizens as a part of the college commitment to serve the educational needs of the community.

The combined College collection of more than 300,000 units of print and non-print materials is "accessed" through joint union catalogs and is available to students at any of the campuses. Books, periodicals, films, and other resources are loaned among the campuses by intercampus mail couriers.

Open stacks and immediate access to materials are common to all campuses. Books, newspapers, pamphlets, documents, and other materials are selected primarily for support of the campus

instructional programs, as well as for personal intellectual growth and the development of a cultural environment. Extensive use of micro-forms for information storage and retrieval adds breadth and depth to the resources. On-line searching of bibliographic data bases is available at all campuses. Access to microcomputers is available at most campuses.

## Library

Each campus library offers basic reference and curricular resources, and is enriched by access to the total College collection. Staff members provide reference assistance and instruction in the use of resources.

Through regional consortia arrangement, students also have borrowing privileges at public libraries in the Washington metropolitan area and at other institutions of higher education in Northern Virginia.

## Learning Laboratory

Systems for individual use of self-instructional materials are common to all campus Learning Laboratories. Individualized instruction is offered through a variety of instructional systems, including electronic study carrels and computer-assisted instruction. Testing services for placement purposes, for classes, and in support of the Extended Learning Institute are administered in the Learning Laboratories. Trained staff members provide access, instruction, and tutorial assistance in foundation subjects. Both specialized and generalized Learning Laboratories are designed to support and complement the instructional programs on the individual campuses.

## Audiovisual Services

Support for classroom instruction, community services, the library, and the Learning Laboratory is a function of Audiovisual Services. Assistance in the technological aspects of instructional design is also provided. Reprographics and photography are available. Television and other mediated approaches to instruction in all major formats are produced by Audiovisual Services.

## Accreditation and Recognition

NVCC is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools.

Curricula of the college are approved by the NVCC Board and by the State Board. The two-year, associate degree programs are also approved by the State Council of Higher Education for Virginia.

Health technologies programs are accredited by the American Medical Association, the American Dental Association, the National League for Nursing, or the American Physical Therapy Association. See the individual program descriptions for additional details.

## Consortium

Northern Virginia Community College is a member of the Consortium for Continuing Higher Education in Northern Virginia, which fosters interinstitutional cooperation to broaden learning opportunities for adult students. The other members of the Consortium are: George Mason University, Marymount College of Virginia, Strayer College (Arlington Campus), the University of Virginia, and Virginia Polytechnic Institute and State University.

## NVCC Educational Foundation

In order to supplement state and local monies, the College has established a foundation to provide additional financial support. The Northern Virginia Community College Educational Foundation, Inc., was established in December, 1979 as a nonprofit, tax-exempt 501(c)(3) charitable foundation to the College and the Virginia Community College System. Its purpose is to raise money to support the College's programs, students, and activities.

Gifts to the Foundation are tax deductible under Section 170 of

the Internal Revenue Service Code and may be restricted or unrestricted. The foundation will accept gifts of cash, securities, real estate, insurance policies, and personal property such as books and other library materials, works of art and equipment. Charitable gift annuities, remainder unitrusts, bequests, life-income plans, and memorial gifts can also be arranged for the donor's and College's benefit. Special procedures have been worked out for the establishment of scholarship funds for the benefit of currently enrolled students.

The Foundation is governed by a board of directors representing both public and private agencies and businesses in Northern Virginia. Day-to-day operations are managed by an executive director. The Foundation is located at the Brault Building, 4001 Wakefield Chapel Road, Annandale, Virginia 22003, (703) 323-3023.

### Alumni Federation

Established in June, 1983, the Northern Virginia Community College Alumni Federation comprises graduates and former non-graduate students (45 credits or more) from the five NVCC campuses.

The federation seeks to advance the growth and development of the College; to promote the personal, educational, and professional development of alumni; and to establish, encourage, and maintain a mutually beneficial relationship among the College, its alumni, and the Northern Virginia community.

Federation policy is formulated by a Board of Governors, elected annually by the membership; Federation management and operation is under the supervision of the Foundation Assistant for Alumni Affairs. Active committees include Publications, Scholarship, Awards, Program, Nominations-Elections-Bylaws, and Alumni Senate. If you have interest in the Alumni Federation, contact the Foundation Assistant, Brault Building, 4001 Wakefield Chapel Road, Annandale, VA, 22003, at 323-2364.

### History of the College

Northern Virginia Community College was established in 1964 as Northern Virginia Technical College to serve the eighth planning district. A statewide technical college system was established with 23 regions under legislation enacted by the Virginia General Assembly. Robert W. McKee was the first president.

The College opened for classes in the fall of 1965 in a renovated warehouse at Bailey's Crossroads. The initial enrollment was 761, served by a faculty and staff of 46. Enrollment for the 1966 Fall Quarter increased to 2,226 students.

The College was renamed Northern Virginia Community College in 1966 when the General Assembly changed the new system to the Virginia Community College System. College transfer curricula were added to the existing occupational/technical curricula for a more comprehensive program.

In 1966, the College Board purchased 78 acres in Annandale as the first of five permanent campus sites. The first permanent building for the College was constructed at the Annandale Campus and opened in 1967. Sites of approximately 100 acres each were purchased in 1967 for future campuses in Loudoun, Manassas and Woodbridge. In 1969, a 22.5-acre site was purchased in Alexandria for that campus.

Dr. Richard J. Ernst became the second president of the College in September, 1968.

The College has experienced rapid growth in student enrollment and the expansion of educational programs. College enrollment steadily increased to almost 10,000 students in the 1970 fall quarter. In the 1973 fall quarter, NVCC became the largest institution of higher education in Virginia with 17,260 students.

The Annandale Campus added buildings in 1969, 1970 and 1972.

The Loudoun, Manassas and Woodbridge Campuses began operation in the fall of 1972 by setting up temporary offices and offering evening courses at community locations. The

Alexandria Campus continued the use of the Bailey's Crossroads facilities and opened the first phase of construction on the new site in the spring of 1973.

The Loudoun and Manassas Campuses added day and evening classes on campus when the first permanent buildings were completed in the fall of 1974. The Woodbridge Campus did the same in the fall of 1975.

The Extended Learning Institute (ELI) of the College began offering home study courses in January 1975. ELI has served more than 80,000 students.

During the 1985-86 fiscal year (July 1, 1985-June 30, 1986), the College served 55,332 different students in credit courses. In addition, 15,682 students registered for non-credit courses. Community service activities attracted 100,362 participants during the year.

The 1986 Fall Quarter enrollment was 34,313 full-time and part-time students.

### Honors Program

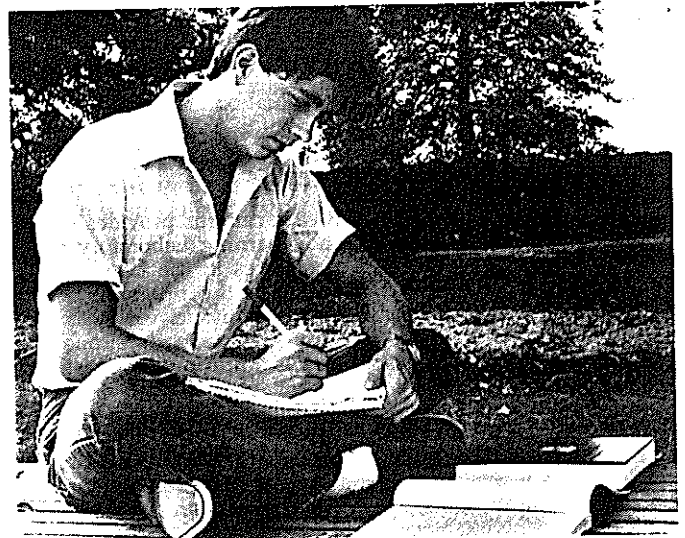
Honors education is for the student who wishes to inquire more deeply into issues. Honors courses are concerned with freeing the motivated student to think broadly and independently. Primarily, two kinds of courses are offered: those consciously interdisciplinary, perhaps coordinating two or more courses, and those within particular disciplines on special topics or new approaches to standard courses. Emphasis is not upon increased amounts of course work but on greater enrichment through a more intensive learning experience.

A student interested in taking any honors course must first apply for admission to that course. Genuine intellectual curiosity and willingness to challenge oneself are the real measures of qualification. An honors student should meet at least one of the following requirements: (1) life experience or special aptitude which may outweigh past, uneven academic performance, (2) the recommendations of two faculty members, (3) a GPA of 3.5 for enrolled students, or (4) SAT scores of 1100 or placement in the top 10% of the student's graduating class. A student who wishes to inquire further into the honors program and the courses offered should contact the Honors Committee Chairman at the campus of his or her choice.

Alexandria Campus  
Annandale Campus  
Loudoun Campus

Manassas Campus  
Woodbridge Campus

Dr. Paul J. McVeigh, Jr.  
Dr. Richard A. Wilan  
Mr. Donatus C. Hayes  
Dr. Victoria S. Poulakis  
Dr. Jean F. Goodine  
Dr. Robert C. Kilmer



Quiet Study

## Home Campus

When you apply to the College, you must designate a home campus. Student records are maintained at the campus you designate. Requests for transcripts should be forwarded to your home campus.

## Change of Home Campus

Should circumstances require you to change your home campus, you should do so as soon as possible before the beginning of the registration period for the next quarter. If you have received financial aid, you must notify the Financial Aid Office to transfer your financial aid records.

If you have been a student at the College previously but are not currently enrolled in classes, you may change your home campus by simply going to any campus for registration for the upcoming quarter. If you are enrolled in classes for the current quarter, you must request a change of campus at least five working days prior to the beginning of registration for the next quarter, or you must wait until after the last day of the add/drop period for that quarter to make a change.

## Classification of Students

### Curricular Student

You are classified as a curricular student when admitted to a curriculum of the College. You must be a high school graduate, have earned a Graduate Equivalency Diploma (GED), or have completed an approved developmental program. Your academic file must contain all of the information required for admission to the College. A curricular student may be either a full-time or part-time student working toward completion of a certificate or associate degree at the College.

### Non-Curricular Student

If you have not requested admission to a curriculum or developmental program, you may still register for courses by identifying your reason for enrolling at NVCC. You may be classified as a non-curricular student under one of the following circumstances:

1. Upgrading employment skills for your present job;
2. Developing skills for a new job;
3. Exploring a new career. You may be undecided about a career goal or an occupational choice. If you are changing from one educational objective to another, you are expected to declare another objective prior to completing 45 credit hours of course work;
4. Personal satisfaction or for general knowledge;
5. Transient student. You may be enrolled at NVCC while maintaining primary enrollment with another college or university;
6. Non-degree transfer student. You may be enrolled at NVCC to take only a certain number of courses for transfer to another college or university prior to completing the graduation requirements of a specific curriculum at NVCC;
7. High school student. You may get special permission from NVCC and your principal to enroll at the College;
8. General or curricula requirements pending. You may not have met all of the general or specific admission requirements as stated in the College Catalog but may be accepted by the College to take courses for one quarter only, with special approval from the College;
9. Restricted enrollment. You may meet admission requirements of a specific curriculum but be temporarily denied entry because of an enrollment limitation. You could enroll in other courses while waiting for entry into your chosen curriculum, with special approval of the College.

### Full-Time Student

You are considered a full-time student if you have enrolled in 12 or more credits of course work as of the last day to add/drop for regular quarter ten (10) week classes.

### Part-Time Student

You are considered a part-time student if you are carrying fewer than 12 credits of course work as of the last day to add/drop for regular quarter ten (10) week classes.

### Freshman

You are classified as a freshman until you complete 45 credits of course work in a degree program.

### Sophomore

You are classified as a sophomore after you complete 45 credits of course work in a degree program. Credits transferred from other institutions are included, provided they apply toward meeting the requirements of your curriculum at NVCC.

## Admission Requirements

### Admission to the College

If you have a high school diploma or the equivalent, or are at least 18 years of age, you are eligible for admission to Northern Virginia Community College.

All applicants must complete the Application for Admission. At this time, you are strongly advised to seek the assistance of counselors for academic, career or transfer information.

Students are accepted on a first-come/first-served basis with priority given to: (1) legal residents domiciled in the cities and counties supporting the College, (2) Virginia residents, (3) U.S. Citizens, and (4) others. It is even more important for you to apply early to the College if you are interested in being admitted to a curriculum. Certain programs have space shortage which can limit enrollment. Some of these curricula may have waiting lists.

High school transcripts are used for academic advisement to enhance your prospects for success in your chosen curriculum. These transcripts are required in order to be considered for admission to the following curricula: Animal Science, Dental Hygiene, Dental Laboratory Technology, Medical Laboratory Technology, Nursing, Physical Therapist Assistant, Radiography, and Respiratory Therapy. Transcripts are preferred for Emergency Medical Services Technology and Medical Record Technology programs. Contact the appropriate campus Counseling Office regarding admission to these programs.

Official transcripts from other colleges or universities are required for acceptance of transfer credits at NVCC. Students seeking veterans benefits will also be required to submit transcripts of all previous college-level study.

International students requiring an I-20 form for admission on an F-1 or M-1 visa must provide official transcripts as noted in the section on "International Student Admission Requirements" in this catalog.

Application for Admission forms may be mailed to the Admissions and Records Office of your choice or brought to the campus during registration. You are urged to submit your Application for Admission to the College at least 30 days prior to the first day of registration for the quarter in which you plan to enroll. This should provide you with the opportunity to meet with a counselor for academic assistance prior to registration. Applications mailed to the College at least two weeks before registration can be processed and a response will be mailed back to you. If you do not mail your application at least two weeks before registration, you should take the application to your selected home campus.

The College reserves the right to evaluate Application for Admission forms and to refuse admission to applicants when it is considered to be in the best interest of the College.

When you enroll as a student at NVCC you accept the rules and regulations of the College. Any violation may be subject to appropriate action by the College.

### Admission to a Curriculum

In addition to the general admission requirements for acceptance by the College, there are specific requirements listed in the Curricula of Study section of this catalog for each individual curriculum. Be sure to check the curriculum of your choice to see if you have the required prerequisites for enrolling in that curriculum. If you do not meet these requirements, you may be able to make up deficiencies by taking developmental courses.

## Registration for Non-Credit Community Service Courses

You do not need to apply for admission to the College to take non-credit courses. Contact the Office of Continuing Education at the campus where you wish to attend for course and registration information.

## International Student Admission Requirements

International students are defined as all non-United States citizens holding either temporary or permanent visas. An international student applying for admission to the College must hold a valid visa either on or beyond the quarter deadline date or to the end of the quarter of enrollment as determined by the U.S. Immigration and Naturalization Service.

NVCC does not issue I-20 forms to applicants who are not in the United States at the time of application.

International Students requiring I-20 forms who entered the United States to study at another college, university, or language school must successfully complete at least one term of work at that institution and submit an I-20 or I-538 form, as appropriate, prior to being considered for admission to NVCC.

A temporary visa holder (except F-1 and M-1 visa holders) may be accepted by the College on a temporary basis but must hold a valid visa continuously during each quarter of enrollment, as indicated on the I-94. Such visa holders may be considered for subsequent issuing of an I-20 for a future quarter if I-20 admission requirements for international students are met. Deadlines are published in the quarterly *Schedule of Classes*.

There are special requirements for international students who must have an I-20 form and are seeking enrollment at NVCC. You must:

1. have the equivalent of an American high school diploma;
  2. have official transcripts and records of previous educational experiences translated into English and certified before they are sent to NVCC by the institution you attended;
  3. submit documentation that you possess health insurance;
  4. submit verification of financial support (INS form I-134);
  5. submit a minimal TOEFL score of 500;
  6. submit all appropriate forms and test scores sixty (60) days prior to the beginning of classes for the quarter you plan to attend.
- Information about required forms and tests is contained in an international student admissions form available in the office of Admissions and Records. You will not be accepted until all general and special application requirements are completed. Generally, you will not be admitted if you are not in good academic standing at your previous institution.

If you are an international applicant for admission and your native language is not English, you must either achieve a 500 TOEFL score for holders of student visas or a satisfactory score on the College English Proficiency Test for holders of other visas. Information on this testing requirement is available from the Admissions and Records office.

If an I-20 form has been submitted for you, you must be admitted to a curriculum and maintain satisfactory full-time enrollment status. Non-immigrant aliens who are students must complete at least one quarter of attendance before NVCC can consider recommending you for employment.

## High School Student Enrollment at NVCC

If you have not yet earned a high school diploma or its equivalent you may attend the College full-time as part of an early admissions program. Some of your College courses can fulfill your Virginia high school graduation requirement if you have prior written approval of your high school principal.

It is also possible to be a part-time NVCC student while still enrolled in high school. Once again, you would need to have written approval of your high school principal.

Any high school student who wants to attend NVCC is required to comply with the admission requirements of the College. This would include a high school transcript showing all study completed to date.

## Domicile Requirements

Effective July 1, 1984 all applicants for admission to Northern Virginia Community College, who are claiming entitlement to in-state tuition privileges are required by Section 23.7-4, of the Code of Virginia, to complete an "Application for Virginia In-State Tuition Rates" form.

To be eligible for in-state tuition rates, you must be domiciled in Virginia for a minimum of one year before the first official day of classes. Domicile is defined as your "present, fixed home where you return following temporary absences and where you intend to stay indefinitely."

As a minor you have the same domicile as your parents/legal guardian. Once you become 18 years old, you can establish a domicile that is different from your parents/legal guardian. However, if you are over 18 and are financially dependent on your parents/legal guardian, they must be domiciled in Virginia in order for you to be eligible for in-state tuition benefits.

The College will review many factors when determining your domicile, for example: residence during the past year prior to the first official day of classes, state to which income taxes are paid or filed, voter registration, motor vehicle registration, driver's license, employment, sources of financial support, other social or economic ties with Virginia or other states. The presence of any or all of these factors does not automatically result in Virginia domicile. The factors used to support a case for in-state tuition benefits must have existed for one year before the first official day of classes.

Residence or physical presence in Virginia primarily to attend a college or university does not entitle you to in-state tuition rates.

If you are a nonmilitary student whose parent or spouse is a member of the United States armed forces, you may establish domicile in the same manner as any other student. However, a nonmilitary student, not otherwise eligible for in-state tuition, whose parent or spouse is a member of the military stationed or residing in the Commonwealth pursuant to military orders and claiming a state other than Virginia on their State of Legal Residence Certificate, shall be entitled to in-state tuition charges under certain conditions. Contact the Admissions and Records office at your home campus for more information.

It is presumed that people falling within the following categories do not have the intent to be domiciled in Virginia: holders of temporary visas, persons who by law must maintain their domicile or legal residence in another state and persons who have selected another state or country as their domicile.

When enrollments must be limited for any program or course, first priority shall be given to qualified students who are domiciled in one of the political subdivisions supporting the College. These subdivisions are listed under General Information.

Domicile requirements are subject to any changes in Virginia law pertaining to entitlement to reduced tuition changes.

## Registration

Before you can register, you must be admitted to NVCC and must designate a home campus, where your records will be maintained. You may register at any campus unless you are enrolled in a restricted program, or unless you are on an F-1 or an M-1 visa. If you are in any of these categories, you must register at your home campus. If you are receiving financial aid, you may register at any campus, but you must pay tuition and process financial aid forms at your home campus.

Refer to the campus section of your choice in the *Schedule of Classes* for specific instructions on how, when, and where to register.

## Extended Learning Institute Registration

Most Extended Learning Institute courses are available for you to start at any time convenient for you. Registration may take place on a campus or by mail through ELI. Registration details are available by calling the Extended Learning Institute (703) 323-3368. See the Extended Learning Institute section for additional information. You may apply to the College at the same time you register by mail.

## Late Registration

When you have not yet enrolled for a specific quarter, you may register late for a specific course in that quarter at any time through the seventh calendar day of the regular ten-week



session classes and through the first fifteen percent of any non-ten-week session classes.

If you have already enrolled for a specific quarter, you may continue to add or drop classes through the first ten calendar days of a ten-week session class and through the first fifteen percent of any non-ten-week session class. You may register and begin most ELI independent study courses at any time.

## Change of Registration

A Registration and Add/Drop Worksheet is required by the Office of Admissions and Records for making any change in your schedule after registration. Failure to follow established procedures could place your college attendance in jeopardy. Changes, refunds, etc., are effective as of the time they are requested and approved. Retroactive changes are not usually permitted. Schedule changes may be made during the periods printed in the quarterly *Schedule of Classes*.

### 1. Dropping a Course

A Registration and Add/Drop Worksheet is required by the Office of Admissions and Records and must be processed through the Business Office for dropping a course. You may drop a course within the first 60% of a session without academic penalty, and you will receive a grade of W. Dropping a course after that time will result in a grade of F except under mitigating circumstances which must be documented. Copies of this documentation will be placed in your academic file. See the Grading System section for explanations of grades. See the Refund section for additional information.

### 2. Adding a Course

A Registration and Add/Drop Worksheet is required by the Office of Admissions and Records and must be processed through the Business Office for adding a course. Once registered, you may add a course at any time during the add/drop period which is published in the quarterly *Schedule of Classes*. Any request for entry into a class after the first week of the quarter must be approved by the instructor, division chairman and provost. Requests must be made through the Office of Admissions and Records, and payment made at the Business Office.

### 3. Withdrawal from the College

To withdraw from the College you should contact a counselor to initiate the appropriate procedure. Failure to follow established procedures could affect your eligibility to return to NVCC or enter another college. You must process withdrawal forms in person to the Office of Admissions and Records, and the Business Office, except under serious circumstances such as hospitalization or death in the family. If you have received any financial aid or veterans benefits, you must also report your withdrawal to your campus Financial Aid Office and/or Veterans Clerk.

### 4. Cancellation of a section or course by the College

The College will process a refund for courses or sections cancelled by the College if no other course or section carrying the same number of credits is added.

### 5. Curriculum Change

To transfer from one curriculum to another, you must contact a counselor to initiate completion of a new Program Placement form.

## Specific Course Schedule Changes

In some circumstances, you may change courses or sections without additional tuition expense.

### Regular Course to Developmental Course

In cases where a student enrolls in an entry-level regular course for which there is a preparatory developmental course, and then incurs difficulty in keeping up with the regular course-work in the first three weeks (21 calendar days) of the course, students may, with the approval of the instructor, initiate a drop and enroll in a developmental course which is more suited to his/her capabilities. In making the transfer from the regular course to the developmental course, the student will be charged additional tuition on a per hour basis for the additional credit hours. If the exchange results in fewer credit hours, the student qualifies for a tuition refund only if the transaction occurs during the regular add/drop period for the course being dropped.

### Developmental Course to Another Developmental Course

Students may transfer from one developmental course to another within the same discipline using the add/drop procedure

form even though this transaction may occur after the standard add/drop period for the ten-week session. In these cases, the three-week (21 calendar days) limit does not apply. No change in tuition occurs if the change from one developmental course to another developmental course occurs within the same discipline and the credit-hour values of the courses remain identical. Any credit hours which are added as a result of this course exchange will result in additional tuition on a per hour basis. If the exchange results in fewer credit hours, the student qualifies for a tuition refund only if the transaction occurs during the regular add/drop period for the course being dropped.

## Developmental Course Changes

Course changes after the end of the add/drop period require the approvals of the gaining Instructor, the gaining Division Chairman, and the Provost. There is no refund for courses dropped and tuition is charged for courses added.

## Course Section Changes

You may request a change from one section to another of the same course and course length within the same quarter after the add/drop period for the ten-week session if you can justify mitigating circumstances. This justification must be recorded on an add/drop form and approved by the instructors of the sections involved and their respective division chairmen. If such changes are approved, no additional tuition will be charged. Decision on tuition will be made by the business office concerned.

## Auditing a Course

You may audit a course and attend without taking examinations. Registrations for audit will be accepted only during the late registration period each quarter, and the approval of the division chairman is required. The regular tuition rate is charged. Requests for credit enrollment in a class will be given priority over audit enrollment.

Audited courses carry no credit and do not count as a part of your course load. If you desire to change your status in a course from audit to credit, you must do so within the add/drop period for the session. Changes from credit to audit must be made by the official last day for students to withdraw from a class without penalty. After this day, the audit grade "X" is invalid if you are enrolled for credit.

Contact the office of Admissions and Records for instructions on auditing a course.

## Senior Citizens Enrollment

Under the Virginia "Senior Citizens Higher Education Act of 1974", as amended, anyone who is 60 years of age or older, whose legal domicile has been Virginia for one year, and whose federal taxable income does not exceed \$7,500 is eligible to enroll in credit courses at NVCC without charge and/or audit a maximum of three courses (credit or non-credit) per quarter without charge. Senior citizens whose taxable income exceeds \$7,500 may audit a maximum of three courses (credit and/or non-credit) per quarter without charge. Senior citizens must submit an application to determine eligibility for tuition free enrollment and be accepted by the College. Under the law, senior citizens will be accommodated on a space-available basis (after all tuition paying students have registered) commencing with the late registration period.

## Application Fee

There is no fee for the submission of an application for admission.

## Tuition

Virginia Domicile.....	\$16.95 per credit
Out-of-State Domicile.....	\$83.00 per credit

Tuition is due and payable before classes begin each quarter. If you pre-register, you may defer payment of tuition until the deferred payment date specified in the applicable *Schedule of Classes*. Failure to pay tuition by the deferred payment date will result in your registration being voided. Payment of tuition entitles you to use the library, bookstore, student lounge, and other facilities of the College except parking. Vehicle registration

is required for a parking permit to be issued. There are no special library fees. You must pay charges for any school property that you damage or lose, such as laboratory or shop equipment, supplies, library books and materials.

Some courses such as music, physical education and aviation require non-college support services from other agencies and individuals. Costs for these additional charges are paid by you directly to the individual or agency providing the service.

All tuition and fees are approved by the State Board for Community Colleges which has the authority to change any and all tuition and fees without prior notice.

### **In-State Tuition Entitlement**

To be eligible for in-state tuition rates, you must be domiciled in Virginia for a minimum of one year before the first official day of classes. See Domicile Requirements section for details.

To change your tuition status from out-of-state to in-state you must initiate the process by completing an "Application for Virginia In-State Tuition Rates" form. These forms can be obtained in your home campus Admissions and Records office. All forms should be completed before the registration period begins for the quarter in which the in-state charges will take effect.

The College reserves the right to recoup deficiency charges when the wrong tuition rate is paid. Your home campus Admissions and Records office can clarify any question concerning domicile status.

### **Payment**

Tuition and fees are payable by cash, check, money order, contract, VISA or Master Card.

Personal checks are acceptable for payment of tuition and fees. Checks payable to NVCC can only be accepted for the exact amount due. Tuition and fees paid at one time can be combined except for the vehicle registration fee. Credit cards are accepted only for tuition. A service charge of \$5.00 is charged to you for any check that is dishonored, except when the bank is at fault. A dishonored check that is not an error of the bank must be redeemed with cash, certified check or money order before you can complete or withdraw from current courses, or register for future courses.

If you issue a dishonored check that is not a bank error, you will be required to pay by cash, certified check or money order for one year from the date of payment to the College for the dishonored check before personal checks will be accepted again. Under extenuating circumstances, waiver of this policy may be considered upon written request to the campus Business Manager.

For students who have paid tuition by VISA or Master Card, authorized refunds cannot be issued as a credit to charge card accounts. Refunds so authorized will be processed in the usual manner and a refund check will be mailed to the student.

### **Refunds for Courses Dropped**

Tuition refunds are not automatic except for courses cancelled by the College.

Students are eligible for a full refund if a course is dropped during the first ten (10) calendar days of standard ten-week classes, or the first fifteen percent (15%) of calendar days of a short session, or for a course which extends beyond one full quarter. There is no refund after these points in time. Specific dates for tuition payments and refunds are published in the quarterly *Schedule of Classes*.

To drop a course, you must complete the Registration and Add/Drop Worksheet, process it through the Admissions and Records Office, and deliver it to the Business Office.

Requests for refunds for ELI courses must be made in writing to ELI and postmarked within 15 percent of your enrollment period. Refund dates will be included in the packet mailed to you by ELI when you register.

Some exceptions in refund procedures for developmental courses exist. For further information, contact your home campus Admissions and Records and/or Business Offices.

If the College cancels a course or the student drops a course during the first ten (10) calendar days of the standard ten week session classes, or first fifteen percent (15%) of calendar days of a short or extended session, the course is deleted from the student's record.

### **Refunds for Withdrawal from College**

You must drop all classes by completing a Registration and Add/Drop Worksheet to withdraw from the college. This form should be processed through the Admissions and Records Office and delivered to the Business Office. Official withdrawal from the College will become effective on the date that this form is received.

Students withdrawing from the College are eligible for a full refund of tuition if they withdraw during the add/drop period for the courses in which they were enrolled as published in the applicable quarterly *Schedule of Classes*.

### **Non-Payment of Debts**

Continued attendance at NVCC is dependent upon proper settlement of all debts owed the institution. Should you fail to satisfy all due and payable amounts for tuition and fees, college loans, college fines, or other debts you owe the College, you may be suspended. Until all current debts you owe the College have been satisfied, you will not be reinstated if suspended and will not be permitted to register. Transcripts will not be issued and recommendations will not be written, nor other services provided.

The policies governing the failure to meet financial obligations will also apply to students owing fines to libraries of institutions and participating public libraries of the Consortium for Continuing Higher Education in Northern Virginia.

### **Graduation Fee**

There is no fee for graduation.

### **Identification Cards**

Student identification cards are issued without charge. They are validated each quarter at registration. Lost cards will be replaced upon request to your home campus Office of Admissions and Records. ID cards may be required for registration, course changes, transcript requests, library material use, admissions to special student activities, etc.

### **Books and Supplies**

You are expected to obtain your own books, supplies, and consumable materials needed in your studies. It is estimated that the cost of these items will average from \$75 to \$100 per quarter for a full-time student.

### **Transcripts**

An NVCC transcript of your academic record may be issued from your home campus Admissions and Records Office. Official transcripts are released only to other colleges or agencies upon your written request. Only an unofficial copy of your transcript may be released directly to you. There is no fee for transcripts. Financial Aid transcripts are available at no cost through your home campus Financial Aid Office.

### **Library Fines**

There is a charge for all overdue library materials. If you lose a book or other materials, you must notify the library to stop the accumulation of any fines. However, you will have to pay for lost materials. This rule also applies to books and materials borrowed from Consortium institutions (George Mason University, the University of Virginia, V.P.I. & S.U. at Reston, and Marymount College).

A fine of five cents a day (with a maximum fine of \$3.00) will be charged for regular circulating material. Fines for reserved materials are fifty cents a day (with a \$5.00 maximum). In the event of loss, the charge will be the replacement cost of the lost item plus any fines. A fine of \$1.00 will be charged for lost or mutilated master cards.

### **Vehicle Registration Fee**

Any student (full or part-time) who wishes to park a vehicle in the student parking lots (Lot B) on any campus must pay a vehicle registration fee. A four-quarter permit may be purchased for \$16 and a three-quarter permit may be purchased for \$12. A two-quarter permit may be purchased for \$8. Permits for a single quarter may be obtained for \$5. Purchase of a permit entitles the

student to use any student parking lot. Students who withdraw from classes may receive a refund on the basis of full quarterly payment for the quarter(s) or partial quarter(s) used. Otherwise, the fee is not refundable unless all courses scheduled are canceled by the College. Students can register their vehicles during the regular registration and add/drop periods. Student permits are required by 7 a.m. the first Monday after the add/drop period.

Some campuses have parking meter spaces and students may choose to use them rather than purchasing a parking permit.

## Student Identification Number

You are requested to use your Social Security number as an identification number at the time you apply for admission. If you are unable or unwilling to provide this number, a substitute identification number will be assigned to you. The Social Security number identification system provides for a consistent and efficient means for student records. Your identification number is used for grade reporting, class rolls and other records.

Applicants for financial aid are requested to submit Social Security numbers. Pell Grant Program applicants are advised that Social Security numbers are required by the U.S. Department of Education when processing applications.

## Student Records Access

The College observes Public Law 93-380 in providing for the privacy of official student records and the rights of students to review these records. You may review your official records by making a request to the office of Admissions and Records. The College will not release any personally identifiable information about you without your permission, except to certain school and governmental officials as provided by the law.

Requests by individuals and agencies for release of student information must be presented in writing. Your permission for the College to release any information must also be in writing. Information which is considered public information is described in the current issue of the College *Student Handbook*.

## Credits

A credit at NVCC is equivalent to one collegiate quarter hour credit or two-thirds of one collegiate semester hour credit. Usually, one credit for a course is given for approximately three clock hours of work weekly as follows:

1. One hour of lecture plus an average of two hours of out-of-class assignments;
2. Two hours of laboratory or shop work plus an average of one hour of out-of-class assignments;
3. Three hours of laboratory or shop work with no regular out-of-class assignments;
4. Fixed credit and variable hours with behavioral objectives assigned to a developmental course; or
5. Variable credit (one to five credits) is assigned to all supervised study, seminar and project, cooperative education, and coordinated internship courses.

## Grading System

- A= Excellent-4 grade points per credit  
 B= Good-3 grade points per credit  
 C= Average-2 grade points per credit  
 D= Poor-1 grade point per credit  
 F= Failure-0 grade points

I= Incomplete-No credit. The "I" grade is used for verifiable unavoidable reasons. Since the "incomplete" extends enrollment in the course, requirements for satisfactory completion will be established through student/faculty consultation. Courses for which the grade of "I" (incomplete) has been awarded must be completed by the end of the subsequent quarter or another grade (A, B, C, D, F, W) must be awarded by the instructor based upon course work which has been completed. (Nursing courses must be completed within the first two

weeks of the subsequent quarter.) For "I" grades earned at the end of the spring quarter, you will have through the end of the subsequent fall quarter to complete the requirements. A "W" grade should only be awarded under mitigating circumstances which must be documented and a copy of this documentation must be placed in your academic file.

- P= Pass-No grade point credit; applies only to Developmental Studies, non-credit courses, Orientation (GENL 100) and specialized courses and seminars at the discretion of the College.
- R= Re-Enroll-No grade point credit. A grade of "R" means that you were making satisfactory progress but did not complete all the course objectives. You must re-enroll and pay the appropriate tuition to complete the course objectives. (The "R" grade applies to a limited number of courses.)
- U= Unsatisfactory-No grade point credit (applies only to Developmental Studies, non-credit courses, Orientation (GENL 100) and specialized courses and seminars at the discretion of the College.)
- W= Withdrawal-No credit. A grade of "W" is awarded if you withdraw or are withdrawn from a course after the add/drop period but prior to the completion of 60% of the session. After that time, you will receive a grade of "F" except under mitigating circumstances which must be documented and a copy of the documentation must be placed in your academic file.
- X= Audit-No credit. Permission of the instructor and the division chairman is required to audit a course.

The grade point average (GPA) is determined by dividing the total number of grade points earned in courses by the total number of credits attempted. The GPA is carried out to two digits past the decimal point (example 1.00). No rounding shall be done to arrive at the GPA. When a course is repeated, only the last grade will be used in the GPA computation for graduation. The following example illustrates a GPA of 2.00 obtained by dividing 30 by 15.

Course	Credit Hours Attempted	Grade	Grade Points	Credit Hours Comp'd	Total Grade Points
FREN 101	4	A	4	4	16
ENGL 111	3	B	3	3	9
MUSC 141	2	C	2	2	4
PHED 100	1	D	1	1	1
MATH 121	5	F	0	0	0
PSYC 110	0	W	0	0	0
	15			10	30

Any grade errors or other errors on grade reports should be reported to the office of Admissions and Records at your home campus within 30 days after the close of the quarter in which grades were received, or the grade report will be assumed to be correct.

## Developmental Courses Grading

A P (pass) will be assigned to indicate satisfactory completion of the course objectives for each developmental course.

If you are making satisfactory progress but have not completed all of the objectives for a developmental course, you will be assigned an R (re-enroll) and you must re-enroll and pay the appropriate tuition to complete course objectives.

If you are not making satisfactory progress in a developmental course, you will be assigned a U (unsatisfactory). You should meet with your counselor for possible re-evaluation of your goals and for determination of any subsequent academic work.

Credits earned for developmental courses are not counted in grade point computations toward graduation or in determining sophomore status. They are used in determining full-time or

part-time status.

### Honor Roll and Dean's List

Your name will be placed on the Honor Roll for any quarter in which your cumulative grade point average is 3.50 or higher and you have earned a minimum of 30 quarter hours of credit at NVCC.

Your name will be placed on the Dean's List for any quarter in which your cumulative grade point average is 3.20 or higher and you have earned a minimum of 15 quarter hours of credit at NVCC.

### Transferring from Other Colleges

If transferring to NVCC from another college, usually you are eligible for acceptance by NVCC if you are eligible for reentry to that college. Courses, grades and grade point average are simply transferred to NVCC.

When transferring from another college, consult the Admissions and Records office at NVCC for an assessment of credits earned. Generally, no credit will be given for subjects with a grade lower than C. You may be advised to repeat courses if it is apparent that this will help you make satisfactory progress in your curriculum at NVCC.

An evaluation of credits earned at other institutions can be made after all official documents required for acceptance have been received by the office of Admissions and Records. When the course content is similar and the credit is the same as an NVCC course, the course generally will transfer as an equivalent course. When the content is unlike any course offered at NVCC, elective credit may be granted. The division in which you are enrolled at NVCC will determine if and how transferred credits may be used in meeting specific degree requirements.

You may take courses at other institutions while attending NVCC. To insure that these courses will transfer, you must receive prior written approval from the chairman of the academic division at NVCC from which you expect to receive your degree.

Credit may be transferred from colleges and universities accredited outside of the Southern Association of Colleges and Schools. This credit may be transferred according to the recommendations in the current issue of the directory published by the U.S. Department of Health, Education and Welfare or in the current AACRAO Guide. These colleges and universities must have been approved by their state accrediting agencies.

Credit will be allowed for military service schools if this credit is recommended in a *Guide to the Evaluation of Educational Experiences in the Armed Services*, and if study is applicable to your program at NVCC.

If you are considering transferring from another college or university to NVCC, you are encouraged to apply for admission to NVCC and submit all transcripts as early as possible.

### Advanced Standing

NVCC has an advanced standing program which allows previous academic study, examination, or occupational experience to be evaluated for possible college credit. To be eligible, you must be admitted to a curriculum. Advanced placement allows you to be placed beyond the starting point for certain courses in your curriculum.

Advanced standing may be granted students who successfully complete examination in any of the following programs:

1. College Level Examination Program (CLEP) examinations from Educational Testing Service (ETS) for advanced standing. The CLEP has been approved in five basic liberal arts areas and in specific subject areas. If you want to participate in the CLEP program, contact the Counseling office at your campus.
2. NVCC will award specific course credit for acceptable scores on the United States Armed Forces Institute (USAFI) tests. As USAFI is no longer operative, arrangements have been made for the Defense Activity for Non-Traditional Education Support (DANTES) to administer and store standardized subject tests and General Educational Development Tests (GEDs) for military personnel.

To obtain results of USAFI courses and high school and college-level GEDs, follow these instructions:

- a. For military personnel tested through USAFI prior to July 1, 1974, write to DANES Contract Representative (Transcripts), Educational Testing Services, P.O. Box 2879, Princeton, New Jersey, 08541.
  - b. The scores of military personnel tested overseas after July 1, 1974, may be obtained from Educational Testing Services, P.O. Box 2819, Princeton, New Jersey, 08541.
  - c. Military personnel tested in the United States at official GED centers or by State Departments of Education must request transcripts directly from the State Department of Education or the official GED center concerned.
3. Advanced Placement examinations of the College Entrance Examination Board may be used for advanced placement. Specific college course credits will be granted for scores of three, four, or five on the Advanced Placement (AP) examinations. You must have official AP score reports forwarded from ETS to NVCC for inclusion in your permanent record in the Admissions and Records office of your home campus in order to get appropriate evaluation.
  4. Assessment by Local Examination (ABLE) is available at NVCC. ABLE examinations are constructed at NVCC where tests are not available from outside sources such as CLEP. The College grants specific course credit for acceptable performance on ABLE examinations.

### Waiver of P.E. Requirements for Veterans

Veterans may receive a waiver for physical education courses upon submission of a discharge certificate to the office of Admissions and Records. No credit is granted for this waiver. Other credits must be substituted to meet the total requirements of a specific curriculum. Application for waiver should be made in the Admissions and Records office during the first quarter of enrollment.

### Degrees and Certificates

Northern Virginia Community College awards the following degrees or certificates to students who successfully complete approved curricula at the College.

1. An associate in applied science degree (A.A.S.) is awarded for completion of two-year occupational/technical curricula. These programs are designed for those who plan to obtain employment immediately following completion of the program.
2. A certificate is awarded for completion of one-year occupational/technical curricula. Also, if you pursue a degree program but fail to meet the degree requirements, you may be eligible for a certificate.
3. An associate in arts degree (A.A.) is awarded for completion of two-year Fine Art, Liberal Arts, or Music curricula at the College. These programs are designed for those who plan to transfer course work to four-year colleges or universities toward completion of a bachelor's degree program.
4. The associate in science degree (A.S.) is awarded for completion of two-year curricula with specializations such as Business Administration, Education, Engineering, and other pre-professional programs. These programs are designed for transfer to four-year colleges or universities toward completion of a bachelor's degree program.
5. Multiple degrees—you may earn more than one degree or certificate at NVCC. All of the graduation requirements for each individual curriculum must be completed prior to the award of the degree or certificate for that program. When the associate in science degree in General Studies is one of the multiple degrees to be awarded, the A.S. degree in General Studies shall include a minimum of 12 quarter hours beyond the requirements of any other degree awarded to you by the College.

## Graduation Requirements

### Associate Degree Requirements

To be eligible for graduation with an associate degree (A.A.S., A.A. or A.S.) from the College, you must:

1. Have applied and been admitted to the curriculum;
2. Have fulfilled all of the course work and credit hour requirements of the curriculum as outlined in the College *Catalog*. The catalog to be used to determine graduation requirements is the one in effect at the time of your initial program placement in the curriculum from which you are graduating, or any subsequent catalog of your choice. The catalog to be used in certifying your graduation shall have been in effect no more than seven years prior to the time of graduation;
3. Have been recommended for graduation by the appropriate instructional authority in your curriculum;
4. Have taken at least 20% of the credits in the curriculum at NVCC;
5. Have completed the general education requirements for an associate degree;
6. Have earned a grade point average of at least 2.00 on courses attempted which are applicable toward graduation in the curriculum;
7. Have applied for graduation in your campus office of Admissions and Records on or before the dates published in the *Schedule of Classes* for each quarter;
8. Have resolved all financial obligations to the College and returned all materials, including library books.

### Certificate Requirements

To be eligible for graduation with a Certificate from the College you must:

1. Have applied and been admitted to the curriculum;
2. Have fulfilled all of the course requirements of the curriculum as outlined in the College *Catalog*. This includes achieving a passing grade in each course in the curriculum. The catalog to be used to determine graduation requirements is the one in effect at the time of your initial program placement in the curriculum from which you are graduating, or any subsequent catalog of your choice. The catalog to be used in certifying your graduation shall have been in effect no more than seven years prior to the time of your graduation.
3. Have been recommended for graduation by the appropriate authority in the curriculum;
4. Have earned a grade point average of at least 2.0 in all courses attempted which are applicable toward graduation in the curriculum;
5. Have completed at least 50% of the credits for the Certificate in specialized courses at NVCC;
6. Have applied for graduation in the office of Admissions and Records on or before the dates published in the *Schedule of Classes* for each quarter;
7. Have resolved all financial obligations to the College and returned all materials, including library books.

### Certificate of Completion

If you successfully complete a program of instruction which does not lead to a certificate or an associate degree, you may be awarded a Certificate of Completion. These are also given for noncredit courses at the College.

### Graduation Honors

Students attending NVCC for a minimum of 45 credit hours in degree programs are eligible for graduation honors. Those attending NVCC for a minimum of 50% of the credit hours in their certificate program are eligible for graduation honors. You must apply for graduation in the office of Admissions and Records to be eligible for graduation honors. Graduation honors are determined by your cumulative grade point average.

Appropriate honors are based on scholastic achievements and recorded on the degree or certificate as follows:

Grade Point Average	Honor
3.20	Cum Laude (with honor)
3.50	Magna Cum Laude (with high honor)
3.80	Summa Cum Laude (with highest honor)

## Academic Regulations

### Attendance

Regular attendance at classes is required. Absences equal to 30 percent of the scheduled instructional time for a course will be considered as unsatisfactory progress unless the instructor has made other arrangements for the class (or individual students) to complete course objectives.

Credit will not be granted for work completed in courses in which you are not officially registered.

It is your responsibility to inform the instructor prior to an absence from class whenever possible. Frequent unexplained absences may result in dismissal from the course. The student is responsible for making up all work missed during an absence.

### Academic Standing

The College is responsible for letting you know when you are having academic difficulty. After you receive official notice, the College will assist in setting objectives, planning for improved study habits, and dealing with other factors that relate to your academic progress.

The College will send you official notification on your student grade report when you are having academic difficulty. You will be given an appropriate period of time to show improvement. The College may determine that you are best served by being prevented from further registration for a period of time if you show no academic improvement.

The College provides the following official indications of academic difficulty:

#### 1. Academic Warning

If you fail to maintain a minimum grade point average of 2.00 for any quarter or fail any course you will receive an academic warning.

#### 2. Academic Probation

If you fail to maintain a minimum cumulative grade point average of 1.50, you will be placed on academic probation until your grade point average reaches 1.50 or better. The Statement "placed on academic probation" will be included on your permanent record. You will be ineligible for appointive or elective office in student organizations and usually will be required to carry less than a normal course load the following quarter. While on academic probation you are required to consult a counselor. An average between 1.50 and 1.99 may not result in formal academic probation; nevertheless, a minimum of 2.00 in your curriculum is a prerequisite to the receipt of an associate degree. Part-time students will not be placed on academic probation until they have attempted 12 quarter credit hours.

#### 3. Academic Suspension

If you are on academic probation and fail to attain a minimum grade point average of 1.50 for the next quarter, you will be subject to academic suspension. Academic suspension normally will be for two quarters unless you reapply and are accepted for readmission to another curriculum of the College. The statement placed on "academic suspension" will be included on your permanent record.

If informed that you are on academic suspension, you may submit an appeal in writing to the chairman of the Admissions Committee for reconsideration of your case. A suspended student may be readmitted after termination of the suspension period and upon formal written petition to the chairman of the Admissions Committee. Part-time students will not be placed on suspension until 24 quarter credit hours have been attempted.

Following your reinstatement after academic suspension, you must achieve a minimum 2.00 grade point average for the



quarter. You must maintain at least a 1.50 grade point average in each subsequent quarter of attendance. You remain on probation until your overall grade point average is raised to a minimum of 1.50.

#### 4. Academic Dismissal

Failure to attain a minimum 1.50 grade point average in a subsequent quarter following academic suspension will result in academic dismissal from the College. The statement "placed on academic dismissal" will be placed on your permanent record. Academic dismissal normally is permanent unless, with good cause, you reapply and are accepted under special consideration for readmission by the Admissions Committee. Part-time students are not subject to academic dismissal until 36 quarter hours have been attempted.

### Examinations

You are expected to take tests at regularly scheduled times. In addition, every student is required to take a final examination, receive an appropriate evaluation instrument, or continue receiving instruction during the scheduled final examination period. Any deviation from the final examination schedule must be approved by the campus provost.

### Academic Load

The minimum full-time academic load is 12 credits, and generally the maximum full-time load is 18 credits. To carry an academic load of more than 18 credits, you ordinarily must have a 3.00 grade point average or higher, the approval of the Provost or his/her designee, and usually the approval of your faculty advisor or counselor.

### Student Rights and Responsibilities

As a member of the student body of the College, there are certain rights which you may expect to enjoy as well as obligations which you accept by your enrollment. The College's policy on academic dishonesty and a statement on student rights and responsibilities are contained in the current edition of the *Student Handbook*. Also found in the *Student Handbook* is the College's

policy and procedures on student conduct and discipline.

## Extended Learning Institute Course Requirements

### Textbooks

Textbooks for Extended Learning Institute (ELI) courses may not be the same as those used on campus. They may be purchased at any NVCC campus bookstore or ordered by mail. If the book is not available at one of the campuses, the bookstore will arrange to get it from another campus for you. Books ordered from the bookstore by mail are shipped within 72 hours.

### Assignment Due Dates

Even though ELI courses are self-paced, you are required to submit some assignments by specific due dates. If you do not submit these assignments on time, you can be dropped from the course with a grade of "W."

### Services Available to ELI Students

All college and campus services are available to ELI students. Some restrictions may exist in the case of financial aid and veterans benefits. Some services, such as bookstores, counseling, and learning laboratory/learning resource centers, are sometimes closed during the first two weeks of September and the last two weeks of December. Faculty members may also be on vacation at these times, so there may be some delay in returning written work that has been submitted to ELI. For more information on the availability of services, contact the campus nearest you or the Extended Learning Institute.

### ELI Examinations

Each course has at least one exam which you must take in person at a campus learning laboratory. This is a proctored exam. To pass an ELI course, you must pass the proctored exams, regardless of how well you do on other course assignments. Proctored exams may be scheduled at your convenience (including evenings) by calling the learning laboratory at the campus nearest to you. If you cannot get to a campus learning laboratory, other arrangements for proctoring the exam can be made by contacting ELI.



Black History Month Exhibit

Each campus provides a number of services designed to help with your education, career and personal development. Counseling, testing, faculty advising, financial aid, job placement, student activities, health services and information about the College are explained in this section. Other services such as admissions and records are explained elsewhere in this catalog.

The Dean of Student Development on each campus is responsible for most of the student services. Contact the Dean or members of the student development staff to take full advantage of these opportunities for assistance. If taking courses through the Extended Learning Institute, you can enroll through the student services on your home campus or contact ELI.

## Counseling Services

Counselors are professionals who are available to assist you in your educational career and life planning. They can help you to make effective decisions and to deal with problems that you may be facing while in attendance at the College. Interviews with counselors are confidential. Referral information is available for persons requiring professional assistance beyond the scope and training of the counselors.

A counselor can help you explore and develop career goals and plan your education to help meet those goals. If you want to enroll in a degree or certificate curriculum, and if you did not indicate a choice of curriculum on your Application for Admission, you must meet with a counselor for curriculum placement. This may mean planning a developmental program to gain the necessary skills in certain areas to meet the entrance requirements for a curriculum. It may mean planning a program to take the right courses for transfer to a four-year college or university when you leave NVCC. It may mean selecting the occupational/technical program best suited to your abilities.

During your first quarter at NVCC, the counselor will refer you to a faculty advisor who will assist you in planning your second quarter and the rest of your program.

Counseling services are open to you throughout your stay at the College. You are encouraged to continue to visit your counselor for whatever reason you may have. Any change of curriculum must be made through your counselor.

Counselors assist you with financial aid information, inventories, career information, volunteer service placement information, job counseling information, and personal information materials. Special group programs are also available in career planning seminars, personal exploration groups, and other skill building workshops.

## Testing Services

The counseling service on each campus provides a testing program to help you better understand your abilities, interests, skills, and values. Tests and inventories are administered and interpreted at nominal charge to students.

Information is available about national testing programs such as the Test of English as a Foreign Language (TOEFL) and College Level Examination Program (CLEP).

## Information Services

### 1. Orientation

An orientation program provides you with the opportunity to learn skills and information that will help you to be successful at NVCC. The orientation program may begin weeks before registration when you meet with a counselor for a program placement interview. In this interview, career interests and educational goals are explored. It will be determined at this time if there is a need for additional information or tests. Your application for admission to a specific curriculum will be evaluated, and the first quarter's courses planned.

The orientation course, GENL 100, is required for graduation in all degree curricula and many certificate curricula. It is best to take this credit course in your first quarter at the College. The Extended Learning Institute also has an orientation course available for those who cannot attend a campus-based section.

### 2. Career, Educational and Personal Information

A variety of printed material is available in the Counseling Center and in the Learning Resource Center of each campus. Reference books and college catalogs providing information on colleges and professional schools are available. Other books and pamphlets describe the entrance requirements, working conditions and compensations of thousands of career and job opportunities. Specialized materials are there to help you learn more about how to plan for your education and personal development.

### 3. Student Handbook

The NVCC *Student Handbook* provides additional information about the College. Student activities and organizations are described. Food services, bookstores, parking regulations, the statement of student rights and responsibilities, and a listing of College and campus office locations and phone numbers are included.

## Faculty Advising

For the first quarter at the college, you should work with a counselor to plan a program for meeting your educational objectives. You will then be referred to a faculty advisor or counselor for all subsequent terms. Your faculty advisor/counselor will assist you in planning the rest of your program.

To graduate, you must obtain certification by your faculty advisor that all course requirements for the degree or certificate have been met. All students are encouraged to seek information and assistance from faculty advisors in career and occupational planning in addition to curriculum planning.

Even if you are not enrolled in a specific curriculum major, you may seek assistance from faculty advisors and counselors to help select courses during registration.

## Financial Aid Services

NVCC strives to assure that no one be denied the opportunity of attending the College for financial reasons. The financial aid program provides a variety of ways for you to get funds for college.

Financial Aid counselors at each campus provide information about financial aid programs, application procedures and eligibility.

Jobs are available on campus under a work-study program. If you are enrolled at least half-time and can show a financial need, you may qualify for participation in this program.

Loans are available through the National Direct Student Loan and the Guaranteed Student Loan Program. If you need a loan, contact the Financial Aid Office for information and a determination of eligibility for a loan.

Supplemental Educational Opportunity Grants (SEOG) are federally funded and available in conjunction with other types of financial aid.

The Pell Grant which is federally funded requires financial need and at least half-time enrollment.

The College Scholarship Assistance Program provides scholarships for full-time students domiciled in Virginia. The program is provided through the State Council of Higher Education for Virginia to students attending Virginia colleges who are in good academic standing.

Applications for financial aid are available from the Financial Aid Office on campus. Application must be made on your home campus and should be made well in advance of the quarter for which assistance is needed. Applications for the 1987-88 academic year should be submitted before April 1, 1987. Applicants for all aid programs, including loans, must file a Financial Aid Form (FAF) through the College Board.

The NVCC Student Financial Aid Committee is composed of representatives of the administration, student body, Financial Aid Offices, and faculty as appointed by the President. The Committee reviews and recommends policy on administering financial aid programs.

Extended Learning Institute courses will not be included in

any calculation used to determine a student's eligibility for any financial aid funds or loan deferments.

Additional information on scholarships, grants, loans, and on-campus employment may be found in the 1987-88 Financial Aid Brochure.

**Satisfactory Progress**

To be eligible for financial aid, a student must maintain satisfactory academic progress for all periods of enrollment. Degree-seeking students may receive financial aid for no more than the equivalent of nine full-time quarters. Students who are required to take developmental studies are limited to receiving financial aid for 45 credits of developmental studies and 45 credits of ESL courses.

Students must demonstrate satisfactory academic progress by completing the minimum number of required credits and achieving the minimum required GPA as measured by the Credit Completion Schedule. Completed credits are those for which a grade of A, B, C, D, R, or P was earned. The schedule is prorated for part-time students. An evaluation of this requirement will be done at the end of each Spring Quarter for degree-seeking students and at the end of each Fall and Spring Quarter for students enrolled in certificate programs.

**CREDIT COMPLETION SCHEDULE**

Total Full-Time Quarter Equivalent	Required Credits Completed	Required Cumulative GPA*
1	12	*
2	24	1.50
3	36	1.50
4	48	1.75
5	60	1.75
6	72	1.75
7	84	2.00
8	96	2.00
9	108	2.00

\*13-23 credits requires a 1.5 G.P.A.

Students whose academic standing is "Suspension" will be immediately ineligible for aid until they have achieved a cumulative GPA of at least 1.50, and made up any other deficiencies under this policy.

Students may apply to the Financial Aid Office for a probationary eligibility when unusual and mitigating circumstances have prevented them from meeting the terms of this policy. Students may appeal their status under this policy through the NVCC Student Grievance Procedures.

Students who withdraw from or fail to attend classes are subject to repaying financial aid. Additional information is available in your Financial Aid Office.

**Scholarships**

Private citizens, businesses, non-profit institutions, and associations have generously donated scholarship funds for students. Recipients are selected by the Student Financial Aid Committee or by the donor. Most scholarships require that you provide a statement of financial need, and some are curriculum or career related. The Financial Aid Office on each campus can provide information about the current availability of individual scholarships as well as application materials.

The following scholarships are generally available each year:

- Kathy Ahern Memorial Scholarship Fund
- Alexandria Women's Club Scholarship
- Alpha Delta Tau
- Robert Altomare Scholarship
- Alumni Federation Scholarship
- American Legion Auxiliary Scholarship
- Philip Arnow Purchase Award
- Baptist Widows'/Wives Fellowship

- Eleanor Becci Memorial Scholarship
- Joseph L. Boneta Security Scholarship
- B.P.O. Elks Lodge Arlington-Fairfax
- Brandel Biology Scholarship
- Senator Adelard L. Brault Scholarship
- Deanna Bronder Memorial Scholarship
- George L. Buc Memorial Scholarship
- Jeff Carroll Memorial Scholarship
- Clifton Community Woman's Club Scholarship
- Steven Dresdner Memorial Scholarship
- Early Childhood Education Scholarship
- Charles Errico Memorial Scholarship
- Fairfax County Home Economists Scholarship
- Fairfax Host Lions Club Scholarship
- Falls Church Garden Club Scholarship
- Federal Water Quality Control Scholarship
- John P. Flannery Scholarship
- Leslie V. Forte Minority Scholarship
- James Freimuth Memorial Scholarship
- Gretchen Gamble Scholarship
- Arthur R. Geier Memorial Scholarship
- Rhonda A. Gilliam Memorial Scholarship, Theta Rho Lambda
- Goose Creek Herb Guild Scholarship
- Christopher T. Hanson, Phi Beta Lambda Memorial Scholarship
- Hazleton Laboratories Scholarship
- Doctor Lloyd and Elizabeth Iddings Tuition Scholarship
- Clifford Alan James Memorial Scholarship
- Dr. Barnard D. Joy Memorial Scholarship
- Knick Scholarship
- Liberty Savings Bank Scholarship
- George F. Lowerre Memorial Scholarship
- Manassas Campus Classified Staff Scholarship
- Marketing Curriculum Advisory Committee Scholarship
- Marriott Corporation
- Media General Cable of Fairfax Scholarship
- Mobil Foundation Scholarship
- Charles Monroe Memorial Scholarship
- National Capital Club Managers Association
- NVAA Cherry/Caldwell Memorial Scholarship
- Northern Virginia Automobile Dealers Association Scholarship
- Northern Virginia Community Foundation Scholarship
- Northern Virginia Dentists Scholarship
- NVDS Dental Assisting Scholarship
- NVDS Dental Lab Technician Scholarship
- David T. Oliver Memorial Scholarship
- Omicron Chi Omega Scholarship
- Optimist Club Scholarship
- Phi Theta Kappa (AN) Scholarship
- Frances Pickett Scholarship (Haymarket Women's Club)
- PROST (Executive Women in Travel) Scholarship
- Providence Club Extension Homemakers Scholarship
- Restaurant Association of Metropolitan Washington
- ROTC, Retired Officers Scholarship
- Dr. Catherine Seaman Scholarship
- Security Administration Scholarship
- Joseph Sobien Memorial Scholarship
- Soroptimist Club of Fairfax Scholarship
- Sterling Area Garden Club Horticulture Scholarship
- Tele-Sec Scholastic Achievement Award
- Evelyn Wade Literary Scholarship
- Women's Auxiliary to Fairfax County Medical Society Scholarship
- Women's Club of Mclean
- Women's Club of Vienna Scholarship
- Zonta Club of Arlington-Fairfax

## Career Planning and Job Counseling

The College maintains a job referral service for off-campus jobs. Employment opportunities may be available while attending NVCC, during vacations, and even after graduation.

Local businesses cooperate with the college to provide part-time employment for students. An effort is made to refer you to a job in a field related to your college program. If you work more than 20 hours per week, you should adjust your course load accordingly. Referral information is available from the Career Planning and Job Counseling Office on each campus.

## Student Health Services

Limited student health services are available on each campus for individual health counseling and referral to appropriate specialists within the community as needed. Various health education and health screening programs are sponsored by the student health services.

A student accident and health insurance policy is available. You are encouraged to consider the coverage provided by this policy if you do not have other accident and health insurance. A dental plan is also available.

## Services for Handicapped Students

NVCC is committed to serving persons with handicaps. A goal of NVCC is that each qualified student have an equal opportunity to pursue a college education regardless of the presence or absence of a handicap. To reach that goal, NVCC will provide the course, program and building modifications and auxiliary services which are necessary to assure equal access. NVCC assumes that handicapped students will assist the college in identifying needed resources and possible agency sources.

Campus resources provide the direct services to students and some of the administrative support with the additional administrative support provided by college staff. Questions of compliance with section 504 of the Rehabilitation Act of 1973, as amended, should be addressed to the Coordinator of Affirmative Action and Grants Development.

Each campus and the Extended Learning Institute has identified a special services team to assist disabled students. These teams generally serve as the handicapped person's initial contact and generally consist of the campus student health nurse and a designated counselor. Areas of general assistance include counseling, registration, special academic needs and liaison with area rehabilitative service agencies. Information regarding medical concerns and special parking permits can be obtained in the Student Health Office.

If you require any of these special services, you should contact the Special Services Team four to six weeks prior to the beginning of classes. Early requests for special services enable the College to better assist you with your individual needs.

## Student Activities

A variety of educational, cultural and social experiences are open to you at NVCC. Many of these learning opportunities are available outside of the classroom.

A counselor/coordinator of student activities on campus assists in planning extracurricular events and with the development of student organizations. The Student Government Association provides support for student groups who are promoting activities on campus. Student activities and organizations are open to all interested students, faculty and staff.

Student organizations which are recognized by the College include:

- Administration of Justice Club
- Alexandria Campus Historical Association
- Alexandria Campus Music Club
- All-Afrikan Student Union
- Animal Science Club
- Anthropology Club
- Arab Students Association\*

- Art Students League
- Association for Cooperative Education Students
- Auto Association
- Baptist Student Union
- Black Studies Association
- Chinese Culture & Friendship Club\*
- Chinese Students Association\*
- Circle K Club of NVCC\*
- Cooperative Education Association
- Data Processing Management Association
- Dental Assistants Association
- Dental Hygienists Association
- Dental Laboratory Technology Club
- Deutscher Klub
- Deutscher Verein
- Fine Arts Club
- Friends of Pakistan
- Horticulture Club
- Hotel Sales Management Association
- Jewish Association\*
- Korean Christian Student Fellowship
- Korean Student Organization
- Le Cercle Francais
- Model United Nations Club
- Musica NOVA
- Nazarene Christian Campus Fellowship
- Newman Student Association
- NOVA Art Association
- NOVA Jazz Club
- NOVA Medieval Society\*
- NOVAN Theatre Players
- Nurses Christian Fellowship\*
- NVCC Freewheelers
- NVCC Nomads\*
- Omega Mu
- Organization of Minority Affairs
- Phi Beta Lambda (National Business Organization)
- Phi Theta Kappa Alumni Association
- Phi Theta Kappa Fraternity (National Junior College Honorary Scholastic Society)
- Physical Therapist Assistants Club
- Psychology Club
- Radiography Association
- Recreation and Parks Society
- Science Club
- Shoes of the Fisherman\*
- Society for Minority Concerns
- Spanish-American Latin Student Association
- Spanish Club
- Special Olympics Advocate Program Club
- Student Accounting Association\*
- Student Network
- Student Nurses Association
- Student Photography Association
- Universal Circle\*
- Vietnamese Student Community
- Virginia Air Conditioning and Refrigeration Association
- Woodbridge Arts Association
- \*Approval pending

## Vocational Rehabilitation

The College cooperates with the Virginia State Department of Vocational Rehabilitation in providing education and training for persons who are handicapped.

## Army Reserve Officer Training Corps (ROTC)

As a Northern Virginia Community College student you may enroll on the Annandale Campus in Army ROTC (Military Science) courses. The ROTC program is available through a cooperative agreement with Georgetown University. If you want information on eligibility for ROTC Financial Assistance or Army Scholarships, you may contact the ROTC program at Georgetown University in Washington, D.C., or the Division of Social Sciences and Public Services at the Annandale Campus. The military science credits transfer to advanced Army ROTC programs at other institutions. There is no service commitment during the first two years of enrollment and you may discontinue participation after any quarter. The program is open to all students.

## Veterans Affairs Office

The College participates in the Veterans Cost of Instruction Program. This federal program is designed to assist veterans in becoming students and supporting educational endeavors while enrolled. The Office of Veterans Affairs coordinates all veterans activities for the College. Veterans benefits, information, and counseling services for veterans are available at each campus.

## Veterans Benefits

The degree programs of the College are approved for training eligible servicepersons, veterans, and dependents. Some certificate programs are also approved for training. Additional information is available from the Veterans Office on each campus.

Veterans and dependents who may be eligible for educational benefits from the Veterans Administration should contact their campus Veterans Office each quarter to complete the necessary forms to establish and maintain their eligibility for benefits. Full-time educational benefits are available to veterans and dependents registering for and maintaining 12 or more credits in degree program courses. Three-quarter-time benefits are paid for 9 to 11 credits and half-time benefits are paid for 6 to 8 credits per quarter. Active duty servicepersons and those registered for less than 6 credits are entitled to tuition reimbursement only. Certificate programs are measured differently for payment. Courses taken through the Extended Learning Institute and accelerated courses are also measured differently. See your campus Veterans Office for details.

Veterans may have earned credits at another college, vocational school, or technical school. Credits may have also been earned by taking CLEP, ABLE, DANTEs, or USAFI exams. You must insure that an official transcript is sent to the Admissions and Records Office during your first quarter of enrollment. Veterans and Service persons must have their military training evaluated along with their transcripts from non-military schools. DD Form 214s (Certificate of Release or Discharge from Active Duty) originals or copy #4 should be copied by Admissions and Records for evaluation and returned to you. Generally, repeating courses which have been previously passed will not be certified to the Veterans Administration for payment.

If you receive educational benefits you must report your enrollment each quarter to the Veterans Office on your home campus. The information will then be certified and reported to the Veterans Administration. Any changes to your registration must also be reported to the Veterans Office. Changes include: cancelled classes, dropped classes, withdrawing from classes, adding classes, or any other type of change that may affect your eligibility to receive benefits from the Veterans Administration. Excessive absences may result in the dismissal from the course and adjustment of benefits from the Veterans Administration. Any change in status must be reported to the Veterans Administration as soon as possible, but no more than 30 days after the change has been officially completed at the College.

## Satisfactory Progress Policy for Recipients of Veterans Benefits

To be eligible for Veterans Educational Benefits, recipients must maintain satisfactory academic progress per Northern Virginia Community College standards as printed in the *College Catalog*. In addition, the following standards must be met by recipients of Veterans Educational Benefits:

1. A recipient may only be certified for enrollments in courses required to complete the recipient's program of study.
2. Recipients must be placed in a program of study by the end of their second quarter of enrollment.
3. Developmental study courses may only be used for purposes of calculating enrollment levels for certification when full authorization has been obtained and submitted to the campus Veterans Clerk.
4. A recipient will be reported to the Veterans Administration as making unsatisfactory progress when his/her cumulative GPA falls below the required level based on the following schedule:

Regular Credits Completed (Grades A,B,C,D,F)	Minimum Cumulative GPA Requirement .
13-36	1.50
37-72	1.75
73+	2.00

This standard will be applied each quarter. However, when a recipient has not achieved the minimum cumulative GPA requirement but has achieved a quarterly GPA of at least a 2.0 for the quarter being evaluated (s)he will have achieved satisfactory progress.

5. If a recipient is found to be making unsatisfactory progress and it has been reported to the Veterans Administration, under the terms of #4 (s)he will be reinstated when (s)he has achieved the required cumulative GPA through continued enrollment at NVCC. The quarterly GPA will have no effect in this instance.
6. At the end of each quarter, recipients who have been identified as meeting the College's definition of "Academic Suspension" will be ineligible for certification and reported to the Veterans Administration as making unsatisfactory academic progress until (s)he has achieved the cumulative GPA required by the schedule in #4 through continued enrollment at NVCC. The quarterly GPA will have no effect on this requirement for reinstatement.
7. Grades of R for nondevelopmental courses and W, I or X for any course will result in a revised certification of the level of enrollment being submitted to the Veterans Administration. Any financial liability that exists because of a revised certification is the responsibility of the recipient. Liabilities are determined by the Veterans Administration.
8. Recipients will be notified in writing when they have not met the minimum standards. Recipients' questions regarding their standing should be addressed to the Veterans Clerk or Dean of Student Development on their home campus.
9. Students may request a probationary period for extension of eligibility when deficiencies are the result of mitigating circumstances by writing the Veterans Administration.

## Virginia War Orphans Education Program

The Virginia War Orphans Education Program provides educational assistance for children, or surviving children, of certain veterans or service personnel. To be eligible for assistance under this program, an applicant must meet some basic eligibility requirements. For more information or applications, contact the Veterans Office on your campus.

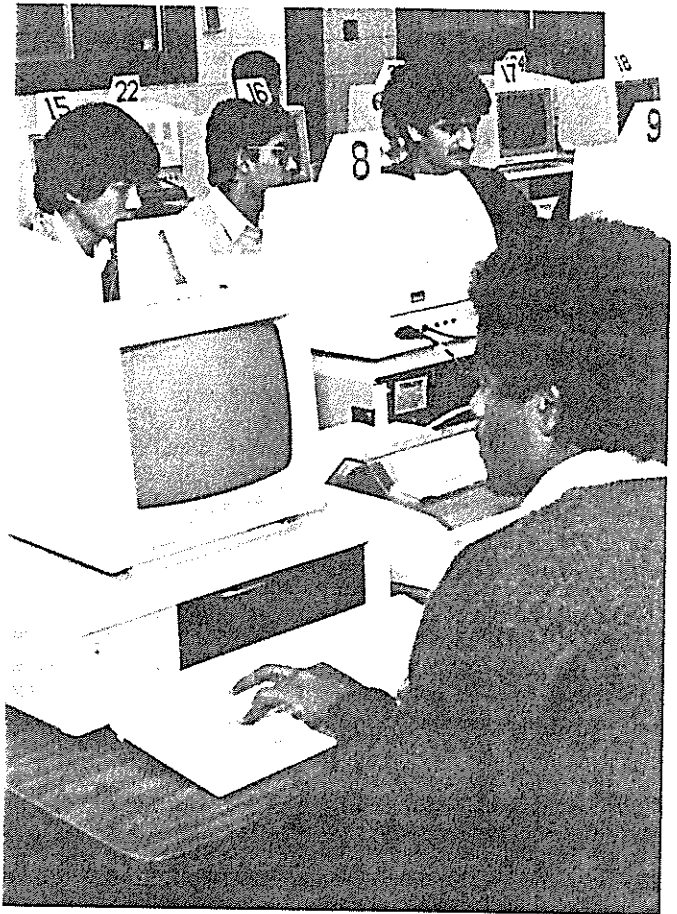


## Servicemembers Opportunity College

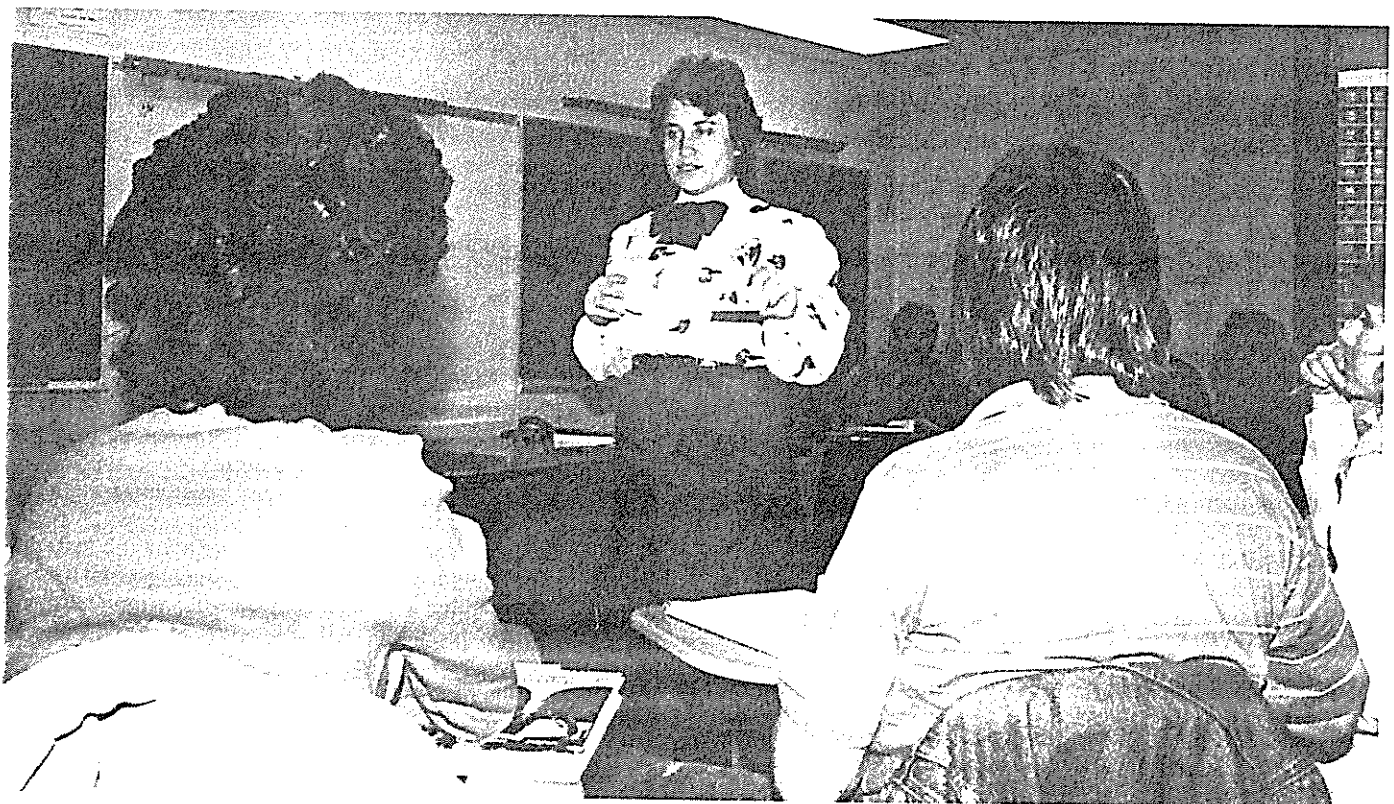
NVCC has been designated as an institutional member of Servicemembers Opportunity Colleges (SOC), a group of over 400 colleges and universities providing voluntary postsecondary education to members of the military throughout the world. As a SOC member, NVCC recognizes the unique nature of the military lifestyle and has committed itself to easing the transfer of relevant course credits, providing flexible academic residency requirements, and crediting learning from appropriate military training and experiences. SOC has been developed jointly by educational representatives of each of the Armed Services, the Office of the Secretary of Defense and a consortium of thirteen leading national higher education associations; it is sponsored by the American Association of State Colleges and Universities (AASCU) and the American Association of Community and Junior Colleges (AACJC).

In addition to its SOC membership, NVCC is one of approximately 50 institutions providing occupational and flexible Servicemembers Opportunity Colleges Associate Degree programs on over 200 Army installations worldwide. These programs lead to associate degrees and most of them correspond to enlisted and warrant officer job specialties. Through prior agreement, students in SOCAD programs:

1. have residency credit limited to 1/4 of total degree requirements taken at any time;
2. are awarded credit for experience in their military occupational specialty (MOS) and service schools as appropriate to their program;
3. are awarded credit for non-traditional learning based on results of national tests, such as CLEP and SSTs, as appropriate to their program;
4. have a SOCAD Student Agreement completed as their official evaluation stating remaining degree requirements and eliminating the need for reevaluation of previous credit;
5. are guaranteed that courses listed in transferability charts in the SOCAD Handbook will be accepted for degree requirements within each curriculum area.



*Microcomputer/Wordprocessing Class*



*Spanish Class*

## Instructional Programs

Northern Virginia Community College offers many types of credit and non-credit programs. This section of the College Catalog will help you understand what these programs are.

This section contains a description of each of the one-year and two-year curricula of the College. Special courses are available to help you upgrade your skills in specific subjects. Cooperative Education programs allow you to work and earn college credits at the same time. The credit programs of the College are outlined and explained in this section.

### Community Service

The Office of Continuing Education on each campus helps to plan and provide many types of credit and non-credit programs to meet special interests within the community. Various community education programs and seminars focus attention on social issues. Business, industry and professional organizations provide special courses at NVCC for their employees. These programs can be set up at the College or where you work.

Many non-credit programs are offered each quarter to serve special community needs. A listing of community service courses is included in each quarterly *Schedule of Classes*.

Courses and workshops often result from requests by individuals or groups within the community. The topics vary from job skills to personal enrichment interests. The programs pay for themselves through fees charged to participants. State funds are not used for setting up or offering a course, or paying the instructor. Fees for community service courses vary depending upon the actual cost of each course. Community service course information and registration instructions are available at each campus Office of Continuing Education.

Cultural affairs are available through short courses, special lectures, music presentations and art festivals. Community groups and organizations may also make special arrangements to use facilities of the College for their own programs or meetings.

### Continuing Education Units for Non-Credit Courses<sup>13</sup>

The College awards Continuing Education Units (CEU) upon completion of most non-credit courses. One CEU represents ten hours of participation in community service courses which meet the following standards:

1. The non-credit activity is planned in response to an assessment of educational needs for a specific target population.
2. There is a statement of objectives and rationale.
3. Content is selected and organized in a sequential manner.
4. There is evidence of pre-planning.
5. The activity is instructional and is approved by an academic or administrative unit of the institution best qualified to affect the quality of the program content and to approve the resource personnel utilized.
6. There is provision for registration for individual participants.
7. Evaluation procedures are utilized.
8. Criteria are established for awarding Continuing Education Units to individual students prior to the beginning of the activity.

### Cooperative Education

Cooperative Education is an academic program designed to provide you with practical on-the-job learning experience. You earn college credit and a grade while working in an approved job. The Cooperative Education (Co-op) Program Coordinator guides you in the cooperative learning process and originates, develops and approves the co-op jobs. The main objective of

Cooperative Education is to bridge the gap between theory and practice by providing you with the opportunity to apply the theory and skills learned in the classroom to a job situation. Faculty advisors and the Cooperative Education Program Coordinator can help you decide about the value of working in an on-the-job learning experience related to your major area of study.

To be eligible to participate in the Cooperative Education Program, you must:

1. Be program placed in a degree-granting program which offers Co-op experience.
2. Have completed two quarters of college work, approximately 24 to 30 credit hours.
3. Have completed a minimum of two courses in your major area of study.
4. Have a 2.00 or better grade point average.

Before registering for Co-op, you must have written approval from the Cooperative Education Program Coordinator and be hired by an approved Co-op employer.

You may earn up to 15 Cooperative Education credits which can be used to meet curriculum requirements; be substituted, with the approval of your faculty advisor, for curriculum requirements; or earned as added elective credit.

Cooperative Education is offered on the Alexandria, Annandale, Loudoun, Manassas and Woodbridge campuses. Information is available through your faculty advisor, counselor or Cooperative Education Office.

### Developmental Studies

If you are coming to the College without some high school courses or prerequisites needed for admission to a curriculum, or if you wish to upgrade your skills, the developmental studies program may be the place for you to begin your course of study at NVCC.

Once you are accepted by the College (see Administrative Information section) you may take developmental courses until you are ready to go into the program of your choice. Developmental courses are offered at all campuses of the College. These courses (numbered 01 through 09) are available in biology, chemistry, English composition, spelling, English as a second language, reading and mathematics (arithmetic through trigonometry).

Counselors will help you determine the areas in which your skills and knowledge are below college entry level. In some cases you must complete your developmental courses before enrolling in certain courses or being admitted to a curriculum. In other cases, you can take college level courses along with developmental courses. The approval of a counselor or faculty advisor in the curriculum would be required.

Developmental courses carry credits, but these are primarily for administrative purposes such as calculating tuition and student course loads. The credits do not apply toward graduation and are not counted in your grade point average.

There is a wide variety of instructional methods and materials used at the college for developmental courses. In some courses there is a choice either the classroom type of lecture/discussion or individualized (programmed) instruction in which you can work at your own rate of learning. Also, with some of these courses you can sign up during the quarter and complete the work at a pace suited to your needs. Some developmental courses are offered through the Extended Learning Institute. If you have any questions, please check with a counselor or faculty advisor.

## Academic Computing

NVCC has a number of academic computing resources available for the support and enhancement of the instructional program.

All campuses have academic computing laboratories with interactive terminals connected to NVCC's IBM-4341 computer.

Campus academic computing systems for special use include a microprocessor, plotter and desk-top microcomputer for instruction in the Annandale campus engineering and data processing disciplines, as well as a medical records computer management system in the Annandale Health Technologies programs. The Alexandria campus uses a mini-computer system called TICCIT (Time-shared, Interactive, Computer-Controlled, Information Television) with 128 time-sharing terminals for instruction in a variety of subject areas, including English, music, mathematics and biology. In addition, each campus is equipped with at least one micro-computer laboratory.

## Curricula of Study

### General Information

In the following section, the degree and certificate curricula are listed. They are arranged in alphabetical order according to title of the major or special area of study. Each curriculum listing:

1. Provides information concerning occupational or transfer objectives;
2. States special curriculum admission requirements, if any, beyond those for acceptance by the College;
3. Specifies the required courses and minimum number of credit hours for completion;
4. Suggests a sequence for taking courses; and
5. Provides an outline to follow for completion of the curriculum with full-time study.

### A.A.S. Degree General Requirements

#### Major Courses and Credit Requirements:

1. Approximately 50% of the courses or credit hours in all A.A.S. degree curricula are in the given major area of study.
2. Approximately 25% of the courses or credit hours are in closely related and supporting areas.
3. The total number of credit hours required for each curriculum is specified, with the minimum number of any degree being 97 credits.

#### General Education Courses for A.A.S. Degrees

Each degree curriculum contains a minimum of 25% of the total credit hours in general education areas. Those areas include humanities, social science, mathematics and natural science.

Some substitutions within the humanities and social science areas are allowed for the A.A.S. degree. These are as follows:

1. **English** (Total of 9 credits required)
  - ENGL 111-112 English Composition I-II (6 cr.) and ENGL 113 English Composition III (3 cr.) or SPDR 136 Oral Communication (3 cr.) or ENGL 137 Technical Writing (3 cr.) or ENGL 180 Business English (3 cr.)
  - Each curriculum lists the preferred third course. The courses should be taken in the sequence listed with the exception that SPDR 136 may be taken at any time.
2. **Social Science** (total of 9 credits required)
  - Alternative A--
    - GOVT 180 American Constitutional Government (3 cr.) and ECON 160 American Economics (3 cr.) and PSYC 110 Principles of Applied Psychology (3 cr.)
  - Alternative B--
    - SOSC 101-102-103 Contemporary American Civilization I-II-

III (9 cr.)

Alternative C--

Any 3-quarter (9 cr.) course sequence in one of the following disciplines:

Anthropology	Sociology
History	Social Science
Government	Geography
Psychology	Economics

Alternative A, B or C may be taken to satisfy the social science requirement for an A.A.S. degree. They need not be taken in the sequence listed.

#### Special Requirements for A.A.S. Degrees:

1. GENL 100 Orientation (1 credit)
2. PHED Physical Education (total of 3 credits)
  - PHED 100 Fundamentals of Physical Activity is required. The remaining 2 credits may be selected from the various 1 credit hour activity courses.

#### Course Level Requirement

Only courses designated with 100 level and above numbers are counted toward degree requirements.

### A.A. and A.S. Degrees General Requirements and Electives

#### Elective Requirements

Specified electives are sometimes given according to discipline area requirement. The exact course to be taken is to be chosen with approval of a counselor or faculty advisor.

Electives should be chosen carefully and after investigation of transfer requirements of the institution to which transfer is contemplated. A full year's sequence of courses is generally easier to transfer than only one or two quarters of a sequence. Quarter-hour and semester-hour equivalencies should be calculated if transfer to an institution operating on the semester system is contemplated.

#### General Requirements

1. **English**
  - For transfer purposes, students should take: ENGL 111-112-113 English Composition (9 cr.) and a 200 level literature sequence.
2. **Mathematics**
  - Mathematics courses for transfer purposes should be selected from one of the following course sequences:
    - a. **Non-Science, Non-Mathematics, and Non-Engineering Majors:** MATH 191-192-193 Finite Mathematics, MATH 161-162-163 College Mathematics, MATH 181-182- 183 General College Mathematics, MATH 141-142-143 Introductory Mathematical Analysis
    - b. **Science, Mathematics, and Engineering Majors:** MATH 141-142-143 Introductory Mathematical Analysis, MATH 161-162-163 College Mathematics, and MATH 241-242-243 Advanced Mathematical Analysis
3. **Foreign Language Requirement for A.A. Degree in Liberal Arts**
  - To receive an associate in arts degree in Liberal Arts, you must demonstrate proficiency in one foreign language through the intermediate level, either by examination or by completion of course work. If you have previously studied a foreign language and wish to continue the same language, you must arrange with the foreign language faculty of the Humanities Division to take a placement test. If you have successfully completed (within the last two years) the second level in high school of a foreign language, you should not enroll in 101-102-103 of the same language. Take 106 or 206, depending on the results of the placement test.

4. **Humanities** Humanities courses for transfer purposes may be selected from the following areas: music, art, drama, humanities, language, philosophy, speech or English. The humanities course sequence selected should be the one acceptable to the four-year college or university to which transfer is contemplated.
5. **Social Science** Three-quarter sequence social science courses may be selected from one of the following disciplines: economics, geography, government, history, psychology, social science, or sociology. Anthropology may be found listed as a sociology course. The social science course sequence selected should be the one acceptable to the four-year college or university to which transfer is contemplated.
6. **Natural Science** Natural Science courses (with labs) for transfer purposes may be selected from the following areas:
  - a. **Science majors:** biology, chemistry, physics and geology.
  - b. **Non-Science majors:** biology, chemistry, physics and geology and the natural science 121-122-123 course sequence.

**Special Requirements for A.A. and A.S. Degrees**

1. **GENL 100 Orientation** (1 credit)
2. **PHED Physical Education** (total of 3 credits)  
 PHED 100 Fundamentals of Physical Activity is required. The remaining two credits may be selected from the various one-credit-hour activity courses. The physical education requirement of the institution to which transfer is contemplated should be completed prior to transfer if at all possible.

**Course Level Requirement**

Only courses with 100 level or above numbers are counted toward degree requirements.

**Minimum Credit Requirements**

A minimum of 97 credits is required for an A.S. or A.A. degree.

**Certificate General Requirements**

1. The total minimum number of credits required for the given certificate is specified for each curriculum.
2. All major courses and possible substitutions are given with each curriculum.
3. The required general education component is incorporated in each curriculum listing.

**Career Studies Certificate**

The Career Studies Certificate is a response to the short-term training needs of many individuals, and can be completed in less time than the conventional one- and two-year programs and degrees. While the Virginia Community College System has established a maximum of 44 credit hours for a Career Studies Certificate, the number of credits required to complete a Career Studies Certificate at the College varies, with generally a 15-27 credit-hour range. The Career Studies programs are designed for expansion of job and life skills, retraining for career change and investigating new career possibilities. In some instances the Career Studies Certificate is applicable toward the achievement of a higher academic award, such as a one-year certificate or an associate degree.

**Curriculum Requirements:**

During the first quarter of enrollment, students must meet the general admission requirements for acceptance by the College and any specific requirements of the curriculum.

**Curricula**

The certificate and degree curricula offered by the College are entered in alphabetical order by major title in the following list.

All general education, orientation, and physical education courses which are required for degree and certificate curricula are offered on all campuses of the College. Specialized major courses required for some degree curricula are not offered on all campuses. Those campuses offering all of the major courses needed for a given degree or certificate are noted by an X in the appropriate box following the curriculum entry. Campus symbols are as follows: AL-Alexandria, AN-Annandale, LO-Loudoun, MA-Manassas, and WO-Woodbridge.



*Computer Drafting*



*Students on Campus*





Dental Hygiene Class



Major (Degree or Certificate)	AL	AN	LO	MA	WO
Specialization	X	X	X	X	X
Accounting (A.A.S.)					X
Air Conditioning and Refrigeration (A.A.S. & Certificate)			X		
Animal Science Technology (A.A.S.)	X	X		X	
Architecture (A.A.S.)	X	X	X	X	X
Art Education (A.S.)	X			X	
Automotive Body Reconditioning (Certificate)	X			X	
Automotive Diagnosis and Tune-Up (Certificate)	X				
Automotive Electrical Technician (Certificate)	X				
Automotive Machinist (Certificate)	X				
Automotive Maintenance and Tune-Up (Career Studies Certificate)					
Automotive Technology (A.A.S.)	X			X	
Diagnostician	X			X	
Mechanics	X				
Automotive Transmissions and Power Trains (Certificate)				X	
Aviation Technology (A.A.S.)				X	
Career Pilot				X	
Aviation Technology/Flight Attendant (Certificate)	X	X	X	X	X
Business Administration (A.S.)	X	X	X	X	X
Business Management (A.A.S.)		X			
Cardiac Care Technician (Career Studies Certificate)	X	X			
Civil Engineering (A.A.S.)		X			
Land Surveying					
Commercial Art (A.A.S.)	X		X		
Advertising Design	X		X		
Commercial Photography	X		X		
Illustration		X			
Complete Dentures (Career Studies Certificate)	X	X	X	X	X
Computer Information Systems (A.A.S.)	X	X	X	X	X
Computer Science (A.S.)	X			X	
Construction Inspection (Certificate)	X			X	
Construction Management Technology (A.A.S.)	X	X			X
Corrections Science (A.A.S. & Certificate)		X			
Dental Hygiene (A.A.S.)		X			
Dental Laboratory Technology (A.A.S.)		X			
Dietary Manager (Certificate)		X			
Dietetic Technician (A.A.S.)		X			
Nutritional Care	X				
Drug Abuse Rehabilitation Counselor (Certificate)	X				
Early Childhood Development Assistant (Certificate)	X				
Early Childhood Education: Child Home Care (Nanny) (Certificate)	X	X	X	X	X
Education (A.S.)	X	X	X	X	X
Industrial Education					
Educational Associate (A.A.S.)	X				
Early Childhood Educational Development		X			X
Electronics (A.A.S.)		X			X
Electronics Technician (Certificate)		X			
Emergency Medical Services Technology (A.A.S. & Certificate)	X	X			
Engineering (A.S.)		X			
Electrical Engineering	X	X		X	
Engineering Drafting (Certificate)	X	X	X	X	X
Fine Arts (A.A.)	X		X		X
Art/Fine Art Photography	X	X	X		X
Art History					
Fire Science (A.A.S.)	X	X			
Administration	X	X			
Investigation	X	X			
Management	X	X			
Transfer	X	X			
Fire Science (Certificate)	X	X	X	X	X
General Studies (A.S.)					
Horticulture Technology (A.A.S.)				X	
Floriculture				X	
Landscape Grower					
Hotel, Restaurant and Institutional Management (A.A.S.)					

Major (Degree or Certificate) Specialization	AL	AN	LO	MA	WO
Food Service Management.....		X			
Hotel-Motel Management.....		X			
Hotel, Restaurant and Institutional Management/Food Service Management (Certificate).....		X			
Hotel, Restaurant and Institutional Management/Hotel-Motel Management (Certificate).....		X			
Hotel, Restaurant and Institutional Management/Travel and Tourism (Certificate).....		X			
Human Services Associate (A.A.S.)		X			
Alcohol Rehabilitation.....					
Gerontology.....	X				
Mental Health.....	X				
Social and Community Services.....	X				
Transfer.....	X				
Interior Design (A.A.S.).....	X				
Legal Assisting (A.A.S.).....			X		
Liberal Arts (A.A.).....	X				
International Studies.....	X	X	X	X	X
Philosophy/Religion.....	X	X	X	X	X
Speech Communication.....	X	X			X
Machine Tool Operation (Certificate).....	X	X	X	X	X
Marketing (A.A.S.)		X			
Fashion.....					
Retail.....	X	X			X
Mechanical Engineering (A.A.S.).....	X	X			X
Computer Aided Design and Manufacturing.....		X			
Electro-Mechanical Technology.....		X			
Medical Laboratory Technology (A.A.S.).....		X			
Medical Office Assisting (Career Studies Certificate).....		X			
Medical Record Technology (A.A.S.).....		X			
Music (A.A.)		X			
Entertainment.....					
Fine Arts.....	X	X	X		
Liberal Arts.....	X	X	X		
Religion.....	X	X	X		
Music Recording Technology (Certificate).....	X	X	X		
Nursing (A.A.S.).....			X		
Occupational Safety Assistant (Career Studies Certificate).....		X			
Office Administration and Management (A.A.S.).....	X				
Office Systems Technology (A.A.S.)	X	X	X	X	X
Administrative Assistant.....					
Executive Secretary.....	X	X	X	X	X
Word Processing.....	X	X	X	X	X
Office Systems Technology (Certificate).....	X	X	X	X	X
Phlebotomy (Career Studies Certificate).....	X	X	X	X	X
Physical Security (Career Studies Certificate).....		X			
Physical Therapist Assistant (A.A.S.).....	X				
Planning (Career Studies Certificate).....		X			
Police Science (A.A.S. & Certificate).....	X				
Transfer.....	X	X			X
Radiography (A.A.S.).....	X	X			X
Real Estate (A.A.S. & Certificate).....		X			
Recreation and Parks (A.A.S.).....		X	X		
Recreation Vehicle/Marine Mechanics (Career Studies Certificate).....		X			
Recreation Vehicle/Motorcycle Mechanics (Career Studies Certificate).....	X				
Respiratory Therapy (A.A.S.).....	X				
Safety Technician (Certificate).....		X			
Science (A.S.).....	X				
Security Administration (A.A.S.).....	X	X	X	X	X
Small Business Management (Certificate).....	X	X			X
Technical Illustration (Career Studies Certificate).....	X	X		X	X
Technical Illustration (Career Studies Certificate).....	X				
Turf and Grounds Management (Career Studies Certificate).....					
Welding (Certificate).....			X		
Welding (Career Studies Certificate).....				X	
Woodworking (Career Studies Certificate).....					X
					X

**ACCOUNTING**

**Associate in Applied Science Degree  
Business Management Degree Program**

*Purpose:* The curriculum is designed for persons who seek employment in the accounting field or for those presently in accounting who desire to increase their knowledge and update their skills. The occupational objectives include: Accounting Trainee / Accounting Technician / Junior Accountant / Accountant.

*Special Curriculum Admission Requirements:* The student should possess a proficiency in high school English and a strong background in basic arithmetic.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
First Year		Qtr.	Qtr.	Qtr.
ACCT	211-212-213 Prin. of Accounting I-II-III .....	3	3	3
BUAD	100 Intro. to Business .....	3		
BUAD	121-122-123 Business Math. I-II-III .....	3	3	3
BUAD	164-165 Prin. of Business Mgmt. I-II .....		3	3
BUAD	254 Applied Business Statistics I or BUAD 246 Business Finance .....			3
DAPR	106 Prin. of Data Processing .....		3	
*ECON	160 American Economics .....	3		
*ENGL	111-112 English Composition I-II .....	3	3	
GENL	100 Orientation .....	1		
PHED	100 Fundamentals of Physical Activity .....		1	
*SPDR	136 Oral Communications .....			3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>15</b>

		Credits		
		1st	2nd	3rd
Second Year		Qtr.	Qtr.	Qtr.
ACCT	221-222-223 Intermediate Accounting I-II-III .....	4	4	4
ACCT	229 Auditing or ACCT 233 Cost Accounting III or ACCT 256 Govt. Accounting or ACCT 298 Seminar & Project .....			3
ACCT	231-232 Cost Accounting I-II .....	3	3	
ACCT	241-242 Prin. of Federal Taxation I-II .....		3	3
ACCT	Elective .....			3
BUAD	241-242 Business Law I-II .....	3	3	
DAPR	124 Structured Computer Prog. Concepts (Logic) or ACCT 274 Computerized Aug- mented Accounting I .....	3		
DAPR	Elect. or ACCT 275 Computerized Augmented Accounting II .....			3
*GOVT	180 Amer. Const. Govt. .....		3	
PHED	Electives .....	1		1
*PSYC	110 Prin. of Applied Psychology .....	3		
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>17</b>

Total minimum credits for the Accounting major (A.A.S. degree) = 97.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

**AIR CONDITIONING AND REFRIGERATION**

**Associate in Applied Science Degree  
Environmental Control Technology Degree Program**

*Purpose:* This curriculum is designed to prepare students for jobs in the refrigeration and air conditioning field. The Occupational Objectives include: service, maintenance, repair and installation of refrigeration and air conditioning equipment.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
First Year		Qtr.	Qtr.	Qtr.
AIRC	101-102-103 Prin. of Refrig. ....	4	4	4
AIRC	159 Air Conditioning/Heating Safety .....	1		
AIRC	111-112-113 Air Cond. & Refrig. Elec. I-II- III .....	3	3	3
AIRC	154 Combustion Devices .....			3
AIRC	199 Supervised Study .....		1	
AIRC	Tech Elective .....			3
*ENGL	111-112-113 English Comp. ....	3	3	3
GENL	100 Orientation .....	1		
MATH	118-119 Intro. to Tech. Math. ....	5	5	
PHED	100 Fund. of Phys. Act. & 2 Electives .....	1	1	1
<b>Total Credits</b>		<b>18</b>	<b>17</b>	<b>17</b>

		Credits		
		1st	2nd	3rd
Second Year		Qtr.	Qtr.	Qtr.
AIRC	211-212 Air Cond. Controls .....	3	3	
AIRC	251-252-253 Air Cond. Systems .....	4	4	4
AIRC	208 Psychrometrics .....			4
AIRC	218 Heat Load Estimating .....	3		
<sup>1</sup> AIRC	Technical Elective .....		3	3
*--	Social Science Elective .....	3	3	3
--	General elective and/or Coop. Educ. ....	3	3	3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>17</b>

Total minimum credits for the Air Conditioning and Refrigeration major (A.A.S. degree) = 101.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

<sup>1</sup> Technical Electives may be selected from Air Conditioning courses or closely related fields after consultation with a faculty advisor.

**AIR CONDITIONING AND REFRIGERATION**

**Certificate**

*Purpose:* The certificate program is intended to prepare students for jobs in the refrigeration and air conditioning field. Upon successful completion of the program, the student is enabled to take full-time employment. The occupational objectives include: Service, maintenance, repair and installation of refrigeration and air conditioning equipment.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
AIRC	101-102-103 Prin. of Refrig. I-II-III .....	4	4	4
AIRC	111-112-113 Air Cond. & Refrig. Elec. I-II-III .....	3	3	3
AIRC	154 Combustion Devices I .....	3		
AIRC	155 Combustion Devices II .....			3
AIRC	236 Electric Heat .....		3	
AIRC	159 Air Conditioning/Heating Safety .....	1		
AIRC	211 Air Conditioning Controls I .....		3	
AIRC	212 Air Conditioning Controls II .....			3
ENGL	111 English Composition .....	3		
MATH	118-119 Intro. to Technical Math .....		5	5
--	Social Science Elective .....	3		
<b>Total Credits</b>		<b>17</b>	<b>18</b>	<b>18</b>

Total minimum credits for the Air Conditioning and Refrigeration Certificate = 53.

**ANIMAL SCIENCE TECHNOLOGY**

**Associate in Applied Science Degree  
Animal Science Degree Program**

*Purpose:* The Student will be trained as a veterinary medical technician. Satisfactory completion of the curriculum will make the student eligible to take State Board examinations for certification as an animal technician. The curriculum is designed for persons who wish to develop the latest techniques and skills that will prepare them for careers as veterinarian assistants and positions in diagnostic laboratories, research laboratories, institutional or pharmaceutical animal colonies, and as federal or state livestock inspectors.

**Special Curriculum Admission Requirements:** Entry into the Animal Science Technology curriculum requires an interview by the Program Head. This curriculum accepts 30 students each year. Preference is given to Virginia residents.

**Satisfactory completion of the following high school units or equivalent as a minimum:** one unit of algebra, one unit of biology, one unit of chemistry, and proficiency in high school English.

**Special Curriculum Completion Requirements:** Because of the eventual certification process, it is necessary for students to maintain satisfactory progress in their course work. Periodic evaluation of each student will be made by the Program Head.

First Year		Credits			
		1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
AGRI	114 Med. Terminology for Animal Tech.....	2			
AGRI	116 Animal Breeds & Identification .....	3			
AGRI	151 Lab Techniques .....			2	
AGRI	152 Lab Techniques .....		4		
AGRI	153 Lab Techniques .....				4
AGRI	155-156 Animal Anatomy & Physiology I-II.....		4	4	
AGRI	161-162 Clinical Practices .....			3	4
AGRI	179 Companion Animal Behavior .....	2			
AGRI	198 Seminar & Project.....	1			
AGRI	214 Animal Diseases w/lab .....				2
AGRI	260 Animal Nutrition.....				3
BIOL	158 Parasitology.....		3		
CHEM	101-102 General Chemistry I-II .....	4	4		
* ENGL	111-112 English Comp. I-II .....	3	3		
GENL	100 Orientation.....	1			
PHED	100 Fund. of Phys. Act. + 2 PHED electives .....		1	1	1
SECR	111 Typing I.....	3			
SPDR	136 Oral Communications .....			3	
<b>Total Credits</b>		<b>19</b>	<b>19</b>	<b>13</b>	<b>14</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
AGRI	154 Lab Techniques.....		4	
AGRI	163-164 Clinical Practices w/lab .....	4		4
AGRI	215 Animal Diseases.....	2		
AGRI	219 Animal Pharmacology w/lab.....	4		
AGRI	290 Coordinated Internship .....		5	
AGRI	298 Seminar & Project .....			2
BIOL	164 Pathology I.....			3
* -	Social Science Electives .....	3	3	3
<b>Total Credits</b>		<b>13</b>	<b>12</b>	<b>12</b>

Total minimum credits for the Animal Science Technology major (A.A.S. degree) = 102.

\* Substitutes for English and social science courses for an A.A.S. degree are listed in the "A.A.S. Degree General Requirements" section.

## ARCHITECTURE

### Associate in Applied Science Degree Architectural and Construction Technology Degree Program

**Purpose:** This curriculum is designed to prepare students for full-time employment in architectural offices or elsewhere in the construction industry. The occupational objectives include: Architectural Draftsman / Design Assistant / Specifications Assistant / Urban Design & City Planning Draftsman / Field Inspector.

**Special Curriculum Admission Requirements:** Proficiency in high school algebra and geometry.

**Cooperative Education:** Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ARCH	111-112-113 Arch. Drafting .....	3	3	3
ARCH	164-165 Matl. & Meth. of Constr. ....	3	3	
ARCH	171 Spec. Writing.....			3
ARCH	204 History of Arch. I (or ARCH 100) .....	3		
ARCH	205 History of Arch. II.....		3	
ARCH	210 Site Planning .....			3
ENGL	111-112 English Comp. ....	3	3	
ENGL	137 Tech. Writing (or ENGL 113).....			3
GENL	100 Orientation.....	1		
MATH	121-122 Engr. Tech. Math.....	5	5	
ENGR	151 Mechanics (Statics) .....			4
<b>Total Credits</b>		<b>18</b>	<b>17</b>	<b>16</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ARCH	211-212-213 Arch. Drafting .....	3	3	3
ARCH	237 Bldg. Mech. Equip.....	3		
ARCH	236 Bldg. Elec. Equip.....		3	
ARCH	276 Constr. Estimating.....			3
ARCH	279 Critical Path Math Prog.....			3
* PHYS	111-112 Tech. Physics .....	4	4	
** -	Social Science Electives .....	3	3	3
PHED	100 Fund. of Phys. Activity .....	1		
PHED	Electives .....		1	1
ENGR	152-154 Mechanics (Strength) & Lab .....	4		
CIVL	217 Structural Steel Design .....		4	
CIVL	218 Reinf. Concrete Design .....			4
<b>Total Credits</b>		<b>18</b>	<b>18</b>	<b>17</b>

Total minimum credits for the Architecture major (A.A.S. degree) = 104.

\* Science alternates: CHEM 101-102, GEOL 101-102, NASC 121-122.

\*\* Social Science Electives sequences: GOVT 180 + ECON 160 + PSYC 110, ECON 211-212-213, GEOG 240-250-260, GOVT 231-232-233, HIST 101-102-103, HIST 111-112-113, HIST 187-188-189, HIST 221-222-223, PSYC 201-202-203, PSYC 231-232-233, SOSC 121-122-123, SOCI 101-102-103, 211-212-213.

## ART/COMMERCIAL ART (See "Commercial Art")

### ART EDUCATION

#### Associate in Science Degree Education Degree Program

**Purpose:** The Associate in Science in Art Education major curriculum is designed for students who plan to transfer to a four-year program in a professional art school or to a college or university baccalaureate degree program in Art Education.

**Special Curriculum Admission Requirements:** Entry into the Art Education Curriculum requires a satisfactory aptitude in visual art and applicants may be required to submit a portfolio for placement.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ARTS	111-112-113 Hist. & Apprec. of Art.....	3	3	3
ARTS	124-125-126 Drawing .....	4	4	4
ARTS	161-162-163 Fund. of Design.....	4	4	4
ENGL	111-112-113 Eng. Comp.....	3	3	3
GENL	100 Orientation.....	1		
PHED	100 Fund. of Phys. Act. + 1 Elective.....		1	1
1 -	Social Science Electives .....	3	3	3
<b>Total Credits</b>		<b>18</b>	<b>18</b>	<b>18</b>

		Credits		
		1st	2nd	3rd
Second Year		Qtr.	Qtr.	Qtr.
ARTS	291-292 Design IV-V or Elective.....	4	4	
ARTS	Approved Studio Electives .....	4	4	4
ENGL	Amer., Eng., or World Lit. ....	3	3	
PHED	Elective .....			1
<sup>2</sup> --	Nat. Sci. (with Lab.).....	4	4	4
<sup>3</sup> --	General electives.....			4
<b>Total Credits</b>		<b>15</b>	<b>15</b>	<b>13</b>

Total minimum credits for the Art Education major (A.S. degree) = 97.

<sup>1</sup> Soc. science courses may be selected from the following: economics, geography, government, history, psychology, social science or sociology (anthropology)

<sup>2</sup> Science courses may be selected from biology, chemistry, physics, geology or the natural science 121-122-123 course.

<sup>3</sup> Electives should be chosen carefully and after investigation of transfer requirements of the institution to which transfer is contemplated.

### ART/FINE ARTS (See "Fine Arts")

### ART HISTORY (See "Fine Arts")

## AUTOMOTIVE BODY RECONDITIONING

### Certificate

*Purpose:* The curriculum is intended to prepare people for immediate employment in automotive body repair work. The curriculum provides experience in evaluation, repair and refinishing of automotive body damage. Occupational objectives include: Automotive Body Refinisher / Automotive Sheet Metal Repairman / Automotive Frame Repairman / Damage Estimator / Auto Body Analyst.

*Special Curriculum Admission Requirements:* One year high school shop program or equivalent. Students not meeting these requirements may correct this deficiency by successfully completing AUTO 128 - Auto Mechanics.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<sup>1</sup> AUTO	100 Auto Shop Pract.....	3		
AUBD	160 Basic Sheet Metal Operations .....		4	
AUBD	165 Automotive Painting.....			4
AUBD	167 Auto-Body Repair.....		4	
AUBD	168 Auto. Sheet Metal Prep. ....			4
AUBD	169 Automotive Frame Repair.....	4		
ENGL	100 Occupational English .....	3		
<sup>2</sup> WELD	115 Arc & Gas Welding .....	4		
--	Social Science Elective .....		3	
<sup>3</sup> --	Technical Electives .....		2-4	2-4
--	General elective .....			3
<b>Total Credits</b>		<b>14</b>	<b>13-15</b>	<b>13-15</b>

Total minimum credits for the Automotive Body Reconditioning Certificate = 42.

<sup>1</sup> Prerequisite or corequisite for all automotive shop courses.

<sup>2</sup> Prerequisite or corequisite for AUTO 160, 167, and AUBD 169.

<sup>3</sup> Suggested electives: AUTO 267 and 268.

## AUTOMOTIVE DIAGNOSIS AND TUNE-UP

### Certificate

*Purpose:* The curriculum is designed to provide current theory, experience and development for those who desire careers as diagnosticians and tune-up service technicians. Also includes recent technical innovations in electronics, automatic engine controls, fuels management and emission

controls. Occupational objectives include: automotive tune-up technicians, emission control technicians, and service technicians.

*Special Curriculum Admission Requirements:* One year high school shop program or equivalent. Students not meeting these requirements may correct this deficiency by successfully completing AUTO 128 - Auto Mechanics.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
* AUTO	100 Auto Shop Pract.....	3		
AUTO	111 Auto Engines I.....	4		
AUTO	121-122 Auto Fuel Systems.....	4	4	
AUTO	126 Antipollution Systems.....			4
AUTO	241 Auto Electricity I.....	4		
AUTO	284-285 Auto Serv. Proc. & Tune-up I-II .....		3	3
--	ENGL/SPDR Electives.....		3	3
MATH	118 Introduction to Technical Math.....		5	
PSYC	128 Human Relations .....			3
--	General Elective.....			3
<b>Total Credits</b>		<b>15</b>	<b>15</b>	<b>16</b>

Total minimum credits for the Automotive Diagnosis and Tune-Up Certificate = 46

\* Prerequisite or corequisite to all automotive shop courses.

## AUTOMOTIVE ELECTRICAL TECHNICIAN

### Certificate

*Purpose:* This curriculum is designed for persons who seek full-time employment in automotive electrical specialty or electrical rebuild shops. The curriculum includes the necessary theory and shop experience to advance the student to a level of competence for immediate employment as an Automotive Electrical Technician or Automotive Electrical Component Rebuild Specialist.

*Special Curriculum Admission Requirements:* One year high school shop program or equivalent. Students not meeting these requirements may correct this deficiency by successfully completing AUTO 100 Auto Shop Practices, and AUTO 128 Auto Mechanics.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
AUTO	104-105 Auto. Elec. Component Rebuilding I-II.....	4	4	
* AUTO	120 Intro. to Auto. Machine Shop .....	4		
AUTO	241-242-243 Auto. Electricity I-II-III .....	4	4	4
AUTO	246 Automotive Electronics .....			4
AUTO	287-288 Shop Mgmt. & Customer Relations I-II .....		3	3
--	ENGL or SPDR Elective .....	3		
MATH	118-119 Intro. to Technical Math. I-II .....		5	5
<b>Total Credits</b>		<b>15</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Automotive Electrical Technician Certificate = 47.

\* AUTO 120 must be taken prior to or concurrent with any automotive laboratory course.

## AUTOMOTIVE MACHINIST

### Certificate

*Purpose:* This curriculum includes the necessary theory and machine shop experience to bring the beginning students to a level of competency so that they are ready for full-time employment as beginning automotive machinists or heavy equipment machinists. The occupational objectives include: Automotive Machinist / Motorcycle Engine Machinist / Heavy Equipment Machinist.



**Special Curriculum Admission Requirements:** One year high school shop program or equivalent. Students not meeting these requirements may correct this deficiency by successfully completing AUTO 128 - Auto Mechanics.

**Cooperative Education:** Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
AUTO	107 Auto. Disassembly & Inspection Tech. ....	3		
AUTO	109 Auto. Shop Fabrication Tech. ....			3
AUTO	111 Automotive Engines I .....	4		
AUTO	114 Cylinder Block Service .....		4	
AUTO	115 Cylinder Head Service .....		4	
AUTO	118 Auto. Turning Operations .....		4	
AUTO	119 Crankshaft, Camshaft & Connecting Rod Service.....			4
*AUTO	120 Intro. to Auto. Machine Shop .....	4		
--	ENGL or SPDR Elective .....			3
**WELD	115 Arc & Gas Welding .....		4	
MATH	118 Intro. to Technical Math .....	5		
--	Humanities or Social Science Elective.....			3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>13</b>

Total minimum credits for the Automotive Machinist Certificate = 45.

\* Prerequisite or corequisite for all automotive machinist courses.

\*\* Prerequisite for AUTO 109.

## AUTOMOTIVE MAINTENANCE AND TUNE-UP

### Career Studies Certificate

**Purpose:** The curriculum is designed to train entry level automotive service technicians in the basic service, tune-up and repair of today's automobile. Those completing this program will be knowledgeable and have basic working experience to prepare them for full-time employment as entry level automotive repair and preventive maintenance service technicians and engine tune-up to include emission control systems.

**Special Curriculum Admission Requirements:** High school automotive shop or equivalent or mechanical aptitude desired.

**Cooperative Education:** Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
AUTO	100 Automotive Shop Practices .....	3		
AUTO	128 Automotive Mechanics .....	4		
AUTO	241 Electricity I .....		4	
AUTO	284 Service Procedures & Tune-Up I .....		3	
AUTO	285 Service Procedures & Tune-Up II .....			3
*--	ENGL or SPDR Elective .....			3
<b>Total Credits</b>		<b>7</b>	<b>7</b>	<b>6</b>

Total minimum credits for the Automotive Maintenance and Tune-up Career Studies Certificate = 20.

\* If SPDR is chosen, SPDR 136 is recommended.

## AUTOMOTIVE TECHNOLOGY

### Associate in Applied Science Degree Vehicle and Equipment Technology Degree Program

**Purpose:** This curriculum is designed to train technicians in the automotive field. People completing this program will be ready for full-time employment as automotive diagnosticians or automotive mechanics according to the specialization selected. The occupational objectives included: Line Mechanic / New Car Make-ready / Tune-Up Specialist / Diagnostician / Customer Service Representative / Service Manager.

**Special Curriculum Admission Requirements:** One year high school shop program or equivalent. Students not meeting these requirements may

correct this deficiency by successfully completing AUTO 128 - Auto Mechanics.

**Cooperative Education:** Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

First Year (Common to both specializations)		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<sup>1</sup> AUTO	100 Auto Shop Prac.....	3		
AUTO	111 Automotive Engines I .....	4		
AUTO	121-122 Automotive Fuel Systems I-II.....		4	4
AUTO	241-242-243 Auto. Elec. I-II-III .....	4	4	4
<sup>2</sup> ENGL	111 English Composition.....		3	
ENGL	137 Technical Writing .....			3
GENL	100 Orientation.....	1		
<sup>2</sup> GOVT	180 American Const. Govt. ....			3
MATH	118-119 Intro. to Technical Math. I-II .....	5	5	
PHED	100 Fundamentals of Physical Activity + 1 PHED elective .....		1	1
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>15</b>

## Diagnostician Specialization

Second Year		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
AUTO	151-152 Auto Power Trains I-II.....	4	4	
<sup>3</sup> AUTO	181 Auto. Diagnostic Tech. I.....	3		
AUTO	267 Auto. Suspension & Braking Syst. ....			4
AUTO	268 Automotive Alignment.....		2	
<sup>4</sup> AUTO	281-282 Auto. Diagnostic Tech. IV-V.....		3	3
<sup>5</sup> AUTO	287-288 Shop Mgmt. & Customer Relations I-II .....		3	3
AUTO	298 Seminar & Project .....			2
<sup>2</sup> ECON	160 American Economics.....	3		
PHED	Elective .....			1
<sup>2</sup> PSYC	128 Human Relations .....	3		
<sup>2</sup> SPDR	136 Oral Communications .....	3		
AUTO	Electives .....		3	4
<b>Total Credits</b>		<b>16</b>	<b>15</b>	<b>17</b>

Total minimum credits for the Automotive Technology major/Diagnostician Specialization (A.A.S. degree) = 97.

<sup>1</sup> AUTO 100 is a prerequisite or corequisite for all automotive shop courses.

<sup>2</sup> For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

<sup>3</sup> AUTO 199 or 299 may be substituted for AUTO 181.

<sup>4</sup> AUTO 284-285 may be substituted for AUTO 281-282.

<sup>5</sup> Business courses or AUTO 134-135 may be substituted for AUTO 287-288.

## Mechanics Specialization

Second Year		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
AUTO	112-113 Automotive Engines II-III.....	4	4	
AUTO	126 Anti-Pollution Systems .....			4
AUTO	151-152 Power Trains.....	4	4	
AUTO	238 Air-Conditioning .....			3
AUTO	267 Suspension & Brakes .....			4
AUTO	268 Steering & Alignment .....		2	
AUTO	298 Seminar & Project .....			2
DRFT	144 Automotive Drawing Interpretation .....	2		
<sup>2</sup> ECON	160 American Economics.....		3	
PHED	Elective .....			1
<sup>2</sup> PSYC	128 Human Relations .....	3		
<sup>2</sup> SPDR	136 Oral Communications .....	3		
--	Automotive Electives.....		3	2
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Automotive Technology major/Mechanics Specialization (A.A.S. degree) = 97.

<sup>1</sup> AUTO 100 is a prerequisite or corequisite for all automotive shop courses.

<sup>2</sup> For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

## AUTOMOTIVE TRANSMISSIONS AND POWER TRAINS

### Certificate

*Purpose:* The curriculum is intended to prepare individuals for immediate employment in Automotive Transmission and Power Trains work. The curriculum provides experience in evaluation, repair, overhaul, and rebuilding of automotive power train assemblies and subassemblies. Occupational objectives include: automatic and manual transmission rebuilders, power train diagnostician, transmission and transaxle service and repair technicians.

*Special Curriculum Admission Requirements:* One year high school shop program or equivalent. Students not meeting these requirements may correct this deficiency by successfully completing AUTO 128 - Auto Mechanics.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
1 AUTO	100 Automotive Shop Practices .....	3		
AUTO	111 Automotive Engines I .....	4		
AUTO	151 Automotive Power Trains I .....	4		
PHYS	111 Technical Physics I (Automotive) .....	4		
AUTO	152 Automotive Power Trains II .....		4	
AUTO	254 Automatic Transmissions I .....		4	
AUTO	256 Automotive Transaxles .....		4	
ENGL	111 English Comp. I .....		3	
AUTO	255 Automatic Transmissions II .....			4
AUTO	281 Automotive Diagnostic Tech. IV .....			3
SOCI	and/or Humanities Elective .....			6
AUTO	Elective .....			2-3
<b>Total Credits</b>		<b>15</b>	<b>15</b>	<b>15-16</b>

Total minimum credits for the Automotive Transmissions and Power Trains Certificate = 45.

<sup>1</sup> AUTO 100 is a pre or corequisite to most Automotive Program Shop Courses.

## AVIATION TECHNOLOGY

### Associate in Applied Science Degree Transportation Degree Program

*Purpose:* The curriculum is designed to prepare the graduate to enter the field of Aviation with a broad base of aeronautical knowledge upon which to build a career. The occupational objectives include: transportation agent/reservation sales agent/station agent/passenger service agent/assistant airport manager/operations agent/airline dispatcher/airline office manager/airport security specialist and other related jobs. Graduates will also have an advantage in taking the Civil Service examinations for appointment to positions with the Federal Aviation Administration as: Air Traffic Controllers/Flight Service specialists/Tower Operators. In the latter area, the Federal Government is the sole employer.

*Special Curriculum Admission Requirements:* Proficiency in high school mathematics (algebra I, algebra II or geometry) is desirable and acceptance by the Program Head following a personal interview is required.

*Coordinated Internship (AERO 290):* Students will find it highly desirable to enroll in a Coordinated Internship experience during one or all quarters of the second year if possible. For further information, see General Usage Courses section.

This degree is designed for entry into all nontechnical Aviation-related careers and the Air Traffic Control field.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
AERO	110 History of Air Transportation .....	3		
AERO	126 Aviation in the U.S. ....		3	
AERO	127 Fundamentals of Flight .....			3
ENGL	111-112-113 English Composition I-II-III .....	3	3	3
*MATH	181-182-183 Gen. Coll. Math. I-II-III .....	3	3	3
PSYC	110 Principles of Applied Psychology .....	3		
AERO	176 Primary Flight (Optional) .....	(1)	(1)	(1)
AERO	136 The National Airspace System .....		3	
AERO	137 Aviation Safety .....			3
GENL	100 Orientation .....	1		
SOCI	101 Introductory Sociology .....		3	
PSYC	128 Human Relations .....			3
BUAD	100 Introduction to Business .....	3		
PHED	100 Fund. of Physical Activity .....		1	
--	General elective .....			3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>18</b>

\* Other MATH courses may be substituted with the approval of faculty advisor; they must be consistent with transferability of the specific field pursued.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>Second Year</b>				
AERO	246 Meteorology .....	4		
AERO	248 Aircraft Support Operations .....		4	
AERO	266 Airport Operations & Management .....			3
AERO	247 Aviation Law .....	3		
AERO	249 Airline & Airport Security .....	3		
AERO	257 Radar, Radio Aids & Communications .....		4	
*AERO	298 Seminar & Project .....	(3)	(3)	3
*AERO	299 Supervised Study .....	3	(3)	(3)
AERO	258 Airline Marketing .....		3	
AERO	Elective .....			3
MKTG	100 Principles of Marketing .....	3		
GEOG	240 Intro. to Physical Geography .....		3	
DAPR	106 Principles of Data Processing .....			3
PHED	Electives .....	1		1
--	General elective .....		3	
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>13</b>

Total minimum credits for the Aviation Technology major (A.A.S. degree) = 97.

\* These courses may be taken during any of the last three (3) quarters.

NOTE: AERO 256, 267, 290 and 297 are electives and may be taken in any of the last three (3) quarters and substituted for 200 series AERO courses or electives.

## VCCS Transfer Program

### Aviation Technology

The breakdown of this curriculum is done to accommodate students outside of the Northern Virginia area. The first three quarters may be taken at any VCCS college and credited toward the A.A.S. degree in Aviation Technology.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>First Year</b>				
BUAD	100 Introduction to Business .....	3		
DAPR	106 Principles of Data Processing .....			3
ENGL	111-112-113 English Comp. I-II-III .....	3	3	3
GENL	100 Orientation .....	1		
GEOG	240 Intro. to Physical Geography .....		3	
MKTG	100 Principles of Marketing .....			3
*MATH	181-182-183 Genl. College Math. I-II-III .....	3	3	3
PHED	100 Fund. of Physical Activity + 2 PHED electives .....		2	1
PSYC	110 Prin. of Applied Psychology .....	3		
PSYC	128 Human Relations .....		3	
SOCI	101 Introductory Sociology .....	3		
--	General elective .....			3
<b>Total Credits</b>		<b>16</b>	<b>14</b>	<b>16</b>

\* Other MATH courses may be substituted with the approval of your faculty advisor; they must be consistent with transferability of the specific field pursued.

The second three quarters shown here are for students transferring to NVCC (Manassas campus) for the A.A.S. degree in Aviation Technology.

Second Year	Credits		
	1st Qtr.	2nd Qtr.	3rd Qtr.
AERO 110 History of Air Transportation.....	3		
AERO 126 Aviation in the U.S.....		3	
AERO 127 Fundamentals of Flight.....			3
AERO 136 National Airspace System.....	3		
AERO 137 Aviation Safety.....		3	
AERO 176 Primary Flight (Optional).....			(1)
AERO 246 Meteorology.....	4		
AERO 247 Aviation Law.....		3	
AERO 248 Aircraft Support Operations.....			4
AERO 249 Airline & Airport Security.....	3		
AERO 257 Radar, Radio Aids & Communications.....			4
AERO 258 Airline Marketing.....	3		
AERO 266 Airport Operations & Management.....		3	
AERO 298 Seminar & Project.....		3	
AERO 299 Supervised Study.....			3
AERO Elective.....			3
-- General elective.....		3	
<b>Total Credits</b>	<b>16</b>	<b>18</b>	<b>17</b>

Total minimum credits for the Aviation Technology (Transfer) major (A.A.S. degree) = 97.  
 AERO 256, 267, 290, and 297 are electives and may be taken in any of the last three quarters and substituted for 200 series AERO courses or electives.

Second Year	Credits		
	1st Qtr.	2nd Qtr.	3rd Qtr.
AERO 247 Aviation Law.....	3		
AERO 128 Theory of Flight (Instrument Pilot).....		3	
AERO 248 Aircraft Support Operations.....			4
AERO 107 Flight IV.....	1		
AERO Elective.....		3	
AERO 257 Radar, Radio Aids and Communications.....			4
AERO 118 Commercial Pilot Ground School.....	5		
AERO 108 Flight V.....		1	
AERO 266 Airport Operations and Mgmt.....			3
*PSYC 128 Human Relations.....	3		
DAPR 106 Principles of Data Processing.....		3	
AERO 267 Airline Operations and Management.....			3
GEOG 240 Introduction to Physical Geography.....	3		
MKTG 100 Principles of Marketing.....		3	
AERO 109 Flight VI.....			1
PHED Elective.....	1		
PHED Elective.....		1	
AERO 298 Seminar and Project.....		3	
<b>Total Credits</b>	<b>16</b>	<b>17</b>	<b>15</b>

Total minimum credits for the Aviation Technology major/Career Pilot Specialization (A.A.S. degree) = 97.  
 AERO 127, 246, 249, 256, 258, 290, 297, and 299 are elective courses and may be substituted for AERO courses other than flight or ground school courses.

\* It is recommended that transfer students select a year's sequence of courses totaling 9 credits in the social sciences: economics, psychology, sociology and anthropology, social science, government, or history.

### Career Pilot Specialization

*Purpose:* The curriculum is designed to prepare the graduate to enter the professional pilot career field with commercial pilot and instrument ratings. These ratings are stepping stones to Certificated Flight Instructor (CFI), Certificated Flight Instructor Instruments (CFII) and Airline Transport Pilot (ATP) ratings. The Career Pilot graduate is prepared to enter the ranks of professional pilots with a broad base of aeronautical knowledge and expertise upon which to build a career. Occupational objectives include: flight instructor, air taxi operator, corporate pilot, commuter airline pilot, preferential treatment in starting a military flying career, and airline pilot. Graduates will also have an advantage in taking the Civil Service Examination for positions where the Federal Government is the sole employer. The knowledge and expertise extant in the professional pilot are de facto credentials assisting entry into many facets of an aviation career.

*Special Curriculum Admission Requirements:* Proficiency in high school mathematics (algebra I, algebra II or geometry) is desirable and acceptance by the Program Head following a personal interview is required.

*Coordinated Internship (AERO 290):* Students interested in air traffic control will find it highly desirable to enroll in a coordinated internship experience during one or all quarters of the second year if possible. For further information, see General Usage Courses section.

This specialization under the Aviation Technology curriculum is designed to facilitate entry into all pilot-related and non-technical aviation-related careers and the air traffic control field.

First Year	Credits		
	1st Qtr.	2nd Qtr.	3rd Qtr.
AERO 104 Flight I.....	1		
AERO 110 History of Air Transportation.....	3		
AERO 126 Aviation in the United States.....		3	
AERO 137 Aviation Safety.....			3
AERO 116 Private Pilot Ground School.....	5		
AERO 105 Flight II.....		1	
AERO 106 Flight III.....			1
AERO 136 The National Airspace System.....		3	
BUAD 100 Introduction to Business.....			3
ENGL 111 English Composition I.....	3		
*SOC 101 Introductory Sociology.....		3	
ENGL 113 English Composition III.....			3
MATH 181 General College Mathematics I.....	3		
ENGL 112 English Composition II.....		3	
GENL 100 Orientation.....	1		
MATH 182 General College Mathematics II.....		3	
MATH 183 General College Mathematics III.....			3
*PSYC 110 Principles of Applied Psychology.....			3
PHED 100 Fundamentals of Physical Activity.....	1		
<b>Total Credits</b>	<b>17</b>	<b>16</b>	<b>16</b>

### AVIATION TECHNOLOGY/FLIGHT ATTENDANT

#### Certificate

*Purpose:* The curriculum is designed to prepare students for the highly competitive flight attendant position. Included are: advantages of the career, exploring the extensive requirements and responsibilities of the job, health and appearance, and application and interviewing techniques. Occupational objectives include: Steward/Stewardess, Customer Service Representative and other related jobs.

*Special Curriculum Admission Requirements:* Students are advised to determine both special and general qualifications for employment as flight attendants prior to entering this curriculum. Information can be obtained from Aviation Technology faculty or counselor.

	Credits		
	1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL 111 English Composition I.....	3		
GENL 100 Orientation.....	1		
GEOG 240 Intro. to Physical Geography.....			3
HLTH 104 First Aid.....		2	
PSYC 128 Human Relations.....	3		
SPDR 136 Oral Communications.....			3
SOCI 101 Introductory Sociology.....			3
AERO 110 History of Air Transportation.....	3		
AERO 126 Aviation in the U.S.....		3	
AERO 136 The National Airspace System.....		3	
AERO 140 Flight Attendant-Introduction.....	3		
AERO 146-147 Flight Attendant-Duties & Responsibilities I-II.....		3	3
AERO 176 Primary Flight (Optional).....	(1)	(1)	(1)
AERO 258 Airline Marketing.....		3	
AERO 266 Airport Operations & Management.....			3
*-- Electives.....	3	3	3
<b>Total Credits</b>	<b>16</b>	<b>17</b>	<b>18</b>

Total minimum credits for the Flight Attendant Certificate = 51.

\* Suggested Electives: AERO 127 (Fundamentals of Flight), AERO 137 (Aviation Safety), AERO 246 (Meteorology), DAPR 106 (Principles of Data Processing), TRAV 150 (Intro. to Travel Industry), TRAV 167 (Intro. to Travel & Tourism), TRAV 169 (Travel Destination Geography), TRAV 177 (Domestic Air Travel Planning), TRAV 178 (International Air Travel Planning), AERO 267 (Airline Operations & Management), HIST 113 (American History), OFTC 111 (Typewriting I), OFTC 121 (Shorthand), Foreign Language (1 full year, language for travelers).

## BUSINESS ADMINISTRATION

### Associate in Science Degree Business Administration Degree Program

*Purpose:* The Associate in Science degree curriculum in Business Administration is designed for persons who plan to transfer to a four-year college or university to complete a baccalaureate degree program in business administration.

*Special Curriculum Admission Requirements:* Satisfactory completion of the following high school units or equivalent as a minimum: 4 units of English; 2 units of mathematics (algebra and geometry); 1 unit of laboratory science; 1 unit of social studies.

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
<b>First Year</b>				
BIOL	101-102-103 Gen. Biol., CHEM 101-102-103, GEOL 101-102-103, or PHYS 201-202-203	4	4	4
ENGL	111-112-113 Eng. Comp.	3	3	3
GENL	100 Orientation	1		
HIST	101-102-103 Hist. of West. Civ. or HIST 111-112-113	3	3	3
MATH	161-162-163 College Math or MATH 181-182-183 or MATH 191-192-193	3	3	3
PHED	100 Fund. of Phys. Act.		1	
1-	General electives	3	3	3
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>16</b>

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
<b>Second Year</b>				
ACCT	211-212-213 Prin. of Acct.	3	3	3
ECON	211-212-213 Prin. of Econ.	3	3	3
ENGL	Amer., Eng., or World Lit.	3	3	3
PHED	Phys. Act. Elect.		1	1
1-	General electives	6	6	6
<b>Total Credits</b>		<b>15</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Business Administration major (A.S. degree) = 97.

<sup>1</sup> Electives should be chosen carefully and after investigation of transfer requirements of the institution to which transfer is contemplated.

## BUSINESS MANAGEMENT

### Associate in Applied Science Degree Business Management Degree Program

*Purpose:* The curriculum is designed for persons who seek employment in business management or for those presently in management who are seeking promotion. The occupational objectives include: Administrative Assistant / Management Trainee / Department Head / Branch Manager / Office Manager / Manager of Small Business / Supervisor.

*Special Curriculum Admission Requirements:* The student should possess a proficiency in high school English and a strong background in basic arithmetic operations.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
<b>First Year</b>				
ACCT	211-212-213 Prin. of Accounting	3	3	3
BUAD	100 Intro. to Bus.	3		
BUAD	164-165 Prin. of Mgt.		3	3
BUAD	121-122-123 Bus. Math.	3	3	3
*ENGL	111-112 Eng. Comp.	3	3	
*SPDR	136 Oral Comm.			3
**ECON	160 Amer. Econ.	3		
**PSYC	110 Prin. of Appl. Psyc.		3	
GENL	100 Orientation	1		
PHED	100 Fund. of Phys. Act.		1	
**GOVT	180 Amer. Const. Govt.			3
--	General elective			3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>18</b>

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
<b>Second Year</b>				
1BUAD	241-242-243 Bus. Law	3	3	3
BUAD	254 Appl. Bus. Stat.	3		
<sup>2</sup> OFTC	111 Typewriting I or Bus. Elect.	3		
PHED	Elect.	1		1
MKTG	100 Prin. of Mkt.	3		
BUAD	269 Purchasing & Matl. Mgt.	3		
<sup>3</sup> BUAD	246 Business Finance		3	
BUAD	276 Personnel Mgt.		3	
ACCT	241 Prin. of Fed. Tax.		3	
<sup>4</sup> --	Bus. Elect.		3	3
DAPR	106 Prin. of Data Processing			3
BUAD	110 Human Relat. & Ldrshp. Tng.			3
BUAD	298 Sem. & Proj.			3
<b>Total Credits</b>		<b>16</b>	<b>15</b>	<b>16</b>

Total minimum credits for the Business Management major (A.A.S. degree) = 97.

\* Substitutes for English courses for A.A.S. are listed in the "A.A.S. Degree General Requirements" section.  
\*\* Substitutes for social science courses for A.A.S. degrees are listed in the "A.A.S. Degree General Requirements" section. At least one ECON course is required in the Business Management Degree program.

<sup>1</sup> Business elective may be substituted for BUAD 243.

<sup>2</sup> Student may petition for credit by examination.

<sup>3</sup> Prerequisite for BUAD 246 is ACCT 211.

<sup>4</sup> Business electives may be chosen from BUAD, DAPR, ACCT, MKTG, REAL, or ECON courses. At least one ECON course is required for graduation.

## CARDIAC CARE TECHNICIAN

### Career Studies Certificate

*Purpose:* The Cardiac Care Technician is a level of competency in pre-hospital emergency care which is recognized by the National Registry of Emergency Medical Technicians as well as the Commonwealth of Virginia as an intermediate level of competency between the basic EMT and the paramedic. With certification as a CCT, individuals can fill the needs of their EMS system as well as work within their capabilities and desired levels of responsibilities. Commonwealth of Virginia certification is available at the completion of the didactic and clinical phase of the program. Students may apply these 24 credits towards the completion of the two-year Associate of Applied Science Degree.

*Special Curriculum Admission Requirements:* The Cardiac Care Technician is certified through the Commonwealth of Virginia's Division of Emergency Medical Services. The Division has established certain criteria for this certification. In order for students to be properly certified prior to entering the CSC Program, they must meet the following prerequisites which parallel those of the Commonwealth:

1. Be at least 18 years of age.
2. Be a certified EMT/Ambulance for at least one year.
3. Be affiliated with an EMS agency which provides advanced life support.
4. Successfully complete the ABLE examination for EMDT 111.

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
<b>First Year</b>				
ENGL	111 English Composition I	3		
EMDT	112 Emergency Med. Services Tech. II	4		
EMDT	217 Introduction to Cardiology		4	
EMDT	226 Paramedic Procedures			7
HLTH	124 Medical Terminology	3		
HLTH	226 General Pharmacology		3	
<b>Total Credits</b>		<b>10</b>	<b>7</b>	<b>7</b>

Total minimum credits for the Cardiac Care Technician Career Studies Certificate = 24.

## CIVIL ENGINEERING

### Associate in Applied Science Degree Civil Engineering Technology Degree Program

*Purpose:* The curriculum is designed to prepare the student for employment as an Engineering Technician, concentrating in either Building

Construction or Land Surveying. Occupational objectives include: Structural Draftsman / Surveying and Planning Assistant / Highways and Building Departments Inspector / Construction Supervisor and Foreman / Civil Engineering Technician.

*Special Curriculum Admission Requirements:* Two units of high school algebra.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see the Cooperative Education Program section.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ARCH	111-112 Architectural Drafting I-II or DRFT 111-112-113 Tech. Drafting I-II-III.....	2-3	2-3	0-2
ARCH	164-165 Materials & Meth. of Constr. I-II.....	3	3	
CIVL	181-182 Surveying I-II.....		4	4
ENGR	100 Intro. to Engineering Tech.....	2		4
ENGR	151 Mechanics I (Statics).....			4
ENGL	111-112 English Composition I-II.....	3	3	
ENGL	137 Tech. Writing or ENGL 113 English Composition III.....			3
GENL	100 Orientation.....	1		
MATH	121-122 Engr. Tech. Math. I-II.....	5	5	
MATH	123 Engr. Tech. Math. III or tech. elec.....			3-5
PHED	100 Fundamentals of Physical Activity.....	1		
<b>Total Credits</b>		<b>17-18</b>	<b>17-18</b>	<b>14-18</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
CIVL	217 Structural Steel Design.....		4	
CIVL	218 Reinforced Concrete Design.....			4
CIVL	227-228 Structural Drafting I-II.....		2	2
CIVL	246 Soil Mechanics.....	3		
CIVL	247 Soil Mechanics Lab.....	1		
CIVL	254 Civil Materials I (Concrete).....		3	
CIVL	257 Concrete Lab.....		1	
ENGR	116 Computer Applications for Engr. Tech. ....			3
ENGR	152 Mechanics II (Strength of Materials).....	3		
ENGR	154 Mechanics Lab.....	1		
PHED	Electives.....	1		1
PHYS	111-112-113 Technical Physics I-II-III.....	4	4	4
1-	Social science electives.....	3	3	3
<b>Total Credits</b>		<b>16</b>	<b>17</b>	<b>17</b>

Total minimum credits for the Civil Engineering major (A.A.S. degree) = 98.

<sup>1</sup> For further explanation of social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

### Land Surveying Specialization

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ARCH	111-112 Architectural Drafting I-II or DRFT 111-112-113 Tech. Drafting I-II-III.....	2-3	2-3	0-2
ARCH	164-165 Materials & Methods of Construction I-II.....	3	3	
CIVL	181-182 Surveying I-II.....		4	4
ENGR	100 Intro. to Engineering Tech.....	2		4
ENGR	151 Mechanics I (Statics).....			4
ENGL	111-112 English Composition I-II.....	3	3	
ENGL	137 Technical Writing or ENGL 113 Eng. Comp. III.....			3
GENL	100 Orientation.....	1		
MATH	121-122 Engineering Technical Math. I-II.....	5	5	
MATH	123 Engineering Technical Math. III or technical elective.....			3-5
PHED	100 Fundamentals of Physical Activity.....	1		
<b>Total Credits</b>		<b>17-18</b>	<b>17-18</b>	<b>14-18</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
CIVL	201-202-203 Suburban Devel. I-II-III.....	3	3	3
CIVL	281-282 Advanced Surveying I-II.....	4	4	
CIVL	298 Seminar & Project or CIVL 297			
	Cooperative Education.....			3
ENGR	116 Computer Appl. for Engineering Tech.....			3
ENGR	152 Mechanics II (Strength of Materials).....	3		
ENGR	154 Mechanics Lab.....	1		
PHED	Electives.....		1	1
PHYS	111-112-113 Technical Physics I-II-III.....	4	4	4
1-	Social science electives.....	3	3	3
<b>Total Credits</b>		<b>18</b>	<b>15</b>	<b>17</b>

Total minimum credits for the Civil Engineering major/Land Surveying Specialization (A.A.S. degree) = 98.

<sup>1</sup> For further explanation of social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

### COMMERCIAL ART

#### Associate in Applied Science Degree Graphic Communications Degree Program

*Purpose:* The curriculum is designed for persons who seek full-time employment in the Commercial Art field immediately upon completion of the program. The occupational objectives include: Commercial Artist / Designer / Illustrator / Photographer.

*Special Curriculum Admission Requirements:* Proficiency in high school English and a satisfactory aptitude for drawing. Applicants may be required to submit a portfolio before final admission is granted.

*Equipment and Supplies* Commercial Art students are required to purchase certain basic equipment and materials necessary to achieve professional-oriented objectives. Most of the equipment is purchased in the beginning class (Introduction to Graphic Skills) and can be used through the two-year program.

*Special Curriculum Completion Requirements:* After completion of the first year, the student's work will be reviewed to ascertain that development is sufficient to enter the Commercial Art field. The student will then choose an area of concentration for the second year from one of the following fields: Advertising Design, Illustration or Photography.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

### Advertising Design and Illustration Specializations

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ARTS	124-125-126 Drawing.....	4	4	4
ARTS	161-162-163 Design.....	4	4	4
ARTS	169 Visual Communications.....			4
ARTS	170 Intro. to Graphic Skills.....	3		
ARTS	171 Typography I.....		3	
ARTS	240 History of Design.....			3
*ENGL	111-112 Engl. Comp.....	3	3	
GENL	100 Orientation.....	1		
PHTG	101 Photography I.....		3	
PHED	100 Fund. of Phys. Act. + 2 electives.....	1	1	1
<b>Total Credits</b>		<b>16</b>	<b>18</b>	<b>16</b>



		Credits		
Second Year		1st	2nd	3rd
Advertising Design Specialization		Qtr.	Qtr.	Qtr.
ARTS	172-173 Typography .....	3	3	
ARTS	214-215 Graphic Tech. ....	4	4	
ARTS	287-288-289 Advertising Design.....	4	4	4
ARTS	298 Seminar & Project .....			3-5
** ARTS	Electives .....		3-4	3-4
* ENGL	113 Engl. Comp. III or SPDR 136 Oral Communications.....	3		
* -	Social Science Electives .....	3	3	3
<b>Total Credits</b>		<b>17</b>	<b>17-18</b>	<b>13-16</b>

Total minimum credits for the Commercial Art major/Advertising Design Specialization (A.A.S. degree) = 97.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

\*\* Electives should be chosen from courses offered in the Commercial Art curriculum. Students transferring to a 4-year college may be required to take History and Appreciation of Art, ARTS 111-112-113, if required by that college.

		Credits		
Second Year		1st	2nd	3rd
Illustration Specialization		Qtr.	Qtr.	Qtr.
ARTS	214 Graphic Tech. I.....	4		
ARTS	260 Painting Tech. for Illust.....		3	
ARTS	281-282-283 Adv. Drawing.....	4	4	4
ARTS	284-285-286 Illustration .....	4	4	4
ARTS	298 Seminar & Project .....			4-5
* ENGL	113 Engl. Comp. III or SPDR 136 Oral Communications.....	3		
* -	Social Science Electives .....	3	3	3
<b>Total Credits</b>		<b>18</b>	<b>14</b>	<b>15-16</b>

Total minimum credits for the Commercial Art major/Illustration Specialization (A.A.S. degree) = 97.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

### Commercial Photography Specialization

		Credits		
First Year		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
ARTS	124-125-126 Drawing .....	4	4	4
ARTS	161-162-163 Design.....	4	4	4
ARTS	169 Visual Communications.....			4
ARTS	170 Intro. to Graphic Skills.....	3		
ARTS	171 Typography.....		3	
* ENGL	111-112 Engl. Comp. ....	3	3	
GENL	100 Orientation.....	1		
PHTG	101-102-103 Photography.....	3	3	3
PHED	100 Fund. of Phys. Act. + 1 Elective.....		1	1
<b>Total Credits</b>		<b>18</b>	<b>18</b>	<b>16</b>

		Credits		
Second Year		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
ARTS	214 Graphic Tech. I.....	4		
ARTS	240 History of Design .....			3
PHTG	144-145 History of Photog. ....	3	3	
PHTG	206 Large Format Photog. ....	3		
PHTG	224-225 Studio Lighting .....	3	3	
PHTG	226-227 Commercial Photog. ....		3	3
PHTG	228 Photo Marketing .....			3
PHTG	299 Supervised Study .....			1-5
* ENGL	113 Engl. Comp. III or SPDR 136 Oral Communications.....		3	
PHED	Elective .....		1	
* -	Social Science Electives .....	3	3	3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>13-17</b>

Total minimum credits for the Commercial Art major/Commercial Photography Specialization (A.A.S. degree) = 97.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

### COMPLETE DENTURES

#### Career Studies Certificate

*Purpose:* The Career Studies Certificate in Complete Dentures will prepare technicians to function productively in the denture department of a private, commercial, or Veterans Administration dental laboratory.

*Special Curriculum Admission Requirements:* An interview with the Program Head is required.

		Credits	
		1st	2nd
		Qtr.	Qtr.
* ENGL	111 English Composition I/SPDR .....	3	
DENT	116 Dental Lab. Materials.....	4	
DENT	128 Head and Neck Anatomy .....		2
DENT	141 Dental Lab. Tech. I.....		7
<b>Total Credits</b>		<b>7</b>	<b>9</b>

Total minimum credits for the Complete Dentures Career Studies Certificate = 16.

\* If SPDR is chosen, SPDR 136 is recommended.

### COMPUTER INFORMATION SYSTEMS

#### Associate in Applied Science Degree Computer Information Systems Degree Program

*Purpose:* The curriculum is for persons who seek employment in the data processing field or for those presently in data processing who desire to increase their knowledge and update their skills. The occupational objectives include: Computer Programmer / Related data processing occupations.

*Special Curriculum Admission Requirements:* The student should possess a proficiency in high school English and one unit of algebra or equivalent.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
First Year		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
DAPR	106 Prin. of Data Processing .....	3		
DAPR	138 Computer System Architecture.....		3	
DAPR	124 Structured Computer Programming Concepts (Logic).....		3	
DAPR	125 Structured Computer Programming (COBOL).....			4
BUAD	100 Intro to Business .....	3		
BUAD	164 Prin. of Business Management .....			3
ACCT	211-212-213 Prin. of Accounting .....	3	3	3
<sup>1</sup> ENGL	111-112 English Comp. ....	3	3	
GENL	100 Orientation.....	1		
MATH	101-102 Fund. of Math or BUAD 121-122 or MATH Elect. ....	3	3	
PHED	100 Fund. of Phys. Act. + 2 electives.....	1	1	1
<sup>1</sup> SPDR	136 Oral Communication .....			3
<sup>1</sup> PSYC	110 Prin. of Appl. Psyc. or BUAD 110.....			3
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>17</b>

Second Year		1st Qtr.	2nd Qtr.	3rd Qtr.
DAPR	256 Computer Programming (Adv. COBOL) .....	4		
DAPR	269 Computer Programming (Assembler) .....		4	
DAPR	281 Systems Analysis I .....	3		
DAPR	286 Computer Program Applications .....		4	
DAPR	287 Computer Software Systems .....		3	
DAPR	298 Seminar & Project .....			4
<sup>3</sup> DAPR	Computer Programming Elect. ....			4
<sup>2</sup> BUAD	254-255 Appl. Bus. Statistics .....	3	3	
<sup>1</sup> ECON	160 Amer. Economics .....	3		
<sup>1</sup> GOVT	180 Amer. Const. Govt. ....			3
--	General electives .....	3		6
<b>Total Credits</b>		<b>16</b>	<b>14</b>	<b>17</b>

Total minimum credits for the Computer Information Systems major (A.A.S. degree) = 97.

<sup>1</sup> For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

<sup>2</sup> BUAD 251-252 may be submitted for BUAD 254-255 with approval of division.

<sup>3</sup> Any four-credit programming language course, including DAPR 237.

## COMPUTER SCIENCE

### Associate in Science Degree Computer and Information Sciences Degree Program

*Purpose:* This curriculum is designed primarily for students who wish to transfer to a four-year college or university to complete the baccalaureate in Computer Science. This curriculum emphasizes the study of the science of computing and the use of computing in a scientific setting.

*Special Curriculum Admission Requirements:* Satisfactory completion of the following high school units or equivalent as a minimum: 4 units of English / 4 units of college preparatory mathematics.

First Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	111-112-113 English Comp. I-II-III .....	3	3	3
MATH	141-142-143 Intro. Math Analysis I-II-III .....	5	5	5
CSCI	201-202-203 Prin. of Computer Science I-II-III .....	4	4	4
--	Science Electives .....	3-4	3-4	3-4
PHED	100 Fund. of Physical Activity and elective .....		1	1
GENL	100 Orientation .....	1		
<b>Total Credits</b>		<b>16-17</b>	<b>16-17</b>	<b>16-17</b>

Second Year		1st Qtr.	2nd Qtr.	3rd Qtr.
MATH	241-242-243 Adv. Math. Anal. I-II-III (3 credits of MATH 298) .....	4(1)	4(1)	4(1)
<sup>1</sup> --	Science Electives .....	4	4	4
<sup>2</sup> --	General Electives .....		4	4
<sup>3</sup> --	Social Science Electives .....	3	3	3
<sup>4</sup> --	Humanities Elective .....	3		
PHED	Elective .....	1		
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Computer Science major (A.S. degree) = 97.

<sup>1</sup> Science electives should constitute two distinct year-long sequences in two of the following areas: (For maximum transferability, students should choose the computer science sequence.)

a. Physical science: (one year sequence in physics or chemistry at appropriate level).

b. Mathematical science (statistics): three courses from MATH 281, 282, 283, 291, 292, 293.

c. Computer science sequence: three courses from CSCI 210, 214, 215, 218.

<sup>2</sup> General electives should be selected carefully in conjunction with an advisor and after examining the requirements at the transfer institution. To insure maximum transferability, students should select ENGR 226, Basic Electric Circuits and ENGR 227, Digital Integrated Electronic Circuits.

<sup>3</sup> Social science courses should be selected from: economics, geography, government, history, psychology, social science or sociology (anthropology). For maximum transferability, a three-quarter sequence in social science electives is recommended.

<sup>4</sup> Humanities courses may be selected from the following: music, arts, drama, language, philosophy, speech, or English.

## CONSTRUCTION INSPECTION

### Certificate

*Purpose:* The curriculum is designed for persons who seek full-time employment in areas of construction inspection or for those presently employed who are seeking advancement and further training. The occupational objective is one of the areas of construction inspection.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		1st Qtr.	2nd Qtr.	3rd Qtr.
BLDG	100 Intro. to Const. Insp. & Safety .....	3		
BLDG	107 Plan Review & Building Codes .....	3		
BLDG	111 Prin. of Residential Bldg. Const. Insp. ....	3		
BLDG	112 Prin. of Concrete & Concrete Insp. ....		3	
BLDG	113 Prin. of Steel Frame Const. & Insp. ....			3
BLDG	121 Prin. of Electrical Inspection .....		3	
BLDG	122 Prin. of Mechanical Inspection .....			3
BLDG	123 Prin. of Plumbing Inspection .....			3
BLDG	197 Cooperative Education .....			2-4
CIVL	246 Soil Mechanics .....		3	
CIVL	247 Soil Mechanics Lab .....		1	
ENGL	100 Occupational English .....	3		
ENGL	137 Technical Writing .....			3
MATH	121-122 Engr. Technical Math. I-II .....	5	5	
<b>Total Credits</b>		<b>17</b>	<b>15</b>	<b>14-16</b>

Total minimum credits for the Construction Inspection Certificate = 46.

## CONSTRUCTION MANAGEMENT TECHNOLOGY

### Associate in Applied Science Degree Architectural and Construction Technology Degree Program

*Purpose:* The curriculum is designed to qualify personnel in both engineering technology and management for employment in all areas of a construction firm. Occupational objectives include: Engineering Aide / Construction Project Manager / Construction Supervisor / Estimator / Building Maintenance Supervisor.

*Cooperative Education:* Students in this curriculum are required to enroll in a Cooperative Education program. For further information, see Cooperative Education Program section.

First Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ARCH	111-112 Architectural Drafting I-II .....	3	3	
ARCH	164-165 Materials & Meth. of Const. I-II .....		3	3
CIVL	140 Construction Planning .....			3
CIVL	181 Surveying I .....			4
ENGR	100 Intro. to Engineering Tech. ....	2		
ENGL	111-112 English Composition I-II .....	3	3	
ENGL	137 Technical Writing .....			3
GENL	100 Orientation .....	1		
MATH	121-122 Engr. Technical Math. I-II .....	5	5	
*--	Social Science Electives .....	3	3	3
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>16</b>

		Credits		
Second Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ARCH	236 Building Electrical Equipment.....		3	
ARCH	237 Building Mechanical Equipment .....	3		
ARCH	277 Building Codes & Contract Documents....		3	
ARCH	279 Critical Path Method Program .....			3
BLDG	234 Materials Take-Off.....	3		
BLDG	235 Cost Estimating.....		3	
BUAD	167 Intro. to Labor Relations.....			3
CIVL	182 Surveying II .....	4		
CIVL	227-228 Structural Drafting I-II .....	2	2	
CIVL	246 Soil Mechanics .....	3		
CIVL	247 Soil Mechanics Lab.....	1		
CIVL	254 Civil Materials (Concrete) .....		3	
CIVL	257 Concrete Lab .....		1	
CIVL	297 Cooperative Education .....			2-4
CIVL	298 Seminar & Project .....			2
PHED	100 Fund. of Physical Activity + 2 PHED electives.....	1		(1)(1)
ARCH	250 Construction Safety .....		3	
<b>Total Credits</b>		<b>17</b>	<b>18</b>	<b>12-14</b>

Total minimum credits for the Construction Management Technology major (A.A.S. degree) = 97.

\* For further explanation of English and social science course requirements for A.A.S. Degrees, see the "A.A.S. Degree General Requirements" section.

## CORRECTIONS SCIENCE

### Associate in Applied Science Degree Public Safety Degree Program

*Purpose:* The curriculum is designed to provide a broad foundation which will prepare the student to enter into full-time employment in any of the varied fields of correction; i.e., probation, penology, court services, and for those presently in a Corrections position who are seeking promotion. Occupational objectives include: Local, State, and Federal Corrections Officer / Probation and Parole Aide.

*Special Curriculum Admission Requirements:* Students must participate in a personal interview with a Police Science-Corrections faculty member. This curriculum is included in the State Law Enforcement Officer's Education Program (SLEOEP). See a Financial Aid Counselor for further details. Program adjustments may be made with faculty approval to enable a student to transfer to a four-year criminal justice program.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see the Cooperative Education Program section.

		Credits		
First Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ADJU	120 Intro. to Corrections .....	3		
ADJU	126 Prevention & Control of Juvenile Delinquency.....		3	
ADJU	128 Criminal Behavior .....		3	
ADJU	129 Treatment of the Offender.....			3
ADJU	156 Corr. & the Community .....			3
ADJU	176 Criminology .....		3	
ADJU	237 Administration of Justice .....	3		
ADJU	287 Principles of Probation & Parole .....			3
GENL	100 Orientation.....	1		
*ENGL	111-112-113 English Comp. I-II-III.....	3	3	3
*SOCI	101-102-103 Introductory Sociology .....	3	3	3
PHED	100 Fund. of Phys. Act. & 2 PHED elect.....	(1)(1)	1	
<b>Total Credits</b>		<b>15</b>	<b>16</b>	<b>15</b>

		Credits		
Second Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ADJU	100 Intro. to Law Enforcement.....		3	
ADJU	124-125 Jail Opr. & Management.....		3	3
ADJU	155 Assessment of Corr. Process .....		3	
ADJU	159 Legal Challenge to Corr. ....	3		
ADJU	231 Crim. Law, Evidence & Procedure .....	3		
ADJU	289 Corr. Counseling.....	3		
ADJU	290/297 Coord. Intern. or Coop. Ed. ....		3	
ADJU	298 Seminar & Project .....			3
SOSC	121-122-123 Current American Social Problems I-II-III.....	3	3	3
PSYC	201-202-203 Genl. Psyc.....	3	3	3
--	Approved Electives .....	3		3
<b>Total Credits</b>		<b>18</b>	<b>18</b>	<b>15</b>

Total minimum credits for the Corrections Science major (A.A.S. degree) = 97.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

## CORRECTIONS SCIENCE

### Certificate

*Purpose:* The certificate curriculum in corrections is designed for those students who wish to take principal courses which relate directly to the corrections field. Courses taken in the certificate program can be applied to the A.A.S. Degree.

*Special Curriculum Admission Requirements:* The same admission requirements apply as stated for the Corrections - A.A.S. Degree Curriculum.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ADJU	120 Intro. to Corrections .....	3		
ADJU	176 Criminology .....	3		
ADJU	126 Prev. & Control of Juvenile Del. ....	3		
ADJU	128 Crim. Behavior .....			3
ADJU	159 Legal Challenge to Corrections.....		3	
ADJU	156 Correction & the Comm. ....			3
ADJU	129 Treat. of the Offender.....		3	
GENL	100 Orientation.....	1		
ENGL	111-112 Comm. Skills .....	3	3	
SOCI	101-102-103 Intro. Soc. (or PSYC 201-202-203).....	3	3	3
SOSC	121-122 Curr. Amer. Soc. Prob.....		3	3
SPDR	136 Oral Comm. or ENGL 113 .....			3
<sup>1</sup> ADJU	Elective .....			3
<b>Total Credits</b>		<b>16</b>	<b>15</b>	<b>18</b>

Total minimum credits for the Corrections Science Certificate = 49.

<sup>1</sup> Suggested ADJU electives: 157, 237, 287.

## DENTAL HYGIENE

### Associate in Applied Science Degree Dental Hygiene Degree Program

*Purpose:* The curriculum is designed to prepare selected students to serve in a dynamic and growing health profession, as valuable members of the Dental Health team. At the successful completion of the program, students will be eligible to take the National Board and State Board Examinations in Dental Hygiene leading to licensure as a Registered Dental Hygienist (R.D.H.) The Program is also designed to accommodate those students who wish to transfer to a four-year college or university to complete the baccalaureate degree in a health related field.

*Special Curriculum Admission Requirements:* (1) high school courses: 1 unit each of algebra, biology, and chemistry (lecture and laboratory), with a minimum grade of "C"; deficiencies may be corrected in the Developmental Program before entering the Dental Hygiene curriculum. (2) Past academic achievement must reflect a "C" average or better. (3) Evidence

of good physical and mental health which may need to be substantiated by a physician's report. The Dental Hygiene Program reserves the right to determine the student's final acceptance. (4) Students majoring in dental hygiene are admitted in September; early application is desirable. Students may take specified support courses prior to entering the Dental Hygiene seven quarter sequence, and are encouraged to work directly with the Counseling Center in planning these courses.

Transfer or prerequisite credits in the natural and social sciences earned at another institution will be evaluated on an individual basis. Developmental work or testing may be advised for credits earned more than ten years ago.

**Special Curriculum Completion Requirements:** Satisfactory health must be maintained for continuance in the program. Any student who receives a final grade less than "C" in any of the courses in the Dental Hygiene sequence must obtain permission from the Program Head to repeat the course and must earn a final grade of "C" or higher before taking the next course in the sequence. Student uniforms and accessories, Dental Hygiene Student Liability Insurance, and transportation to and from the College and the various health agencies utilized for extramural experiences are the responsibility of the individual student.

**Readmission Policy:** Any student who has withdrawn or who has been asked to withdraw due to unsatisfactory academic or clinical performance may apply for readmission to the program the following year. Acceptance will be based upon availability of space, fulfillment of contingencies outlined at the time of withdrawal, faculty approval, and a personal interview.

**Special Accreditation Status:** The curriculum has been accredited by the Commission on Dental Accreditation of the American Dental Association, a specialized accrediting body recognized by the Council on Postsecondary Accreditation and by the U.S. Department of Education.

First Year		Credits			
		1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
DENT	126 Oral Anatomy.....	3			
DENT	127 General & Oral Histology.....	3			
DENT	128 Head & Neck Anatomy.....		2		
DENT	144-145 Dental Hygiene I-II.....	5	5		
DENT	146 Oral Radiographic Tech.....		3		
DENT	147 Nutrition.....				3
DENT	150 General & Oral Pathology.....			3	
DENT	154 Periodontics for Dental Hygiene I.....			2	
DENT	261-262 Dental Hygiene III-IV.....			6	5
* ENGL	111 English Composition I.....		3		
GENL	100 Orientation.....	1			
NASC	111-112-113 Health Science I-II-III.....	4	4	4	
PHED	100 Fund. of Phys. Activity + PHED elective.....			1	1
SOCI	101 Introductory Sociology I.....				3
SPDR	136 Oral Communications.....				3
<b>Total Credits</b>		<b>16</b>	<b>17</b>	<b>16</b>	<b>15</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
DENT	116 Dental Lab. Materials.....	4		
DENT	136 Pharmacology.....	2		
DENT	138 Community Dental Health.....	4		
DENT	148 Office Practice & Ethics.....			2
DENT	155 Periodontics for Dental Hygiene II.....	2		
DENT	238 Community Dental Health Educ.....		3	
DENT	263-264-265 Dental Hygiene V-VI-VII.....	5	5	5
* ENGL	112 English Composition II.....		3	
PHED	Elective.....		1	
PSYC	201 General Psychology.....			3
SOCI	102-103 Introductory Sociology II-III.....		3	3
<b>Total Credits</b>		<b>17</b>	<b>15</b>	<b>13</b>

Total minimum credits for the Dental Hygiene major (A.A.S. degree) = 109.

\* For further explanation of English course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

## DENTAL LABORATORY TECHNOLOGY

### Associate in Applied Science Degree Dental Laboratory Degree Program

**Purpose:** The curriculum is designed to prepare the individual to construct and repair all types of dental prosthetic appliances according to the dentist's prescription. The occupational objectives include: dental laboratory technician work in commercial or public dental laboratory or in a dental office.

**Special Curriculum Admission Requirements:** The student should perform a manual dexterity test and must participate in a personal interview with Counseling Services and the Dental Laboratory Program Head.

**Special Curriculum Completion Requirements:** Any student whose overall GPA falls below a 2.00 must obtain permission from the program head to continue the major in Dental Laboratory Technology.

**Special Accreditation Status:** The program has been accredited by the Commission on Dental Accreditation of the American Dental Association, a specialized accrediting body recognized by the Council on Postsecondary Accreditation and by the U.S. Department of Education.

First Year		Credits			
		1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
DENT	116 Dental Lab. Materials.....	4			
DENT	137 Dental Anatomy & Physiology.....	4			
DENT	141-142-143 Dental Lab. Tech. I-II-III.....		7	7	7
DENT	166 Orthodontic & Pedodontic Appliances.....				3
* ENGL	111-112-113 English Comp. I-II-III.....	3	3	3	
GENL	100 Orientation.....	1			
DENT	240 Intro. to Maxillo-Facial Prosthetics.....				3
NASC	111-112-113 Health Science I-II-III.....	4	4	4	
PHED	100 Fund. of Physical Activity + PHED elective.....		1	1	
<b>Total Credits</b>		<b>16</b>	<b>15</b>	<b>15</b>	<b>13</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
BUAD	100 Introduction to Business.....	3		
BUAD	121 Business Mathematics I.....			3
DENT	108 Intro. to Dental Health Care Delivery.....		3	
DENT	244-245-246 Dental Lab. Tech. IV-V-VI.....	7	8	8
DENT	247 Dental Lab. Tech. Practice.....			4
PHED	Elective.....	1		
SOCI	101-102-103 Introductory Sociology I-II-III.....	3	3	3
<b>Total Credits</b>		<b>14</b>	<b>14</b>	<b>18</b>

Total minimum credits for the Dental Laboratory Technology major (A.A.S. degree) = 105.

\* SPDR 136 may be substituted for ENGL 113. For further explanation of English course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

## DIETARY MANAGER

### Certificate

**Purpose:** The Dietary Manager Certificate Program is designed to provide upward mobility in the field of dietetics and to develop competency in food service management in such health care facilities as: hospitals, nursing homes, retirement homes, schools, meals-on-wheels, and day care centers. The occupational objectives include staff development for in-service personnel for positions as: assistants to registered dietitians, dietetic technicians, or food service directors in hospitals, nursing homes, schools or day care centers.

**Special Curriculum Admission Requirements:** A personal interview with a program faculty member or counselor and good health which may need to be substantiated by a physician's report.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
BUAD	121 Business Math. I .....		3	
*DIET	100 Intro. to Dietetics .....	1		
DIET	106 Dietetics & the Health Field .....		3	
*DIET	130 Nutritional Care .....	3		
*DIET	140 Food Prep. & Mgt. Systems .....		3	
DIET	146 Menu Planning for Nut. Prog.....		3	
*DIET	190 Coordinated Practice.....	1-2	1-2	1-2
DIET	246 Quantity Food Prod. & Purchasing .....		3	
*DIET	247 Training & Super. of Diet & School Food Service Worker .....		3	
ENGL	111 English Comp. I.....	3		
GENL	100 Orientation.....	1		
HRIM	124 Prin. of Food Prep. I.....	4		
HRIM	236 Sanitation.....		3	
SOSC	101 Contemp. Amer. Civ. I.....		3	
<b>Total Credits</b>		<b>13-14</b>	<b>13-14</b>	<b>13-14</b>

Total minimum credits for the Dietary Manager Certificate = 39.

\* Minimum requirements for membership in the Dietary Managers Association (DMA).

### DIETETIC TECHNICIAN

#### Associate in Applied Science Degree Dietetics Degree Program

*Purpose:* The curriculum is designed to provide upward career mobility in dietetics. The technician is the middle management and service person, working with both a Registered Dietitian and the dietetic assistant (food service supervisor) in a hospital or other health care facility. The technician may also direct the food service operations in a small hospital, nursing home, restaurant or any food service facility, under the supervision of a Registered Dietitian.

*Special Curriculum Admission Requirements:* A personal interview with a faculty member or counselor and good health, which may need to be substantiated by a physician's report.

*Special Accreditation Status:* The program is approved by the American Dietetic Association. Graduates are eligible for membership in ADA in the Dietetic Technician category.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
BUAD	121 Business Math I .....			3
DIET	100 Intro. to Dietetics .....	1		
DIET	106 Dietetics and the Health Field .....		3	
DIET	121-122-123 Nutrition Science I-II-III.....	3	3	3
DIET	134 Nutrition I.....			3
DIET	140 Food Prep. & Mgt. Systems .....		3	
DIET	190 Coordinated Practice.....		1	1
*ENGL	111-112 English Comp. I-II .....	3	3	
GENL	100 Orientation.....	1		
HRIM	124-125 Prin. of Food Prep. I-II.....	4	4	
HRIM	126 Prin. of Comm. Food Prep.....			4
HRIM	236 Sanitation.....	3		
PHED	100 Fund. of Phys. Act. ....	1		
SPDR	136 Oral Comm. or ENGL 113 English Comp. III .....			3
<b>Total Credits</b>		<b>16</b>	<b>17</b>	<b>17</b>

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>Second Year</b>				
ACCT	211 Prin. of Accounting I .....		3	
BUAD	122 Business Math. II .....	3		
DIET	135 Nutrition II.....	3		
DIET	146 Menu Plan. for Nut. Prog.....	3		
DIET	190 Coord. Practice .....	1	2	
DIET	290 Coord. Practice .....			3
DIET	234-235 Therapeutic Nutrition.....		4	3
DIET	246 Quant. Food Prod. & Purch. ....			3
DIET	247 Training & Super. of Diet & School Food Serv. Worker.....	3		
DIET	298 Seminar & Project .....			3
HRIM	264 Food & Bev. Cost Controls I .....		3	
PHED	Electives .....		1	1
*SOSC	101-102-103 Contem. Amer. Civ. I-II-III.....	3	3	3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Dietetic Technician major (A.A.S. degree) = 98.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

Students wishing to transfer to Virginia Polytechnic Institute and State University in dietetics may see the Program Head for substitutions in the above curriculum.

### Nutritional Care Specialization

*Purpose:* The curriculum is designed to provide the knowledge and skill for the graduate to assist a Registered Dietitian in the assessment implementation and evaluation of nutritional care provided in health care facilities.

*Special Curriculum Admission Requirements:* A personal interview with a faculty member or counselor and good health, which may need to be substantiated by a physician's report.

*Special Accreditation Status:* The program is approved by the American Dietetic Association. Graduates are eligible for membership in ADA in the Dietetic Technician category.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>First Year</b>				
BUAD	121 Business Math. I .....			3
DIET	100 Intro. to Dietetics .....	1		
DIET	106 Dietetics and the Health Field .....		3	
DIET	121-122-123 Nutrition Science I-II-III.....	3	3	3
DIET	134 Nutrition I.....			3
DIET	138 Community Nutrition .....			3
DIET	140 Food Prep. & Management Systems.....		3	
DIET	190 Coordinated Practice.....		1	1
*ENGL	111-112 English Composition I-II .....	3	3	
GENL	100 Orientation.....	1		
HRIM	124-125 Prin. of Food Preparation I-II.....	4	4	
HRIM	236 Sanitation.....	3		
PHED	100 Fundamentals of Physical Activity .....	1		
SPDR	136 Oral Communications or ENGL 113 English Comp. III .....			3
<b>Total Credits</b>		<b>16</b>	<b>17</b>	<b>16</b>



Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
DIET	135 Nutrition II.....	3		
DIET	146 Menu Plan. for Nutrition Programs.....	3		
DIET	190 Coordinated Practice.....	1	2	
DIET	290 Coordinated Practice.....			3
DIET	210 Food Services Computer Appl.....		3	
DIET	226 Nutritional Assessment and Planning.....		3	
DIET	234-235 Therapeutic Nutrition I-II.....	4		3
DIET	246 Quant. Food Prod. & Purchasing.....			3
DIET	247 Training & Super. of the Diet. and School Food Service Worker.....	3		
DIET	298 Seminar & Project.....			3
PHED	Electives.....		1	1
PSYC	247 Educational Psychology.....	3		
*SOSC	101-102-103 Contemp. Amer. Civ. I-II-III.....	3	3	3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Dietetic Technician major/NutritionalCare Specialization (A.A.S. degree) = 97.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

Students wishing to transfer to a four-year program may see the Program Head for recommendations on course selection.

## DRUG ABUSE REHABILITATION COUNSELOR

### Certificate

*Purpose:* This curriculum is designed to fulfill the Virginia State educational requirements for the certification of drug counselors. To meet drug counselor certification requirements, the applicant is expected to meet specific education requirements including didactic and experiential learning, with a supervised internship required.

Individuals desiring skills and knowledge in this career field, but not seeking State Certification, may also enroll. Courses taken in the Drug Abuse Certificate program can be applied to the A.A.S. degree in Alcohol Rehabilitation.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education section.

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
GENL	100 Orientation.....	1		
ENGL	111 English Composition I or SPDR 136 Oral Communications.....	3		
HMSV	134-135-136 Helping Relationships I-II-III.....	3	3	3
HMSV	128 Community Resources & Services.....			3
HMSV	211-212-213 Alcohol/Drug Abuse Rehabilitation Program I-II-III.....	3	3	3
HMSV	248 Case Management & Substance Abuse.....		3	
HMSV	290 Coordinated Internship or HMSV 297 Coop. Ed.....			3
HMSV	298 Seminar and Project.....	3		
MENT	222 Mental Health II.....		3	
PSYC	231-232-233 Human Growth & Development.....	3	3	3
<b>Total Credits</b>		<b>16</b>	<b>15</b>	<b>15</b>

Total minimum credits for the Drug Abuse Rehabilitation Counselor Certificate = 46.

## EARLY CHILDHOOD DEVELOPMENT ASSISTANT

### Certificate

*Purpose:* The curriculum is designed to prepare individuals for employment in situations wherein care and maintenance of young children is the primary object. Occupational objectives include: Aides in Child Development Centers / Day Care Centers / Nursery School / Residential Facilities / Family Day Care Homes.

*Special Curriculum Admission Requirements:* Students must successfully complete a personal interview with a program faculty member.

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
GENL	100 Orientation.....	1		
EDUC	100 Orientation to Early Child. Devel. & Educ.....	2		
ENGL	111-112 Engl. Comp.....	3	3	
PSYC	128 Human Relations.....			3
PSYC	231 Human Growth & Devel.....			3
PHED	108 Phys. Act. for Child.....	3		
*EDUC	137 Creative Act. for Child.....		3	
*EDUC	190 Coordinated Internship.....		3	
**EDUC	298 Seminar & Project.....			3
**EDUC	190 Coordinated Internship.....			3
EDUC	121 Intro. to Early Child. Ed.....	3		
EDUC	111-112-113 Tech. in Child Study.....	3	3	3
EDUC	136 Math. & Equip. for Inst. Aides.....		3	
EDUC	176 Single Parent Families.....		3	
<b>Total Credits</b>		<b>15</b>	<b>18</b>	<b>15</b>

Total credits for the Early Childhood Development Assistant Certificate = 48.

\* Must be taken concurrently

\*\* Must be taken concurrently

## EARLY CHILDHOOD EDUCATION: CHILD HOME CARE (NANNY)

### Certificate

*Purpose:* The Nanny Program trains the candidate for a career in private home settings to provide care and supervision of children of that family. A foundation in the theoretical bases of development and learning is provided. Because the Nanny is often a parent surrogate, the sociology/psychology of family, school and community are covered, as well as nutrition, physical and social development, learning skills and appropriate aspects of handicapped education, and perceptual motor development. Supervised practicum is required.

The Nanny Program awards a certificate and requires 51 credit hours plus a Red Cross First Aid Card, dated within one year of graduation.

*Special Curriculum Admission Requirement:* Students must successfully complete a successful interview with an Education faculty advisor.

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
GENL	100 Orientation.....	1		
ENGL	111 English Composition.....	3		
PSYC	231 Human Growth & Development.....	3		
EDUC	121 Childhood Educ. I.....	3		
EDUC	122 Childhood Educ. II.....		3	
EDUC	112 Tech. in Child Study.....		3	
EDUC	128 Perceptual Motor Dev.....			2
EDUC	137 Creative Act. for Children.....			3
EDUC	198 Coordinated Internship.....			3
EDUC	109 Early Intervention for Phys. Handicapped Preschooler.....	3		
EDUC	127 Problem Solving in Early Childhood Educ.....		3	
EDUC	106 Language Arts for Children.....		3	
EDUC	298 Seminar & Project for Nannies.....			3
SOCI	116 Child-Parent Comm. Relat.....	3		
SOCI	143 Family Violence.....			3
HLTH	156 Child Health & Nutrition.....		3	
HLTH	216 Infant-Toddler Care & Dev.....			3
ECON	160 Survey of American Economics.....		3	
<b>Total Credits</b>		<b>16</b>	<b>18</b>	<b>17</b>

Total minimum credits for the Early Childhood Education: Child Home Care (Nanny) Certificate = 51.

## EDUCATION

### Associate in Science Degree Education Degree Program

*Purpose:* The curriculum is designed for persons who plan to transfer to a four-year college or university to complete a baccalaureate degree program in Teacher Education. The curriculum is designed to accommo-

date all teacher education majors or specialty areas of study - elementary and secondary.

*Special Curriculum Admission Requirements:* Satisfactory completion of the following high school units or equivalent as a minimum: 4 units of English, 2 units of mathematics (algebra and geometry), 1 unit of laboratory science, and 1 unit of social science.

		Credits		
First Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	111-112-113 Eng. Comp.....	3	3	3
GENL	100 Orientation.....	1		
HIST	111-112-113 U.S. History I-II-III.....	3	3	3
*MATH	Mathematics.....	3	3	3
<sup>1</sup> --	Nat. Science (with Lab.).....	4	4	4
<sup>2</sup> --	General electives.....	3	3	3
PHED	100 Fund. of Phys. Act.....			1
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>17</b>

		Credits		
Second Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	Amer., Eng., or World Lit.....	3	3	3
<sup>3</sup> --	Social Science Electives.....	3-5	3	3
PSYC	201-202-203 Gen. Psyc.....	3	3	3
PHED	Electives.....		1	1
SPDR	130 Prin. of Pub. Speaking or Elect.....			5
<sup>2</sup> --	Electives.....	6	6	3
<b>Total Credits</b>		<b>15-17</b>	<b>16</b>	<b>18</b>

Total minimum credits for the Education major (A.S. degree) = 99.

\* Math courses to be selected are listed in the "A.A. and A.S. Degrees General Requirements and Electives" section.

<sup>1</sup> Science courses may be selected from the following: biology, chemistry, physics, geology or the NASC 121-122-123 course.

<sup>2</sup> Electives should be chosen carefully and after investigation of transfer requirements of the institution to which transfer is contemplated.

<sup>3</sup> Soc. Sci. courses may be selected from the following: economics, geography, government, history, psychology, social science or sociology (anthropology).

### Industrial Education Specialization

*Purpose:* The curriculum is designed for persons who plan to transfer to a four year college or university to complete a baccalaureate degree program in Teacher Education with an Industrial Arts major. A transfer agreement is currently in effect with George Mason University.

*Special Curriculum Admission Requirements:* Satisfactory completion of the following high school units or equivalent as a minimum: 4 units of English, 2 units of mathematics (algebra and geometry), 1 unit of laboratory science, and 1 unit of social science.

		Credits		
First Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	111-112-113 Engl. Comp.....	3	3	3
GENL	100 Orientation.....	1		
HIST	111-112-113 U.S. History I-II-III.....	3	3	3
MATH	191-192 Finite Math.....	3	3	
PHYS	111-112-113 Tech. Phys.....	4	4	4
PHED	100 Fund. of Phys. Act.....			1
PHED	Elective.....			1
*--	Tech. Electives.....	3	3	6
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>17</b>

		Credits		
Second Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	Amer., Eng., or World Lit.....	3	3	3
<sup>1</sup> --	Soc. Science (Transfer Series).....	3	3	3
PHED	Elective.....	1		
SPDR	130 Prin. of Pub. Speaking.....	5		
*--	Tech. Electives.....	4	9	9
<b>Total Credits</b>		<b>16</b>	<b>15</b>	<b>15</b>

Total minimum credits for the Education major/Industrial Education Specialization (A.S. degree) = 97.

<sup>1</sup> Social science courses may be selected from the following: economics, geography, government, history, psychology, social science or sociology (anthropology).

\* Technical Electives: Students enrolled in the Industrial Education Specialization whose career goals or interests are addressed in any of the following three areas, may wish to select courses listed under that respective area of concentration. For state certification in Industrial Education, the Department of Education recommends 9-10 quarter hours in one field. Drafting is an exception and a student may select a maximum of 15 quarter hours. Students are encouraged to work closely with a counselor or faculty advisor in selection of courses.

### Communications

ARCH	111-112-113 Arch. Drft. (3 cr.)
ARTS	124-125-126 Drawing I-II-III (4 cr.)
ARTS	157-158-159 Ceramics I-II-III (4 cr.)
ARTS	170 Intro. to Graphic Skills (3 cr.)
ARTS	278 Printmaking: Silk Screen (4 cr.)
ARTS	279 Printmaking Relief (4 cr.)
ARTS	280 Printmaking: Intaglio (4 cr.)
DAPR	106 Prin. of Data Process (3 cr.)
DRFT	111-112-113 Drft. I-II-III (2 cr.)
ELEC	110 intro. Elec. (4 cr.)
PHTG	101-102-103 Photo I-II-III (3 cr.)

### Manufacturing and Construction

BLDG	100 Intro. to Construction (3 cr.)
BLDG	156 Dwelling Maintenance (3 cr.)
CIVL	181-182 Surveying I-II (4 cr.)
CIVL	140 Construction Planning (3 cr.)
INDT	111-112 Materials and Processes of Industry I-II (3 cr.)
WELD	106 Pipe Welding (3 cr.)
WELD	115 Arc and Gas Weld (4 cr.)

### Power, Energy, Transportation

AIRC	101-102-103 Prin. of Refrig. (4 cr.)
AUTO	137 Consumer Auto Repair (2 cr.)
AUTO	176 Small Gasoline Engines (3 cr.)
MECH	131-132-133 Mach. Lab. I-II-III (2 cr.)

### EDUCATIONAL ASSOCIATE

Associate in Applied Science Degree  
Educational Services Degree Program

### Early Childhood Educational Development Specialization

*Purpose:* The curriculum is designed for persons who seek full-time employment involving the care and direction of young children, or for those persons presently employed in these situations who wish to update and enhance their competencies. Occupational objectives include: Assistants, Managers, and/or Directors in Day Care and Child Development facilities.

*Special Curriculum Admission Requirements:* Students must successfully complete a personal interview with a program faculty member.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
GENL	100 Orientation.....	1		
EDUC	100 Orientation to Early Childhood Devel. & Educ.....	2		
* ENGL	111-112 Eng. Comp.....	3	3	
* SPDR	136 Oral Comm.....			3
PSYC	231 Human Growth & Development I.....	3		
PSYC	128 Human Relations.....		3	
PHED	100 Fund. of Phys. Act. & 1 elect.....	1		1
PHED	108 Phys. Act. for Children.....		3	
HLTH	110 Concepts of Pers. & Comm. Hlth.....	3		
EDUC	121-122-123 Childhood Ed.....	3	3	3
EDUC	111-112-113 Tech. in Child Study.....	3	3	3
EDUC	137 Creative Act. for Child.....			3
-	General elective.....			3
<b>Total Credits</b>		<b>18</b>	<b>16</b>	<b>16</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
EDUC	136 Matl. & Equip. for Inst. Aides.....	3		
EDUC	210 Intro. to Spec. Ed.....	3		
EDUC	127 Problem Solving in Early Childhood Educ.....		3	
EDUC	106 Lang. Arts for Children.....		3	
EDUC	236 Child Dev. Programs, Plan. & Mgt.....			3
EDUC	217 Models of Child Dev. Prog.....		3	
EDUC	298 Sem. & Project.....			3
PHED	Elective.....	1		
SOCI	101 Intro. Soc. or PSYC 232.....		3	
SOCI	116 Child-Parent Comm. Relat.....	3		
SOCI	236 Marriage & the Fam.....			3
HLTH	156 Child Health & Nutrition.....		3	
HLTH	106 First Aid & Safety.....	3		
HLTH	216 Infant-Toddler Care & Dev.....			3
MUSC	109 Music for Children.....		3	
-	General electives.....	3		4
<b>Total Credits</b>		<b>16</b>	<b>18</b>	<b>16</b>

Total minimum credits for the Educational Associate major/Early Childhood Development Specialization (A.A.S. degree) = 100.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

## ELECTRONICS

### Associate in Applied Science Degree Electrical/Electronics Technology Degree Program

*Purpose:* The curriculum is designed for persons who seek employment in the field of electronics. Additionally, the successful student is prepared for transfer into a baccalaureate program in Electronics Technology that is offered by a limited number of universities. Occupational objectives include: Electronics Technician / Instrument and Laboratory Technician / Radio and Television Technician / Computer Technician / Communication Technician.

*Special Curriculum Admission Requirements:* High school algebra and geometry.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ELEC	169 DC Circuits.....	4		
ELEC	122 AC Circuits.....		4	
ELEC	123 Advanced AC Circuits.....			4
MATH	121-122-123 Engr. Tech. Math.....	5	5	5
ELEC	164-165 Solid State Electronics I-II.....		4	4
ELEC	229 Pulse, Switching & Logic Circuits.....			4
ENGR	116 Computer Appl. for Engr. Tech.....	3		
ENGL	111-112 English Composition I-II.....	3	3	
* -	Social science elective.....	3		
GENL	100 Orientation.....			1
PHED	100 Fundamentals of Physical Activity.....		1	
PHED	Elective.....			1
<b>Total Credits</b>		<b>18</b>	<b>18</b>	<b>18</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ELEC	251-252 Computer Electronics I-II.....	4	4	
ELEC	260 Control Circuits.....			4
ELEC	241-242-243 Communications I-II-III.....	4	4	4
ELEC	221 Intermediate Electronics.....	4		
ELEC	276 Instruments & Measurements or ELEC 208 Digital Communication.....		4	
PHYS	111-112 Technical Physics I-II.....		4	4
ENGL	137 Technical Writing.....	3		
* -	Social science electives.....	3		3
PHED	Elective.....		1	
DRFT	256 Electronics Drafting or ELEC 297 Cooperative Education.....		2-1	
ELEC	210 Video Techniques.....			3
<b>Total Credits</b>		<b>18</b>	<b>19-18</b>	<b>18</b>

Total minimum credits for the Electronics major (A.A.S. degree) = 108.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

## ELECTRONICS TECHNICIAN

### Certificate

*Purpose:* The purpose of the Electronics Technician certificate is to prepare graduates for employment in a variety of occupations in the electronics industry. Among the jobs for which students will be eligible would be Test Technician, Assembler, Prototype Fabrication, and Electronic Draftsman. Also, students are eligible to continue studies in the two-year Electronics Technology major for completion of the requirements in the A.A.S. degree curriculum. Persons with experience in the field of electronics who are seeking formal training, or persons who might be exploring a career in electronics, may enroll in this certificate program.

*Special Curriculum Admission Requirements:* High school algebra and geometry.

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ELEC	169 DC Circuits.....	4		
ELEC	122 AC Circuits.....		4	
ELEC	123 Advanced AC Circuits.....			4
ELEC	164-165 Solid State Electronics I-II.....		4	4
ELEC	229 Pulse, Switching & Logic Circuits.....			4
MATH	121-122 Engineering Tech. Math. I-II.....	5	5	
ENGR	116 Comp. Appl. for Engineering Tech.....	3		
PHYS	111 Technical Physics I.....			4
<sup>1</sup> ENGL	100 Occupational English & ENGL 110 English Grammar or ENGL 111-112 English Comp. I-II.....	3	3	
-	Social science elective.....	3		
DRFT	256 Electronics Drafting.....			2
<b>Total Credits</b>		<b>18</b>	<b>16</b>	<b>18</b>

Total minimum credits for the Electronics Technician Certificate = 52.

<sup>1</sup>Students seeking an A.A.S. degree in Electronics must take ENGL 111-112.

## EMERGENCY MEDICAL SERVICES TECHNOLOGY

### Associate in Applied Science Degree Emergency Medical Services Degree Program

*Purpose:* The curriculum is designed to further develop the competency of the Emergency Medical Services Technologist. Upon successful completion of this curriculum, the student will be eligible to become certified as an Emergency Medical Technician (Paramedic).

*Second Year Curriculum Prerequisites:*

1. Have completed the first year curriculum.
2. Have current certification by the American Heart Association in Basic Life Support.
3. Have evidence of both successful completion of a basic emergency medical training course and current certification as an Emergency Medical Technician (Ambulance).
4. Have current association with an Emergency Medical Service agency which provides pre-hospital care or will be equipped in the near future to provide advanced emergency care.
5. Have demonstrated the ability to function in an emergency situation for at least one year; that is, as an ambulance Emergency Medical Technician, fire fighter, military corpsman, emergency department or intensive care unit technician, or a nurse. Documentation attesting to satisfactory experience and the degree of formal training in emergency care is expected.

For students in the combined two year EMDT certificate (Ambulance) and degree (Paramedic) program, the requirements of 3, 4 and 5 may be completed concurrently with the didactic and clinical portions of the EMDT program. These requirements must be fulfilled before the student begins the field internship. NOTE: In order to obtain valid certification evidencing any advanced EMS certification pursuant to section 6:00 of the Rules and Regulations Governing Emergency Medical Services of the Commonwealth of Virginia, an individual must be affiliated with an EMS agency.

*Special Advanced Placement Requirements:* Individuals who desire advanced placement within the curriculum should also submit a minimum of two letters attesting to the individual's levels of knowledge, skills, formal training, experience and level of EMS certification by the student's EMS agency and current medical director. The letters should include information regarding the description of the course(s) taken, and the number of hours in didactic, clinical and practical field experience. Placement in the program will depend on the medical director's and program head's evaluations, school policy and the flexibility of the curriculum to fulfill student needs.

*Special Accreditation Status:* The program is accredited by the AMA Committee on Allied Health Education and Accreditation (CAHEA) in cooperation with the Joint Review Committee on Educational Programs for EMT-Paramedics.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
EMDT	111-112 Emergency Medical Services Tech. I-II	4	4	
EMDT	190 Coord. Practice in Basic Emergency Care		1	
EMDT	217 Intro. to Cardiology			4
BIOL	151-152-153 Human Anatomy and Physiology	4	4	4
ENGL	111-112 English Comp. I-II	3	3	
FIRE	111-112 Hazardous Materials I-II or CHEM electives		3	3
GENL	100 Orientation	1		
HLTH	100 Orientation to Allied Careers		1	
HLTH	124 Medical Terminology I	3		
MATH	139 Health Science Mathematics			2
SPDR	136 Oral Communication or ENGL 113 Eng. Comp. III			3
<b>Total Credits</b>		<b>15</b>	<b>16</b>	<b>16</b>

Second Year		Credits			
		1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
EMDT	216 Prin. of Extrication			4	
EMDT	226-227-228 Paramedic Procedures I-II-III	7	9	6	
EMDT	290 Coord. Practice in Advanced Emergency Care				4
EMDT	298 Seminar & Project				2
HLTH	226 Intro. to Pharmacology	3			
PSYC	206 Personal Conflict & Crisis Management			3	
PHED	100 Fund. of Phys. Educ.	1			
PHED	Elective		1		
PHED	Elective		1		
* --	Social Science Electives	3	3	3	
<b>Total Credits</b>		<b>14</b>	<b>14</b>	<b>16</b>	<b>6</b>

Total minimum credits for the Emergency Medical Services Technology major (A.A.S.) degree = 97.

\* For further explanation of social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

## EMERGENCY MEDICAL SERVICES TECHNOLOGY

### Certificate

*Purpose:* The EMDT curriculum is designed to develop the competency of pre-service or inservice personnel in methods of advanced emergency care. It provides the student with the knowledge about the acute critical differences in physiology, pathophysiology, and clinical symptoms as they pertain to the pre-hospital emergency care of the infant child, adolescent, adult and geriatric patient. In addition to the didactic (classroom) phase of the program, the student will receive clinical experiences in a hospital and on a mobile intensive care unit.

Upon successful completion of the program, the student will be eligible to take the Virginia State and National Registry examinations leading to certification as an Emergency Medical Technician. Students successfully completing this examination may also be eligible to participate in the Emergency Medical Services Technology Associate in Applied Science degree (Paramedic) program.

Students are advised that most Emergency Medical Service agencies require excellent moral character, a rigorous physical examination, fitness testing, and background investigation prior to consideration for employment.

*Special Curriculum Admission Requirements:* Satisfactory physical and mental health which is to be substantiated by a physician's report. The Emergency Medical Services Technology Program reserves the right to determine the students final acceptance. Students may take support courses prior to entering the Emergency Medical Services Technology Program.

*Special Curriculum Completion Requirements:* Satisfactory health must be maintained for continuance in the program. Any student who receives a final grade less than "C" in any of the courses in the EMDT sequence must obtain permission from the Program Head to continue the major in EMDT and must then repeat the course and earn a final grade of "C" or higher before taking the next course in the sequence. Students are totally responsible for transportation to and from the College and the various hospitals for clinical laboratory experiences. Student uniforms and accessories are the financial responsibility of the individual student.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
BIOL	151-152-153 Hum. Anat. & Phys. I-II-III.....	4	4	4
EMDT	111-112 Emergency Med. Services Tech. I-II.....	4	4	
EMDT	190 Coord. Practice.....		1	
ENGL	111-112 Eng. Comp. I-II.....	3	3	
FIRE	111-112 Hazardous Materials I-II or CHEM Electives.....		3	3
GENL	100 Orientation.....	1		
HLTH	100 Orientation to Allied Careers.....		1	
HLTH	124 Medical Terminology I.....	3		
PHED	100 Fund. of Phys. Activity + Elective.....			(1)(1)
SPDR	136 Oral Communication or ENGL 113 Engl. Comp. III.....			3
--	General elective.....			4
<b>Total Credits</b>		<b>15</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Emergency Medical Services Technology Certificate = 47.

## ENGINEERING

### Associate in Science Degree Engineering Degree Program

*Purpose:* The curriculum is designed to prepare the student to transfer into a baccalaureate degree program in engineering fields such as: Mechanical Engineering, Civil Engineering, Chemical Engineering, Aeronautical Engineering and Naval Architecture.

*Special Curriculum Admission Requirements:* High school courses: 4 units of English, 2 units of algebra, 1 of geometry, 1 of trigonometry and 1 unit of laboratory science (chemistry or physics). Proficiency tests in mathematics, chemistry and English are required prior to taking those and engineering course sequences at NVCC. Developmental studies may be undertaken to satisfy these requirements.

*Special Curriculum Completion Requirements:* Grades of "C" and above are required in those courses in the program that are intended to be transferred for credit to a baccalaureate degree granting college/university. The only course sequences to which this does not apply are PHED and GENL.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>First Year</b>				
ENGL	111-112-113 English Comp. I-II-III.....	3	3	3
CHEM	111-112-113 College Chemistry I-II-III.....	4	4	4
MATH	141-142-143 Intro. Math. Anal. I-II-III.....	5	5	5
ENGR	104 Intro. to Engineering.....	3		
ENGR	106 Computer Programming for Engineers.....		4	
ENGR	124 Engineering Graphics I.....			3
GENL	100 Orientation.....	1		
PHED	100 Fund. of Physical Activity & 1 PHED elective.....	1	1	
<sup>1</sup> --	Social science elective.....			3
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>18</b>

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>Second Year</b>				
MATH	241-243-242 Adv. Math. Analysis I-III-II.....	4	4	4
PHYS	221-222-223 Gen. Univ. Physics I-II-III.....	4	4	4
*ENGR	246 Statics of Particles & Rigid Bodies.....	4		
ENGR	241 Mechanics of Particles.....		3	
ENGR	242 Dynamics of Rigid Bodies.....			3
ENGR	243 Mechanics of Deformable Solids.....			5
ENGR	206 Engr. Economy.....		3	
PHED	Elective.....			1
<sup>1</sup> --	Social science electives.....	3	3	
<sup>2</sup> --	Humanities elective.....	3		
<b>Total Credits</b>		<b>18</b>	<b>17</b>	<b>17</b>

Total minimum credits for the Engineering major (A.S. degree) = 104.

<sup>1</sup> Social science courses may be selected from the following disciplines: economics, geography, government, history, psychology, social science or sociology (anthropology).

\* MATH 241 and PHYS 221 are required corequisites.

<sup>2</sup> Humanities courses may be selected from the following: music, arts, drama, language, philosophy, speech or English.

### Electrical Engineering Specialization

*Purpose:* The curriculum is designed to prepare the student to transfer into a baccalaureate degree program in Electrical Engineering. All BS(EE) degree granting colleges/universities require specific preparation in the sophomore year for EE majors.

*Special Curriculum Admission Requirements:* High school courses: 4 units of English, 2 units of algebra, 1 of geometry, 1 of trigonometry and 1 unit of laboratory science (chemistry or physics). Proficiency tests in mathematics, chemistry and English are required prior to taking those and engineering course sequences at NVCC. Developmental studies may be undertaken to satisfy these requirements.

*Special Curriculum Completion Requirements:* Grades of "C" and above are required in those courses in the program that are intended to be transferred for credit to a baccalaureate degree granting college/university. The only course sequences to which this does not apply are PHED and GENL.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>First Year</b>				
ENGL	111-112-113 English Comp. I-II-III.....	3	3	3
CHEM	111-112-113 College Chemistry I-II-III.....	4	4	4
MATH	141-142-143 Intro. to Math. Anal. I-II-III.....	5	5	5
ENGR	104 Intro. to Engineering.....	3		
ENGR	106 Computer Prog. for Engineers.....		4	
ENGR	124 Engr. Graphics I.....			3
GENL	100 Orientation.....	1		
PHED	100 Fund. of Phys. Act. & 1 PHED elective.....	1	1	
<sup>1</sup> --	Social science elective.....			3
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>18</b>



Second Year		Credits			
		1st Qtr.	2nd Qtr.	3rd Qtr.	4th <sup>3</sup> Qtr.
MATH	241-243-242 Adv. Math. Analysis I-III-II.	4	4	4	
MATH	274 Applied Mathematics .....				4
PHYS	221-222-223-224 Gen. Univ. Physics I-II-III-IV.....	4	4	4	4
ENGR	206 Engr. Economy .....		3		
* ENGR	246 Statics of Particles & Rigid Bodies ..	4			
ENGR	241 Mechanics of Particles .....		3		
ENGR	242 Dynamics of Rigid Bodies .....			3	
ENGR	226-236 Basic Electric Circuits I-II .....			4	4
ENGR	227 Digital Integrated Elect. Circuits ....				4
PHED	Elective.....			1	
<sup>1</sup> --	Social science electives .....	3	3		
<sup>2</sup> --	Humanities elective .....	3			
<b>Total Credits</b>		<b>18</b>	<b>17</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Engineering major/Electrical Engineering Specialization (A.S. degree) = 103.

<sup>1</sup> Social science courses may be selected from the following disciplines: economics, geography, government, history, psychology, social science or sociology (anthropology).

\* MATH 241 and PHYS 221 are required prerequisites.

<sup>2</sup> Humanities courses may be selected from the following: music, arts, drama, language, philosophy, speech or English.

<sup>3</sup> Courses in the fourth quarter of the second year are not required for the A.S. degree, but are required for transfer as a junior in EE.

## ENGINEERING DRAFTING

### Certificate

*Purpose:* The curriculum is designed to prepare the student for employment after a course of study normally one academic year in length. Alternatively, the successful student can choose to transfer into one of the A.A.S. programs after completing the certificate program. Usually, a substantial amount of credit can be so transferred. Occupational objectives include: Architectural Draftsman / Mechanical Engineering Draftsman / Structural Draftsman / Junior Engineering Aide.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

### Technical Drafting Concentration

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
<sup>1</sup> ENGL	100-111 Occupational Eng./Eng. Comp. I .....		3	
ENGL	110-112 Eng. Grammar/Eng. Comp. II .....			3
<sup>2</sup> MATH	118-121 Elem. of Math /Tech. Math I.....	5		
MATH	119-122 Elem. of Math II/Tech. Math II.....		5	
ENGR	100 Intro. to Engr. Tech. ....	2		
--	Non-Technical Elect. ....	3		
ENGR	116 Comp. Applications for Engr. Tech. ....		3	
ENGR	150-151 Mechanics I (Statics).....			3-4
DRFT	111 Tech. Draft. I.....	2		
DRFT	112-113 Tech. Draft. II-III .....		4	
DRFT	211 Advanced Tech. Draft. V.....			3
INDT	111-112 Mtl. & Processes of Indus. I-II .....		3	3
MECH	131-132 Machine Lab I-II .....	2	2	
DRFT	266 Computer Graphics or Tech. Elec. ....			3
DRFT	198-197 Seminar & Project/Co-op .....			2
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>17-18</b>

## Architectural Drafting Concentration

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
<sup>1</sup> ENGL	100-111 Occupational Eng./Eng. Comp. I.....	3		
ENGL	110-112 Eng. Grammar/Eng. Comp. ....		3	
<sup>2</sup> MATH	118-121 Elem. of Math I/Tech. Math I.....	5		
MATH	119-122 Elem. of Math II/Tech. Math II.....		5	
ENGR	100 Intro. to Engr. Tech. ....	2		
--	Non-Technical Elect. ....	3		
<sup>3</sup> ENGR	150-151 Mechanics I (Statics).....			3-4
DRFT	266 Computer Graphics or Tech. Elec. ....			3
ARCH	111-112-113 Arch. Drafting I-II-III .....	3	3	3
ARCH	164-165 Matrls. & Meth. of Constr. I-II.....		3	3
ENGR	116 Computer Appl. for Engr. Tech. ....		3	
DRFT	198-197 Seminar & Proj./Co-op .....			2
ARCH	Elective .....			3
<b>Total Credits</b>		<b>16</b>	<b>17</b>	<b>17-18</b>

Total minimum credits for the Engineering Drafting Certificate are 50 credits for the Architectural Concentration and 51 for the Technical Drafting Concentration.

<sup>1</sup> For students who continue to a two-year degree program, ENGL 111-112 will be required.

<sup>2</sup> For students who continue to a two-year degree program, MATH 121-122 will be required.

<sup>3</sup> For students who continue to a two-year degree program, ENGR 151 will be required.

## FASHION (See "Marketing")

### FINE ARTS

#### Associate in Arts Degree

#### Visual and Performing Arts Degree Program

*Purpose:* The Associate in Arts in Fine Arts is designed for students who plan to transfer to a four-year program in a professional school or to a college or university baccalaureate degree program in Fine Arts.

*Special Curriculum Admission Requirements:* Entry into Fine Arts requires a satisfactory aptitude in visual art. Applicants may be required to submit a portfolio for placement.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ARTS	111-112-113 History & Apprec. of Art.....	3	3	3
ARTS	124-125-126 Drawing .....	4	4	4
ARTS	161-162-163 Fund. of Design .....	4	4	4
ENGL	111-112-113 Eng. Comp.....	3	3	3
GENL	100 Orientation.....	1		
<sup>1</sup> --	Social Science Elect. ....	3	3	3
<b>Total Credits</b>		<b>18</b>	<b>17</b>	<b>17</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ARTS	281-282-283 Advanced Drawing.....	4	4	4
<sup>2</sup> ARTS	Approved Fine Arts studio courses.....	4	4	4
<sup>2</sup> ARTS	Approved studio or general electives .....	4	4	4
ENGL	Amer., Engl., or World Lit. ....	3	3	
PHED	100 Fund of Phys. Act. + 2 Electives .....	1	1	1
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>13</b>

Total minimum credits for the Fine Arts major (A.A. degree) = 97.

<sup>1</sup> Social science courses may be selected from the following: economics, geography, government, history, psychology, social science or sociology (anthropology).

<sup>2</sup> Students may be required to take math., natural science or a foreign language by the college of transfer. Recommended studio electives: painting, sculpture, printmaking, ceramics. Electives should be chosen carefully and after investigation of transfer requirements of the institution to which transfer is contemplated.

### Art/Fine Art Photography Specialization

*Purpose:* The Associate in Arts in Fine Art Photography is designed for students who plan to transfer to a four-year program in a professional school or to a college or university baccalaureate degree program in Fine Arts.

**Special Admission Requirements:** Entry into Fine Art Photography requires a satisfactory aptitude in visual art, and applicants may be required to submit a portfolio for placement.

		Credits		
		1st	2nd	3rd
First Year		Qtr.	Qtr.	Qtr.
ARTS	111-112-113 History & Apprec. of Art.....	3	3	3
ARTS	124-125-126 Drawing .....	4	4	4
ARTS	161-162-163 Fund. of Design .....	4	4	4
PHTG	101-102-103 Photography.....	3	3	3
ENGL	111-112-113 Engl. Comp.....	3	3	3
GENL	100 Orientation.....	1		
<b>Total Credits</b>		<b>18</b>	<b>17</b>	<b>17</b>

		Credits		
		1st	2nd	3rd
Second Year		Qtr.	Qtr.	Qtr.
PHTG	144-145 History of Photography .....	3	3	
--	General electives.....	6	6	6
<sup>1</sup> --	Social Science Elect. ....	3	3	3
ENGL	American, English or World Lit. ....	3	3	3
PHED	100 Fund. of Phys. Act. + 2 Electives .....	1	1	1
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>13</b>

Total minimum credits for the Fine Arts major/Art/Fine Art Photography Specialization (A.A. degree) = 97.

<sup>1</sup> Soc. Sci. courses may be selected from the following: economics, geography, government, history, psychology, social science or sociology (anthropology).

The specialization in Art/Fine Art Photography is designed for students who expect to transfer to four-year art or liberal arts colleges. Because of the differences in transfer requirements between art and liberal arts colleges, second year electives should be carefully matched with programs of study at prospective transfer institutions.

### Art History Specialization

**Purpose:** The Art History Associate in Arts curriculum is designed for students who plan to transfer to a college or university baccalaureate degree program in Art History.

		Credits		
		1st	2nd	3rd
First Year		Qtr.	Qtr.	Qtr.
ARTS	111-112-113 Hist. & Apprec. of Art.....	3	3	3
ARTS	124-125-126 Drawing or ARTS 161-162-163 Fund. of Design.....	4	4	4
ENGL	111-112-113 Eng. Comp.....	3	3	3
GENL	100 Orientation.....	1		
PHED	100 Fund. of Phys. Act. & 1 Elect.....	1	1	1
<sup>2</sup> --	Foreign Language .....	4	4	4
<sup>3</sup> --	General elective .....			3
<b>Total Credits</b>		<b>15</b>	<b>15</b>	<b>18</b>

		Credits		
		1st	2nd	3rd
Second Year		Qtr.	Qtr.	Qtr.
<sup>4</sup> ARTS	191-192-193 Hist. of American Art or approved Art History Elect.....	3	3	3
ENGL	271-272-273 World Lit. ....	3	3	3
PHED	Elective .....	1		
<sup>3,4</sup> --	Approved Art History, Studio, or Liberal Arts Elect. ....	7	7	7
<sup>1</sup> --	Social Science Elective .....	3	3	3
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Fine Arts major/Art History Specialization (A.A. degree) = 97.

<sup>1</sup> Social science courses may be selected from the following: economics, geography, government, history (recommended), psychology or sociology (anthropology).

<sup>2</sup> The language course may be either the first or second year sequence depending on the student's prior knowledge. French and German are preferred.

<sup>3</sup> Electives should be chosen carefully and after investigation of transfer requirements of the institution to which transfer is contemplated.

<sup>4</sup> Art History Electives: Primitive Art, Far Eastern Art, History of Printmaking, Aesthetics (Philosophy), Art in World Culture, Seminar and Project in Art History, Gallery Management (other, as approved).

### FIRE SCIENCE

#### Associate in Applied Science Degree Public Safety Degree Program

#### Administration Specialization

**Purpose:** The curriculum is designed for persons seeking employment in the broad field of the fire service with specialization in administration. The occupational objectives include: Fire Suppression / Communications / Insurance Investigation / Equipment Sales & Service.

**Cooperative Education:** Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
First Year		Qtr.	Qtr.	Qtr.
<sup>1</sup> ENGL	111-112 English Composition I-II .....	3	3	
FIRE	100 Intro. to Fire Science.....	3		
FIRE	106 Fund. of Fire Service Administration .....	3		
FIRE	108 Fund. of Fire Suppression .....	3		
FIRE	116 Fund. of Fire Prevention .....		3	
FIRE	120 Fire Protection Equipment & Systems .....			3
FIRE	141 Fire Administration .....		3	
GENL	100 Orientation.....	1		
NASC	121-122-123 Natural Sciences.....	4	4	4
PHED	100 Fundamentals of Physical Activity + 1 PHED elective .....			1
<sup>2</sup> --	Mathematics .....		3	3
--	General electives.....			6
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>17</b>

		Credits		
		1st	2nd	3rd
Second Year		Qtr.	Qtr.	Qtr.
BUAD	110 Human Relations & Leadership Training .....	3		
BUAD	276 Personnel Management.....		3	
ENGL	137 Technical Writing .....	3		
FIRE	147 Methods of Fire Instruction.....	3		
FIRE	208 Water Distribution Systems.....			3
FIRE	216 Fire Hydraulics & Equipment .....			4
FIRE	227 Building Construction & Codes .....		4	
FIRE	298 Seminar & Project .....			3
PHED	Elective .....	1		
<sup>1</sup> SPDR	136 Oral Communications .....		3	
<sup>1</sup> --	Social Science Electives .....	3	3	3
--	General electives.....	3	3	3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Fire Science major/Administration Specialization (A.A.S. degree) = 99.

<sup>1</sup> For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

<sup>2</sup> Mathematics courses may be selected from: BUAD 121-122, MATH 161-162, or MATH 191-192.

#### Investigation Specialization

**Purpose:** The curriculum is designed for persons seeking employment in the broad field of the fire service with specialization in fire investigation.

**Cooperative Education:** Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see the Cooperative Education Program section.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
<sup>1</sup> ENGL	111-112 English Composition I-II	3	3	
FIRE	100 Intro. to Fire Science	3		
FIRE	111-112 Hazardous Materials I-II		3	3
FIRE	116 Fund. of Fire Prevention		3	
FIRE	120 Fire Protection Equipment & Systems			3
FIRE	146 Fire Administration & Law	3		
GENL	100 Orientation	1		
NASC	121-122-123 Natural Sciences I-II-III	4	4	4
PHED	100 Fundamentals of Physical Activity + 1 PHED elective		1	1
<sup>2</sup> --	Mathematics	3	3	
--	General electives			6
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>17</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ADJU	231-232-233 Criminal Law Evidence & Procedures I-II-III	3	3	3
ENGL	137 Technical Writing		3	
FIRE	119 Industrial Fire Protection	3		
FIRE	147 Methods of Fire Instruction	3		
FIRE	227 Building Construction & Codes		4	
FIRE	237 Arson Detection & Investigation		3	
FIRE	298 Seminar & Project			3
PHED	Elective	1		
<sup>3</sup> SPDR	136 Oral Communications			3
<sup>1</sup> --	Social Science Electives	3	3	3
--	General electives	3		3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>15</b>

Total minimum credits for the Fire Science major/Investigation Specialization (A.A.S. degree) = 98.

<sup>1</sup> For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

<sup>2</sup> Mathematics courses may be selected from: BUAD 121-122, MATH 161-162, or MATH 191-192.

### Management Specialization

*Purpose:* The curriculum is designed for persons seeking employment in the broad field of the fire service with specialization in fire management. The occupational objectives include: Fire Suppression / Communications / Insurance Investigation / Equipment Sales & Service.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
<sup>1</sup> ENGL	111-112 English Composition I-II	3	3	
FIRE	100 Intro. to Fire Science	3		
FIRE	108 Fund. of Fire Suppression	3		
FIRE	109 Fire Suppression Operations			3
FIRE	111-112 Hazardous Materials I-II		3	3
FIRE	116 Fund. of Fire Prevention		3	
FIRE	120 Fire Protection Equipment & Systems			3
GENL	100 Orientation	1		
NASC	121-122-123 Natural Sciences I-II-III	4	4	4
PHED	100 Fundamentals of Physical Activity + 1 PHED elective		1	1
<sup>2</sup> --	Mathematics	3	3	
--	General electives			3
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>17</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
<sup>1</sup> ENGL	137 Technical Writing		3	
FIRE	119 Industrial Fire Protection	3		
FIRE	137 Fire Fighting Tactics & Strategy		3	
FIRE	147 Methods of Fire Instruction	3		
FIRE	208 Water Distribution Systems			3
FIRE	216 Fire Hydraulics & Equipment			4
FIRE	227 Building Construction & Codes		4	
FIRE	298 Seminar & Project			3
PHED	Elective	1		
SPDR	136 Oral Communications	3		
<sup>1</sup> --	Social Science Electives	3	3	3
--	General electives	3	3	3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Fire Science major/Management Specialization (A.A.S. degree) = 99.

<sup>1</sup> For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

<sup>2</sup> Mathematics courses may be selected from: BUAD 121-122, MATH 161-162, or MATH 191-192.

### George Mason University Transfer Program

*Purpose:* This curriculum is designed for persons who plan to transfer to George Mason University to complete a Bachelor of Individualized Studies Degree with a concentration in Fire Administration and Technology.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	111-112-113 English Comp. I-II-III	3	3	3
FIRE	100 Intro. to Fire Science	3		
FIRE	106 Fund. of Fire Service Administration	3		
FIRE	108 Fund. of Fire Suppression	3		
FIRE	109 Fire Suppression Operations			3
FIRE	111-112 Hazardous Materials I-II		3	3
FIRE	116 Fund. of Fire Prevention		3	
FIRE	120 Fire Protection Equipment & Systems			3
FIRE	141 Fire Administration		3	
<sup>1</sup> GENL	100 Orientation	1		
MATH	191-192-193 Finite Math. I-II-III	3	3	3
<sup>1</sup> PHED	100 Fundamentals of Physical Activity + 2 PHED electives	1	1	1
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>16</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
FIRE	119 Industrial Fire Protection	3		
FIRE	137 Fire Fighting Tactics & Strategy		3	
FIRE	208 Water Distribution Systems			3
FIRE	216 Fire Hydraulics & Equipment			4
FIRE	227 Building Construction & Codes		4	
SOCI	101-102-103 Introductory Sociology I-II-III	3	3	3
SPDR	136 Oral Communications	3		
<sup>2</sup> --	Sciences with laboratory	4	4	4
<sup>3</sup> --	General electives	3	3	3
<b>Total Credits</b>		<b>16</b>	<b>17</b>	<b>17</b>

Total minimum credits for the Fire Science major/Transfer Program (A.A.S. degree) = 99.

<sup>1</sup> GENL 100 (1 cr.), PHED 100 (1 cr.), and 2 credits of PHED electives will not be acceptable for transfer.

<sup>2</sup> Science courses may be selected from biology, chemistry, physics and geology.

<sup>3</sup> Elective courses may be selected from the following: economics, psychology, sociology & anthropology, social science, government and history. It is recommended that a student select a year's sequence of courses which total 9 credits. A student should obtain the guidance of a counselor or a Fire Science faculty advisor prior to registering for these courses.

**FIRE SCIENCE**

**Certificate**

**Administration Concentration**

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
FIRE	100 Intro. to Fire Sci. ....	3		
FIRE	106 Fund. of Fire Serv. Admin. ....	3		
FIRE	116 Fund. of Fire Prevention .....		3	
FIRE	120 Fire Protection Equip. & Sys. ....			3
FIRE	141 Fire Admin. ....		3	
FIRE	146 Fire Admin. & Law .....			3
ENGL	111-112 Eng. Comp. ....	3	3	
*	MATH .....		3	3
NASC	121-122-123 Natural Science .....	4	4	4
GENL	100 Orientation .....	1		
BUAD	110 Human Relations & Ldrshp. Trng. ....	3		
--	Social Science Elect. ....			3
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Fire Science (Administration) Certificate = 49.

**Investigation Concentration**

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
FIRE	100 Intro. to Fire Sci. ....	3		
ADJU	231 Criminal Law, Evid. & Procedures .....	3		
FIRE	116 Fund. of Fire Prevention .....		3	
FIRE	120 Fire Protection Equip. & Sys. ....			3
FIRE	111-112 Hazardous Matl. ....		3	3
FIRE	237 Arson Detect. & Inv. ....			3
ENGL	111-112 Eng. Comp. ....	3	3	
*	MATH .....	3	3	
NASC	121-122-123 Natural Science .....	4	4	4
GENL	100 Orientation .....	1		
SOSC	Elect. ....			3
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Fire Science (Investigation) Certificate = 49.

**Management Concentration**

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
FIRE	100 Intro. to Fire Sci. ....	3		
FIRE	108 Fund. of Fire Suppression .....	3		
FIRE	109 Fire Suppression Oper. ....			3
FIRE	111-112 Hazardous Matl. ....		3	3
FIRE	116 Fund. of Fire Prevention .....		3	
FIRE	120 Fire Protection Equip. & Sys. ....			3
ENGL	111-112 Eng. Comp. ....	3	3	
*	MATH .....	3	3	
NASC	121-122-123 Natural Science .....	4	4	4
GENL	100 Orientation .....	1		
SOSC	Elective .....			3
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Fire Science (Management) Certificate = 49.

\* MATH courses may be selected from: BUAD 121-122, MATH 161-162, or MATH 191-192.

**FOODS/FOOD SERVICE MANAGEMENT**

(See "Hotel, Restaurant & Institutional Management")

**GENERAL STUDIES**

**Associate in Science Degree  
General Studies Degree Program**

*Purpose:* The curriculum is designed for persons who are interested in transfer to a four-year college or university, and who wish the flexibility

of either broadening or narrowing as much as possible their first two years of undergraduate study.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>First Year</b>				
ENGL	111-112-113 Eng. Comp. ....	3	3	3
HIST	Elect. ....	3		
GENL	100 Orientation .....	1		
PHED	100 Fund. of Phys. Act. & 2 Elect. ....	1	1	1
<sup>1</sup> HUMN	Elect. ....	3		
<sup>2</sup> SOSC	Elect. ....	3	3	3
--	General electives .....	0-4	8-11	8-11
<b>Total Credits</b>		<b>14-18</b>	<b>15-18</b>	<b>15-18</b>

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>Second Year</b>				
<sup>3</sup> --	General electives .....	15-18	15-18	15-18

Total minimum credits for the General Studies major (A.S. degree) = 97.

<sup>1</sup> Humanities courses may be selected from the following: music, art, drama, language, philosophy, speech, English, or humanities.

<sup>2</sup> Three-quarter sequence social science courses may be selected from one of the following disciplines: economics, psychology, sociology (anthropology), social science, government, history.

<sup>3</sup> Electives may be selected according to interest. It is recommended that a student select a year's sequence or combination of courses which total 5 credits or more if transfer is desired. A student desiring to transfer should consult the college or university to which transfer is contemplated in addition to seeking the guidance of a counselor and/or faculty advisor. All requirements for the degree are included in the first year as specified prefixes and specified electives. Any course offered by the college numbered 100 or above is applicable toward meeting the graduation requirements with the General Studies major and may be taken as an elective. However, if transfer is planned, all electives should be carefully selected based on the course requirements of the institution to which transfer is intended. Up to 15 quarter hours of credit toward this degree may be earned in courses which may be repeated for academic credit (e.g., SPDR 119).

**HORTICULTURE TECHNOLOGY**

**Associate in Applied Science Degree  
Agricultural Business Degree Program**

*Purpose:* The curriculum is designed to prepare students for full-time employment within the field of commercial horticulture as well as for those presently working who seek further knowledge and advancement.

Graduates of the program are prepared for managerial/supervisory level positions in areas which include: landscaping, grounds maintenance, floristry, greenhouse and nursery management, garden center operation, fruit and vegetable production, sales and marketing in related industries.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>First Year (Common to both specializations)</b>				
HORT	100 Intro. to Hort. ....	4		
BUAD	121-122-123 Bus. Math .....	3	3	3
*ENGL	111-112 Eng. Comp. ....	3	3	
SPDR	136 Oral Comm. ....			3
GENL	100 Orientation .....	1		
PHED	100 Fund. of Phys. Act. & 2 Elect. ....	1	1	1
CHEM	110 Hort. Chem. ....	4		
HORT	107 Plant Propagation .....			3
HORT	146 Horticulture Botany .....		4	
ECON	160 Amer. Econ. ....		3	
PSYC	110 Prin. of Appl. Psych. ....		3	
HORT	120 Soils .....			4
GOVT	180 Amer. Const. Govt. ....			3
<b>Total Credits</b>		<b>16</b>	<b>17</b>	<b>17</b>

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

**Floriculture Specialization**

Second Year	Credits		
	1st Qtr.	2nd Qtr.	3rd Qtr.
BUAD 174-175 Small Bus. Mgt.....	3	3	
MKTG 100 Prin. of Mktg.....	3		
HORT 130 Envir. Factors in Plant Growth.....	3		
HORT 216 Horticultural Entomology.....	3		
HORT 270 Floral Design & Arranging I.....	2		
HORT 290 Coord. Intern. or Coop. Ed.....	1-5		
MKTG 109 Prin. of Salesmanship.....		3	
HORT 217 Hort. Plant Pathology.....		3	
HORT 257 Herbaceous Plants.....			3
HORT 266 House & Conservatory Plants.....		3	
HORT 254 Planting Design I.....		3	
HORT 230 Greenhouse Mgt.....		3	
HORT 260 Flower Shop Mgt.....			3
HORT 156 Greenhouse Crop Production.....			3
HORT 276 Floral Design & Arranging II.....			2
<sup>1</sup> HORT Elective.....			4-6
<b>Total Credits</b>	<b>15-19</b>	<b>18</b>	<b>15-17</b>

Total minimum credits for the Horticulture Technology major/Floriculture Specialization (A.A.S. degree) = 98.

<sup>1</sup> Following is a list of approved Horticulture electives: HORT 157 Fruit Production, HORT 158 Vegetable Production, HORT 226 Garden Center Management, HORT 136 Interior Landscaping, HORT 255 Planting Design II.

**Landscape Grower Specialization**

Second Year	Credits		
	1st Qtr.	2nd Qtr.	3rd Qtr.
BUAD 174-175 Small Bus. Mgt.....	3	3	
MKTG 100 Prin. of Mktg.....	3		
HORT 130 Envir. Factors in Plant Growth.....	3		
HORT 216 Horticultural Entomology.....	3		
HORT 256 Woody Plants.....	3		
HORT 290 Coord. Intern. or Coop. Ed.....	1-5		
<sup>*</sup> HORT 297 Cooperative Education.....	1-5		
MKTG 109 Prin. of Salesmanship.....		3	
HORT 217 Hort. Plant Pathology.....		3	
HORT 257 Herbaceous Plants.....			3
HORT 254 Planting Design I.....		3	
HORT Elective.....		2-3	
HORT 220 Nursery Mgt.....			3
HORT 240 Turf Green Mgt.....			3
HORT 230 Greenhouse Mgt.....		3	
HORT 126 Landscape Constr. & Maint.....			3
HORT Elective.....			4-6
<b>Total Credits</b>	<b>17-25</b>	<b>17-18</b>	<b>16-18</b>

Total minimum credits for the Horticulture Technology major/Landscape Grower Specialization (A.A.S. degree) = 100.

<sup>\*</sup> Students may choose between Coordinated Internship (non-paid position) or Cooperative Education (paid position) for their credit(s).

**HOTEL, RESTAURANT AND INSTITUTIONAL MANAGEMENT**

Associate in Applied Science Degree  
Business Management Degree Program

**Food Service Management Specialization**

*Purpose:* The curriculum is designed to enable the student to enter executive training and management positions in food establishments, institution feeding complexes, hotels, resorts, or private clubs. The curriculum specializes in the food service management phase of the hospitality industry.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

*Uniforms:* A white uniform is required in food preparation laboratories (HRIM 124, 125, 227, 286). Uniforms are the financial responsibility of the student.

*Special Curriculum Requirement:* A current TB skin test or chest x-ray is required for all HRIM laboratory classes.

First Year	Credits		
	1st Qtr.	2nd Qtr.	3rd Qtr.
<sup>1</sup> BUAD 121-122 Business Math. I-II (or a transferable MATH I-II series).....		3	3
<sup>2</sup> ENGL 111-112-113 English Comp. I-II-III.....	3	3	3
GENL 100 Orientation.....	1		
HRIM 100 Intro. to Hotel & Rest. Mgmt.....	3		
HRIM 124-125 Prin. of Food Preparation I-II.....	4	4	
HRIM 126 Prin. of Commercial Food Prep.....			4
HRIM 184-185 Hotel-Rest. Org. & Man. I-II.....		3	3
HRIM 236 Sanitation.....	3		
PHED 100 Fund. of Phys. Act. + Elective.....		1	1
<sup>2</sup> -- Social Science Electives.....	3	3	3
<b>Total Credits</b>	<b>17</b>	<b>17</b>	<b>17</b>

Second Year	Credits		
	1st Qtr.	2nd Qtr.	3rd Qtr.
ACCT 211-212 Prin. of Accounting I-II.....	3	3	
DIET 130 Nutritional Care or DIET 136 Diet for Living.....			3
HRIM 186 Equipment Layout-Design.....	3		
HRIM 226 Menu Planning & Food Merchandising.....		3	
HRIM 227 Advanced Foods.....			3
HRIM 246 Labor Cost Control.....		3	
HRIM 264 Food & Beverage Cost Controls I.....		3	
HRIM 277 Personnel Management & Training for Hotels, Restaurants & Institutions.....	3		
HRIM 286 Catering.....			3
HRIM 289 Hotel & Motel Law.....			3
<sup>3</sup> HRIM Electives.....	6	3	3
PHED Elective.....	1		
<b>Total Credits</b>	<b>16</b>	<b>15</b>	<b>15</b>

Total minimum credits for the Hotel, Restaurant & Institutional Management major/Food Service Management Specialization (A.A.S. degree) = 97.

<sup>1</sup> For alternate MATH courses, see your faculty advisor.

<sup>2</sup> For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

<sup>3</sup> HRIM electives may be selected from HRIM 156, 168, 188, 265, 266, 287, 297, ACCT 126, 213, DAPR 106 and TRAV.

**HOTEL, RESTAURANT AND INSTITUTIONAL MANAGEMENT/FOOD SERVICE MANAGEMENT**

**Certificate**

*Purpose:* The curriculum is designed for persons seeking employment in the hospitality industry and for those presently employed who desire updating in their occupational specialty.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

*Uniforms:* A white uniform is required in food preparation laboratories (HRIM 124, 125, 227, 286). Uniforms are the financial responsibility of the student.

*Special Curriculum Requirement:* A current TB skin test or chest x-ray is required for all HRIM laboratory classes.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<sup>1</sup> ENGL	111 English Comp. I.....	3		
GENL	100 Orientation.....	1		
HRIM	100 Intro. to Hotel/Rest. Management.....	3		
HRIM	124-125 Prin. of Food Preparation I-II.....	4	4	
HRIM	126 Prin. of Commercial Food Prep. ....			4
HRIM	184-185 Hotel-Rest. Org. & Man. I-II.....		3	3
HRIM	226 Menu Planning & Food Merchandising .....		3	
HRIM	236 Sanitation.....	3		
HRIM	277 Personnel Mgt. & Training for Hotels, Restaurants, & Institutions .....			3
<sup>2</sup> HRIM	Elective .....		3	
<sup>3</sup> --	Social Science Elective .....			3
<b>Total Credits</b>		<b>14</b>	<b>13</b>	<b>13</b>

Total minimum credits for the Hotel, Restaurant & Institutional Management Food Service Management Certificate = 40.

<sup>1</sup> ENGL 100 Occupational English may be substituted; however, it will not count toward the A.A.S. degree.

<sup>2</sup> HRIM electives may be selected from HRIM 156, 168, 186, 188, 246, 264, 265, 266, 286, 287, 289, 297, DIET 130, 136, ACCT 211, 212, BUAD 121, 122, and TRAV.

<sup>3</sup> For social science courses, refer to the "A.A.S. Degree General Requirements" section.

## HOTEL, RESTAURANT AND INSTITUTIONAL MANAGEMENT

Associate in Applied Science Degree  
Business Management Degree Program

### Hotel-Motel Management Specialization

*Purpose:* The curriculum is designed to enable the student to enter executive training and management positions in Hotels, Motor Hotels, and Clubs. The curriculum specializes in the Hotel/Motor Hotel management phase of the public hospitality industry.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

*Uniforms:* A white uniform is required in food preparation laboratories (HRIM 124, 125, 227, 286). Uniforms are the financial responsibility of the student.

*Special Curriculum Requirement:* A current TB skin test or chest x-ray is required for all HRIM laboratory classes.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<sup>1</sup> BUAD	121-122 Business Math. I-II (or a transferable MATH I-II series).....		3	3
<sup>2</sup> ENGL	111-112-113 English Comp. I-II-III.....	3	3	3
GENL	100 Orientation.....	1		
HRIM	100 Intro. to Hotel & Rest. Mgmt. ....	3		
HRIM	124-125 Prin. of Food Preparation I-II.....	4	4	
HRIM	126 Prin. of Commercial Food Prep. ....			4
HRIM	184-185 Hotel-Rest. Org. & Mgt. I-II .....		3	3
HRIM	236 Sanitation.....	3		
PHED	100 Fund. of Phys. Act. + Elective .....		1	1
<sup>2</sup> --	Social Science Electives .....	3	3	3
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>17</b>

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>Second Year</b>				
ACCT	211-212 Prin. of Accounting I-II.....	3	3	
HRIM	168 Executive Housekeeping.....			3
HRIM	188 Marketing of Hospitality Services.....		3	
HRIM	246 Labor Cost Control .....		3	
HRIM	264 Food & Beverage Cost Control I .....		3	
HRIM	277 Personnel Mgt. & Training for Hotels, Restaurants, & Institutions .....	3		
HRIM	286 Catering.....			3
HRIM	287 Hotel/Motel Front Office Procedures.....	3		
HRIM	289 Hotel & Motel Law .....			3
<sup>3</sup> HRIM	Electives .....	6	3	6
PHED	Elective .....	1		
<b>Total Credits</b>		<b>16</b>	<b>15</b>	<b>15</b>

Total minimum credits for the Hotel, Restaurant & Institutional Management major/Hotel-Motel Management Specialization (A.A.S. degree) = 97.

<sup>1</sup> For alternate MATH courses, see your faculty advisor.

<sup>2</sup> For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

<sup>3</sup> HRIM electives may be selected from: HRIM 156, 186, 226, 227, 265, 266, 297, ACCT 126, 213, DAPR 106, DIET 130, 136, and TRAV.

## HOTEL, RESTAURANT AND INSTITUTIONAL MANAGEMENT/HOTEL-MOTEL MANAGEMENT

Certificate

*Purpose:* The curriculum is designed for persons seeking employment in the hospitality industry and for those presently employed who desire updating in the lodging industry.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

*Uniforms:* A white uniform is required in food preparation laboratories (HRIM 124, 125, 227, 286). Uniforms are the financial responsibility of the student.

*Special Curriculum Requirement:* A current TB skin test or chest x-ray is required for all HRIM laboratory classes.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<sup>1</sup> ENGL	111 English Comp. I.....		3	
GENL	100 Orientation.....	1		
HRIM	100 Intro. to Hotel/Restaurant Mgmt. ....	3		
HRIM	124-125 Prin. of Food Preparation I-II.....	4	4	
HRIM	168 Executive Housekeeping.....			3
HRIM	184-185 Hotel-Rest. Org. & Man. I-II.....		3	3
HRIM	188 Marketing of Hospitality Services.....		3	
HRIM	277 Personnel Mgt. & Training for Hotels, Restaurants, & Institutions .....			3
HRIM	287 Hotel/Motel Front Office Procedures.....	3		
<sup>2</sup> HRIM	Elective .....	3		
<sup>3</sup> --	Social Science Elective .....			3
<b>Total Credits</b>		<b>14</b>	<b>13</b>	<b>12</b>

Total minimum credits for the Hotel, Restaurant & Institutional Management/Hotel-Motel Management Certificate = 39.

<sup>1</sup> ENGL 100 Occupational English may be substituted; however, it will not count toward the A.A.S. degree.

<sup>2</sup> HRIM electives may be selected from HRIM 156, 168, 186, 246, 264, 265, 266, 286, 287, 289, 297, DIET 130, 136, ACCT 211, 212, BUAD 121, 122, and TRAV.

<sup>3</sup> For social science courses, refer to the "A.A.S. Degree General Requirements" section.



## HOTEL, RESTAURANT AND INSTITUTIONAL MANAGEMENT/TRAVEL AND TOURISM

### Certificate

*Purpose:* Supplement the staffs of airlines, automobile associations, hotel and hotel chains, major oil companies, railroads, steamship companies, and travel agencies by providing new employees who have combined meaningful technical training with work experience. Help develop and up-date the present manpower in Travel Industry.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
BUAD	121 Business Math. I .....		3	
ENGL	111 English Composition I.....	3		
HRIM	277 Personnel Management & Training for Hotels, Restaurants & Institutions .....	3		
PSYC	110 Prin. of Applied Psychology or Social Science elective.....		3	
<sup>1</sup> OFTC	111 Typewriting I.....	3		
TRAV	150 Intro. to the Travel Industry .....	3		
TRAV	154-155 Geography of Tourism I-II.....	3	3	
<sup>2</sup> TRAV	159 Ground Transportation, Tours, Cruises & Services Planning .....		3	
<sup>2</sup> TRAV	177 Domestic Air Travel Planning.....		3	
<sup>3</sup> TRAV	178 International Air Travel Planning.....			3
<sup>3</sup> TRAV	179 Prin. of Group Travel Planning .....			3
TRAV	189 Marketing & Sales Management for Travel Industry.....			3
<sup>4</sup> TRAV	190 Coordinated Internship or TRAV/HRIM electives.....			3
<b>Total Credits</b>		<b>15</b>	<b>15</b>	<b>12</b>

Total minimum credits for the Hotel, Restaurant & Institutional Management/Travel and Tourism Certificate = 42.

<sup>1</sup> May be completed by taking the ABLE examination.

<sup>2</sup> TRAV 150 is a prerequisite.

<sup>3</sup> TRAV 177 is a prerequisite.

<sup>4</sup> TRAV elective may be selected from TRAV 276 or 297 or an appropriate HRIM course.

## HUMAN SERVICES ASSOCIATE

### Associate in Applied Science Degree Human Services Degree Program

*Purpose:* The curriculum is designed to provide a broad base of knowledge, methods and skills which underlie comprehensive delivery of human services with options or specialties in alcohol/drug rehabilitation counseling, gerontology, mental health, and social/community services. Occupational objectives include: Drug and Alcohol Rehabilitation Counselors, Gerontology Assistants, Nursing Home Assistants, Mental Health Technician, Community Development and Social Service Technicians, and other associate professional positions in the helping field.

*Special Curriculum Admission Requirements:* In addition to requirements established for admission to the College, an interview with a faculty review committee is required. Any student who receives a final grade less than "C" in any of the courses in the Human Services major must obtain permission from the Program Head to continue the major in Human Services, and must then repeat the course and earn a final grade of "C" or higher before taking the next course in the program sequence.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

## Alcohol Rehabilitation Specialization

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>First Year</b>				
ENGL	111-112-113 English Comp. I-II-III.....	3	3	3
GENL	100 Orientation.....	1		
HMSV	106 Intro. to Human Services.....	3		
HMSV	128 Community Resources & Services .....			3
HMSV	134-135-136 Helping Relationships I-II-III.....	3	3	3
HMSV	211-212-213 Alcohol/Drug Abuse Rehabil. Prog. I-II-III .....	3	3	3
*HMSV	216 Adolescent Alcohol Use & Abuse .....			3
*HMSV	246 Culture, Class & Substance Abuse .....		3	
*HMSV	247 Substance Abuse & the Family .....	3		
HMSV	248 Case Mgmt. & Substance Abuse .....		3	
PHED	100 Fund. of Phys. Act. + 2 electives.....	1	1	1
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>16</b>

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>Second Year</b>				
HMSV	144-145-146 Group Process I-II-III .....	3	3	3
HMSV	290 Coord. Internship or HMSV 297 Coop. Educ.....			3
HMSV	298 Seminar & Project .....			3
*MENT	104-105 Intro. to Mental Health I-II.....	3	3	
MENT	221-222 Mental Health I-II .....	3	.3	
HMSV	228 Helper as a Change Agent.....			3
PSYC	201-202-203 General Psychology.....	3	3	3
PSYC	231-232-233 Human Growth & Develop. ....	3	3	3
<b>Total Credits</b>		<b>15</b>	<b>15</b>	<b>18</b>

Total minimum credits for the Human Services Associate major/Alcohol Rehabilitation Specialization (A.A.S. degree) = 97.

\* Transfer option: Enroll in SOCI 101-102-103 and delete MENT 104-105 and one of the HMSV courses.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>First Year—Gerontology, Mental Health and Social and Community Services</b>				
ENGL	111-112-113 Eng. Comp.....	3	3	3
GENL	100 Orientation.....	1		
SOCI	101-102-103 Intro. Soc.....	3	3	3
PSYC	201-202-203 Gen. Psych.....	3	3	3
PSYC	231-232-233 Human Growth & Development .....	3	3	3
PHED	100 Fund. of Phys. Act. & 1 elective .....	1	1	
HMSV	106 Intro. to Human Services.....	3		
HMSV	134-135 Helping Relationships I-II .....		3	3
HMSV	128 Community Resources & Services .....			3
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>18</b>

## Gerontology Specialization

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>Second Year</b>				
HMSV	201-202-203 Gerontology I-II-III .....	3	3	3
HMSV	144-145 Group Process I-II.....	3		3
HMSV	217 Rec. for Senior Adults.....		3	
HMSV	228 Helper as a Change Agent.....		3	
HMSV	290 Coord. Internship (or HMSV 297 Co-op Ed.) .....	2	2	2
HMSV	298 Sem. & Proj.....			3
MENT	221-222 Mental Health I-II .....	3	3	
HLTH	110 Concepts of Personal & Community Hlth. ....	3		
HMSV	136 Helping Relationships III .....			3
*SOCI	266 Death & Society .....	3		
PHED	Elective .....			1
<b>Total Credits</b>		<b>14</b>	<b>17</b>	<b>15</b>

Total minimum credits for the Human Services Associate major/Gerontology Specialization (A.A.S. degree) = 97.

\* Or approved substitute

### Mental Health Specialization

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
MENT	104-105 Intro. Mental Health .....	3	3	
MENT	221-222-223 Mental Health I-II-III.....	3	3	3
MENT	110 Intro. to Abnormal Psych.....			3
HMSV	136 Helping Relationships III.....		3	
HMSV	227 Helping Across Cultures or DAPR 106.....	3		
HMSV	144-145 Group Process I-II.....		3	3
HMSV	290 Coord. Internship (or HMSV 297 Co-op. Ed.).....	2	2	2
HMSV	298 Sem. & Proj.....			3
HMSV	228 The Helper as a Change Agent.....		3	
*HMSV	226 Functional Family Intervention.....	3		
PHED	Elective .....	1		
<b>Total Credits</b>		<b>15</b>	<b>17</b>	<b>14</b>

Total minimum credits for the Human Services Associate major/Mental Health Specialization (A.A.S. degree) = 97.

\* Or approved substitute

### Social & Community Services Specialization

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
HMSV	144-145-146 Group Process I-II-III .....	3	3	3
HMSV	290 Coord. Internship (or HMSV 297 Co-op Ed.).....	2	2	2
HMSV	298 Sem. & Proj.....			3
PBSV	116 Public Personnel Admin.....	3		
HMSV	226 Family Intervention .....	3		
PBSV	259 Social Legislation.....			3
SOCI	184-185 Cont. Soc. Problems I-II.....	3	3	
HMSV	227 Helping Across Cultures or DAPR 106.....		3	
MENT	221-222 Mental Health I-II.....	3	3	
HMSV	228 Helper as a Change Agent.....			3
PHED	Elective .....		1	
<b>Total Credits</b>		<b>17</b>	<b>15</b>	<b>14</b>

Total minimum credits for the Human Services Associate major/Social & Community Services Specialization (A.A.S. degree) = 97.

### Gerontology Specialization/George Mason University Transfer Program

*Purpose:* The curriculum is designed for persons interested in gerontology and who plan to transfer to George Mason University to complete a Bachelor of Arts or a Bachelor of Science degree in psychology with a gerontology certificate.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
BIOL	101-102-103 Gen. Biology I-II-III .....	4	4	4
ENGL	111-112-113 English Comp. I-II-III.....	3	3	3
GENL	100 Orientation.....	1		
HMSV	201-202-203 Gerontology I-II-III .....	3	3	3
PHED	100 Fund. of Phys. Act. + 2 electives.....	1	1	1
PSYC	201-202-203 Gen. Psychology I-II-III .....	3	3	3
SOCI	101-102-103 Intro. Sociology.....	3	3	3
<b>Total Credits</b>		<b>18</b>	<b>17</b>	<b>17</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	Amer., English, or World Lit.....	3	3	3
MENT	221-222-223 Mental Health I-II-III.....	3	3	3
PSYC	231-232-233 Human Growth & Develop. I-II-III.....	3	3	3
SOCI	266 Death & Society .....	3		
<sup>1</sup> --	Foreign Language or MATH.....	4	4	
<sup>2</sup> --	Social Science Electives .....			4-6
--	General elective .....		3	
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>13-15</b>

Total minimum requirements for the Human Services Associate major/Gerontology Transfer Specialization (A.A.S. degree) = 97.

<sup>1</sup> If foreign language requirements are met, electives may be selected. To meet the transfer requirements for a Bachelor of Science degree in psychology, either the MATH 191-192-193 or 141-142-143 series is required.

<sup>2</sup> Social science electives should be chosen carefully and after investigation of the transfer requirements of the institution to which transfer is contemplated.

### INTERIOR DESIGN

#### Associate in Applied Science Degree Interior Design Degree Program

*Purpose:* The Interior Design program is intended to prepare the graduate to enter the interior design field at the technician's level. The program is designed to give the student a basic foundation in: (1) the visual presentation skills (2) a knowledge of elements of formal and special design and color coordination (3) a knowledge of the evolution of furniture and interior styles, and (4) a basic knowledge of the business procedures in the profession. A personal interview with the head of the Interior Design Department is helpful to a new student.

After completing two years (six quarters) of the program, the graduate will earn an Associate in Applied Science degree. Electives within the program enable the student to specialize in areas of interest and future potential employment. Career opportunities exist in the retail market, furniture, fabric or interior accessories, and in interior space planning and drafting with architectural firms.

*Coordinated Internship/Cooperative Education:* Each student, when he/she reaches the end of the curriculum, is required to spend 24 hours per week under the direct supervision of an interior designer, interior design firm or architectural design firm, for one quarter. The student will apply for the internship as if he/she were applying for a full-time job. This program is most beneficial to the student in learning the practical side of the Interior Design business.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
INDG	104 Tech. of Interior Design .....	3		
ARTS	154-155-156 Design.....	3	3	3
INDG	105 Beg. Drafting Tech. for the Int. Designer.....		3	
INDG	106 Isometrics and Model Const.....			3
INDG	107 Perspective and Rendering .....		3	
ARTS	111-112-113 Hist. & Appre. of Art .....	3	3	3
INDG	109 Styles in Furniture & Int.....			3
ENGL	111-112 Eng. Comp. ....	3	3	
SPDR	136 Oral Commun. ....			3
GENL	100 Orientation.....	1		
PHED	100 Fund. of Phys. Act. & 1 Elective.....	1	1	
INDG	108 Color and Space Theories .....	3		
HORT	137 Landscaping for Interior Design .....			3
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>18</b>

		Credits		
Second Year		1st Qtr.	2nd Qtr.	3rd Qtr.
INDG	208 Advanced Drafting Tech.....		3	
INDG	206 Textile, Floorcoverings, Wall & Window Treat.....		3	
INDG	207 Furniture, Lighting Equipment and Access.....	3		
INDG	216 Bus. Procedures for Int. Design.....	3		
INDG	299 Supervised Study.....		3	
INDG	290 Coord. Intern. or Co-op Educ.....		3	
*INDG	297 Cooperative Education.....		3	
PSYC	110 Principles of Applied Psyc.....	3		
--	Social Science Electives.....	3	3	
PHTG	101 Intro. to Photography or Commercial Art elective.....	3		
INDG	217 Int. Design Trade Sources.....			3
<sup>1</sup> INDG	Electives.....	3	3	3
PHED	Elect.....			1
<b>Total Credits</b>		<b>15</b>	<b>15</b>	<b>16</b>

Total minimum credits for the Interior Design major (A.A.S. degree) = 97.

<sup>1</sup> Areas of electives may also be selected from the following curricula which offer complimentary areas to Interior Design: Architectural Technology, Commercial Art, Art History, Business Administration, Horticultural Technology/Floral Design, Hotel Management, Retail Merchandising.

\* Students may choose between Coordinated Internship (non-paid position) or Cooperative Education (paid position) for their credit(s).

## LEGAL ASSISTING

### Associate in Applied Science Degree Business and Office Degree Program

*Purpose:* The curriculum is designed to provide an individual with a sufficient level of knowledge, understanding, and proficiency to perform the tasks in meeting a client's needs which can be performed by a trained, non-lawyer assistant working under the direction and supervision of a lawyer. A Legal Assistant will have a basic understanding of the general processes of American Law, and will have the knowledge and proficiency to perform specific tasks under the supervision of a lawyer in the fields of criminal and civil law. The occupational objectives include employment in public and in private, both individual and corporate, law-related activities, organizations, and agencies.

*Special Curriculum Admission Requirements:* Proficiency in high school English. Within practical limits, the curriculum will accommodate students with diverse educational backgrounds.

Enrollment in the curriculum is limited. The curriculum provides equality of opportunity in admission, and in all other areas, without discrimination or segregation on the grounds of race, color, sex, religion, or natural origin. The curriculum permits the enrollment in each individual course, as auditors or for credit, a limited number of non-degree candidate or candidates pursuing degrees in other areas.

*Special Curriculum Completion Requirements:* To remain in the program, students must complete each of the Administration of Justice (ADJU) and Legal (LEGL) courses in the program with a grade of "C" or better.

*Cooperative Education:* Students in this curriculum will participate in at least 6 quarter hours of Cooperative Education unless they already have equivalent experience.

		Credits		
First Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ACCT	211 Prin. of Accounting I.....			3
ENGL	111-112-113 English Comp. I-II-III.....	3	3	3
GENL	100 Orientation.....	1		
LEGL	110 Overview of Legal Processes.....	3		
LEGL	126 Legal Research.....	3		
LEGL	127 Legal Writing.....		3	
LEGL	134 Domestic Relations.....			3
LEGL	136 Law Office Management.....	3		
LEGL	221 Civil Trial & Appellate Practice I.....		3	
LEGL	226 Trial Practice.....			3
LEGL	251 Legal Transactions I.....		3	
PHED	100 Fund. of Phys. Act. + 2 Electives.....	1	1	1
SOCI	101-102-103 Intro. Sociology I-II-III or GOVT 281-282-283 U. S. Government I-II-III.....	3	3	3
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>16</b>

		Credits		
Second Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ADJU	231-232-233 Criminal Law Evidence and Proced. I-II-III.....	3	3	3
LEGL	241 Legal Aspects of Bus. Org. I.....			3
LEGL	246 Law of Income Taxation.....		4	
LEGL	256 Legal Aspects of Real Estate.....			4
LEGL	258 Administration of Decedents' Estates.....	3		
*LEGL	290/297 Coordinated Internship/Coop. Ed.....		3	3
PSYC	201-202-203 Gen. Psych. I-II-III.....	3	3	3
SPDR	136 Oral Communications.....	3		
--	Approved Electives.....	6		3
<b>Total Credits</b>		<b>18</b>	<b>13</b>	<b>19</b>

Total minimum credits for the Legal Assisting major (A.A.S. degree) = 99.

\* Students who are, or have been, employed in a law-related activity will substitute division-approved ADJU/LEGL courses for this requirement.

## LIBERAL ARTS

### Associate in Arts Degree Liberal Arts Degree Program

*Purpose:* The Associate in Arts degree major in Liberal Arts is designed for persons who plan to transfer to a four year institution to complete a bachelors degree program in any of the humanities or social science areas.

*Special Curriculum Admission Requirements:* Satisfactory completion of the following high school units or equivalent: 4 of English, 2 of mathematics (algebra and geometry), 1 of laboratory science and 1 of history. Two units of foreign language are recommended.

		Credits		
First Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	111-112-113 & Eng. Comp.....	3	3	3
GENL	100 Orientation.....	1		
HIST	Amer. Hist., Hist. of Western Civ., or Hist. of Civ.....	3	3	3
*MATH	Mathematics.....	3	3	3
<sup>1</sup> --	Natural Science (with Lab).....	4	4	4
**--	Foreign Language.....	3-4	3-4	3-4
<b>Total Credits</b>		<b>17-18</b>	<b>16-17</b>	<b>16-17</b>

		Credits		
Second Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	Amer., Eng., or World Lit.	3	3	3
**	Foreign Language	3	3	3
2--	Soc. Sci. Elect.	3	3	3
PHED	100 Fund. of Phys. Act. & 2 Elect.	1	1	1
3--	General electives	6	6	6
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Liberal Arts major (A.A. degree) = 97.

\* Math courses to be selected are listed in General Requirements And Electives For A.A. and A.S. Degrees.

\*\* See "Foreign Lang. Requirement for A.A. degree in Liberal Arts" in the "A.A. and A.S. Degrees General Requirements" section.

<sup>1</sup> Science courses may be selected from biology, chemistry, physics, geology or the natural science 121-122-123 courses.

<sup>2</sup> Three-quarter sequence social science courses may be selected from one of the following disciplines: economics, geography, government, history, humanities, psychology, social science or sociology (anthropology).

<sup>3</sup> Electives should be chosen carefully and after investigation of transfer requirements of the institution to which transfer is contemplated.

\*\* If foreign language requirements are met, electives may be selected.

### International Studies Specialization

*Purpose:* The Liberal Arts A.A. degree with a specialization in International Studies is designed to prepare students who intend to transfer to a four-year institution to complete a bachelor's degree program in International Studies or in any discipline of the humanities or social sciences. Whatever the student's ultimate career objectives, the International Studies Specialization will broaden the student's education to include more emphasis on other cultures and countries in recognition of the increasing interdependence of today's world.

		Credits		
First Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	111-112-113 English Comp. I-II-III	3	3	3
GENL	100 Orientation	1		
HIST	101-102-103 History of West. Civ. I-II-III	3	3	3
<sup>1</sup> MATH	Mathematics	3	3	3
2--	Natural science (with lab)	4	4	4
3--	Foreign language	3-4	3-4	3-4
<b>Total Credits</b>		<b>17-18</b>	<b>16-17</b>	<b>16-17</b>

		Credits		
Second Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	271-272-273 Survey of World Lit. I-II-III	3	3	3
--	Foreign language	3	3	3
ECON	211-212-213 Prin. of Economics I-II-III	3	3	3
<sup>4</sup> --	Non-Western requirement	3	3	3
PHED	100 Fund. of Physical Act. & 2 PHED elect.	1	1	1
5--	General electives	3	3	3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Liberal Arts major/International Studies Specialization (A.A. degree) = 97.

<sup>1</sup> MATH courses to be selected are listed in "A.A. and A.S. Degrees General Requirements and Electives".

<sup>2</sup> Science courses may be selected from biology, chemistry, physics, geology, or natural science 121-122-123.

<sup>3</sup> See "Foreign Language Requirement for A.A. degree in Liberal Arts" in "A.A. and A.S. Degrees General Requirements and Electives".

<sup>4</sup> Students may choose: ARTS 136-137-138, History of Far Eastern Art; HIST 231-232-233, Survey of Asian Civilization; HIST 234-235-236, Middle East Civilization; HIST 256-257-258, Survey of Russian History; HIST 281-282-283, Survey of Latin American Civilization; PHIL 231-232-233, Comparative Religion.

<sup>5</sup> Electives should be chosen carefully and after investigation of transfer requirements of the institution to which transfer is contemplated. ENGL 261-262-263, Survey of English Literature; GEOG 240-250-260, Physical, Cultural, and Economic Geography; GOVT 211-212-213, International Relations; HIST 261-262-263, History of England; HUMN 201-202-203, Survey of Western Culture; MUSC 221-222-223, History of Music; PHIL 201-202-203, History of Western Philosophy; SOCI 211-212-213, Principles of Anthropology; or SOSC 201-202-203, Survey of Urbanization (Old, New, and Third World Cities) are highly recommended.

### Philosophy/Religion Specialization

*Purpose:* The Liberal Arts degree with a specialization in Philosophy or Religion is designed primarily for students who wish to transfer to a four-year institution to complete a baccalaureate degree in Philosophy or Religion or who are contemplating future studies in theology.

		Credits		
First Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	111-112-113	3	3	3
**	Foreign Language (101-102-103)	3-4	3-4	3-4
HIST	101-102-103	3	3	3
PHIL	101-102-103	3	3	3
PHIL	121-122 or PHIL 221-222	3	3	
**	General elective			3
GENL	100	1		
<b>Total Credits</b>		<b>16-17</b>	<b>15-16</b>	<b>15-16</b>

		Credits		
Second Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	American, English or World Literature	3	3	3
+	Natural Science (with lab)	4	4	4
MATH		3	3	3
PHIL	201-202-203 or PHIL 231-232-233 or HUMN 201-202-203	3	3	3
** PHIL	Electives	3	3	3
PHED	100 Fund. of Physical Activity + 2 PHED elect.	1	1	1
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>17</b>

Total minimum credits for the Liberal Arts major/Philosophy-Religion Specialization (A.A. degree) = 97.

\* Languages may be selected from French, German, Spanish, Italian, Chinese, Japanese, Russian, Latin or Greek. Students should investigate transfer requirements of the institution to which they plan to transfer.

\*\* All electives should be chosen carefully, after investigation of transfer requirements of the institution to which the student plans to transfer.

+ Science may be selected from biology, chemistry, physics, geology or the natural sciences 121-122-123.

++ It is advisable to take PHIL electives in a series: PHIL 121-122-123/PHIL 211-212-213/PHIL 217-218-246/PHIL 221-222/PHIL 231-232-233/PHIL 236-237/PHIL 271-272-273. PHIL 110 and PHIL 210 are also advisable electives.

### Speech Communication Specialization

*Purpose:* The Liberal Arts A.A. degree with a specialization in Speech Communication is designed primarily for students who wish to transfer to a four-year college or university to complete a baccalaureate degree in Speech Communication. It is meant to be a general introduction to the field of communication offering those courses conducive to further study in these areas.

		Credits		
First Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	111-112-113 Engl. Comp. I-II-III	3	3	3
GENL	100 Orientation	1		
HIST	Amer. Hist. or Hist. of Western Civ.	3	3	3
<sup>1</sup> MATH		3	3	3
PHED	100 Fund of Phys. Act. + 1 elect.		1	1
<sup>2</sup> SPDR	136 Oral Comm. or SPDR 151 Fund. of Speech Comm I or SPDR 130 Prin. of Pub. Speak.	3-5		
<sup>2</sup> SPDR	136 Oral Comm + 137 Oral Comm or 151 Fund. of Speech Comm + 152 Fund. of Speech Comm. or 130 Prin of Pub Spkg + 3 cr. SPDR elect. <sup>3</sup>		3	3
SPDR	141 Voice & Diction or SPDR 276			3
--	Foreign Language	3-4	3-4	3-4
<b>Total Credits</b>		<b>16-19</b>	<b>16-17</b>	<b>19-20</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	Amer., Engl. or World Lit. ....	3	3	3
PHED	Elective .....		1	
SPDR	146 Intro to Small Group Comm. ....	5		
<sup>3</sup> SPDR	Elective .....			3-5
--	Natural Science (with lab.) .....	4	4	4
<sup>4</sup> --	Social Science Electives .....	3	3	3
--	General electives .....	3	3	3
<b>Total Credits</b>		<b>18</b>	<b>14</b>	<b>16-18</b>

Total minimum credits for the Liberal Arts major/Speech Communication Specialization (A.A. degree) = 99.

- <sup>1</sup> MATH courses to be selected are listed in the "A.A. and A.S. Degrees General Requirements" section.
- <sup>2</sup> Students may choose either SPDR 136-137 or SPDR 151-152 for a total of 6 credits in 2 quarters, or SPDR 130 + a 3 credit SPDR elective totaling 8 credits in 2 quarters.
- <sup>3</sup> Electives must be chosen from SPDR 184, 230, 119 (maximum of 5 hrs.), or 158 (maximum of 5 hrs.).
- <sup>4</sup> Three-quarter sequence social science courses may be selected from one of the following disciplines: economics, geography, government, history, humanities, psychology, social science, or sociology (anthropology).

## MACHINE TOOL OPERATION

### Certificate

*Purpose:* This curriculum is designed to prepare the student for industrial employment with an emphasis on basic machine tool operation. The curriculum includes the necessary theory and laboratory experience to advance the student to an entry level of competency as a machine shop aide, drill press operator, lathe operator or mechanical draftsman.

*Curriculum Admission Requirements:* Meet general admission requirements established by the College. Math and English placement exams are required at the time of entry.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see the Cooperative Education Program section.

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
DRFT	111-112 Technical Drafting I-II .....	2	2	
ENGR	100 Intro. to Engineering Tech. ....	2		
ENGR	116 Computer Applications for Engineering Tech. ....			3
ENGL	100 Occupational English or ENGL 111 English Comp. I .....	3		
ENGL	110 English Grammar: Its Logic & Function or ENGL 112 English Composition II .....		3	
INDT	111-112 Materials & Processes of Industry I-II .....		3	3
INDT	170 Industrial Management .....			3
MATH	118-119 Intro. to Technical Math. I-II .....	5	5	
MECH	116 Numerical Control Programming I .....			4
MECH	119 Jig & Fixture Design .....		3	
MECH	131-132-133 Machine Laboratory I-II-III .....	2	2	2
--	Non-Technical Elective .....	3		
<b>Total Credits</b>		<b>17</b>	<b>18</b>	<b>15</b>

Total minimum credits for the Machine Tool Operation Certificate = 50.

## MARKETING

### Associate in Applied Science Degree Business Management Degree Program

*Purpose:* The curriculum is designed for persons who seek full-time employment in areas involving the marketing and distribution of goods and for those presently in these fields who are seeking promotion. The occupational objectives include: Store Manager / Assistant Manager / Sales Supervisor / Department Manager / Sales Representative / Buyer / Assistant Buyer. The curriculum offers specialization in Fashion Marketing and Retail Marketing. These specializations are designed for the second year of the curriculum after a common first year.

*Special Curriculum Admission Requirements:* The student should possess a proficiency in high school English and a strong background in basic arithmetic operations.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see the Cooperative Education Program section.

First Year (Common to both specializations)		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
<sup>1</sup> ACCT	211-212-213 Prin. of Accounting I-II-III .....	3	3	3
BUAD	100 Intro. to Bus. ....	3		
<sup>2</sup> ECON	160 Amer. Econ. ....	3		
<sup>2</sup> ENGL	111-112 Eng. Comp. I-II .....	3	3	
<sup>2</sup> SPDR	136 Oral Comm. (or ENGL 180) .....			3
<sup>1</sup> BUAD	121-122-123 Bus. Math I-II-III .....	3	3	3
GENL	100 Orientation .....	1		
PHED	100 Fund. of Phys. Act. & 2 Elect. ....	1	1	1
BUAD	164 Prin. of Bus. Mgt. I .....		3	
MKTG	100 Prin. of Marketing .....		3	
MKTG	136 Retail Organization Mgt. ....			3
<sup>2</sup> PSYC	110 Prin. of Applied Psyc. ....			3
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>16</b>

<sup>1</sup> A business-related elective may be substituted for ACCT 213 and BUAD 123.

<sup>2</sup> For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

## Fashion Specialization

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
DAPR	106 Prin. of Data Processing .....	3		
GOVT	180 American Constitutional Govt. ....	3		
MKTG	109 Prin. of Salesmanship .....	3		
MKTG	110 Fund. of Fashion .....	3		
MKTG	217 Color, Line, & Design in Retailing .....	3		
BUAD	110 Human Relat. & Ldrshp. Tng. ....	3		
BUAD	241 Bus. Law I + BUAD 242 Bus. Law II or Bus. Elect. ....		3	3
MKTG	218 Fashion Mdse. (Buying & Control) .....		3	
MKTG	225 Prin. of Advertising .....		3	
MKTG	216 Mdse. Infor. ....		3	
ACCT	241 Prin. of Fed. Tax. I (or Bus. Elect.) .....		3	
BUAD	276 Personnel Mgt. ....			3
MKTG	219 Fashion Sales Prom. ....			3
MKTG	209 Sales Mgt. ....			3
MKTG	298 Sem. & Proj. ....			3
<b>Total Credits</b>		<b>18</b>	<b>15</b>	<b>15</b>

Total minimum credits for the Marketing major/Fashion Specialization (A.A.S. degree) = 97.

## Retail Specialization

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
BUAD	254 Appl. Bus. Statistics or Bus. Elect. ....	3		
DAPR	106 Prin. of Data Proc. ....	3		
MKTG	109 Prin. of Salesmanship .....	3		
GOVT	180 American Constitutional Govt. ....	3		
BUAD	110 Human Relat. & Ldrshp. Tng. ....	3		
MKTG	216 Mdse. Infor. ....		3	
BUAD	241 Bus. Law I + BUAD 242 Bus. Law II or Bus. Elect. ....		3	3
MKTG	226 Mdse. Buying & Control .....		3	
MKTG	225 Prin. of Advertising .....		3	
ACCT	241 Bus. Taxes or Bus. Elect. ....		3	
BUAD	276 Personnel Mgt. ....			3
MKTG	228 Sales Prom. ....			3
MKTG	209 Sales Mgt. ....			3
MKTG	298 Sem. & Proj. ....			3
--	General elective .....	3		
<b>Total Credits</b>		<b>18</b>	<b>15</b>	<b>15</b>

Total minimum credits for the Marketing major/Retail Specialization (A.A.S. degree) = 97.

## MECHANICAL ENGINEERING

Associate in Applied Science Degree  
Mechanical Technology Degree Program

*Purpose:* The curriculum is designed to prepare the student for industrial employment as a mechanical engineering technician. Occupational objectives include: Draftsman or Drafting Supervisor / Estimator / Engineering Equipment Inspector / Engineering Plant Operator / Research and Development Technician.

*Special Curriculum Admission Requirements:* Two units of high school algebra.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see the Cooperative Education Program section.

		Credits		
First Year		1st Qtr.	2nd Qtr.	3rd Qtr.
DRFT	111-112 Technical Drafting I-II.....	2	2	
DRFT	113 Technical Drafting III or DRFT 266 Computer Graphics.....			2-3
ENGR	100 Intro. to Engineering Tech.....	2		
ENGR	151 Mechanics I (Statics).....			4
ENGL	111-112 English Composition I-II.....	3	3	
ENGL	113 English Composition III or ENGL 137 Technical Writing.....			3
GENL	100 Orientation.....	1		
INDT	111-112 Materials & Processes of Industry I-II.....		3	3
MATH	121-122 Engineering Technical Math. I-II.....	5	5	
MECH	131-132-133 Machine Laboratory I-II-III.....	2	2	2
*--	Social Science Electives.....	3	3	3
<b>Total Credits</b>		<b>18</b>	<b>18</b>	<b>17-18</b>

		Credits		
Second Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGR	116 Computer Applications for Engineering Tech.....		3	
ENGR	152 Mechanics II (Strength of Materials).....	3		
ENGR	153 Mechanics III.....		3	
ENGR	154 Mechanics Laboratory.....	1		
MECH	116 Numerical Control Programming I.....			4
MECH	237 Machine Design I.....		4	
MECH	246 Metallurgy I.....	4		
MECH	264 Thermodynamics I.....	4		
MECH	297 Cooperative Education or MECH 298 Seminar & Project.....			2
PHED	100 Fundamentals of Physical Activity + 2 PHED electives.....	1		(1)(1)
PHYS	111-112-113 Technical Physics I-II-III.....	4	4	4
--	Technical elective.....		3-4	
--	Technical elective or MATH 123 Engineering Technical Math. III.....			3-5
<b>Total Credits</b>		<b>17</b>	<b>17-18</b>	<b>15-17</b>

Total minimum credits for the Mechanical Engineering major (A.A.S. degree) = 102.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

## Computer Aided Design and Manufacturing Specialization

*Purpose:* The curriculum is designed to prepare the student for employment as a technical specialist in CAD operation, or as an automated manufacturing technician. Occupational objectives: CAD Operator, Mechanical Engineering Technician, Numerical Control Programmer, Robotics Technician, Research and Development Technician, Mechanical Draftsman.

*Special Curriculum Admission Requirements:* Two years of high school algebra.

		Credits		
First Year		1st Qtr.	2nd Qtr.	3rd Qtr.
DRFT	231 Computer Aided Drafting I.....			3
MATH	121-122 Engineering Technical Math. I-II.....	5	5	
MECH	131-132 Machine Lab. I-II.....	2	2	
INDT	111-112 Mat. & Processes of Industry I-II.....	3	3	
*DRFT	151 Engineering/Drawing Fundamentals I.....	3		
*DRFT	152 Engineering/Drawing Fundamentals II.....		3	
ENGR	100 Introduction to Engineering Tech.....	2		
ENGR	116 Computer Applications for Engr. Tech. ...		3	
ENGR	151 Mechanics I (Statics).....			4
PHYS	111 Technical Physics I.....			4
MECH	116 Numerical Control Programming.....			4
ENGL	111-112 English Comp. I-II.....	3		3
GENL	100 Orientation.....		1	
<b>Total Credits</b>		<b>18</b>	<b>17</b>	<b>18</b>

		Credits		
Second Year		1st Qtr.	2nd Qtr.	3rd Qtr.
MECH	117 Numerical Programming II.....	4		
MECH	237 Machine Design I.....		4	
MECH	246 Metallurgy I.....	4		
DRFT	206 Numerical Control Drafting.....	3		
MECH	254-255 Robotics Applications I-II.....		3	3
DRFT	232 Computer Aided Drafting II.....			3
PHYS	112-113 Technical Physics II-III.....		4	4
--	Social science electives.....	3	3	3
ENGL	137 Technical Writing.....		3	
MECH	298 Seminar & Project or MECH 297, Cooperative Ed.....			3
PHED	Electives.....			(1)(1)
ENGR	152 Mechanics II (Strength of Materials).....	3		
ENGR	154 Mechanics Laboratory.....	1		
PHED	100 Fundamentals of Physical Activity.....		1	
<b>Total Credits</b>		<b>18</b>	<b>18</b>	<b>18</b>

Total minimum credits for the Mechanical Engineering major/Computer Aided Design and Manufacturing Specialization (A.A.S. degree) = 107.

\* With approval, students may substitute DRFT 111-112-113 for DRFT 151-152.

## Electro-Mechanical Technology Specialization

*Purpose:* The curriculum is designed to prepare the student for industrial employment as an electro-mechanical technician. Occupational objectives include: Engineering Equipment Inspector, Engineering Plant Operator, Research and Development Technician, and Engineering Sales Representative.

*Special Curriculum Admission Requirements:* Two units of high school algebra.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see the Cooperative Education Program section.

		Credits		
First Year		1st Qtr.	2nd Qtr.	3rd Qtr.
DRFT	111-112 Technical Drafting I-II.....	2	2	
ELEC	114 Fundamentals of Direct Current.....	4		
ELEC	115 Fundamentals of Alternating Current.....		4	
ELEC	116 Intro. to Circuit Analysis.....			4
ENGR	100 Intro. to Engineering Tech.....	2		
ENGR	151 Mechanics I (Statics).....			4
ENGL	111-112 English Composition I-II.....	3		3
INDT	111-112 Materials & Processes of Industry I-II.....		3	3
MATH	121-122 Engineering Technical Math. I-II.....	5	5	
MECH	131-132 Machine Laboratory I-II.....	2	2	
PHED	100 Fundamentals of Physical Activity + PHED elective.....		1	1
1--	Social Science Elective.....			3
<b>Total Credits</b>		<b>18</b>	<b>17</b>	<b>18</b>



		Credits		
		1st	2nd	3rd
Second Year		Qtr.	Qtr.	Qtr.
ELEC	261-262 Electromechanical Systems I-II .....	4	4	
ENGR	116 Computer Applications for Engineering Tech. ....		3	
ENGR	152 Mechanics II (Strength of Materials) .....	3		
ENGR	153 Mechanics III .....		3	
ENGR	154 Mechanics Laboratory .....	1		
ENGL	113 English Composition III or ENGL 137 Technical Writing .....		3	
GENL	100 Orientation .....			1
MECH	116 Numerical Control Programming I .....			4
MECH	237 Machine Design I .....		4	
MECH	297 Cooperative Education or MECH 298 Seminar & Project .....			2
PHED	Elective .....			1
PHYS	111-112 Technical Physics I-II .....	4	4	
1 -	Social Science Electives .....	3		3
2 -	Technical Elective or MATH 123 Engineering Technical Math. III .....			3-5
2 -	Technical Elective .....			3
<b>Total Credits</b>		<b>18</b>	<b>18</b>	<b>17-19</b>

Total minimum credits for the Mechanical Engineering major/Electro-Mechanical Technology Specialization (A.A.S. degree) = 106.

<sup>1</sup> For further explanation of social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

<sup>2</sup> Suggested electives: ENGR 116, DRFT 266, ENGR 160.

### MEDICAL LABORATORY TECHNOLOGY

#### Associate in Applied Science Degree Medical Laboratory Degree Program

*Purpose:* The curriculum is designed to prepare the students for employment, upon graduation and certification, as Medical Laboratory Technicians in hospital laboratories, private laboratories, physician's office laboratories, health department laboratories, and industrial medical laboratories.

*Special Curriculum Admission Requirements:* (1) High School courses: 2 units of mathematics, 1 unit of biology, 1 unit of chemistry. Deficiencies may be corrected in the Developmental Program before entering the Medical Laboratory Technology Program. (2) Past achievement must reflect a "C" average. (3) Good physical and mental health may need to be substantiated by a physician's report. (4) Satisfactory interview with the Program Head. (5) The Medical Laboratory Technician Program reserves the right to determine the student's final acceptance. (6) Students are admitted into the program in September; early application through the counselor is necessary. Students may take support courses prior to entering the seven quarter program. Students should not take BIOL 176 prior to entering the program.

Transfer credits earned at another institution will be evaluated on an individual basis. Developmental work or testing may be advised for credits earned more than ten (10) years ago.

*Special Curriculum Completion Requirements:* (1) Students must maintain a "C" in all courses in the Medical Laboratory sequence to remain in the program. (2) Students are responsible for transportation to the hospital laboratories. (3) Student liability insurance and uniforms are the financial responsibility of the student. (4) Laboratory placement may require students to spend varying hours in the clinical affiliates.

*Special Accreditation Status:* The program is accredited by the AMA committee on Allied Health Education and Accreditation (CAHEA) in cooperation with the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS).

		Credits			
		1st	2nd	3rd	4th
First Year		Qtr.	Qtr.	Qtr.	Qtr.
BIOL	176 Microbiology .....			4	
BIOL	251-252 Anatomy & Physiology .....	4	4		
CHEM	101-102-103 Gen. Chem. or CHEM 111-112-113 Coll. Chem. ....	4	4	4	
* ENGL	111-112-113 English Comp. ....	3	3	3	
GENL	100 Orientation .....	1			
MATH	181-182-183 Gen. Coll. Math. or MATH 191-192-193 or MATH 161-162-163 .....	3	3	3	
MDLB	100 Intro. to Med. Lab. Sci. ....	3			
MDLB	116 Intro. to the Clinical Lab. ....		4		
MDLB	118 Intro. to Diag. Microbiology .....				3
MDLB	126 Prin. of Hematology .....			4	
MDLB	290 Coord. Internship .....				3
* -	Social Science Electives .....				6
<b>Total Credits</b>		<b>18</b>	<b>18</b>	<b>18</b>	<b>12</b>

		Credits		
		1st	2nd	3rd
Second Year		Qtr.	Qtr.	Qtr.
MDLB	225 Clin. Hematology .....	7		
MDLB	230 Blood Banking .....			5
MDLB	259 Diag. Microbiology .....	4		
MDLB	264-265 Clin. Chem. ....			8
MDLB	277 Clin. Microbiology .....	6		
MDLB	278 Clin. Lab. Instrumentation .....		2	
MDLB	287 Clin. Blood Bkg. & Serology .....			7
MDLB	298 Sem. & Proj. ....			2
PHED	100 Fund. of Phys. Act. + 2 PHED electives .....	1	(1)(1)	
* -	Social Science Elective .....			3
<b>Total Credits</b>		<b>18</b>	<b>17</b>	<b>17</b>

Total minimum credits for the Medical Laboratory Technology major (A.A.S.) degree = 118.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

### MEDICAL OFFICE ASSISTING

#### Career Studies Certificate

*Purpose:* The Career Studies Certificate in Medical Office Assisting is designed to prepare personnel to perform administrative and clinical functions in physicians' offices and clinics. Some examples of these functions include administering first aid, performing sterilization procedures, checking vision and hearing, having a working knowledge of laboratory procedures on blood and urine, scheduling appointments, maintaining health records, responding to requests for information, coding clinical data, and completing health insurance forms. The curriculum includes learning experiences in on-campus laboratories.

*Special Curriculum Admission Requirements:* High school diploma (biology and typing desirable); current certification in CPR (may be taken at beginning of course sequence); good physical and mental health substantiated by a physician's report.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see the Cooperative Education Program section.

		Credits	
		1st	2nd
		Qtr.	Qtr.
* ENGL	/SPDR .....		3
HLTH	100 Orientation to Allied Health Careers .....	1	
MDLB	100 Introduction to Med. Lab. Tech. ....		3
MDRS	112 Medical Record Science II .....		4
MDRS	120 Introduction to Medical Science .....	4	
MDRS	126 Intl. Classification of Diseases .....		3
NURS	106 Elementary Nursing Skills .....	4	
NURS	198 Seminar and Project .....		3
<b>Total credits</b>		<b>12</b>	<b>13</b>

Total minimum credits for the Medical Office Assisting Career Studies Certificate = 25.

\* If SPDR is chosen, SPDR 136 is recommended.

## MEDICAL RECORD TECHNOLOGY

### Associate in Applied Science Degree Medical Records Degree Program

*Purpose:* The curriculum is designed to prepare students to work as medical record technicians in a health record service located in hospitals, consulting firms, health centers, pharmaceutical companies, medical research institutions, and other health-related facilities.

The medical record—a written account of medications, treatment, and care given to a patient—is as necessary to the practice of medicine as medications are to the effective treatment. Information in the medical record is also important for planning patient care. It is the source of medical research data, and a medical/legal document.

Some of the important functions a professional medical record specialist performs as a key member of the health care team are:

- (1) Works with physicians and other health care providers to insure medical records are complete and accurate.
- (2) Protects patient confidentiality by knowing the legal aspects of patient rights—an issue of increasing concern in the medical field.
- (3) Prepares special studies and tabulates medical record data for research purposes important to the health facility.
- (4) Designs procedures and systems to insure that records are complete, accurate, and available for patient care activities.
- (5) Reviews and abstracts information from medical records using knowledge of medical conditions, disease processes, surgical procedures, and medications.

Graduates are eligible to apply to take the national accreditation examination administered by the American Medical Record Association.

*Special Curriculum Admission Requirements:* (1) High school courses: 1 unit each of algebra and science (biology or chemistry recommended). Deficiencies may be corrected in the Developmental Program before entering the technical program. Transfer credits in the natural sciences earned at another institution will be evaluated on an individual basis. (2) Good physical and mental health which may need to be substantiated by a physician's report.

*Special Curriculum Completion Requirements:* Any student whose final average falls below a "C" in any Medical Record Science, medical terminology or concepts of disease course must obtain permission from the Program Head to repeat the course and should earn a final grade of "C" or higher before taking the next course in the sequence. Students are totally responsible for transportation to and from the College and the various hospitals and other health agencies which are utilized for coordinated practical experience. In addition, students are responsible for purchasing laboratory jackets and accessories prior to beginning their practical experience.

*Special Accreditation Status:* The program is accredited by the AMA Committee on Allied Health Education and Accreditation (CAHEA) in cooperation with the American Medical Record Association.

First Year	Credits		
	1st Qtr.	2nd Qtr.	3rd Qtr.
DAPR 106 Prin. of Data Processing .....			3
* ENGL 111-112-113 English Comp. I-II-III .....	3	3	3
GENL 100 Orientation .....	1		
HLTH 124-125 Med. Terminology .....	3	2	
MDRS 100 Med. Report Transcription .....			3
MDRS 111-112 Medical Record Science I-II .....	4	4	
MDRS 130 Intro. to Health Rec. Appl. ....		1	
MDRS 221 Clinical Practice I .....			3
NASC 111-112-113 Health Science I-II-III .....	4	4	4
PHED 100 Fund. of Phys. Act. + 2 Electives .....	1	1	1
OFTC 111 Typewriting I or Elective .....		3	
<b>Total Credits</b>	<b>16</b>	<b>18</b>	<b>17</b>

Second Year	Credits		
	1st Qtr.	2nd Qtr.	3rd Qtr.
BUAD 110 Human Relat. & Leadership Training .....			3
BUAD 164 Bus. Mgt. ....			3
HLTH 150 Concepts of Disease .....	3		
MDRS 213-214 Medical Record Science III-IV .....	4	4	
MDRS 215 Medical Record Science V .....		4	
MDRS 222-223 Clinical Practice II-III .....		1	1
MDRS 231-232-233 Advanced Health Rec. Applications I-II-III .....	3	3	3
MDRS 235 Hosp. Appl. of Data Processing .....	3		
MDRS 298 Seminar & Project .....			2
*SOSC 101-102-103 Contemp. Amer. Civ. ....	3	3	3
<b>Total Credits</b>	<b>16</b>	<b>15</b>	<b>15</b>

Total minimum credits for the Medical Record Technology major (A.A.S. degree) = 97.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

## MUSIC

### Associate in Arts Degree Visual and Performing Arts Degree Program

*Purpose:* The Associate in Arts Degree curriculum in Music is designed primarily for students who wish to transfer to a four-year college or university to complete the baccalaureate degree in music or music education. The curriculum offers emphasis in four different areas of musical interest. These are designed for the second year of the curriculum after a common first year.

*Special Curriculum Admission Requirements:* An audition and interview by the music faculty is necessary prior to final acceptance in this program.

*Special Curriculum Completion Requirements:* Applied music students: Tuition fees are payable to the College. Studio charges are payable directly to applied music instructors.

First Year (Common to all four specializations)	Credits		
	1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL 111-112-113 .....	3	3	3
HIST Amer. Hist. or Hist. of West. Civ. ....	3	3	3
PHED 100 Fund. of Phys. Act. & 2 PHED electives .....	1	1	1
MUSC 111-112-113 Music Theory .....	4	4	4
MUSC Applied Music (Major) .....	2	2	2
+ MUSC Applied Music (Minor) .....	1	1	1
MUSC Chorus/Band/Orch/Ensemble .....	1	1	1
GENL 100 Orientation .....	1		
*-- General elective .....			3
<b>Total Credits</b>	<b>16</b>	<b>15</b>	<b>18</b>

## Entertainment Specialization

Second Year	Credits		
	1st Qtr.	2nd Qtr.	3rd Qtr.
MUSC 158 Improvisational Techniques .....	3		
MUSC 258 Advanced Improvisational Techniques .....		3	
MUSC 220 The History of Jazz .....	3		
MUSC 214-215 Composition I-II .....		2	2
MUSC Appl. Music (Major) .....	2	2	2
+ MUSC Appl. Music (Minor) .....	1	1	1
MUSC Chorus/Band/Orchestra/ Ensemble .....	1	1	1
MUSC Electives .....		3	5
ENGL American, English, or World Lit. ....	3	3	
*-- Electives .....			5
-- Science Elective .....	4		
<b>Total Credits</b>	<b>17</b>	<b>15</b>	<b>16</b>

Total minimum credits for the Music major/Entertainment Specialization (A.A. degree) = 97.

\* Class instruction such as Class Voice or Class Piano may be substituted; non-keyboard majors are required to minor in piano.

\* Electives should be chosen carefully and after investigation of transfer requirements of the institution to which the transfer is contemplated.

**Fine Arts Specialization**

Second Year	Credits		
	1st Qtr.	2nd Qtr.	3rd Qtr.
MUSC 211-212-213 Adv. Music Theory.....	4	4	4
MUSC 221-222-223 Music History.....	3	3	3
MUSC Appl. Music (Major).....	2	2	2
+ MUSC Appl. Music (Minor).....	1	1	1
MUSC Chorus/Band/Orch/Ensemble.....	1	1	1
ENGL Amer., Engl., or World Literature.....	3	3	
* -- General elective.....			5
- Science Elective.....	4		
<b>Total Credits</b>	<b>18</b>	<b>14</b>	<b>16</b>

Total minimum credits for the Music major/Fine Arts Specialization (A.A. degree) =97.

+ Class instruction such as Class Voice or Class Piano may be substituted; non-keyboard majors are required to minor in piano.

\* Electives should be chosen carefully and after investigation of transfer requirements of the institution to which the transfer is contemplated.

**Liberal Arts Specialization**

Second Year	Credits		
	1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL American, English, or World Lit. ....	3	3	3
MUSC Appl. Music (Major).....	2	2	2
+ MUSC Appl. Music (Minor).....	1	1	1
MUSC Chorus/Band/Orchestra/Ensemble.....	1	1	1
MUSC 121-122-123 Music Appreciation I-II-III (or approved MUSC elective).....	3	3	3
* -- General electives.....	2	2	2
<sup>1</sup> -- Science Elective (with Lab).....	4	4	4
<b>Total Credits</b>	<b>16</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Music major/Liberal Arts Specialization (A.A. degree) =97.

+ Class instruction such as Class Voice or Class Piano may be substituted; non-keyboard majors are required to minor in piano.

\* Electives should be chosen carefully and after investigation of transfer requirements of the institution to which the transfer is contemplated.

<sup>1</sup> Science courses may be selected from biology, chemistry, physics, geology or the natural science 121, 122, 123 courses.

**Religion Specialization**

Second Year	Credits		
	1st Qtr.	2nd Qtr.	3rd Qtr.
MUSC 110 Choral Organization.....		3	
MUSC 146 Liturgical Music.....			3
MUSC 120 Hymnology.....	3		
MUSC 244-245 Service Playing I-II.....		3	3
MUSC Appl. Music (Major).....	2	2	2
MUSC 214-215 Composition I-II.....	2	2	
MUSC 226 Twentieth Century Music and Music Cultures.....			3
MUSC Chorus/Band/Orchestra/Ensemble.....	1	1	1
ENGL American, English, or World Lit. ....	3	3	
<sup>1</sup> MUSC Choral Directing.....	3	3	
* -- General elective.....			3
- Science Elective (with Lab).....	4		
<b>Total Credits</b>	<b>18</b>	<b>17</b>	<b>15</b>

Total minimum credits for the Music major/Religion Specialization (A.A. degree) =99.

+ Class instruction such as Class Voice or Class Piano may be substituted; non-keyboard majors are required to minor in piano.

<sup>1</sup> This requirement may be met with MUSC 117, 118, Cooperative Education, Coordinated Internship, or Supervised Study.

\* Electives should be chosen carefully and after investigation of transfer requirements of the institution to which the transfer is contemplated.

**MUSIC RECORDING TECHNOLOGY**

**Certificate**

*Purpose:* The Music Recording curriculum is designed for persons who seek employment as music recording technicians. Occupational objectives include: development for positions as assistants and aids in recording studios, broadcast studios, television studios, a myriad of other recording enterprises, (i.e., Musak) and countless private studios in the recording industry.

*Special Curriculum Admission Requirements:* Students must successfully complete a personal interview with a program faculty member.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits			
		1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
ENGL	111-112-113 English Comp. I-II-III.....	3	3	3	
MATH	118 Intro. to Technical Math. I.....	5			
BUAD	174-175 Small Business Management I-II.....		3	3	
PSYC	128 Human Relations.....		3		
GENL	100 Orientation.....	1			
MUSC	130 Overview of the Recording Industry.....	1			
MUSC	140 Intro. to Recording Techniques.....	3			
MUSC	150 Intro. to Recording Elec. Theory.....		3		
MUSC	154 Sound Studio Design.....	3			
MUSC	156 Adv. Recording Elec. Theory.....			3	
MUSC	178 Music Copyright Law.....		3		
MUSC	227 Multi-Channel Record. Techniques.....		3		
MUSC	228 Editing and Mixdown Techniques.....			3	
MUSC	229 Adv. Recording Techniques.....			3	
MUSC	288 Recording Problems Seminar.....				3
MUSC	290 Coordinated Internship.....				5
<b>Total Credits</b>		<b>16</b>	<b>18</b>	<b>15</b>	<b>8</b>

Total minimum credits for the Music Recording Technology Certificate = 57.

**NURSING**

**Associate in Applied Science Degree Nursing Degree Program**

*Purpose:* To prepare students as contributing members of the health team, rendering direct patient care as beginning practitioners of nursing in a variety of health service facilities. Upon graduation, students will be eligible to take the National Council Licensure Examination (NCLEX) leading to licensure as a Registered Nurse (R.N.).

*Special Curriculum Admission Requirements:* (1) High School courses: 1 unit each of biology, algebra, and chemistry, with a minimum grade of "C". Deficiencies may be corrected in the Developmental Program before entering the Nursing curriculum. (2) Past achievement should reflect a "C" average, (3) CPR Certification, (4) completion of a basic first aid course, (5) good physical and mental health substantiated by a physician's report. The Nursing Program reserves the right to determine the student's final acceptance, (6) students majoring in nursing are admitted in September; early application is desirable. Students may take support courses prior to entering the Nursing seven quarter sequence.

Transfer or prerequisite credits in the natural and social sciences earned at another institution will be evaluated on an individual basis. Developmental work or testing may be advised for credits earned more than ten years ago.

Students requesting advanced placement in the nursing sequence by means of transfer from another nursing program will be evaluated on an individual basis.

Advanced Placement Examinations for NURS 131 and 132 are available for Licenced Practical Nurses wishing to enter this major with advanced standing. Additionally, an Advanced Placement Examination for NURS 133 is available for LPNs who are graduates of programs which are articulated with NVCC. See Program Head for details.

**Special Curriculum Completion Requirements:** Satisfactory health must be maintained for continuance in the program. Any student who receives a final grade less than "C" in any of the courses in the Nursing and/or the Natural Science sequence may be disenrolled from the program. In order to re-enter the program, the course must be repeated and a final grade of "C" or better must be earned before the next course in the sequence may be taken. Students are totally responsible for transportation to and from the College and the various hospitals and other health agencies which are utilized for clinical laboratory experiences. The autotutorial method of learning will necessitate that the student utilize additional individual time in the campus nursing skills laboratory and the library. Student uniforms and accessories, and malpractice insurance are the financial responsibility of the individual student.

**Readmission Policy:** Readmission to the Nursing Program is based upon the following:

1. Availability of student space in the Nursing Program
2. Fulfillment of contingencies such as:
  - a. Cumulative G.P.A. of 2.00 or above
  - b. Satisfactory health report
  - c. Completion of support or other course work as may be detailed on the Nursing Program Withdrawal Form (NVCC (125-34))
3. Faculty recommendation for readmission
4. Satisfactory personal interview
5. Approval of Program Head for Nursing. Because of the rapid changes in technology and in nursing practice and nursing theory, students seeking reentry into the Nursing Program may be expected to start the entire nursing sequence over from the beginning. Experience has shown that many students who enter the Nursing Program more than once do not do well on the NCLEX examination. Therefore, students may not be encouraged to apply for readmission.

**Special Accreditation Status:** The program is approved by the Virginia State Board of Nursing and accredited by the National League for Nursing, Council of Associate Degree Programs.

		Credits			
First Year		1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
ENGL	111-112 English Comp. I-II	3	3		
GENL	100 Orientation	1			
NASC	111-112-113 Health Science I-II-III	4	4	4	
NURS	131-132-133 Found. of Nursing I-II-III	6	7	9	
*NURS	160 Nursing Perspectives I	1			
NURS	251 Nursing in Common Health Prob. I				9
PHED	100 Fund. of Physical Activity			1	
PSYC	201-202-203 Gen. Psychology I-II-III	3	3	3	
<b>Total Credits</b>		<b>18</b>	<b>17</b>	<b>17</b>	<b>9</b>

		Credits		
Second Year		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	113 English Composition III		3	
NURS	252-253-254 Nursing in Common Health Problems II-III-IV	9	9	9
*NURS	261-262-263 Nursing Perspectives II-III-IV	1	1	1
PHED	Electives		1	1
** --	Social Science Electives	3	3	3
<b>Total Credits</b>		<b>16</b>	<b>14</b>	<b>14</b>

Total minimum credits for the Nursing major (A.A.S. degree) = 105.

\* Open enrollment.

\*\* For further explanation of social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

## OCCUPATIONAL SAFETY ASSISTANT

### Career Studies Certificate

**Purpose:** The certificate curriculum is designed to provide students with an understanding of the fundamental principles of occupational safety and health programs for industry, construction, public institutions and government activities. The curriculum is especially appropriate for individuals assigned part-time or collateral safety responsibilities.

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
*ENGL	or SPDR Elective	3		
FIRE	116 Fundamentals of Fire Prevention	3		
SAFE	127 Safety & Health Standards, Regulations, and Codes		3	
SAFE	130 Safety Prog. Organization & Admin.		3	
SAFE	146 Occupational Injury & Disease Control			3
SAFE	206 Safety Prog. Evaluation			3
<b>Total Credits</b>		<b>6</b>	<b>6</b>	<b>6</b>

Total minimum credits for the Occupational Safety Assistant Career Studies Certificate = 18.

\* If SPDR is chosen, SPDR 136 is recommended.

## OFFICE ADMINISTRATION AND MANAGEMENT

### Associate in Applied Science Degree Business and Office Degree Program

**Purpose:** The curriculum is designed to prepare students in the administration and supervision of a large office in terms of selection, interviewing, hiring, training and coordinating of office, secretarial and clerical personnel; to provide to individuals currently employed in secretarial and clerical fields an opportunity to upgrade their skills and enhance their careers by enabling them to enter into an administrative-management area.

**Special Curriculum Admission Requirements:** Proficiency in high school English and mathematics.

**Cooperative Education:** Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
First Year		1st Qtr.	2nd Qtr.	3rd Qtr.
GENL	100 Orientation	1		
OFTC	111-112-113 Typewriting I-II-III	3	3	3
*ENGL	111-112 English Composition I-II	3	3	
*SPDR	136 Oral Communications			3
BUAD	100 Intro. to Business	3		
BUAD	121-122 Business Math. I-II	3	3	
BUAD	164 Prin. of Business Management I		3	
*PSYC	110 Prin. of Applied Psychology	3		
ECON	160 American Economics			3
OFTC	144 Proofreading and Editing Skills			3
DAPR	106 Principles of Data Processing			3
OFTC	136 Filing & Records Management		3	
PHED	100 Fund. of Phys. Activity & 2 PHED electives	1	1	1
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>16</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
OFTC	251-252-253 Office Systems & Proc. I-II-III.....	4	4	4
OFTC	216 Word Processing Equip. Operation.....			3
*GOVT	180 American Const. Government.....		3	
BUAD	110 Human Relations & Leadership Training.....			3
BUAD	114 Principles of Supervision I.....	3		
BUAD	241-242 Business Law I-II.....	3	3	
BUAD	276 Personnel Management.....		3	
ACCT	211-212-213 Prin. of Accounting I-II-III.....	3	3	3
<sup>1</sup> --	Business electives.....	3		3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Office Administration and Management major (A.A.S. degree) = 97.

\* For further explanation of English and social science requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

<sup>1</sup> Preferred electives from OFTC program.

### OFFICE SYSTEMS TECHNOLOGY

#### Associate in Applied Science Degree Business and Office Degree Program

#### Administrative Assistant Specialization

*Purpose:* The curriculum is designed to prepare persons for initial full-time employment in the secretarial, word processing, and administrative areas of business or to enhance and further develop job related competencies for those presently employed. The curriculum offers a specialization for preparation as an Administrative Assistant.

*Special Curriculum Admission Requirements:* The student should possess a proficiency in high school English and a strong background in basic arithmetic operations.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see the Cooperative Education Program section.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
GENL	100 Orientation.....	1		
OFTC	111-112-113 Typewriting I-II-III.....	3	3	3
*ENGL	111-112 English Composition I-II.....	3	3	
*ENGL	180 Fund. of Business English or SPDR 136.....			3
<sup>1</sup> BUAD	121-122-123 Business Math.....	3	3	3
BUAD	100 Intro. to Business.....	3		
BUAD	164 Prin. of Business Management I.....		3	
*PSYC	110 Prin. of Applied Psychology.....	3		
ECON	160 American Economics.....			3
OFTC	144 Proofreading and Editing Skills.....			3
OFTC	136 Filing & Records Management.....		3	
PHED	100 Fund. of Phys. Act. & 2 PHED elect.....	1	1	1
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>16</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
OFTC	251-252-253 Office Systems & Proc. I-II-III.....	4	4	4
OFTC	216 Word Processing Equip. Operation.....	3		
OFTC	234-235 Machine Transcription I-II.....		3	3
*GOVT	180 American Const. Government.....		3	
BUAD	241 Business Law I.....	3		
ACCT	211 Prin. of Accounting I or OFTC 139 Office Recordkeeping.....	3		
ACCT	212-213 Prin. of Accounting II-III or BUAD 242-243 Business Law II-III.....		3	3
BUAD	276 Personnel Management.....		3	
OFTC	298 Seminar & Project.....			3
<sup>2</sup> OFTC	Business electives.....	3		3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Office Systems Technology major/Administrative Assistant Specialization (A.A.S. degree) = 97.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

<sup>1</sup> OFTC 200 or elective may be substituted for BUAD 123.

<sup>2</sup> Preferred electives from OFTC program.

#### Executive Secretary Specialization

*Purpose:* The curriculum in the Executive Secretary Specialization is designed to prepare students for initial employment or advancement in present employment.

*Special Curriculum Admission Requirements:* The student should possess a proficiency in high school English and a strong background in basic arithmetic operations.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see the Cooperative Education Program section.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
GENL	100 Orientation.....	1		
OFTC	111-112-113 Typewriting I-II-III.....	3	3	3
OFTC	121-122-123 Shorthand I-II-III.....	4	4	4
*ENGL	111-112 English Composition I-II.....	3	3	
*ENGL	180 Fund. of Business English.....			3
OFTC	144 Proofreading and Editing Skills.....			3
OFTC	136 Filing & Records Management.....		3	
BUAD	100 Introduction to Business.....	3		
<sup>1</sup> BUAD	121-122-123 Business Math. I-II-III.....	3	3	3
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>16</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
OFTC	251-252-253 Office Systems & Proc. I-II-III.....	4	4	4
*PSYC	110 Prin. of Applied Psychology.....	3		
*GOVT	180 American Const. Government.....		3	
*ECON	160 American Economics.....			3
OFTC	200 Intro. to Office Automation.....	3		
OFTC	216 Word Processing Equip. Operation.....		3	
OFTC	124 Shorthand IV.....			4
OFTC	234 Machine Transcription I.....		3	
BUAD	164 Prin. of Business Management I.....		3	
ACCT	211 Prin. of Accounting I or OFTC 139 Office Recordkeeping.....	3		
BUAD	241 Business Law I.....	3		
PHED	100 Fund. of Phys. Activity & 2 PHED electives.....	1	1	1
OFTC	298 Seminar & Project.....			3
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>15</b>

Total minimum credits for the Office Systems Technology major/Executive Secretary Specialization (A.A.S. degree) = 98.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

<sup>1</sup> OFTC elective may be substituted for BUAD 123.

### Word Processing Specialization

*Purpose:* The curriculum in the Word Processing Specialization is designed to prepare students for initial full-time employment or advancement in present employment.

*Special Curriculum Admission Requirements:* The student should possess a proficiency in high school English and a strong background in basic arithmetic operations.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see the Cooperative Education Program section.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
GENL	100 Orientation.....	1		
OFTC	111-112-113 Typewriting I-II-III.....	3	3	3
*ENGL	111-112 English Composition I-II.....	3	3	
*ENGL	180 Fundamentals of Business English.....			3
BUAD	100 Intro. to Business.....	3		
BUAD	121-122 Business Math. I-II.....	3	3	
BUAD	164 Prin. of Business Management I.....		3	
*PSYC	110 Prin. of Applied Psychology.....	3		
*ECON	160 American Economics.....			3
OFTC	200 Introduction to Office Automation.....			3
OFTC	144 Proofreading and Editing Skills.....			3
OFTC	136 Filing & Records Management.....		3	
PHED	100 Fund. of Physical Act. & 2 PHED electives.....	1	1	1
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>16</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
OFTC	251-252-253 Office Syst. & Proc. I-II-III.....	4	4	4
OFTC	216 Word Processing Equip. Operation.....	3		
OFTC	217 Adv. Word Proc. Equip. Operation.....		3	
OFTC	218 Microcomputer Office Applications I.....	3		
OFTC	257 Prin. of Office Automation Mgmt. or OFTC 258 Word Processing System Supervision.....			3
OFTC	234-235 Machine Transcription I-II.....		3	3
BUAD	110 Human Relations & Leadership Training.....			3
*GOVT	180 American Constitutional Government.....		3	
BUAD	241 Business Law I.....	3		
ACCT	211 Prin. of Accounting I or OFTC 139 Office Recordkeeping.....	3		
ACCT	212-213 Prin. of Accounting II-III or OFTC electives.....		3	3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>16</b>

Total minimum credits for the Office Systems Technology major/Word Processing Specialization (A.A.S. degree) = 97.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

### OFFICE SYSTEMS TECHNOLOGY

#### Certificate

*Purpose:* The one-year certificate program is designed to prepare students for entry-level office work. Upon completion of the program, students will be able to secure positions as clerk typists, file clerks, receptionists, or general office workers. Additionally, students will be equipped to pass a Civil Service examination for typewriting (and for shorthand if students elect to take OFTC 121, 122, and 123).

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
GENL	100 Orientation.....	1		
OFTC	111-112-113 Typewriting I-II-III.....	3	3	3
ENGL	111 English Comp. I.....	3		
BUAD	121 Business Math. I.....	3		
BUAD	100 Intro. to Business.....	3		
PSYC	110 Prin. of Applied Psychology.....			3
OFTC	144 Proofreading and Editing Skills.....			3
OFTC	136 Filing & Records Management.....		3	
OFTC	200 Intro. to Office Automation.....	3		
OFTC	137 Office Procedures or OFTC 251 Office Systems & Procedures I.....		3-4	
OFTC	139 Office Recordkeeping or Acct 211 Principles of Accounting I.....			3
OFTC	216 Word Processing Equipment Operation.....		3	
OFTC	218 Microcomputer Office Applications I.....			3
OFTC	234 Machine Trans. I.....		3	
<b>Total Credits</b>		<b>16</b>	<b>15-16</b>	<b>15</b>

Total minimum credits for the Office Systems Technology Certificate = 46.

### PHLEBOTOMY

#### Career Studies Certificate

*Purpose:* The Career Studies Certificate in Phlebotomy is designed to prepare personnel who collect and process blood and other samples for medical laboratory analysis. Phlebotomists work in hospitals, medical clinics, commercial laboratories and in other settings where blood is collected from patients. The curriculum includes learning experiences both in on-campus laboratories and at affiliated clinical laboratories.

*Special Curriculum Admission Requirements:* An interview with a faculty member in the Medical Laboratory Technology program is required. Students must pass the ENGL 111 placement test before they can be admitted to this certificate program.

*Advanced Standing for Practicing Phlebotomists:* Persons who have been certified by a national agency as a Phlebotomist or who have extensive experience in Phlebotomy may seek advanced standing for MDLB 190-Coordinated Practice in Phlebotomy.

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
*ENGL	/SPDR.....	3		
HLTH	100 Orientation to Allied Health Careers.....			1
PSYC	110 Principles of Applied Psychology.....		3	
MDLB	100 Introduction to Medical Lab. Tech. ....	3		
**MDLB	190 Coordinated Practice-Phlebotomy.....		3	
MDLB	198 Seminar and Project-Phlebotomy.....			3
<b>Total Credits</b>		<b>6</b>	<b>6</b>	<b>4</b>

Total minimum credits for the Phlebotomy Career Studies Certificate = 16.

\* If SPDR is chosen, SPDR 136 is recommended.

\*\* Prerequisite for MDLB 190 is completion of MDLB 100 with a grade of C or better.

### PHYSICAL SECURITY

#### Career Studies Certificate

*Purpose:* This curriculum is a response to the short-term educational needs of experienced security practitioners who wish to extend their knowledge and skills in physical security; mid-career transition persons who wish to gain insight into physical security and possibly decide on a career alternative in the security field; and security personnel with little formal education who need an initial boost. This certificate is applicable toward the two-year associate degree in Security Administration at this College.

*Special Curriculum Admission Requirement:* A personal interview with a representative of the Administration of Justice Program.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see the Cooperative Education Program section.



		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
* ENGL	111 or SPDR.....	3		
** ADJU	.....		(3)(3)	
ADJU	185 Physical Security.....			3
ADJU	278 Emergency Planning.....			3
<b>Total Credits</b>		<b>3</b>	<b>6</b>	<b>6</b>

Total minimum credits for the Physical Security Career Studies Certificate = 15.

\* If SPDR is chosen, one course from the following is required: SPDR 151, Fundamentals of Speech Communication I; SPDR 137, Public Speaking; SPDR 184, Industrial and Organizational Communication I; SPDR 230, Advanced Public Speaking.

\*\* Two of the following ADJU courses are required: ADJU 140, Introduction to Security Administration; ADJU 181, Investigations for Security; ADJU 182, Legal Aspects of Security; ADJU 246, Principles of Criminal Investigation.

### PHYSICAL THERAPIST ASSISTANT

#### Associate in Applied Science Degree Physical Therapy Degree Program

*Purpose:* This curriculum is designed to prepare students as skilled technical health workers who possess the knowledge and abilities that are necessary to assist the professional physical therapist in providing specific patient services for the prevention or alleviation of physical impairments. Upon successful completion of the Program, students are eligible to take the Virginia State Licensing Examination leading to licensure as a Physical Therapist Assistant.

*Special Curriculum Admission Requirements:* (1) High School courses: 1 unit each of biology and chemistry, with a minimum grade of "C". Deficiencies may be corrected in the Developmental Program before entering the technical program. (2) past achievement reflects a "C" average (3) good physical and mental health which may need to be substantiated by a physician's report (4) personal interview (5) clinic visitation (6) The Physical Therapist Assistant Program reserves the right to determine the student's final acceptance. Early application is desirable. Students may take support courses prior to entering the six quarter sequence of Physical Therapy courses. Transfer credits or prerequisites in the natural and social sciences earned at another institution will be evaluated on an individual basis. Developmental work or testing may be advised for credits earned more than ten years ago.

*Special Curriculum Completion Requirements:* Satisfactory health must be maintained for continuance in the program. Any student who receives a final grade less than "C" in any of the courses in the Physical Therapist Assistant Program sequence must obtain permission from the Program Head to repeat the course and earn a final grade of "C" or higher before taking the next course in the sequence. Students are totally responsible for transportation to and from the college and the various hospitals and other health agencies which are utilized for clinical laboratory experiences. Uniform and accessories, and PTA Student Liability Insurance are the financial responsibility of the individual student.

*Special Accreditation Status:* The program is accredited by the American Physical Therapy Association.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>First Year</b>				
<sup>1</sup> BIOL	151-152-153 Human Anatomy & Physiology.....	4	4	4
<sup>2</sup> ENGL	111-112-113 English Comp. I-II-III.....	3	3	3
GENL	100 Orientation.....	1		
PHED	100 Fundamentals of Physical Activity.....		1	
PSTH	100 Intro. to Physical Therapy Assisting.....	2		
PSTH	116 Emergency Situations & Procedures.....	2		
PSTH	120 Medical Reporting.....			2
PSTH	126 Kinesiology for the Physical Therapist Assistant.....			8
PSTH	131-132 Therapeutic Procedures I-II.....	6	4	
PSTH	181 Clinical Education I.....		5	
<b>Total Credits</b>		<b>18</b>	<b>17</b>	<b>17</b>

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>Second Year</b>				
HLTH	150 Concepts of Disease.....	3		
PHED	Electives.....	1		1
PSTH	210 Psychological Aspects of Therapy.....	3		
PSTH	232 Therapeutic Procedures III.....		4	
PSTH	246 Rehabilitation Procedures.....		4	
PSTH	256 Pathological Conditioning.....		2	
PSTH	266 Professional Trends & Administrative Procedures.....			3
PSTH	282-283 Clinical Education II-III.....	7		8
<sup>3</sup> PSYC	231 Human Growth & Dev. I.....	3		
<sup>3</sup> PSYC	232 Human Growth & Dev. II.....		3	
<sup>3</sup> PSYC	233 Human Growth & Dev. III.....			3
<b>Total Credits</b>		<b>17</b>	<b>13</b>	<b>15</b>

Total minimum credits for the Physical Therapist Assistant major (A.A.S. degree) = 97.

<sup>1</sup> NASC 111-112-113 may be substituted for BIOL 151-152-153.

<sup>2</sup> For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

<sup>3</sup> PSYC 201-202-203 may be substituted for PSYC 231, PSYC 232, and PSYC 233.

### PLANNING

#### Career Studies Certificate

*Purpose:* This curriculum is designed to provide students an opportunity to become familiar with urban-regional problems and planning theory, provide preparation in urban-regional studies and prepare for entry level employment at the paraprofessional level. Graduates will be able to assist in phases of planning such as data gathering and analysis in studies of land use, public facilities, transportation, housing, community services and population studies.

*Special Curriculum Admission Requirements:* High school degree or equivalent.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
PLAN	100 Introduction to Planning.....	3		
PLAN	106 Planning and Forecasting Methods.....		3	
PLAN	107 Financial Planning.....		3	
PLAN	116 Corporate Planning.....			3
PLAN	117 Urban Housing Planning.....			3
PLAN	118 Planning Applications.....			3
* ENGL	or SPDR Elective.....	3		
<b>Total Credits</b>		<b>6</b>	<b>6</b>	<b>9</b>

Total minimum credits for the Planning Career Studies Certificate = 21.

\* If SPDR is chosen, SPDR 136 is recommended.

**POLICE SCIENCE**

**Associate in Applied Science Degree  
Public Safety Degree Program**

*Purpose:* The curriculum is designed to provide a broad foundation which will prepare the student to enter any of the varied fields of law enforcement or prepare for professional advancement. The occupational objectives include: Local, State and Federal Enforcement Officer / Police Officer / Private or Government Investigator.

*Special Curriculum Admission Requirements:* A personal interview with a member of the Police Science faculty is required. Students are advised that many criminal justice agencies require excellent moral character and a written record of conduct prior to consideration for employment. Adjustments in the curriculum may be made with faculty approval to enable a student to transfer to a four year criminal justice program. This program is included under the Safe Streets Act of 1968 for S.L.E.O.E.P. Grants and loans. See financial aid counselor for details.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ADJU	100 Intro. to Law Enforce.....	3		
ADJU	120 Intro. to Corrections .....		3	
ADJU	126 Prev. & Control of Juv. Delinq. ....			3
ADJU	140 Intro. to Security Admin. ....	3		
ADJU	267 Organ. Crime & Corruption .....	3		
ADJU	158 Intro. to Law Enforce. Photo. or ADJU 117 Special Enforc. Problems .....			3
ADJU	237 Admin. of Justice .....			3
ADJU	176 Criminology .....		3	
DAPR	106 Prin. of Data Processing .....		3	
*ENGL	111-112 Eng. Comp. ....	3	3	
*SPDR	136 Oral Comm. or ENGL 113 Eng. Comp. ....			3
*SOCI	101-102-103 Intro. to Sociology .....	3	3	3
PHED	100 Fund. of Phys. Act. & 2 Elect. ....	1	1	1
GENL	100 Orientation.....	1		
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>16</b>

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ADJU	114-115-116 Police Organ. & Admin. ....	3	3	3
ADJU	186 Interrog. & Report Writing .....	3		
ADJU	228 Law Enforce. & the Comm. ....			3
ADJU	231-232-233 Crim. Law Evidence & Proc. ....	3	3	3
ADJU	246-247 Crim. Invest. ....	3	3	
ADJU	248 Special Invest. Tech. or ADJU 298 Seminar & Project .....			3
GOVT	281-282 U.S. Govt. ....		3	3
PSYC	201-202-203 Gen. Psych. ....	3	3	3
<b>Total Credits</b>		<b>15</b>	<b>15</b>	<b>18</b>

Total minimum credits for the Police Science major (A.A.S. degree) = 97.

This is a terminal A.A.S. degree Program. Adjustments in course requirements to suit the needs for transfer to a four-year institution may be made with faculty approval.

**George Mason University Transfer Program**

*Purpose:* This curriculum is designed for students who plan to transfer to George Mason University to complete a Bachelor of Science degree in Law Enforcement.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ADJU	100 Intro. to Law Enforcement.....	3		
ADJU	120 Intro. to Corrections .....		3	
ADJU	126 Prev. & Control of Juv. Delinq. ....			3
ADJU	140 Intro. to Security Admin. ....	3		
ADJU	267 Organ. Crime & Corruption .....	3		
ADJU	158 Intro. to Law Enforce. Photo. or ADJU 117 Special Enforc. Problems .....			3
ADJU	237 Admin. of Justice .....			3
ADJU	176 Criminology .....		3	
DAPR	106 Prin. of Data Processing .....		3	
ENGL	111-112 English Composition I-II .....	3	3	
SPDR	136 Oral Comm. or ENGL 113 Eng. Comp. III .....			3
SOCI	101-102-103 Intro. Sociology I-II-III .....	3	3	3
*PHED	100 Fund. of Phys. Act. & 2 PHED electives .....	1	1	1
*GENL	100 Orientation.....	1		
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>16</b>
Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
**ADJU	114-115-116 Police Organ. & Admin. ....	3	3	3
ADJU	186 Interrog. & Report Writing .....	3		
ADJU	228 Law Enforce. & the Comm. ....			3
ADJU	231-232-233 Crim. Law Evidence & Proc. I-II-III .....	3	3	3
ADJU	246 Principles of Crim. Invest. ....	3		
ADJU	247 Advanced Crim. Invest. ....		3	
ADJU	248 Special Invest. Tech. ....			3
GOVT	281-282-283 United States Govt. I-II-III .....	3	3	3
PSYC	201-202-203 Gen. Psychology I-II-III .....	3	3	3
<b>Total Credits</b>		<b>18</b>	<b>15</b>	<b>18</b>

Total minimum credits for the Police Science major/Transfer Program (A.A.S. degree) = 100.

\* GENL 100 (1 cr.), PHED 100 (1 cr.), and PHED electives (2 cr.) will not be acceptable for transfer.

\*\* Prerequisites: ADJU 100 and ADJU 110. ADJU 110 may be waived with divisional approval.

**POLICE SCIENCE**

**Certificate**

*Purpose:* The certificate curriculum in Police Science is designed for those students who wish to take only those courses which relate directly to the law enforcement field. Courses taken in the certificate program can be applied to the A.A.S. Degree.

*Special Curriculum Admission Requirements:* The same requirements apply as stated for the A.A.S. Curriculum.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
ADJU	100 Intro. to Law Enforce.....	3		
ADJU	120 Intro. to Corrections .....			3
ADJU	114-115 Police Organ. & Admin. ....	3	3	
ADJU	231-232-233 Crim. Law Evidence & Proc.....	3	3	3
ADJU	140 Intro. to Security Admin. ....	3		
ADJU	186 Interrogation & Report Writing.....		3	
DAPR	106 Intro. to Data Processing .....		3	
ADJU	246 Prin. of Crim. Invest.....		3	
ADJU	126 Prev. & Control of Juv. Del.....			3
GENL	100 Orientation.....	1		
ENGL	111 Eng. Comp.....			3
--	Social Science Elect. ....	3	3	3
<b>Total Credits</b>		<b>16</b>	<b>18</b>	<b>15</b>

Total minimum credits for the Police Science Certificate = 49.

## RADIOGRAPHY

### Associate in Applied Science Degree Radiography Degree Program

*Purpose:* The curriculum is designed to prepare students to produce diagnostic images of the human body through safe application of X-radiation. The radiographer is a member of the health care team and assists radiologists. Upon successful completion of degree requirements, the student may be eligible to take a national examination for certification in Radiography.

*Special Curriculum Admission Requirements:* (1) High School courses: 2 units of science (physics, chemistry or biology) and 1 unit of mathematics (algebra or geometry) with a minimum grade of "C". Deficiencies may be corrected in the Developmental Program before entering the curriculum. (2) Past achievement should reflect a "C" average. (3) Good physical and mental health which may need to be substantiated by a physician's report. (4) Selection of students shall be made by an admissions committee in cooperation with the Radiography Program. (5) Students majoring in Radiography are admitted in September; early application is desirable. Students may take support courses prior to entering the Radiography sequence. Transfer or prerequisite credits in natural and social sciences earned at another institution will be evaluated on an individual basis. Developmental work or testing may be advised for credits earned more than ten years ago.

*Special Curriculum Completion Requirements:* Satisfactory health must be maintained for continuance in the program. Any student who receives a final grade less than "C" in any of the courses in the Radiography sequence must obtain permission from the Program Head to continue the major in Radiography and must then repeat the course and earn a final grade of "C" or higher before taking the next course in the sequence. Students are totally responsible for transportation to and from the College and the various hospitals and other health agencies which are utilized for clinical experience. Student uniform and accessories and liability insurance are the financial responsibility of the individual student.

*Special Accreditation Status:* The program is accredited by the AMA Committee on Allied Health Education and Accreditation (CAHEA) in cooperation with the Joint Review Committee on Education in Radiological Technology.

		Credits			
		1st	2nd	3rd	4th
		Qtr.	Qtr.	Qtr.	Qtr.
<b>First Year</b>					
ENGL	111-112-113 English Composition I-II-III .....	3	3	3	
GENL	100 Orientation.....	1			
HLTH	124 Medical Terminology I .....				3
NASC	111-112-113 Health Science I-II-III .....	4	4	4	
PSYC	128 Human Relations.....				3
RADL	100 Intro. to Radiology & Protection .....	2			
RADL	114-115 Principles of Exposure I-II .....		4	4	
RADL	124-125 Positioning I-II.....		4	4	
RADL	136 Patient Care Procedures .....	2			
RADL	190 Coordinated Practice .....	2	2	2	5
RADL	210 Radiation Protection & Radiobiology .....	3			
RADL	298 Seminar & Project.....				3
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>17</b>	<b>14</b>

		Credits			
		1st	2nd	3rd	4th
		Qtr.	Qtr.	Qtr.	Qtr.
<b>Second Year</b>					
HLTH	100 Orientation to Allied Health Careers.....				1
PHYS	101-102 Introductory Physics I-II.....	4	4		
RADL	216 Applied Radiation Physics .....			4	
RADL	250 Radiologic Specialties .....		3		
RADL	256 Special Procedures .....	3			
RADL	290 Coordinated Practice .....	4	4	4	
RADL	296 Applied Radiography .....				16
RADL	298 Seminar & Project.....	1	3	3	
--	Social Science Electives .....	3		3	
<b>Total Credits</b>		<b>15</b>	<b>14</b>	<b>15</b>	<b>16</b>

Total minimum credits for the Radiography major (A.A.S. degree) = 125.

## REAL ESTATE

### Associate in Applied Science Degree Business Management Degree Program

*Purpose:* The curriculum is designed for persons who seek full-time employment in the real estate field or for those presently in the field who are seeking promotion. The occupational objectives include: Real Estate Salesman / Real Estate Broker / Apartment House Manager / Real Estate Office Manager / Real Estate Loan Officer / Real Estate Sales Manager / County Urban Planner.

*Special Curriculum Admission Requirements:* The students should possess a proficiency in high school English and a strong background in basic arithmetic operations.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>First Year</b>				
ACCT	211-212-213 Prin. of Accounting I-II-III .....	3	3	3
BUAD	100 Intro. to Bus. ....	3		
BUAD	121-122 Bus. Math I-II.....	3	3	
REAL	166 Real Estate Math .....			3
*ENGL	111-112 Eng. Comp. I-II .....	3	3	
*SPDR	136 Oral Comm. ....			3
*ECON	160 Amer. Econ. ....	3		
GENL	100 Orientation.....	1		
BUAD	164-165 Prin. of Bus. Mgt. I-II.....		3	3
REAL	164-165 Prin. of Real Estate I-II .....		3	3
PHED	100 Fund. of Phys. Act. ....		1	
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>15</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
BUAD	241-242 Business Law .....	3	3	
OFTC	111 Typewriting or Elect. ....	3		
REAL	268 Property Mgt. ....	3		
REAL	267 Real Estate Appraisal .....	3		
*PSYC	110 Prin. of Applied Psychology .....	3		
PHED	Elect. ....	1	1	
*GOVT	180 American Constitutional Govt. ....			3
REAL	168 Real Estate Sales .....		3	
REAL	266 Real Estate Brokerage I.....			3
REAL	269 Real Estate Finance.....		3	
REAL	278 Real Estate Econ. or Elect. ....			3
REAL	276 Land Planning & Use.....		3	
REAL	277 Legal Aspects of Real Estate.....			3
ACCT	241 Prin. of Fed. Taxation .....		3	
REAL	279 Real Estate Investment.....			3
--	General elective .....			3
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>18</b>

Total minimum credits for the Real Estate major (A.A.S. degree) = 97.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

## REAL ESTATE

### Certificate

*Purpose:* The curriculum is designed for present or future practitioners in the profession who wish to improve or acquire understanding and knowledge of essential real estate subjects.

*Special Curriculum Admission Requirements:* Proficiency in high school English and background in basic arithmetic operations.

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
BUAD	100 Intro. to Bus. ....	3		
REAL	164-165 Prin of Real Estate I-II .....	3	3	
--	Social Science or Humanities Elect. ....	3		
REAL	166 Real Estate Math .....	3		
REAL	168 Real Estate Sales .....		3	
BUAD	164 Prin of Bus. Mgt. ....		3	
REAL	269 Real Estate Finance.....		3	
PSYC	Psyc. Elect. ....			3
REAL	266 Real Estate Brokerage I.....			3
REAL	267 Real Estate Appraisal .....			3
REAL	277 Legal Aspects of Real Estate.....			3
<b>Total Credits</b>		<b>12</b>	<b>12</b>	<b>12</b>

Total minimum credits for the Real Estate Certificate = 36.

## RECREATION AND PARKS

### Associate in Applied Science Degree Parks and Recreation Degree Program

*Purpose:* The curriculum is designed with three purposes:

1. To prepare students for entry level into the field of Recreation and Parks in both the private and public agencies.
2. To provide those already employed in these fields an opportunity to improve and upgrade their skills.
3. To guide students who wish to transfer to a 4-year institution in Recreation and Parks. The occupational objectives include: Recreation Leader/Assistant Recreation Supervisor/Park Ranger/Assistant Park Manager/Park Manager.

*Special Curriculum Admission Requirements:* Proficiency in high school English and background in basic arithmetic operation.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
*ENGL	111-112 Eng. Comp. ....	3	3	
GENL	100 Orientation.....	1		
SOCI	101 Intro. to Sociology .....	3		
RCPK	100 Intro. to Rec. & Park Field.....	3		
RCPK	160 The Arts in Rec.....	1		
*--	Social Science Electives .....	3	3	3
BUAD	121 Bus. Math I .....	3		
<sup>1</sup> BIOL	101 General Biology I .....		4	
RCPK	101 Rec. & Park Mgt. I .....		3	
PHED	100 Fund. of Phys. Act. & 1 Elect. ....		1	1
<sup>2</sup> --	Approved Rec. Art Elect. ....		2	
HORT	147 Hort. Methods & Materials for Rec. & Park .....			3
RCPK	126 Nat. Resources & Urban Envir. ....			2
RCPK	136 Program Planning, Org. & Group Leadership.....			2
RCPK	137 Org. & Mgt. of Sports Act. ....			3
<sup>3</sup> --	Approved Rec. Elect.....			3-4
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>17-18</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ACCT	211 Prin. of Accounting I .....	3		
BUAD	174 Small Bus. Mgt. I .....	3		
RCPK	150 Private, Comm. & Indus. Rec.....	3		
HORT	240 Turf Green Mgt.....	3		
BUAD	241 Business Law I.....	3		
HORT	148 Landscape Planning for Rec. Areas .....		3	
RCPK	102-103 Rec. & Parks Mgt. II-III.....		3	3
PHED	Elect. ....		1	
*SPDR	136 Speech Communications .....		3	
RCPK	127 Park Planning.....		2	
RCPK	224-225 Natural & Historical Interpretation in the Urban Env. I-II .....		2	2
RCPK	298 Seminar & Project .....			3
<sup>3</sup> --	Approved Rec. Elect.....		3-4	7-8
<b>Total Credits</b>		<b>15</b>	<b>17-18</b>	<b>15-16</b>

Total minimum credits for the Recreation and Parks major (A.A.S. degree) = 97.

\* For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

<sup>1</sup> Substitutions of other laboratory sciences may be made with approval of the Program Head.

<sup>2</sup> Approved Recreation Art electives: RCPK 110 Applied Arts Major, RCPK 207 Rec. Drama, MUSC 296 Recreation Music.

<sup>3</sup> Recommended Electives (with Program Head Approval): RCPK 108 Rec. for Special Groups, RCPK 299 Supervised Study, RCPK 116 Soc. Rec. Leadership, FORE 117 Dendrology, RCPK 138 Fund. of Camp Mgt. & Oper., FORE 131 Fish. & Wildlife Mgt., RCPK 146 Comm. & Family Rec., HORT 146 Hort. Botany, RCPK 297 Cooperative Education, HRIM 156 Club Management, FORE 132 Forest Recreation.

## RECREATION VEHICLE/MARINE MECHANICS

### Career Studies Certificate

*Purpose:* This curriculum is designed to train the student to be a safe, knowledgeable and well-equipped powerboat mechanic, with the basic skills and knowledge necessary for full-time employment as a technician, installer, or tune-up specialist. Complete theory and lab experiences for all powerboat systems are included.

*Special Curriculum Admission Requirements:* Automotive Shop or equivalent.

*Cooperative Education:* Students are urged to investigate the potential benefits of Cooperative Education.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
ENGL	or SPDR (if the SPDR option, then SPDR 136 is recommended).....	3		
* AUTO	176 Small Gasoline Engines .....	3		
RVEH	116 Motorcycle Machine Lab.....			3
RVEH	140 Marine Cooling, Fuel & Elect Syst.....			3
RVEH	146 Outboard Engines .....		3	
RVEH	147 Inboard/Outdrives .....			3
RVEH	149 Powerboat Rigging .....		3	
<b>Total Credits</b>		<b>6</b>	<b>6</b>	<b>9</b>

Total minimum credits for the Recreation Vehicle/Marine Mechanics Career Studies Certificate = 21.

\* Prerequisite or corequisite for all Marine Mechanics courses.

## RECREATION VEHICLE/MOTORCYCLE MECHANICS

### Career Studies Certificate

*Purpose:* The curriculum is designed to train the student to be a safe, knowledgeable motorcycle mechanic with basic working experience so that the individual is prepared for full-time employment as a mechanic, set-up or tune-up specialist. Complete theory and lab experiences for all motorcycle systems are included.

*Special Curriculum Admission Requirements:* Automotive Shop or equivalent.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
ENGL	or SPDR (if the SPDR option, then SPDR 136 is recommended).....	3		
* RVEH	120 Intro to Motorcycle Mechanics.....	3		
RVEH	116 Motorcycle Machine Lab.....			3
RVEH	126 Fuel Systems .....		3	
RVEH	127 Electrical Systems.....			3
RVEH	156 Drive Trains .....		3	
RVEH	267 Suspensions .....			3
RVEH	124-125 Motorcycle Engines I-II .....	3	3	
<b>Total Credits</b>		<b>9</b>	<b>9</b>	<b>9</b>

Total minimum credits for the Recreation Vehicle/Motorcycle Mechanics Career Studies Certificate = 27.

\* Prerequisite or corequisite for all RVEH courses.

## RESPIRATORY THERAPY

### Associate in Applied Science Degree Respiratory Therapy Degree Program

*Purpose:* The curriculum is designed to prepare students as effective members of the health care team in assisting with diagnosis, treatment, management, and preventive care of patients with cardio-pulmonary problems. Upon successful completion of the Program and specific employment experiences, students may be eligible to take the registry examination leading to registration as a Registered Respiratory Therapist (R.R.T.).

*Special Curriculum Admission Requirements:* (1) High School courses: 1 unit each of algebra, biology, & chemistry or physics, with a minimum grade of "C". Developmental work or testing may be advised for credits earned more than ten years ago. Transfer credits in the Natural Sciences earned at another institution will be evaluated on an individual basis (2) Achievement must reflect a "C" average or better (3) Good physical and mental health which may need to be substantiated by a physician's report.

*Advanced Standing:* The program considers advanced standing for work experience and previous education on an individual basis.

*Special Curriculum Completion Requirements:* Satisfactory health must be maintained for continuance in the major. Any student who receives a final grade of less than "C" in any of the courses in the Respiratory Therapy or Natural Science sequences must obtain permission from the Program Head to continue in the major and must then repeat the course and earn a final grade of "C" or higher before taking the next course in either of the sequences. Students are totally responsible for transportation to and from the College and the various hospitals and other health agencies which are utilized for clinical laboratory experiences. Student uniform and accessories, and Respiratory Therapy Student Liability Insurance are the financial responsibility of the individual student.

*Special Accreditation Status:* The program is accredited by the AMA committee on Allied Health Education and Accreditation (CAHEA) in cooperation with the joint review committee for respiratory therapy education.

		Credits			
		1st	2nd	3rd	4th
		Qtr.	Qtr.	Qtr.	Qtr.
<b>First Year</b>					
ENGL	111-112 English Composition I-II .....		3	3	
GENL	100 Orientation.....	1			
RPTH	136 Fundamental Arts I.....	3			
CHEM	101-102 General Chemistry I-II .....		4	4	
PHYS	101 Introductory Physics I .....	4			
NASC	111-112-113 Health Science I-II-III .....	4	4	4	
PHED	100 Fundamentals of Physical Activity & 1 PHED elective .....	1		1	
RPTH	144-145-242 Fundamental Theory & Proced. I-II-IV.....	4	4		4
RPTH	184-185 Clinical Instruction I-II .....		2	2	
RPTH	231-232 Cardiopulmonary Science I-II...			3	4
RPTH	286 Clinical Instruction III .....				5
<b>Total Credits</b>		<b>17</b>	<b>17</b>	<b>17</b>	<b>13</b>

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>Second Year</b>				
ENGL	113 English Composition III.....		3	
PHED	Elective .....			1
PSYC	201-202-203 General Psychology I-II-III .....		3	3
RPTH	234-235 Cardiopulmonary Science IV-V .....		2	2
RPTH	236 Fundamental Arts II .....			3
RPTH	241-243 Fundamental Theory & Procedures III-V .....		4	4
RPTH	258 Neonatal & Pediatric Resp. Care.....			3
RPTH	287-288-289 Clinical Instruction IV-V-VI .....		5	5
<b>Total Credits</b>		<b>15</b>	<b>15</b>	<b>16</b>

Total minimum credits for the Respiratory Therapy major (A.A.S. degree) = 110.

## SAFETY TECHNICIAN

### Certificate

*Purpose:* The Safety Technician curriculum covers the basics of on-the-job safety management and supervision and is appropriate for persons who have additional duty or part-time safety responsibilities. The curriculum includes fundamental courses in safety management, standards, hazard recognition and control, construction safety, industrial hygiene, and instrumentation, as well as electives in fire prevention or emergency medical technology.

*Cooperative Education:* Students are encouraged to participate in Cooperative Education. See the section on Cooperative Education for further information.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
ARCH	250 Construction Safety & Health.....	3		
EMDT	111-112 Emerg. Med. Serv. Tech. I-II or approved electives .....	4	4	
ENGL	111 English Comp. I.....	3		
FIRE	116 Fund. of Fire Prevention .....			3
SAFE	146 Intro. to Industrial Hygiene .....	3		
SAFE	116 Instrum. for Occ. Safety & Health.....			3
SAFE	127 Safety & Health Standards, Reg. & Codes .....	3		
SAFE	130 Safety Program Org. & Admin. ....	3		
SAFE	134 Power Source Hazard Control .....			3
SAFE	180 Intro. to Ind. Health .....			3
MATH	118 Intro. to Tech. Math. I.....		5	
PSYC	110 Prin. of Appl. Psych. ....	3		
SPDR	136 Oral Communication .....			3
<b>Total Credits</b>		<b>16</b>	<b>15</b>	<b>15</b>

Total minimum credits for the Safety Technician Certificate = 46.

Substitutions for these courses can be made subject to division approval.

## SCIENCE

### Associate in Science Degree Physical and Natural Sciences Degree Program

*Purpose:* The curriculum is designed for persons who are interested in a pre-professional or scientific program and who plan to transfer to a four-year college or university to complete a baccalaureate degree program with a major in one of the following fields: Agriculture / Biology / Chemistry / Dentistry / Forestry / Geology / Home Economics / Mathematics / Nursing / Oceanography / Pharmacy / Physics / Physical Therapy / Pre-Medicine / Science Education.

*Special Curriculum Admission Requirements:* Satisfactory completion of the following high school units or equivalent as a minimum: 4 units of English / 3 units of college preparatory mathematics / 1 unit of laboratory science / 1 unit of social science.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>First Year</b>				
ENGL	111-112-113 English Comp. I-II-III.....	3	3	3
GENL	100 Orientation.....	1		
<sup>1</sup> HIST	101-102-103 History of Western Civilization I-II-III or HIST 111-112-113 U.S. History I-II-III.....	3	3	3
<sup>2</sup> MATH	141-142-143 Intro. Math. Analysis I-II-III or MATH 161-162-163 College Math. I-II-III.....	3-5	3-5	3-5
PHED	100 Fundamentals of Physical Activity + 2 PHED electives.....	1	(1)(1)	
<sup>3</sup> --	Science (with laboratory).....	4	4	4
<sup>4</sup> --	General elective .....			3
<b>Total Credits</b>		<b>15-17</b>	<b>15-17</b>	<b>16-18</b>

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
<b>Second Year</b>				
ENGL	251-252-253 Survey of American Literature I-II-III or ENGL 261-262-263 Survey of English Literature I-II-III or ENGL 271-272-273 Survey of World Literature I-II-III .....	3	3	3
<sup>3</sup> --	Science (with laboratory).....	4-5	4-5	4-5
<sup>3</sup> --	Science Electives or MATH 241-242-243 Advanced Math. Analysis I-II-III or MATH 261-262-263 Advanced College Math. I-II-III or Science (with laboratory).....	3-5	3-5	3-5
<sup>5</sup> --	Social Science Electives .....	3	3	3
<sup>4</sup> --	General electives.....	3	3	3
<b>Total Credits</b>		<b>16-19</b>	<b>16-19</b>	<b>16-19</b>

Total minimum credits for the Science major (A.S. degree) = 97. (30 of these credits must be taken in laboratory science courses for transfer to a four-year institution with a major in science, and 30 must be taken in mathematics courses for transfer to a four-year institution with a major in mathematics.)

- Students with a good background in mathematics and science may take two beginning laboratory science courses the first year and history the second year.
- MATH 141-142-143 is required for students planning a four-year major in mathematics, physics, or chemistry. MATH 191-192-193 may be taken by four-year biology majors with division approval. Students not adequately prepared for MATH 141 are advised to take MATH 161-162 first.
- Sciences (with laboratories) may be selected from the following: BIOL 101-102-103, CHEM 111-112-113, PHYS 201-202-203, PHYS 221-222-223-224, GEOL 101-102-103, or any 200-level biology, chemistry, geology, or physics courses.
- Electives should be chosen carefully and after investigation of transfer requirements of the institution to which transfer is contemplated.
- Three-quarter sequence social science courses may be selected from one of the following disciplines: economics, geography, government, history, psychology, social science, or sociology (anthropology).

## SECURITY ADMINISTRATION

### Associate in Applied Science Degree Public Safety Degree Program

*Purpose:* The curriculum in Security Administration is designed to prepare students to enter any of the varied fields of security administration and to improve the competencies of in-service personnel. The occupational objectives include: Security Administrator, Director & Manager / Loss Prevention Director / Classification Manager / Personnel Clearance Administrator.

*Special Curriculum Admission Requirements:* Entry into the Security Administration curriculum requires a personal interview with a representative of the Administration of Justice Program. Students are advised that many criminal justice agencies require excellent moral character and a written record of conduct prior to consideration for employment.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.



First Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ADJU	140 Intro. to Security Admin. ....	3		
ADJU	181 Investigations for Security .....		3	
ADJU	182 Legal Aspects of Security.....			3
ADJU	184 Personnel Security.....	3		
ADJU	185 Physical Security .....		3	
ADJU	186 Interrogation & Report Writing.....			3
<sup>1</sup> ADJU	Elective .....			3
<sup>1</sup> BUAD	100 Intro. to Business .....	3		
<sup>1</sup> BUAD	164 Prin. of Bus. Mgmt. or BUAD 276 Personnel Mgmt. ....		3	
DAPR	106 Prin. of Data Proc.....	3		
<sup>2</sup> ENGL	111-112 English Comp. I-II .....	3	3	
<sup>2</sup> ENGL	113 English Comp. III or SPDR 136 Oral Communication .....			3
<sup>1</sup> FIRE	116 Fund. of Fire Prev. or FIRE 237 Arson Detection & Inv. ....		3	
GENL	100 Orientation.....	1		
<sup>1</sup> SAFE	130 Safety Program or SAFE 134 Power Source Hazards .....			3
PHED	100 Fund. of Phys. Act. + 2 PHED electives.....	1	1	1
<b>Total Credits</b>		<b>17</b>	<b>16</b>	<b>16</b>

Second Year		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
<sup>3</sup> ADJU	183 Computer Security .....		3	
ADJU	206 Security Mgmt. ....			3
ADJU	207 Information Security .....		3	
ADJU	208 Retail Security.....			3
ADJU	209 Substances Abuse in Security .....	3		
ADJU	231-232-233 Crim. Law Evidence & Procedure .....	3	3	3
ADJU	246 Prin. of Crim. Invest. ....	3		
ADJU	247 Advanced Crim. Invest. ....		3	
ADJU	278 Emergency Planning.....	3		
<sup>1</sup> FIRE	111 Hazardous Materials .....			3
<sup>1</sup> SAFE	127 Safety & Health Standards, Req. & Codes .....			3
<sup>2</sup> —	Social Science Electives .....	3	3	3
<b>Total Credits</b>		<b>15</b>	<b>15</b>	<b>18</b>

Total minimum credits for the Security Administration major (A.A.S. degree) = 97.

<sup>1</sup> Or elective approved by faculty advisor.

<sup>2</sup> For further explanation of English and social science course requirements for A.A.S. degrees, see the "A.A.S. Degree General Requirements" section.

<sup>3</sup> DAPR 106 is a prerequisite for ADJU 183.

## SMALL BUSINESS MANAGEMENT

### Certificate

*Purpose:* The one-year certificate program is designed to acquaint present and potential small business owners and employees with the business fundamentals essential to starting a small business.

*Special Curriculum Admission Requirements:* The student should possess a proficiency in high school English and a strong background in basic arithmetic operations.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see Cooperative Education Program section.

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
ENGL	180 Fundamentals of Business English or ENGL 111 English Composition I.....			3
BUAD	121 Business Mathematics .....	3		
ECON	160 American Economics.....	3		
BUAD	114 Principles of Supervision .....			3
ACCT	211-212 Principles of Accounting I & II.....	3	3	
BUAD	241 Business Law I.....	3		
BUAD	174-175 Small Business Mgmt. I-II .....		3	3
ACCT	241 Principles of Federal Taxation I.....		3	
BUAD	246 Business Finance .....			3
DAPR	226 Microcomputers .....		4	
MKTG	100 Principles of Marketing or MKTG 136 Retail Organization & Management.....	3		
MKTG	109 Principles of Salesmanship.....			3
BUAD	110 Human Rel. & Leadership Training.....		3	
GENL	Orientation .....	1		
<b>Total Credits</b>		<b>16</b>	<b>16</b>	<b>15</b>

Total minimum credits for the Small Business Management Certificate = 47.

## TECHNICAL ILLUSTRATION

### Career Studies Certificate

*Purpose:* To provide students already in a drafting career the opportunity to broaden their skills, to offer a career change for others, and to provide those already in the technical illustration field a means of updating their skills with the use of computer aided drafting.

*Special Curriculum Admission Requirements:* College-level competencies in language and mathematics.

		Credits		
		1st Qtr.	2nd Qtr.	3rd Qtr.
*ENGL	111 English Composition I or SPDR elective .....	3		
DRFT	151 Engr. Drawing Fundamentals I.....	3		
<sup>1</sup> DRFT	154 Advanced Technical Illustration I.....		3	
DRFT	152 Engr. Drawing Fundamentals II.....		3	
<sup>2</sup> DRFT	155 Advanced Technical Illustration II.....			3
DRFT	231 Computer Aided Drafting I.....		3	
<sup>3</sup> DRFT	298 Seminar & Project .....			3
<b>Total Credits</b>		<b>6</b>	<b>9</b>	<b>6</b>

Total minimum credits for the Technical Illustration Career Studies Certificate = 21.

\* If SPDR is chosen, SPDR 136 is recommended.

<sup>1</sup> Prerequisite: DRFT 151 or equivalent.

<sup>2</sup> Prerequisite: DRFT 154.

<sup>3</sup> Prerequisite: DRFT 231 and Corequisite DRFT 155.

## TRAVEL/TOURISM

(See "Hotel, Restaurant and Institutional Management")

## TURF AND GROUNDS MANAGEMENT

### Career Studies Certificate

*Purpose:* This curriculum prepares the student for employment in the turf care industry. Theory is combined with laboratory and field experience to prepare graduates for entry level or supervisory positions with golf courses, lawn services, parks, cemeteries and companies that install and maintain irrigation systems. Specific positions include pesticide applicator, irrigation system technician, lawn care technician and sales of turf care products and services.

*Special Curriculum Admission Requirements:* Entry into the Turf and Grounds Management curriculum requires an interview by the Program Head.

*Cooperative Education:* Students must complete the Cooperative Education requirement in order to receive this certificate.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
HORT	116 Professional Turf Care.....	3		
HORT	118 Irrigation Systems for Turf and Ornamentals .....		3	
HORT	117 Turf Pests .....	3		
HORT	211 Plant Pest Control .....		3	
HORT	110 Tools and Equipment.....	3		
* ENGL	111 English Composition I/SPDR.....			3
HORT	197 Cooperative Education .....			5
<b>Total Credits</b>		<b>9</b>	<b>6</b>	<b>8</b>

Total minimum credits for the Turf and Grounds Management Career Studies Certificate = 23.

Due to the seasonal nature of the industry, turf courses will be offered between November 1 and March 1. Cooperative Education will be taken during the spring quarter. Students will be placed in a turf care position for on-the-job training during the busy turf growing season. English Composition I may be taken at any campus during the spring or summer quarter. The Career Studies Certificate will be awarded only after completion of all course work, including the Cooperative Education.

\* If SPDR is chosen, SPDR 136 is recommended.

## WELDING

### Certificate

*Purpose:* The Welding Curriculum is designed primarily to prepare students for industrial employment as welder apprentices, welding instructors, structural steel inspectors, quality control inspectors, welding equipment salesmen and metallurgical and welding laboratory assistants.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
DRFT	111 Tech. Drafting I .....	2		
WELD	137 Oxyacetylene Welding I .....	3		
ENGL	100 Occupational English .....		3	
WELD	106 Pipe Welding.....			3
BUAD	116 Personal Finance .....			3
PSYC	128 Human Relations .....			3
WELD	130 Inert Gas Welding .....		3	
WELD	146 Welding Quality Control .....			2
MATH	118-119 Intro. to Tech. Math.....	5	5	
WELD	131-132-133 Arc Welding .....	3	3	3
WELD	141-142-143 Welding Tests.....	2	2	2
DRFT	76 Welding Blueprint Reading .....		2	
<b>Total Credits</b>		<b>15</b>	<b>18</b>	<b>16</b>

Total minimum credits for the Welding Certificate = 49.

## WELDING

### Career Studies Certificate

*Purpose:* The Welding Career Studies Certificate curriculum is designed primarily to prepare students for starting positions in the welding industry.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see the Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
WELD	137 Oxyacetylene Welding & Cutting.....	3		
WELD	131 Arc Welding I .....	3		
DRFT	111 Technical Drafting I .....	2		
WELD	132 Arc Welding II .....		3	
ENGL	or SPDR elective .....		3	
MATH	198 Seminar & Project .....		5	
WELD	133 Arc Welding III .....			3
WELD	130 Inert Gas Welding .....			3
<b>Total Credits</b>		<b>8</b>	<b>11</b>	<b>6</b>

Total minimum credits for the Welding Career Studies Certificate = 25.

## WOODWORKING

### Career Studies Certificate

*Purpose:* The curriculum is designed to train students to become competent woodworkers and cabinetmakers and to provide a broad range of experience in all aspects of woodworking.

*Cooperative Education:* Students in this curriculum are urged to investigate the potential benefits of Cooperative Education. For further information, see the Cooperative Education Program section.

		Credits		
		1st	2nd	3rd
		Qtr.	Qtr.	Qtr.
WOOD	100 Introduction to Woodworking .....	2		
WOOD	101 Woodworking I-Hand Tools.....	3		
WOOD	102 Woodworking II-Power Tools.....		3	
WOOD	103 Woodworking III-Advanced Power Tools .....		3	
WOOD	110 Basic Cabinetmaking.....			3
WOOD	114 Wood Finishing Techniques I.....			2
WOOD	116 Special Woodworking Techniques.....			3
* ENGL	or SPDR elective .....	3		
<b>Total Credits</b>		<b>8</b>	<b>6</b>	<b>8</b>

Total minimum credits for the Woodworking Career Studies Certificate = 22.

\* If SPDR is chosen, SPDR 136 is recommended.



Electronics

## Course Numbers

Courses numbered 001-009 are developmental courses (see "Developmental Studies Program"). The credits earned in these courses are not applicable toward a degree, certificate or diploma.

Courses numbered 010-099 are freshman level courses for the diploma and certificate programs. The credits earned in these courses are not applicable toward an Associate Degree.

Courses numbered 100-299 are applicable toward an Associate Degree. They may also be used in certificate and diploma courses.

## Course Credits

The credit for each course is indicated in parentheses after the title in the course description. One credit is equivalent to one collegiate quarter-hour credit or two-thirds of a collegiate semester hour credit.

## Course Hours

The number of lecture hours in class each week (including lecture, seminar and discussion hours) and/or the number of laboratory hours in each week (including laboratory shop, supervised practice, and cooperative work experiences) are indicated for each course in the course description. The number of lecture and laboratory hours in class each week are also called "contact" hours because it is time spent under the direct supervision of a faculty member. In addition to the lecture and laboratory hours in class each week, each student must spend some time on out-of-class assignments under his own direction. Usually each credit per course requires an average of three hours of in-class and out-of-class work each week.

## Prerequisites and Corequisites

If any prerequisites are required before enrolling in a course, they will be identified in the course description. Courses in sequences (usually identified by the numerals I-II-III) require that the preceding course(s) in the sequence (or equivalent(s)) be completed before one can enroll in the next course in the sequence. Usually corequisites must be taken at the same time. The prerequisites or their equivalent must be completed satisfactorily before enrolling in a course unless special permission is obtained from the division. The *NVCC Schedule of Classes* lists additional information on special enrollment requirements.

## Frequency of Offerings

The College is not obligated to offer, nor can it offer, all courses every quarter. Courses are usually offered in the quarters indicated in the degree or certificate outline given in the Instructional Programs chapter of this catalog. The quarterly *NVCC Schedule of Classes* lists the courses being offered for the respective quarter.

## General Usage Courses

The following "General Usage Courses" apply to multiple curricula and may carry a variety of prefix designations. The descriptions of the courses are identical for each different prefix and are as follows:

### 90-190-290 Coordinated Practice (1-5 cr.)

Supervised practice in selected health agencies coordinated by the College. Credit/Practice Ratio maximum 1:5 hrs. May be repeated for credit. Variable hrs.

### 90-190-290 Coordinated Internship (1-5 cr.)

Supervised on-the-job training in selected business, industrial or service firms coordinated by the College. Credit/Work Ratio not to exceed 1:5 hrs. May be repeated for credit. Variable hrs.

### 97-197-297 Cooperative Education (1-5 cr.)

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the College's Cooperative Education Office. Applicable to all curricula at the discretion of the College.

Credit/Work Ratio not to exceed 1:5 hrs. May be repeated for credit. Variable hrs.

### 98-198-298 Seminar and Project (1-5 cr.)

Completion of a project or research report related to the student's occupational objective and a study of approaches to the selection and pursuit of career opportunities in the field. May be repeated for credit. Variable hrs.

### 99-199-299 Supervised Study (1-5 cr.)

Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hrs.

## ACCOUNTING

### ACCT 114-115 Applied Accounting I-II (3 cr.) (3 cr.)

Practical accounting as applied to retail stores, professional individuals in firms, and to personal service occupations; accounting firms and practical accounting procedures. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

### ACCT 197 Cooperative Education (1-5 cr.)

(See General Usage Courses Section)

### ACCT 211-212-213 Principles of Accounting I-II-III (3 cr.) (3 cr.) (3 cr.)

Accounting principles and their application to various forms of business. Coverage includes the basic accounting cycle, inventory valuation, internal control systems, manufacturing processes, budgeting and analysis of financial statements. These courses must be taken in sequence. Lect. 3 hrs. per wk.

### ACCT 221-222-223 Intermediate Accounting I-II-III (4 cr.) (4 cr.) (4 cr.)

Prerequisites: ACCT 211-212-213. The course is directed toward accounting majors who desire to enter some area of the accounting field as a career goal. Extensive analysis of the principal elements of accounting systems and statements. These courses must be taken in sequence. Lect. 4 hrs. per wk.

### ACCT 229 Auditing (3 cr.)

Prerequisites: ACCT 211-212-213. Purposes of audit, relationships of auditor and client, kinds of audits, working papers, internal controls and examination of accounting systems, audit reports. Lect. 3 hrs. per wk.

### ACCT 231-232-233 Cost Accounting I-II-III (3 cr.) (3 cr.) (3 cr.)

Prerequisite: ACCT 213. Studies in accounting systems, methods and statements involved in process and job cost accounting; use of standards and cost controls; profit analysis; intra-company transfer pricing; capital expenditure analysis; product pricing; and inventory decision models. Lect. 3 hrs. per wk.

### ACCT 241 Principles of Federal Taxation I (3 cr.)

Principles of Federal Taxation as applied to individual income tax returns. Emphasis is on tax planning and problem solving. Lect. 3 hrs. per wk.

### ACCT 242 Principles of Federal Taxation II (3 cr.)

Prerequisite ACCT 241 or Division Approval. Principles of federal taxation as applied to corporate and partnership tax concepts and problems. Emphasis is placed on minimizing income tax burden through evaluation of business transactions. Lect. 3 hrs. per wk.

### ACCT 243 Principles of Federal Taxation III (3 cr.)

Prerequisite ACCT 242 or Division Approval. A study of the law of federal income taxation designed to provide the student with a working knowledge of federal estate and federal gift taxes. Special emphasis is placed on federal tax questions, profit sharing plans, and foreign income. Lect. 3 hrs. per wk.

### ACCT 256 Governmental Accounting (3 cr.)

Prerequisites: ACCT 211-212-213 or divisional permission. Application of general accounting principles to governmental and institutional unit. Special emphasis placed upon auditing and financial reporting through budgetary accounting and its potential usefulness in planning and controlling revenues and expenditures. Lect. 3 hrs. per wk.

**ACCT 274 Computerized Augmented Accounting I (3 cr.)**

Prerequisite: ACCT 211. Allows students who have completed at least one quarter of accounting principles to use the computer in solving accounting problems. The course will cover keypunching, balance sheet, the recording procedure, adjusting and closing entries, simple interest, valuation of inventory, depreciation, bank reconciliation, and computerized payroll system. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**ACCT 275 Computerized Augmented Accounting II (3 cr.)**

Prerequisites: ACCT 212 & 274. Deals with managerial accounting, and covers goodwill, bonds, contract and effective rates of interest, sinking fund, long-term investments, process cost, job order cost, standard cost, present value, patents, replacement of equipment, discounted cash flow, break-even analysis, price-level accounting, and financial analysis. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**ACCT 297 Cooperative Education (1-5 cr.)**

(See General Usage Courses Section)

**ACCT 298 Seminar and Project (1-5 cr.)**

(See General Usage Courses Section)

**ACCT 299 Supervised Study (1-5 cr.)**

(See General Usage Courses Section)

**ADMINISTRATION OF JUSTICE****ADJU 100 Introduction to Law Enforcement (3 cr.)**

The philosophy and history of law enforcement, overview of crime and police problems; organization and jurisdiction of local, state, and federal law enforcement agencies; survey of professional career opportunities and qualifications required. Lect. 3 hrs. per wk.

**ADJU 109 Security Officers-Duties and Responsibilities (3 cr.)**

A broad overview of the theory and practice of duties of security officers, guards, watchmen, merchant police and private police-leading toward the objective of licensing and professionalization. Lect. 3 hrs. per wk.

**ADJU 110 Patrol Administration (3 cr.)**

Examines the various types of patrol and their importance to the overall police function. Emphasis is upon the responsibilities and problems of the administrators and supervisors of a field level law enforcement office; the most efficient methods of the assignment of personnel in order to prevent crime, provide needed police services and protect the community. Lect. 3 hrs. per wk.

**ADJU 114 Police Organization and Administration I (3 cr.)**

Prerequisites: ADJU 100 & 110. A consideration of police problems at the administrative level. The organization and management of line operations as well as staff and auxiliary services are examined, including investigative, juvenile, and vice units. Lect. 3 hrs. per wk.

**ADJU 115 Police Organization and Administration II (3 cr.)**

Prerequisite: ADJU 114 or divisional approval. A continuation of the analysis of the administrative function begun in ADJU 114. Among the topics included are the organization and management of the personnel, internal control, planning and research, and housing and material functions. Lect. 3 hrs. per wk.

**ADJU 116 Police Organization and Administration III (3 cr.)**

Prerequisites: ADJU 114-115. Principles of organization and administration as applied to the records and communication systems of an urban department, including police utilization of data processing, and the concepts of custody, central services, and logistics. Lect. 3 hrs. per wk.

**ADJU 117 Special Enforcement Problems (3 cr.)**

Crowd control during civil demonstrations, picketing, rioting and other emergency situations, the police role in civil defense; police problems caused by narcotics addiction; the handling of mentally or emotionally abnormal persons. Lect. 3 hrs. per wk.

**ADJU 120 Introduction to Corrections (3 cr.)**

(Corrections) The philosophy and overview of corrections and related problems as an important dimension in the administration of justice;

history of corrections, career opportunities, purposes of correctional jurisdictions. Lect. 3 hrs. per wk.

**ADJU 124 Jail Operations and Management I (Basic) (3 cr.)**

(Corrections) Correctional history as a frame of reference: security procedures in jail operation; the effect of the jail climate on inmates and personnel criteria for effective supervision of prisoners; correctional aspects of inmate discipline; handling special prisoners. Lect. 3 hrs. per wk.

**ADJU 125 Jail Operations and Management II (Advanced) (3 cr.)**

(Corrections) The functions of jail management as it relates to jail and community programs, planning of jail operation, legal problems in jail administration, community relations, personnel supervision. Lect. 3 hrs. per wk.

**ADJU 126 Prevention and Control of Juvenile Delinquency (3 cr.)**

Survey of youth crime stressing the police role in community programs of prevention and control. The philosophy and functioning of the juvenile courts are studied and related to the juvenile program. Lect. 3 hrs. per wk.

**ADJU 127 Criminal Offenses (3 cr.)**

(Corrections) The study of particular types of crime with emphasis on the pathology of criminals. Lect. 3 hrs. per wk.

**ADJU 128 Criminal Behavior (3 cr.)**

(Corrections) Analysis of relationship of society, socialization, and deviancy. Social responses to deviancy and criminal offenders. Lect. 3 hrs. per wk.

**ADJU 129 Treatment of the Offender (3 cr.)**

(Corrections) The theory, practice and problems in the fields of probation and parole as well as in institutional and community treatment of juvenile and adult offenders. Lect. 3 hrs. per wk.

**ADJU 140 Introduction to Security Administration (3 cr.)**

The historical, philosophical, and legal basis of security. The role of security in a modern society. A survey of the administrative, personnel, and physical aspects of the security field. Lect. 3 hrs. per wk.

**ADJU 144 Correctional Law I (3 cr.)**

Prerequisite: ADJU 120. A study of the consequences of convictions of criminal acts committed by adults and juveniles; the sentencing process; the various types of attack upon the validity of convictions. Lect. 3 hrs. per wk.

**ADJU 146 Special and Current Security Problems (3 cr.)**

An analysis of special problem areas such as security education and training, community relations, white collar crime, drug abuse, theft control, shoplifting, document control, subversion and sabotage, protection of classified information and business espionage, labor problems, civil disturbances, natural and man-made disasters. Lect. 3 hrs. per wk.

**ADJU 155 Assessment of the Correctional Process (3 cr.)**

(Corrections) The effectiveness of the courts, penal institutions, probation and parole agencies, and community based correctional facilities in improving and rehabilitating the offender will be assessed. Emphasis will be placed on evaluating standards for effective correctional institutions and programs. Lect. 3 hrs. per wk.

**ADJU 156 Corrections and the Community (3 cr.)**

(Corrections) The relationship of social norms to both conforming and deviant behavior. Emphasis on the rehabilitation aspects of criminals and their return to the community. Lect. 3 hrs. per wk.

**ADJU 158 Introduction to Law Enforcement Photography (3 cr.)**

Techniques of photography and their application to law enforcement situations. Dark room operations, theory and practice; field and laboratory exercises; fundamentals of court room presentation of photographic evidence. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**ADJU 159 Legal Challenge to Corrections (3 cr.)**

(Corrections) Examines legal changes occurring within and without the criminal process which have implications for corrections; analysis of legal problems related to sentencing, probation, parole, prisoners' rights, loss and restoration of civil rights. Lect. 3 hrs. per wk.



- ADJU 169 Crisis Intervention and Current Critical Issues** (3 cr.)  
Basic problems involved in crisis intervention situations and current critical issues in administration of justice with emphasis on practical approaches and methodology to control and effect solutions. Lect. 3 hrs. per wk.
- ADJU 176 Criminology** (3 cr.)  
Volume and scope of crime, and the background of criminal behavior in the American setting; organized crime and its affiliated problems; subjective theories and explanation of crime; the control, treatment and rehabilitation of the criminal offender. Lect. 3 hrs. per wk.
- ADJU 178 Current Problems in Dangerous Drug Enforcement**(2 cr.)  
A survey of current techniques and procedures used by law enforcement agencies in the identification and field testing of suspected drugs, as well as enforcement techniques and the current laws and interpretation of the law, including information on the extent and patterns of national and international drug traffic. Lect. 2 hrs. per wk.
- ADJU 181 Investigations for Security** (3 cr.)  
A study of the various techniques, resources, procedures, and technical aids used in investigations by the competent security investigator. Lect. 3 hrs. per wk.
- ADJU 182 Legal Aspects of Security** (3 cr.)  
A study of the rights and liabilities from a legal standpoint for the security officer in the various roles he plays. The rights of individuals and the employer in accordance with the Virginia code will be reviewed. Lect. 3 hrs. per wk.
- ADJU 183 Computer Security** (3 cr.)  
Prerequisite: DAPR 106. Access controls at the computer and at terminals. Shutdown alternatives. Software and hardware security considerations. Contingency planning. Data encryption. Lect. 3 hrs. per wk.
- ADJU 184 Personnel Security** (3 cr.)  
A study of the personnel security processes in both government and proprietary organizations. The process for developing comprehensive personnel systems, employee recruitment, screening, and termination will be studied. Lect. 3 hrs. per wk.
- ADJU 185 Physical Security** (3 cr.)  
A study of the natural and structural barriers, including all perimeter barriers that have an impact on security operations. The course will also include the consideration of UL certification, insurance, fire codes, and safety and health considerations. Lect. 3 hrs. per wk.
- ADJU 186 Interrogation and Report Writing** (3 cr.)  
Presents the mechanics for obtaining background information, selecting the location, and other aids to conducting the interrogation; the personal influence and psychological factors involved and the rudiments of report writing. Lect. 3 hrs. per wk.
- ADJU 187 Traffic Administration and Control** (3 cr.)  
Traffic problems confronting the field law enforcement administrator, modern methods of traffic facilitation and control, techniques of selective enforcement and police responsibilities in special situations. Lect. 3 hrs. per wk.
- ADJU 188 Traffic Accident Investigation** (3 cr.)  
Conduct at the scene of a traffic accident; required tests and measurements, collection and handling of evidence, interviewing and interrogations, note-taking, case preparation and court appearances, practical exercises. Lect. 3 hrs. per wk.
- ADJU 190 Coordinated Internship** (1-5 cr.)  
(See General Usage Courses Section)
- ADJU 197 Cooperative Education** (1-5 cr.)  
(See General Usage Courses Section)
- ADJU 206 Security Management** (3 cr.)  
The major management operations of organizing, planning, staffing, directing and controlling will be discussed within the context of security management. The functions of general management and institutional program and staff development will be reviewed. Lect. 3 hrs. per wk.
- ADJU 207 Information Security** (3 cr.)  
A study of the means of protection of both government classified information and private, proprietary information. Identification of sensitive information: investigations, clearances, transmission, storage, destruction, necessary records. Lect. 3 hrs. per wk.
- ADJU 208 Retail Security** (3 cr.)  
A study of internal and external thefts that affect retail security operations. A review of factors related to loss and procedures required for preventive loss is also included. Lect. 3 hrs. per wk.
- ADJU 209 Substance Abuse in Security Administration** (3 cr.)  
A review of the use and abuses of prescription and non-prescription drugs and their impact on security operations. The student will learn to recognize the symptoms of drug abuse and the societal impact and response to drug abuse. Lect. 3 hrs. per wk.
- ADJU 228 Law Enforcement and the Community** (3 cr.)  
An examination of the current efforts undertaken by the police to achieve an effective working relationship with the community. Among the topics studied in depth are the police image, crisis areas, public and police attitudes, and community relations activities. Lect. 3 hrs. per wk.
- ADJU 231-232-233 Criminal Law Evidence and Procedures I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Prerequisite: 2nd year standing or permission of program. Note: ADJU 231-232-233 may be taken out of sequence with divisional approval. Major crimes; their classification, elements of proof, intent, conspiracy, responsibility, parties and defenses. Emphasis on the common law and Virginia adaptations. Kinds, degrees, and admissibility of evidence; methods and techniques of its acquisition, use in criminal proceedings, moot court activities. Review of court systems with emphasis on procedures from incident to final disposition of the accused and on applicable principles of criminal and civil law. Intended to satisfy transfer requirements for one year of criminal law. Lect. 3 hrs. per wk.
- ADJU 237 Administration of Justice** (3 cr.)  
Review of court systems with emphasis on procedures from incident to final disposition of the accused and on applicable principles of criminal and civil law. Includes field trips and guest lectures by representatives of local agencies and tribunals. Lect. 3 hrs. per wk.
- ADJU 238 Basic Questioned Documents Investigation** (2 cr.)  
Prerequisite: ADJU 246. A survey of current techniques used by forensic scientists in identifying, collecting, and examining questioned and known documents, from their discovery in the field to their being examined and prepared for the use as evidence in court. The relationship of the duties of the field officer to the laboratory forensic scientist is explored. Lect. 2 hrs. per wk.
- ADJU 239 Firearms & Toolmark Examination** (2 cr.)  
Prerequisite: ADJU 246. A survey of current techniques and laboratory practices utilized by police laboratory technicians in examining and identifying firearms and toolmark evidence, from discovery at the scene through laboratory examination and court room presentation as evidence. Lect. 2 hrs. per wk.
- ADJU 246 Principles of Criminal Investigation** (3 cr.)  
Conduct at the crime scene; collection and handling of evidence; interviewing and interrogations; obtaining statements, admissions and confessions; testifying in court. Practical exercises are included. Lect. 3 hrs. per wk.
- ADJU 247 Advanced Criminal Investigation** (3 cr.)  
Prerequisite: ADJU 246. Continued study of the investigative process; introduction to scientific aids and examinations; application of investigative techniques to specific offenses. Practical exercises are included. Lect. 3 hrs. per wk.
- ADJU 248 Special Investigation Techniques** (3 cr.)  
The development and retention of unique information systems such as informants, surveillance, under-cover assignments, and use of electronic aids. Lect. 3 hrs. per wk.
- ADJU 254 Criminal Investigation Techniques I** (4 cr.)  
Prerequisite: 2nd year standing or permission of program. Crime scene searches; collection and preservation of evidence; interrogations and interviews; obtaining statements, admissions and confessions; testifying in court. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.
- ADJU 255 Criminal Investigation Techniques II** (4 cr.)  
Prerequisite: ADJU 254. A continuation of the study begun in ADJU 254. Advanced laboratory work relating to investigations; introduction and use of scientific aids and examinations; application of investigative techniques to specific offenses. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

- ADJU 267 Organized Crime and Corruption** (3 cr.)  
Problems in the administration of justice, including organized crime, vice, prostitution, homosexuality, pornography, gambling, bookmaking and corruption. Lect. 3 hrs. per wk.
- ADJU 276 Industrial and Commercial Security** (3 cr.)  
Organization, methods, techniques and equipment for physical protection of industrial and commercial facilities and prevention of theft of merchandise and valuables by persons within and without those facilities. Practical exercises are included. Lect. 3 hrs. per wk.
- ADJU 277 Proprietary and Governmental Security** (3 cr.)  
Prerequisite: ADJU 276 or departmental approval. Parallel course: ADJU 254. Continuation and expansion of principles and procedures begun in ADJU 276. Field work and visits to various types of establishments and installations. Inquiry into internal controls of organization. Application of investigative procedures and techniques. Lecture and demonstrations. Lect. 3 hrs. per wk.
- ADJU 278 Emergency Planning** (3 cr.)  
A course designed to aid the Security Director in developing a cost conscious, effective plan of operations for various types of facilities under adverse circumstances. Lect. 3 hrs. per wk.
- ADJU 287 Elementary Principles of Probation and Parole** (3 cr.)  
Prerequisite: ADJU 120. Probation and parole as methods for treating offenders; history; organization and administration; eligibility; selection; revocation and termination; procedures and techniques; trends. Lect. 3 hrs. per wk.
- ADJU 289 Correctional Counseling** (3 cr.)  
The principles and processes of counseling in correctional facilities and other related fields. Major aspects of counseling theory and principles along with practical applications of same. Lect. 3 hrs. per wk.
- ADJU 290 Coordinated Internship** (1-5 cr.)  
(See General Usage Courses Section)
- ADJU 297 Cooperative Education** (1-5 cr.)  
(See General Usage Courses Section)
- ADJU 298 Seminar and Project** (1-5 cr.)  
(See General Usage Courses Section)
- AGRI 179 Companion Animal Behavior** (2 cr.)  
Study of the behavior of domestic and non-domestic animals with emphasis on canine behaviors, and on human influence in the development of animal behavior patterns. Lect. 2 hrs. per wk.
- AGRI 214-215 Animal Diseases I-II** (2 cr.) (2 cr.)  
Discussion of animal health and disease, surgical techniques, and animal behavior. Demonstrations and selected observation and practice in animal hospitals, clinics or research laboratories are included as applicable. Lect. 1-2 hrs., Lab. 3-0 hrs., Total 4-2 hrs. per wk.
- AGRI 219 Animal Pharmacology** (4 cr.)  
Prerequisite: division permission. Drugs and other medical substances of veterinary importance, including characteristics, usage, measurement, administration and storage. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.
- AGRI 260 Animal Nutrition** (3 cr.)  
The principles of nutrition, digestion, and metabolism and their application to feed practices. Analysis of individual feeds and ration requirements. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- AGRI 290 Coordinated Internship** (1-5 cr.)  
(see General Usage Courses section)
- AGRI 297 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)
- AGRI 298 Seminar and Project** (2 cr.)  
(see General Usage Courses section)
- AIR CONDITIONING AND REFRIGERATION**
- AIRC 101-102-103 Principles of Refrigeration I-II-III** (4 cr.) (4 cr.) (4 cr.)  
A study of refrigeration principles and systems, characteristics of refrigerants, compressors, condensers, evaporators, float valves, expansion valves; compression and absorption systems; temperature and pressure control; electrical controls for climate control units; electrical motors and motor controls, starters, relays, overloads, and control circuits. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- AIRC 111-112-113 Air Conditioning & Refrigeration Electricity I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Study of electronic theory, magnetism, Ohm's Law, resistance, current flow, instruments for electrical measurements, transformers, inductance, capacitance, AC motors and controls, power transmission and distribution, pictorial and schematic circuit diagrams used in air conditioning, refrigeration, and heating for home, commercial, and light industrial installations. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- AIRC 154-155 Combustion Devices I-II** (3 cr.) (3 cr.)  
Fuels, types of burners and their components, installation and servicing will be studied. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- AIRC 159 Heating and Cooling Safety** (1 cr.)  
The standard safety procedures used in field work for those persons involved in the installation and repair of heating and cooling equipment. Lect. 1 hr. per wk.
- AIRC 199 Supervised Study** (1-5 cr.)  
(See General Usage Courses Section)
- AIRC 200 Hydronics** (4 cr.)  
Prerequisite: AIRC 103. The design and installation of hydronic systems for heating and cooling. "Hydronics" includes steam heated and chilled water systems; primarily concerns systems using water under forced circulation. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.
- AIRC 208 Psychrometrics** (4 cr.)  
Prerequisite: AIRC 103. A study of air and its properties, characteristics, and measurement as it applies to human comfort. Control of temperature, humidity, and distribution of air and air mixtures. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.
- AIRC 211-212 Air Conditioning Controls I-II** (3 cr.) (3 cr.)  
Prerequisites: AIRC 103, AIRC 113. Electrical, pneumatic and electronic control circuits as applied to year round air conditioning systems. Reading wiring and schematic diagrams, trouble shooting, and designing high and low voltage control systems. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- AGRICULTURE**
- AGRI 114 Medical Terminology for Animal Technicians** (2 cr.)  
Introduction to medical abbreviations and terms, including the study of prefixes, suffixes, stem words, and technical terms with emphasis on proper spelling and usage. Lect. 2 hrs. per week.
- AGRI 115 Fundamentals of Horse Management** (3 cr.)  
A survey of horse breeds, their functions and uses; conformation; facilities; basic feeds and feeding; and principles of horse nutrition. Lect. 3 hrs. per wk.
- AGRI 116 Animal Breeds and Identification** (3 cr.)  
Common breeds of large and small domestic animals. Breed characteristics and fundamental breeding and management procedures. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- AGRI 151-152-153-154 Laboratory Techniques I-II-III-IV** (2 cr.) (4 cr.) (4 cr.) (4 cr.)  
Prerequisite: division permission. Hematology, urinalysis, bacteriology, mycology, radiology, and restraint procedures as related to assisting in the practice of veterinary medicine. Lect. 0-2-2-2 hrs., Lab. 6-6-6-6 hrs., Total 6-8-8-8 hrs. per wk.
- AGRI 155-156 Anatomy and Physiology I-II** (4 cr.) (4 cr.)  
Applied study of structure and function of the normal body of domestic and laboratory animals. Lect. 2 hrs., Lab. 6 hrs., Total 8 hrs. per wk.
- AGRI 161-162-163-164 Clinical Practices I-II-III-IV** (3 cr.) (4 cr.) (4 cr.) (4 cr.)  
Prerequisite: division permission. Study of practical experience in sterilization, sanitation, surgical procedures, record keeping, professional ethics and other necessary practices and procedures related to assisting in the practice of veterinary medicine. Lect. 2 hrs., Lab. 3-6-6-6 hrs., Total 5-8-8-8 hrs. per wk.



**AIRC 218 Heat Load Estimation** (3 cr.)  
Prerequisite: AIRC 103. A study of heat loss and heat gain factors. The effect, the selection, and the layout of both residential and commercial air conditioning and refrigeration systems. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**AIRC 221-222-223 Solar Energy Technology I-II-III** (4 cr.) (4 cr.) (4 cr.)  
Prerequisites: AIRC 103, 111; MATH 118, 119. Study of solar energy and solar principles and their system components, characteristics of collectors, heat storage, and the major system components of a solar unit, either passive or active. The course covers real and experimental solar units and the installation of both passive and active types. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AIRC 236 Electric Heating** (3 cr.)  
Prerequisite: AIRC 103, AIRC 113. A study of electric heating, basic construction, application, calculations, installation wiring, troubleshooting, and repair. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**AIRC 237 Heat Pumps** (3 cr.)  
Prerequisites: AIRC 103 and 236. Theory and operation of reverse-cycle refrigeration systems as applied to air conditioning, including service, installation, and maintenance. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**AIRC 251-252-253 Air Conditioning Systems I-II-III** (4 cr.) (4 cr.) (4 cr.)  
Prerequisite: AIRC 103. Study of equipment used in cooling, heating, humidification, dehumidification, and air cleaning. Equipment components, installation, servicing and maintenance will be studied. Residential and commercial equipment will be covered. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AIRC 297 Cooperative Education** (1-5 cr.)  
(See General Usage Courses Section)

## **ANTHROPOLOGY** (See Sociology Section)

## **ARCHITECTURE**

**ARCH 111 Architectural Drafting I** (3 cr.)  
Designed to provide a fundamental knowledge of the principles and techniques of architectural drafting used in professional offices. Skills in the use of architectural drafting materials and equipment are developed. Geometric construction, orthographic instrument drawing of principal views, isometric and oblique drawing, lettering, basic dimensioning, notation, significance of line weights, line quality, and diagrammatic working drawing techniques are introduced in the development of simple plans, sections, elevations and details. Freehand sketching. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.

**ARCH 112 Architectural Drafting II** (3 cr.)  
Prerequisite: ARCH 111 or equivalent. Continuing the development of architectural drafting techniques and skills in the production of a limited set of working drawings for a house or a small commercial or civic structure, introducing materials indications, cross-reference systems and symbols, analytic solutions of drafting problems involving auxiliary views, intersections and developments, development of construction details, and the drawing of scale and full size details from preliminary sketches. Freehand sketching. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.

**ARCH 113 Architectural Drafting III** (3 cr.)  
Prerequisite: ARCH 112 or equivalent. Continuing the development of architectural drafting skills in the process of relating plan, sections, and elevations to site conditions and development using a topographic site survey in the production of a preliminary architectural site plan. Quick freehand perspective and rendering techniques used in architects' offices are introduced, and a set of preliminary drawings of the project reflecting design decisions are produced by the students. Freehand sketching. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.

**ARCH 164 Materials and Methods of Construction I** (3 cr.)  
Designed to introduce the materials used in erection of structures, the physical properties and structural characteristics of steel, concrete, tim-

ber, glass, related materials and the methods used in testing materials. Lect. 3 hrs. per wk.

**ARCH 165 Materials and Methods of Construction II** (3 cr.)  
Prerequisite: ARCH 164. Designed to introduce the practical use of materials and methods of structures. The architectural and structural relationship of concrete, steel, and timber structures are analyzed with an introduction to cost analysis and the economic aspect involved in construction. Lect. 3 hrs. per wk.

**ARCH 171 Specification Writing for General Construction I** (3 cr.)  
Relationship of specifications to design and working drawings, graphical versus narrative presentation, relating trades and materials, quality control for labor materials. Types of specifications, format and writing procedures; general conditions, requirements and responsibility of specifications; source of information, evaluation and language involved in specification writing. Legal aspects of specifications including bonds and insurance, bidding procedures, types of contracts and pre-bid documents. Lect. 3 hrs. per wk.

**ARCH 204-205 History of Architecture I-II** (3 cr.) (3 cr.)  
The history of architecture from ancient times to the present but with emphasis on the designs and forms of twentieth century developments. Lect. 3 hrs. per wk.

**ARCH 210 Site Planning** (3 cr.)  
The fundamentals of surveying required for site evaluation and planning. Principles of horizontal measurements, leveling, profiles, direction, coordinate systems, topographic maps, contours, horizontal and vertical curves, boundaries. Surveying methods and instruments demonstrated. Lect. 3 hrs. per wk.

**ARCH 211 Architectural Drafting IV** (3 cr.)  
Prerequisite: ARCH 113 or equivalent. Introduction to professional office organization and to working on a complex structure under simulated architectural office conditions. Coordinated preparation of architectural and structural plans, elevations, sections, details, schedules and specifications. Preparation of preplanned sheet layouts using a specific cross-reference system. Research and use of reference data. Stating of problems and possible solutions as a means of actively contributing to the process of obtaining prompt and accurate decisions. Special attention to clarity, brevity and completeness of information shown, and firm and authoritative drawing and lettering techniques for effective reproduction. Freehand sketching. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.

**ARCH 212 Architectural Drafting V** (3 cr.)  
Prerequisite: ARCH 211. Reintroduction of the design process for the purpose of developing drawings and details within the context of a design concept and demonstrating the entire production process within which the architectural draftsman works. Working on coordinated architectural, structural, mechanical and electrical design, working drawings, and specifications, of commercial or industrial structures under simulated architectural office conditions with the aid of faculty consultants. Use of building codes. Final assembly of the complete document for construction purposes. Time limits and the broad scope of the instruction demand a simple design quickly arrived at, with typical undivided floor plans and typical details. Freehand sketching. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.

**ARCH 213 Architectural Drafting VI** (3 cr.)  
Prerequisite: ARCH 212. The course concentrates on problems and solutions of the urban design context of the structure worked out in ARCH 212 and its immediate vicinity. Foundations and parking facilities under the structure are designed. Vehicular and pedestrian circulation, site development including pavements, planting, storm water drainage, street furniture, orientation, sunlight and air are considered. An actual site is chosen and local zoning regulations are used. The overall urban site is developed in block form with consideration of the major elements of economic feasibility. Special attention is given to scale and the environmental quality for the individual user. Freehand sketching. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.

**ARCH 236 Building Electrical Equipment** (3 cr.)  
Prerequisite: ARCH 237. Study of equipment, materials, and symbols. Building code requirements, pertaining to residential and commercial construction; reading and interpretation of working drawings by electrical engineers; coordination of electrical features with architectural and structural design. Lect. 3 hrs. per wk.

**ARCH 237 Building Mechanical Equipment (3 cr.)**

General study of heating, air conditioning, plumbing and electrical equipment, materials and symbols. Building code requirements pertaining to residential and commercial structures; reading and interpretation of working drawings by mechanical engineers; coordination of mechanical and electrical features with structural and architectural designs. Lect. 3 hrs. per wk.

**ARCH 250 Construction Safety and Health (3 cr.)**

An introduction into construction industry safety and health operations hazards control. Includes safety and health aspects and procedures relative to site clearing, demolition, excavation, building and highway construction with special emphasis placed on planning a safety program in the construction industry. Lect. 3 hrs. per wk.

**ARCH 276 Construction Estimating (3 cr.)**

Interpretation of working drawings for a project; preparation of material and labor quantity surveys from plans and specifications; approximate and detailed estimates of cost. The student will study materials take-off, subcontractors estimates of cost, and bid and contract procedures. Detailed inspection of the construction by comparing the finished work to the specifications. Lect. 3 hrs. per wk.

**ARCH 277 Building Codes and Contract Documents (3 cr.)**

A study of building codes and their effect in relation to specifications and drawings. The purpose and writing of specifications will be studied along with their legal and practical application to working drawings. Contract documents will be analyzed and studied for the purpose of client-architect-contractor responsibilities, duties and mutual protection. Lect. 3 hrs. per wk.

**ARCH 279 Critical Path Method Program (3 cr.)**

Working knowledge of C.P.M. programming and its implication for the building industry as a vehicle for control of project construction. Lect. 3 hrs. per wk.

**ARCH 297 Cooperative Education (1-5 cr.)**  
(See General Usage Courses Section)**ARCH 298 Seminar and Project (1-5 cr.)**  
(See General Usage Courses Section)**ARCH 299 Supervised Study (1-5 cr.)**  
(See General Usage Courses Section)**ARTS****ARTS 110 Art Appreciation (3 cr.)**

A survey of art from prehistoric times to the present day. Architectural styles, sculpture, and painting by lecture and slide illustrations. Lect. 3 hrs. per wk.

**ARTS 111-112-113 History and Appreciation of Art I-II-III (3 cr.) (3 cr.) (3 cr.)**

The history and interpretation of architecture, sculpture and painting. The course begins with prehistoric art and follows the mainstream of western civilization to the present. Lect. 3 hrs. per wk.

**ARTS 115 Art in World Culture (5 cr.)**

The conceptual approach rather than historic with emphasis on the contemporary period. Designed to develop a non-technical, general, cultural understanding of the space arts such as architecture, painting, sculpture, graphics, and industrial design. Lect. 5 hrs. per wk.

**ARTS 116 History of Printmaking (3 cr.)**

A chronological history of the development of printmaking techniques, including woodcut, etching, and engraving, lithography and serigraphy, from medieval to the present time. Emphasis on printmaking techniques in relation to art forms. Lect. 3 hrs. per wk.

**ARTS 124-125-126 Drawing I-II-III (4 cr.) (4 cr.) (4 cr.)**

Introduction to drawing skills, concepts, and media including pencil, ink, charcoal, pastel, and watercolor. Related gallery assignments and field trips. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

**ARTS 136-137-138 History of Far Eastern Art I-II-III (3 cr.) (3 cr.) (3 cr.)**

A survey of the history of Far Eastern Art from the prehistoric period to the present. The first quarter will cover the art of India and Southeast Asia from 2500 B.C. to the present, the second quarter the art of China

from 3000 B.C. to the present, the third quarter the art of Japan and Korea from 200 B.C. to the present. Emphasis will be placed on architecture, painting, and sculpture, with additional instruction on printmaking and the decorative arts. Lect. 3 hrs. per wk.

**ARTS 154-155-156 Design I-II-III (3 cr.) (3 cr.) (3 cr.)**

Introduction to the concepts of two and three dimensional design and the theory and use of color. Field trips related to design concepts. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**ARTS 157-158-159 Ceramics I-II-III (4 cr.) (4 cr.) (4 cr.)**

Prerequisite: ARTS 161 or divisional permission. Problems in the design and production of functional and non-functional ceramic works, including handbuilding, use of the wheel, study of clays and glazes. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

**ARTS 161-162-163 Fundamentals of Design I-II-III (4 cr.) (4 cr.) (4 cr.)**

Introduction to and application of the basic concepts of two and three dimensional design and the theory and use of color. Field trips related to design concepts and other outside assignments. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

**ARTS 166-167 Fundamentals of Lettering I-II (3 cr.)**

Calligraphy as an introduction to script and the constructed letter; creative, freehand, and mechanical lettering; other forms of letters used in today's graphic layout and design. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**ARTS 169 Visual Communications (4 cr.)**

Prerequisites: ARTS 161, 170, or divisional permission. Advanced 2- and 3-dimensional design concepts applicable to all fields of commercial art. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

**ARTS 170 Introduction to Graphic Skills (3 cr.)**

Designed to provide basic studio skills necessary for the commercial art student. Emphasis is placed on the proper use of drafting equipment and other materials such as knives, pencils, pens, brushes, glues and papers. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**ARTS 171-172-173 Typography I-II-III (3 cr.) (3 cr.) (3 cr.)**

Prerequisite: ARTS 170 or divisional permission. Instruction in the historical elements of letter forms, typefaces and their use in contemporary communications media. The emphasis is on application of this knowledge to specific design problems. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**ARTS 181-182-183 Gallery Management I-II-III (3 cr.) (3 cr.) (3 cr.)**

Lectures on the history and development of museums problems of museum administration, connoisseurship, cataloging, accessing installation, conservation, and educational services. Field trips to galleries and museums observing how the above are dealt with on a day-to-day basis. Students will participate in the management of the school gallery and intern in professional galleries under the instructor's supervision. Lect. 3 hrs. per wk.

**ARTS 191-192-193 History of American Art I-II-III (3 cr.) (3 cr.) (3 cr.)**

A survey of the history of American art from the 1600s to the present. The first quarter will cover the period from 1600-1850, the second from 1850-1935 and the third from 1935 to the present. Architecture, painting, sculpture, and printmaking will be emphasized and crafts, the decorative arts, and photography included. Lect. 3 hrs. per wk.

**ARTS 197 Cooperative Education (1-5 cr.)**  
(see General Usage Courses section)**ARTS 200 Introduction to Primitive Art (3 cr.)**

Survey of the visual arts of primitive cultures, including those of pre-history; of North and South American Indians, of Tribal Africa and Australia, of the Eskimos, etc. Lect. 3 hrs. per wk.

**ARTS 201-202-203 Sculpture I-II-III (4 cr.) (4 cr.) (4 cr.)**

Prerequisite: ARTS 163 or divisional permission. Introduction to sculptural concepts and methods of production both traditional and contemporary, including work in plastics and metals. Field trips and other related assignments. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

- ARTS 206 The Growth of American Art** (3 cr.)  
A survey of the development of the fine arts in the United States from their colonial beginning to the present. Special emphasis will be given to the relationship between American crafts and fine arts, and the influence of historical events and economic ideals on the quality of the art produced. Lect. 3 hrs. per wk. Also offered as a videocourse-continuous registration, 24 wk. course that requires on-campus viewing of video cassettes (through the Extended Learning Institute).
- ARTS 211-212-213 Painting I-II-III** (4 cr.) (4 cr.) (4 cr.)  
Prerequisite: ARTS 126 and ARTS 162 or divisional permission. Introduction to painting styles, materials, and techniques, both traditional and contemporary. Gallery trips and other related assignments. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.
- ARTS 214-215 Graphic Techniques I-II** (4 cr.) (4 cr.)  
Prerequisites: ARTS 170, 171 or divisional permission. The use of drawing instruments and materials; introduction to engraving processes and the mechanics of reproduction. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.
- ARTS 216 Functional Ceramics** (4 cr.)  
Prerequisite: ARTS 159 or divisional permission. Problems in the design and production of functional ceramics, including handbuilding and use of the wheel. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.
- ARTS 217 Sculptural Ceramics** (4 cr.)  
Prerequisite: ARTS 159 or divisional permission. Problems in the design and production of sculptural ceramics, including handbuilding and use of the wheel. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.
- ARTS 218 Museum Resources** (3 cr.)  
Prerequisite: Divisional permission. Designed to make fine arts and art history majors familiar with the museums and architectural landmarks of the local area. The resources investigated will include not only works of art but also audio-visual materials available, museum libraries where one might do research and the circumstances under which an artist would be allowed to copy paintings in the museums. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- ARTS 219 Ceramic Decoration** (4 cr.)  
Prerequisite: ARTS 159 or divisional permission. Problems in execution of various ceramic decoration techniques. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.
- ARTS 227-228-229 Drawing IV-V-VI** (3 cr.) (3 cr.) (3 cr.)  
Prerequisite: ARTS 126 or divisional permission. Advanced study of concepts with emphasis on the drawing as a work of art, and on creative independence. Related gallery assignments. Lab. 6 hrs. per wk.
- ARTS 234-235 Theory and Practice of Watercolor Painting I-II** (3 cr.) (3 cr.)  
Prerequisites: ARTS 126, 162, or divisional permission. Abstract and representational painting in watercolor with emphasis on design, color, composition, and value. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- ARTS 240 History of Design** (3 cr.)  
A study of the development of visual communication with examples from art history, graphic design and illustration. The influence of style, cultural trends and technological processes on the development of art forms with emphasis on the 19th and 20th centuries. Required for commercial art majors. Lect. 3 hrs. per wk.
- ARTS 246 Theory and Practice of Watercolor Painting III** (3 cr.)  
Prerequisite: ARTS 234-235 or divisional permission. A continuation of ARTS 234-235. Abstract and representational painting in watercolor with emphasis on design, color, composition, and value. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- ARTS 248-249 Visual Communications I-II** (3 cr.) (3 cr.)  
Prerequisites: ARTS 161, ARTS 170, or divisional permission. Advanced two dimensional design concepts applicable to all fields of commercial art. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- ARTS 251-252-253 Advanced Design I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Prerequisite: ARTS 163 or divisional permission. Concerned with the ordering and interpretive application of design elements (line, shape, form, texture, color, space, etc.) in two and three dimensions. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- ARTS 254-255 Experimental Fabric Design I-II** (3 cr.) (3 cr.)  
Prerequisites: ARTS 161-162 or divisional permission. Introduction to simple fabric design techniques such as frame weaving, dye techniques, and printing design and application. Emphasis on creative design approach. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- ARTS 256 Printing: Intermediate Intaglio** (4 cr.)  
Prerequisite: ARTS 280 or divisional permission. Continued experimentation with the Intaglio Printmaking techniques with an introduction to color and photographic technique, and edition printing. Curatorial and display methods to be covered. Emphasis on individual expressive needs and an overview of the history of Intaglio Printmaking. Related field trips. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.
- ARTS 257 Magazine Design** (3 cr.)  
Prerequisites: ARTS 61, ARTS 170, and ARTS 171. Design and production of the campus literature and arts magazine. Designing promotion material for its sale and the editing of art work submitted for entry. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- ARTS 258 Newspaper Layout** (3 cr.)  
Prerequisites: ARTS 161, ARTS 170, and ARTS 171, or divisional permission. Design and production of the campus biweekly newspaper. Layout and possible contribution of graphics, cartoons, illustration, and photography for story assignments. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- ARTS 259 Printmaking: Advanced Intaglio** (4 cr.)  
Prerequisite: ARTS 256 or divisional permission. Emphasis on independent work, seeking a more complete creative expression on the student's part. A concentration on the works of contemporary artists and an introduction to the field of professional printmaking. Related field trips to artists' studios and print collections. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.
- ARTS 260 Painting Techniques for Illustrators** (3 cr.)  
Prerequisites: ARTS 124, ARTS 125, ARTS 161, ARTS 162, or divisional permission. An introduction to the materials and techniques of water-based paints (watercolor, acrylics and gouache) as used in illustration. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- ARTS 261-262-263 Advertising Design I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Prerequisites: ARTS 161, ARTS 170, ARTS 171 and ARTS 248, or divisional permission. A study of the principles of optical communications applied to advertising design in newspaper, magazines, and direct mail advertising. Analysis of the influence of contemporary art on layout. Lect. 2 hrs., Lab 3 hrs., Total 5 hrs. per wk.
- ARTS 264-265 Silkscreen Design and Production I-II** (3 cr.) (3 cr.)  
Prerequisite: ARTS 161 or divisional permission. A study of silkscreen techniques with emphasis on design and communication. Design of products such as posters. Introduction to photo silkscreen techniques. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- ARTS 266-267-268 Illustration I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Prerequisite: ARTS 126 or divisional permission. Introductory courses of methods and materials used in the following fields of illustration: spot, product, story (book and magazine), fashion, furniture, news, reporting and cartooning. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- ARTS 269 Printmaking: Lithography** (4 cr.)  
Prerequisites: ARTS 126 and 162, or divisional permission. Introduction to lithographic processes and techniques, with emphasis on stone lithography. Related field trips. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.
- ARTS 270 Design Studio** (4 cr.)  
Prerequisites: ARTS 126, 162, 214, 261, and PHTG 101 (or equivalent), or divisional permission. Advanced commercial design in a studio situation. Experiences are provided in: conceptualizing designs based on client needs; solving "real" problems of instructional value from a limited market; all practical aspects of production; art direction; contract writing;

client contact; some inter-relationship of design, illustration, commercial photography. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

**ARTS 271-272-273 Graphic Techniques I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Prerequisites: ARTS 161, ARTS 170, and ARTS 171, or divisional permission. The use of drawing instruments and materials; introduction to engraving processes; and the mechanics of reproduction. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**ARTS 278 Printmaking: Silk Screen** (4 cr.)  
Prerequisites: ARTS 126 and ARTS 162, or divisional permission. Introduction to silk screen stencil techniques, styles, and materials. Field trips related to screen printing. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

**ARTS 279 Printmaking: Relief Printing** (4 cr.)  
Prerequisites: ARTS 126 & 162, or divisional permission. Introduction to relief printing processes and techniques including woodblock, linocut, and collograph. Field trips related to relief printing. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

**ARTS 280 Printmaking: Intaglio Printing** (4 cr.)  
Prerequisites: ARTS 126 & 162, or divisional permission. Introduction to intaglio printmaking processes including etching, engraving, dry point, and related techniques. Related field trips. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

**ARTS 281-282-283 Advanced Drawing I-II-III** (4 cr.) (4 cr.) (4 cr.)  
Prerequisite: ARTS 126 or divisional permission. Advanced exploration of drawing concepts and techniques. Related gallery assignments. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

**ARTS 284-285-286 Illustration I-II-III** (4 cr.) (4 cr.) (4 cr.)  
Prerequisites: ARTS 126, 162, 170, 248, or divisional permission. An introduction to the concepts, methods and skills involved in the following fields of illustration: editorial (book, magazine, newspaper), institutional (government, corporate) and advertising. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

**ARTS 287-288-289 Advertising Design I-II-III** (4 cr.) (4 cr.) (4 cr.)  
Prerequisite: ARTS 161, 169, 170, 171, or divisional permission. A study of the principles of visual communications as applied to advertising and graphic design. Analysis of the influence of contemporary art on layout. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

**ARTS 291-292-293 Design IV-V-VI** (4 cr.) (4 cr.) (4 cr.)  
Prerequisite: ARTS 163 or divisional permission. Concerned with the application of basic design concepts to more complex problems, and the development of a questioning and problem solving method of thinking. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

**ARTS 297 Cooperative Education** (1-5 cr.)  
(See General Usage Courses Section)

**ARTS 298 Seminar and Project** (1-5 cr.)  
(See General Usage Courses Section)

**ARTS 299 Supervised Study** (1-5 cr.)  
(See General Usage Courses Section)

## AUTO BODY

**AUBD 160 Basic Sheet Metal Operations** (4 cr.)  
Use of metal straightening tools, basic straightening operations, shrinking, filling, sheet metal damage and repair procedures. Lect. 2 hrs., Lab. 6 hrs., Total 8 hrs. per wk.

**AUBD 165 Automotive Painting** (4 cr.)  
Knowledge and use of spray painting and painting materials including thinners, primers, lacquer, enamel, acrylics, rubbing components, waxes and cleaners. Lect. 2 hrs., Lab. 6 hrs., Total 8 hrs. per wk.

**AUBD 167 Auto-Body Repair** (4 cr.)  
Understanding collision straightening procedures and equipment, planning repair procedures, disassembly techniques, body fastening systems, glass removal and replacement and panel repair and alignment. Lect. 2 hrs., Lab. 6 hrs., Total 8 hrs. per wk.

**AUBD 168 Automotive Sheet Metal Preparation** (4 cr.)  
Using the materials, processes and equipment to prepare straightening metal and old finishes for painting. Includes sanding, cleaning, solvents,

special materials, fillers and priming. Lect. 2 hrs., Lab. 6 hrs., Total 8 hrs. per wk.

**AUBD 169 Automotive Frame Repair** (4 cr.)  
Determining frame and unit construction straightening processes, equipment use and measurement processes. Practice using pulling set-ups, typical repair procedures, pushing set-ups and gauges, and frame and body checking. Lect. 2 hrs., Lab. 6 hrs., Total 8 hrs. per wk.

## AUTOMOTIVE

**AUTO 100 Automotive Shop Practices** (3 cr.)  
Shop practices for the automotive laboratory and shop safety, identification and use of hand tools, general power equipment and maintenance of an automotive shop. Basic operating procedures of installed shop equipment. Occupational Safety and Health act standards. A prerequisite or corequisite for all automotive courses, except those in the Automotive Machinist curriculum. Lect. 3 hrs. per wk.

**AUTO 104-105 Automotive Electrical Component Rebuilding I-II** (4 cr.) (4 cr.)  
A study of special equipment and procedures used in the component rebuild shop. Emphasis is on batteries, generators, and cranking motors. AUTO 105 is a continuation of AUTO 104. Emphasis is on alternators, distributors, and speedometers. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 107 Automotive Disassembly and Inspection Techniques** (3 cr.)  
A study of disassembly procedures, cleaning methods and inspection techniques, including the proper use of measuring devices. Magnetic Particle and Dye Penetrant inspection is included with parts ordering procedures. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**AUTO 109 Automotive Shop Fabrication Techniques** (3 cr.)  
A study and experience in the methods of fabricating equipment and fixtures for the automotive repair and machine shop. The course includes project planning, layout work, gas welding, arc welding, fasteners, and tool and fixture making. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**AUTO 111-112-113 Automotive Engines I-II-III** (4 cr.) (4 cr.) (4 cr.)  
Prerequisite or corequisite: AUTO 100. Analysis of power, cylinder condition, valves, and bearings in the automotive engine to establish the present condition, repairs or adjustments. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 114 Cylinder Block Service** (4 cr.)  
Basic cylinder block reconditioning to include boring, resleeving, line-boring and deck resurfacing. Repair techniques for damaged block and cylinder head castings to include cold welding, brazing, welding and epoxy. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 115 Cylinder Head Service** (4 cr.)  
Prerequisite: AUTO 114. A study of cylinder head reconditioning to include valve seat grinding, refacing valves, servicing valve guides, valve seat inserts, cutting for valve seals and springs, thread repair and resurfacing mating surfaces. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 118 Automotive Turning Operations** (4 cr.)  
Principles and methods of lathe operations for fabrication, modifications and tool making. Includes brake drum and disc lathes. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 119 Crankshaft, Camshaft and Connecting Rod Service** (4 cr.)  
A study of the techniques of crankshaft and camshaft reconditioning to include grinding, polishing, straightening, welding, and balancing. Connecting rod service to include installing and reaming bushings, straightening, aligning, and balancing. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 120 Introduction to Automotive Machine Shop** (4 cr.)  
Prerequisite or corequisite for all other machinist courses. An introductory course in automotive machining operations emphasizing shop safety and the safe use of machine shop tools. The course surveys basic machining operations and specialized auto machining techniques necessary for reconditioning engine and chassis components. A basic set of machinist's hand tools is required for this course. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 121-122 Automotive Fuel Systems I-II (4 cr.) (4 cr.)**

Prerequisite or corequisite: AUTO 100. Analysis of automotive fuel systems to include carburetors, fuel injection, superchargers, fuel pumps, filters, instruments, tanks and connecting lines. Complete overhaul, repairs and adjustment of fuel system components. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 126 Antipollution Systems (4 cr.)**

Prerequisite: AUTO 122. A study of various antipollution systems used on modern automobiles, installation, inspection, repair and service. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 128 Auto Mechanics (4 cr.)**

Prerequisite or corequisite: AUTO 100. The automobile, its systems, operating principles, problems, and basic repair techniques. The introductory diagnosis, disassembly, inspection, repair reassembly and adjustment of automobile components. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 134 Automotive Parts Management I (3 cr.)**

A study of the duties and qualifications, including catalog and telephone use, invoicing, parts classification, salesmanship and customer relations. Lect. 3 hrs. per wk.

**AUTO 135 Automotive Parts Management II (3 cr.)**

Prerequisite: AUTO 134. A study of the duties and qualifications, including collections and collection practices, fleet and other accounts, techniques of product demonstration, salesmanship and customer relations. Lect. 3 hrs. per wk.

**AUTO 136 Automotive Lubrication and Cooling Systems (3 cr.)**

Testing and analysis of lubrication systems to include lubricants, pumps, lines, filter, and vents. Analysis of cooling systems, coolants, pumps, fans, lines and connections. Estimating repairs, adjustments needed and their costs. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**AUTO 137 Consumer Auto Repair (2 cr.)**

The basic study and practice of home maintenance and repair of automotive vehicles. To include basic theory of the automobile, hand tool selection and use, and the repair tasks able to be accomplished in the home garage without power equipment. For non-Automotive degree/certificate students only. Lect. 1 hr., Lab. 2 hrs., Total 3 hrs. per wk.

**AUTO 138 Automotive Vehicle Inspection (3 cr.)**

This course is designed to provide information on how to perform an automotive vehicle safety inspection. Emphasis is placed on the inspection of brakes, lighting and electrical, steering and suspension, tires, wheels and rims, vehicle glazing, body and sheet metal, muffler and exhaust systems, and air pollution control systems. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**AUTO 145 Service Station Operation III (4 cr.)**

Prerequisite: AUTO 144. Covers financial management, personnel management, planning and development. Inventory controls, protecting investment and safeguarding inventory and cash are also covered. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 147 Automotive Radiator Repair (4 cr.)**

This course is designed to provide the student with a comprehensive and detailed description of the operations and techniques involved in the repair and service of automotive radiators. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 149 Emissions Control Mechanic (3 cr.)**

Prerequisite: practicing auto mechanic. For motor vehicle mechanics who wish to specialize in emission controls. Requirements for the Control of Vehicle pollutants, inspection, repair, and service as determined by the latest test equipment and scientific methods and accomplishing needed repairs, replacement or adjustment. Lect. 3 hrs. per wk.

**AUTO 151-152 Auto Power Trains I-II (4 cr.) (4 cr.)**

The operation, design, construction and repair of power train components: clutches, propeller shaft, universal joints, rear axle assemblies, fluid couplings, torque converters: 2, 3, and 4 speed standard, overdrive and automatic transmissions. AUTO 151 is not a prerequisite for AUTO 152. Lect. 2 hrs., Lab. 6 hrs., Total 8 hrs. per wk.

**AUTO 176 Small Gasoline Engines (3 cr.)**

A study of small gasoline engine operating principles, construction, design, variety and their many purposes. Instruction on the two-cycle

and four-cycle small gas engines, their construction, design, fuel system, ignition system, and lubricating systems. The disassembly, reconditioning, overhaul and reassembly is demonstrated in the lab. Thorough study and practice in trouble-shooting and tune-up. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**AUTO 181 Automotive Diagnosis I (3 cr.)**

Introduction to the principles of automotive maintenance using modern diagnostic methods. Theory and laboratory experiments designed to explain and illustrate the scientific basis of modern electronic and mechanical diagnostic procedures. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**AUTO 197 Cooperative Education (1-5 cr.)**

(see General Usage Courses section)

**AUTO 198 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)

**AUTO 199 Supervised Study (1-5 cr.)**

(see General Usage Courses section)

**AUTO 210 Emissions Systems Diagnosis and Repair (2 cr.)**

Prerequisite: Working auto mechanic or state inspector. Presents logical diagnostic paths to identify vehicle HC-CO failure areas. Will teach a progression of failure detection from most likely to more complex causes. Emphasis will be on the use of the infrared analyzer and manufacturer's specified adjustments. Lect. 2 hrs. per week.

**AUTO 238 Automotive Air Conditioning (3 cr.)**

Principles of refrigeration, air conditioning controls, and the adjustment and general servicing of automotive air conditioning systems. Lect. 3 hrs. per wk.

**AUTO 241-242-243 Automotive Electricity I-II-III(4 cr.) (4 cr.)**

Prerequisite or corequisite: AUTO 100 or 120. The theory of electricity and electrical circuitry as it applies to the automobile. The construction, operation, diagnosis and service of the automotive battery, starting, charging, ignition, lighting and power accessory systems. Diagnosis and testing performed with modern test equipment. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 246 Automotive Electronics (4 cr.)**

Prerequisite: AUTO 241-242. An introduction to the field of electronics as it applies to the modern automobile. Emphasis is on basic circuit operation, diagnosis and repair of electronic ignition, fuel control, pollution control, braking control, digital indicator, and warning systems. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 254-255 Automatic Transmissions I-II (4 cr.) (4 cr.)**

A study of the several types of automatic transmissions, fluid coupling, converters, and their principles of operation. Includes adjustment, servicing, and repair. Lect. 3 hrs., Lab 3 hrs., Total 6 hrs. per wk.

**AUTO 256 Automotive Transaxles (4 cr.)**

Combined drive systems for automobiles, including transaxles for front and rear end drives. Includes principles of operation, assembly, measurements and adjustments, repair and reassembly. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 267 Automotive Suspension & Braking Systems (4 cr.)**

Operation, design, construction, repair, and servicing of braking and suspension systems; use of tools and test equipment, evaluation of test results, estimation and repair cost, front and rear suspension alignment, power and standard steering, and power, standard and disc brakes. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**AUTO 268 Automotive Alignment (2 cr.)**

Use of alignment equipment in diagnosing, adjusting, and repairing suspension problems. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.

**AUTO 281-282 Automotive Diagnostic Technology IV-V (3 cr.) (3 cr.)**

Application of modern electronic and mechanical diagnostic procedures in the evaluation of the operational condition of automobiles. Safety and economy of operation are stressed. The student acquires actual diagnostic experience in the laboratory. Course content is: AUTO 281-Power Train diagnosis; AUTO 282-Brake and Suspension diagnosis. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**AUTO 284-285 Automotive Service Procedures & Tune-Up I-II** (3 cr.) (3 cr.)

Prerequisite or corequisite: AUTO 100. Diagnostic and service procedures for automotive electrical and mechanical systems; use of tools and test equipment, evaluation of test results, estimation of repair cost, and performance of required service. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**AUTO 287-288 Shop Management and Customer Relations I-II** (3 cr.) (3 cr.)

A study of shop layout, personnel and management, cost analysis, record keeping and quality control. The shop manager, service salesman, and service writer's role in customer relations. Lect. 3 hrs. per wk.

**AUTO 290 Coordinated Internship** (1-5 cr.)

(See General Usage Courses Section)

**AUTO 297 Cooperative Education** (1-5 cr.)

(See General Usage Courses Section)

**AUTO 298 Seminar and Project** (1-5 cr.)

(See General Usage Courses Section)

**AUTO 299 Supervised Study** (1-5 cr.)

(See General Usage Courses Section)

**AVIATION****AERO 104 Flight I** (1 cr.)

Flight training required to complete the private pilot certificate. The student is expected to acquire the aeronautical skill necessary to meet the requirements for the private pilot certificate. Commercial flight training will begin. These courses consist of 34 hours of flight training. A special fee is required. Lab. 3 hrs. per wk.

**AERO 105 Flight II** (1 cr.)

Prerequisite: AERO 104. Continuation of Flight I. Lab. 3 hrs. per wk.

**AERO 106 Flight III** (1 cr.)

Prerequisite: AERO 105. For the student who has met the requirements for private pilot certificate. The required flight training for the commercial pilot certificate is conducted. The student will complete the solo-cross-country requirements and develop a high degree of proficiency in commercial and primary maneuvers. This course consists of thirty-four hours of flight training. A special fee is required. Lab. 3 hrs. per wk.

**AERO 107 Flight IV** (1 cr.)

Prerequisite: AERO 106. Continuation of Flight III. Lab. 3 hrs. per wk.

**AERO 108 Flight V** (1 cr.)

Prerequisite: AERO 107. Corequisite: AERO 175. A continuation of flight training to obtain the commercial flight certificate. Training for the instrument flight certificate will begin. The student will develop a high degree of proficiency in commercial maneuvers and instrument flight. All flight requirements for commercial and instrument ratings will be completed. This course consists of thirty-four hours of flight training. A special fee is required. Lab. 3 hrs. per wk.

**AERO 109 Flight VI** (1 cr.)

Prerequisite: AERO 108. Continuation of Flight V. Lab. 3 hrs. per wk.

**AERO 110 History of Air Transportation** (3 cr.)

An informative, historical survey of manned flight, the development of aircraft, milestones in aviation, noted pioneers, and the socio-economic impact of flight upon modern civilization. Lect. 3 hrs. per wk.

**AERO 116 Private Pilot Ground School** (5 cr.)

The fundamental principles of flight including theory of flight, aircraft standards and specifications, basic aircraft construction, weight and balance, navigation, meteorology, principles of radio communication and application of aerophysics. Course intended to prepare radio communication and application of aerophysics. Course intended to prepare students for the FAA examination for private pilot rating. Lect. 5 hrs. per wk.

**AERO 118 Commercial Pilot Ground School** (5 cr.)

An advanced theory of flight covering navigation, meteorology, radio communication, aerophysics and performance. An in-depth study of the aim and its use, and the Federal Aviation Regulations. Course intended to prepare students for the FAA Examination for the commercial pilot rating. Lect. 5 hrs. per wk.

**AERO 126 Aviation in the United States** (3 cr.)

The development and present status of air transportation. Federal legislation, characteristics and classifications of air carriers; the organization and functions of the Federal Aviation Administration and Civil Aeronautics Board. The state of aviation in the U.S. and other advanced countries. Potentials and problems. Survey of present day aerospace technology. Lect. 3 hrs. per wk.

**AERO 127 Fundamentals of Flight** (3 cr.)

Introduction to the basic principles of flight including applications of aerophysics, theory of flight, aircraft standards and specifications, basic airplane construction, weight and balance fundamentals. Lect. 3 hrs. per wk.

**AERO 128 Theory of Flight (Instrument Pilot)** (3 cr.)

An advanced theory course covering the pertinent principles applicable to instrument aviation requirements. Includes the study of aerodynamics pertaining to instrument flight, flight instruments, and airways. Course intended to prepare students for the FAA examination for instrument pilot rating. Lect. 3 hrs. per wk.

**AERO 136 The National Airspace System** (3 cr.)

A survey of the common system of facilities, equipment, regulations, procedures, and personnel providing air traffic services. Includes standard procedures for the safe and efficient movement of aircraft. Lect. 3 hrs. per wk.

**AERO 137 Aviation Safety** (3 cr.)

A study of the fundamentals essential to safe flight; instruments used and the evaluation and interpretation of their indications. Weight and balance problems. Federal Aviation Regulations pertaining to safe flight. Lect. 3 hrs. per wk.

**AERO 140 Flight Attendants-Introduction** (3 cr.)

The Flight Attendant's role in aviation from the beginning to the present day. Includes the advantages and disadvantages the career offers as they pertain to the individual airlines' qualifications, training schools and career appointments. Includes field trips. Lect. 3 hrs. per wk.

**AERO 146 Flight Attendants Duties and Responsibilities I** (3 cr.)

A study of the Flight Attendant's environment, including bidding and scheduling, food and beverage service, emergency procedures, and post-flight responsibilities. Includes field trips. Lect. 3 hrs. per wk.

**AERO 147 Flight Attendants Duties and Responsibilities II** (3 cr.)

Prerequisite: AERO 146. An in-depth study of the Flight Attendant's image. Emphasis is placed on the Flight Attendant's health and appearance. Interview preparation and communication skills are explored. Lect. 3 hrs. per wk.

**AERO 176 Primary Flight** (1 cr.)

A specific introduction to flight through actual flying experience in modern, safe, fully equipped aircraft. Sixteen hours of instruction are provided of which 10 hours are spent in dual flight and 6 hours in oral instruction and briefing. The program is sufficient to qualify a student pilot for solo flight. Optional for all Aviation Technology Programs. Estimated cost: \$45. Lect. 1 hr., Lab. 2 hrs., Total 3 hrs. per wk. NOTE: Solo flight is not permitted in this course.

**AERO 197 Cooperative Education** (1-5 cr.)

(See General Usage Courses Section)

**AERO 246 Meteorology** (4 cr.)

The interpretation of meteorological phenomena affecting aircraft flight. A study of the basic concepts of aviation meteorology: temperature, pressure, moisture, stability, clouds, air masses, fronts, thunderstorms, icing, fog. Analysis and use of weather data for flight planning and safe flying; interpretation of U.S. Weather Service maps, reports, and forecasts. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**AERO 247 Aviation Law** (3 cr.)

Insight into the federal aviation agencies, as well as international, federal and local laws forming the present structure of aviation law. Lect. 3 hrs. per wk.

**AERO 248 Aircraft Support Operations** (4 cr.)

Logistics and services necessary to insure and support safe, efficient flight operations. Aviation supply and maintenance loading and unloading; pre-flight checks and services. Logistical support enroute. Scheduled maintenance and operations. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.



- AERO 249 Airline and Airport Security** (3 cr.)  
Federal Aviation Administration rules and regulations pertaining to airport and airline security. History of air piracy and terrorism and the methods and techniques used to control and combat these threats nationally and internationally. Lect. 3 hrs. per wk.
- AERO 256 Air Navigation** (3 cr.)  
The basic elements of air navigation; the fundamentals and practical application of pilotage and dead reckoning, including the use of plotter, computer, aerial charts and navigation systems. Lect. 3 hrs. per wk.
- AERO 257 Radar, Radio Aids, and Communications** (4 cr.)  
Radar theory and use. Basic radio fundamentals used by the pilot. Description and practical use of various radio aids to safe aerial navigation, including Very High Frequency Omni Direction Range (VOR), Instrument Landing System (ILS), Direction Finding (DF), and others. Charts and approach plates as adopted to radio navigation and the application of the Airmen's Information Manual. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- AERO 258 Airline Marketing** (3 cr.)  
The function of marketing in airline operations; market research; demand analysis; advertising and promotion; sales, traffic, and the theory of price determination. Lect. 3 hrs. per wk.
- AERO 266 Airport Operations and Management** (3 cr.)  
A presentation of the major functions of airport management: organization, zoning, adequacy, financing, revenues, expenses, evaluation and safety. A study of the airport and its social-economic effect on the community. Lect. 3 hrs. per wk.
- AERO 267 Airline Operations and Management** (3 cr.)  
The functions of management in airline operation; air carrier familiarization effect of Federal regulations; organization, uniform system of accounts and reports, rules of practice in economic proceedings; industrial, financial and economic implications relative to decision making. Lect. 3 hrs. per wk.
- AERO 290 Coordinated Internship** (1-5 cr.)  
This course is unique and is highly recommended for students interested in air traffic control. Pending availability of facilities, students are offered a hands-on learning opportunity in the Air Route Traffic Control Center and control towers in the Washington, D.C., area. Students study with F.A.A. controller trainees. Variable hrs.
- AERO 297 Cooperative Education** (3 cr.)  
(see General Usage Courses section)
- AERO 298 Seminar and Project** (3 cr.)  
(see General Usage Courses section)
- AERO 299 Supervised Study** (3 cr.)  
(see General Usage Courses section)
- BIOLOGY**
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- BIOL 01 Biology** (1-5 cr.)  
A developmental course in general biology designed to develop a basic understanding of plant and animal life. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hrs.
- BIOL 101-102-103 General Biology I-II-III** (4 cr.) (4 cr.) (4 cr.)  
Fundamental characteristics of living matter from the molecular level to the ecological community with emphasis on general biological principles. Diversity of living organisms; their structure, physiology and evolution. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- BIOL 104-105 General Biology I-II** (6 cr.) (6 cr.)  
Fundamental characteristics of living matter from the molecular level and the ecological community with emphasis on general biological principles. Diversity of living organisms; their structure, physiology and evolution. Lect. 4 hrs., Lab. 6 hrs., Total 10 hrs. per wk.
- BIOL 151-152-153 Human Anatomy and Physiology** (4 cr.) (4 cr.) (4 cr.)  
Prerequisite: one unit of laboratory science or departmental approval. An integrated study of the systems of the human body including cell structure, physiology, tissues, skeletal and muscular systems. A study of the metabolic systems including circulatory, respiratory, digestive and excretory systems. A study of the control and functions of the human body in the nervous, endocrine and reproductive systems. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- BIOL 156 Foundations of Zoology** (4 cr.)  
Prerequisite: high school biology. Fundamental biological principles of structure and function as applied to animals from the cell to organ systems. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- BIOL 158 Parasites of Domestic Animals** (3 cr.)  
Classification, life history, and control measures of the common species of parasites of domestic animals (internal and external). Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- BIOL 164 Pathology I** (3 cr.)  
The basic principles regarding alteration of the structure and function in disease and the genesis and effect of disease in the various organ systems. Lect. 3 hrs. per wk.
- BIOL 176 Microbiology** (4 cr.)  
The characteristics and activities of micro-organisms, showing their essential relation to diagnosis, treatment, and prevention of disease. Fundamentals of bacteriology, mycology, and parasitology, emphasizing their relationships to individual community health. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- BIOL 198 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- BIOL 199 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)
- BIOL 206 Biological Problems in Contemporary Society** (3 cr.)  
Prerequisites: BIOL 103 or permission of instructor. A course designed for understanding some of the major problems of today's living. Contemporary readings will include topics on population problems, pollution, drug abuse, famine, ecology, conservation, disease, genetics, and evolution. Lect. 3 hrs. per wk.
- BIOL 214 Introduction to Non-Vascular Plants** (4 cr.)  
Prerequisites: BIOL 103 or equivalent or approval of division. Designed to cover the lower plants including the algae, fungi, and bryophytes. Studies of major taxonomic groups-their morphology, life cycles, ecology, physiology, economic importance. Sight recognition and collections may be required. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- BIOL 215 Introduction to Vascular Plants** (4 cr.)  
Prerequisites BIOL 103 or equivalent or approval of division. Designed to cover the higher plants beginning with those that have vascular tissue, and including flowering and non-flowering plants. Studies of major taxonomic groups-their morphology, life cycles, ecology, physiology, economic importance. Sight recognition and collections may be included. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- BIOL 221-222-223 Introductory Invertebrate and Vertebrate Zoology** (4 cr.) (4 cr.) (4 cr.)  
Prerequisites BIOL 103 or equivalent or approval of division. Fundamentals of invertebrate and vertebrate anatomy, physiology, embryology, classification and evolution. Lect. 3 hrs., Lab. 3 hrs., Total of 6 hrs. per wk.
- BIOL 224-225 Introductory Vertebrate Zoology I-II** (3 cr.) (3 cr.)  
Prerequisite BIOL 103 or equivalent or approval of division. Fundamentals of vertebrate anatomy, physiology, embryology, classification and evolution. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- BIOL 234-235 Introductory Invertebrate Zoology I-II** (3 cr.) (3 cr.)  
Prerequisites BIOL 103 or equivalent or approval of division. The biology of invertebrate animals with special reference to structure, embryology, function, ecology, classification and evolution. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- BIOL 251-252 Human Anatomy and Physiology I-II** (4 cr.) (4 cr.)  
Prerequisites BIOL 103 and one year of college chemistry, or divisional permission. Consideration of basic biological principles as revealed by anatomical and physiological studies. An integrated study of the systems of the human body including gross and microscopic structures and their physiology. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.



**BIOL 254-255 General Genetics I-II** (3 cr.) (3 cr.)

Prerequisite one year of general biology or division approval. An introductory course in the science of genetics including the biochemical nature and function of the gene, classical Mendelian inheritance, cytogenetics, developmental and population genetics, human genetics and aspects of genetic counseling. Students will also receive experience in experimental design and elementary statistical analysis of data. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**BIOL 258 Comparative Anatomy of Vertebrates** (6 cr.)

Prerequisite BIOL 103. A study of the evolution of the larger taxonomic groups of chordates with a comparative study of their gross morphology. Lect. 3 hrs., Lab. 6 hrs., Total 9 hrs. per wk.

**BIOL 264-265 General Ecology I-II** (3 cr.) (3 cr.)

Prerequisite BIOL 103 or divisional permission. Study of the interrelationships between organisms and the natural cultural environments with emphasis on survey of populations, communities and ecosystems. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**BIOL 267 General Ecology** (5 cr.)

Prerequisite: BIOL 103 or divisional approval. This course is a study of the interrelationships between organisms and the natural and cultural environments with emphasis on human influences on ecological structures, survey of populations, communities and ecosystems. Lect. 4 hrs., Lab. 3 hrs., Total 7 hrs. per wk.

**BIOL 268 Microbiology** (6 cr.)

Prerequisite BIOL 103 and one year of college chemistry or division approval. Introduction to the morphology, genetics, physiology, ecology and control of microorganisms and to the nature of infectious diseases and immunity. The laboratory emphasizes standard microbiological techniques. Lect. 3 hrs., Lab. 6 hrs., Total 9 hrs. per wk.

**BIOL 276 Regional Flora** (3 cr.)

Family characteristics of vascular plants including principal phylogeny and classification based principally on local flora. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs., per wk.

**BIOL 298 Seminar and Project** (1-5 cr.)

(see General Usage Courses section)

**BIOL 299 Supervised Study** (1-5 cr.)

(see General Usage Courses section)

**BUILDING****BLDG 100 Introduction to Construction Inspection and Safety** (3 cr.)

Introduction to the construction inspection profession, qualifications of the inspector, methods and procedures for field report writing, records and public relations, safety on construction sites, and the legal aspects governing the construction inspector. Lect. 3 hrs. per wk.

**BLDG 107 Plan Review and Building Codes** (3 cr.)

Corequisite: BLDG 100. A study and interpretation of the basic building codes as they relate to construction of residential, commercial and public facilities. Interpretation of working drawings and construction specifications for compliance to the basic building codes. Lect. 3 hrs. per wk.

**BLDG 111 Principles of Residential Building Construction Inspection** (3 cr.)

Corequisite: BLDG 100. Introduction to the general principles of residential building inspection to include materials, foundations, framing, finishing and building codes. Lect. 3 hrs. per wk.

**BLDG 112 Principles of Concrete and Concrete Inspection** (3 cr.)

Prerequisite: BLDG 100 or equivalent field experience. Fundamentals of concrete and new developments that directly apply to modern construction technology. Develop an understanding of the ingredients of concrete, properties of concrete, mix proportions and testing procedures which result in quality-controlled product, concrete form use and removal. Lect. 3 hrs. per wk.

**BLDG 113 Principles of Steel Frame Construction and Inspection** (3 cr.)

Prerequisite: BLDG 100 or equivalent field experience. Fundamentals of modern steel framing methods and non-destructive testing methods.

Introduction of the principles, techniques and materials used in the fireproofing of steel structural elements utilized in construction projects to comply with national fire protection standards and local codes. Lect. 3 hrs. per wk.

**BLDG 121 Principles of Electrical Inspection** (3 cr.)

Prerequisite: BLDG 100 or equivalent field experience. Fundamentals of electrical wiring systems used in residential, commercial and industrial buildings. Introduction to the principle of computing loads on circuits, services and equipment. The understanding of the national and local electrical codes for safe installation of wiring systems to include outlets, feeders and direct services. Lect. 3 hrs. per wk.

**BLDG 122 Principles of Mechanical Inspection** (3 cr.)

Prerequisite: BLDG 100 or equivalent field experience. Fundamentals and theory of heating, cooling and refrigeration, terminology and symbols as used in layouts for the various systems. Introduce the code requirements for installation and safety and inspection problems. Lect. 3 hrs. per wk.

**BLDG 123 Principles of Plumbing Inspection** (3 cr.)

Fundamentals of sanitary plumbing systems, terminology and symbols as used in layout of the various systems. Introduce the code and inspections problems for commercial, industrial and residential public and private sanitary systems. Lect. 3 hrs. per wk.

**BLDG 124 Principles of Public Facilities Inspection** (3 cr.)

Prerequisite: BLDG 100 or equivalent field experience. Fundamentals of highway, curb and gutter, and storm water drainage systems. Develop an understanding of the materials, and construction methods used in roadway construction. Introduction to the construction methods, inspection and testing techniques of drainage systems to include collection basins, interceptors, flow gradient and piping materials. Lect. 3 hrs. per wk.

**BLDG 131-132-133 Woodworking and Millwork I-II-III** (3 cr.) (3 cr.) (3 cr.)

Prerequisite BLDG 130. Designed to provide an introduction to the use of hand and power tools used in woodworking and millwork fabrication. The use of all tools to be developed through the development of basic woodworking projects to the more complex fabrication and construction of cabinet and custom furniture items. Lect. 1 hr., Lab. 5 hrs., Total 6 hrs. per wk.

**BLDG 156 Dwelling Maintenance** (3 cr.)

The basic study and practice of dwelling (house or apartment) maintenance and repair. To include basic theory for energy conservation, hand tool selection and use, repair task able to be accomplished by owner-occupant without special tools and building permit. Introduction of the type projects that can be accomplished with basic hand tools in limited space. Lect. 3 hrs.

**BLDG 166 Construction Law** (3 cr.)

Prerequisite: Divisional approval. The general principles of construction law as these pertain to contract documents, general conditions, changes in specifications, pricing of claims, arbitration, design responsibility, mechanic's liens, delays, and damages. This course is intended for persons with prior experience in construction management. Lect. 3 hrs. per wk.

**BLDG 176 Shop Safety Practices** (2 cr.)

Shop practices and shop safety, identification and use of hand tools, general power equipment and maintenance of building trades shops, occupational safety and health act standards, and first aid building trades and vocational shops. Lect. 2 hrs. per wk.

**BLDG 234 Materials Take-Off** (3 cr.)

Prerequisite: ARCH 113 or equivalent. Interpreting and computing data from working drawings and specifications for estimating and fabricating purposes. Includes systems used in computing excavation, concrete, masonry block, brick, wood frame, steel, and various building materials. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**BLDG 235 Cost Estimating** (3 cr.)

Prerequisite: BLDG 234 or equivalent. Principle and methods of pricing materials, transportation and handling cost, mark-up discount procedures, equipment cost, and wage rates. Preparing estimate forms for various types of estimates as itemized, approximate, lump-sum, unit-cost, and comparative. Lect. 3 hrs. per wk.

## BUSINESS MANAGEMENT AND ADMINISTRATION

- BUAD 100 Introduction to Business** (3 cr.)  
The role and function of business enterprise within our economic framework. Includes organization, finance, marketing, personnel administration, production and economics. Designed primarily to help students select their field of business specialization. Lect. 3 hrs. per wk.
- BUAD 110 Human Relations & Leadership Training** (3 cr.)  
The task of management involved in getting things done through people; understanding of human motivation and behavior patterns, performance, and analysis of manpower growth in an organization. Lect. 3 hrs. per wk.
- BUAD 114 Principles of Supervision I** (3 cr.)  
Fundamentals of supervision including responsibilities of the supervisor, factors relating to his work and that of his subordinates, aspects of job leadership and effective human relations as related to efficient supervision. Lect. 3 hrs. per wk.
- BUAD 116 Personal Finance** (3 cr.)  
A course designed to build a framework of money management concepts. Content includes establishing values and goals, earning income, managing income, developing consumer buying ability, using credit, understanding savings, insurance, and responsibilities as a consumer. Lect. 3 hrs. per wk.
- BUAD 117 Principles of Securities Investment** (3 cr.)  
Designed to aid the student in developing a broad perspective in the area of stocks and bonds. Mechanics of stock exchanges, types of securities, types of orders, and specific investment objectives. Lect. 3 hrs. per wk.
- BUAD 121-122-123 Business Mathematics I-II-III** (3 cr.) (3 cr.) (3 cr.)  
A sequence of three courses with instruction, review and drill in solving mathematical problems arising from normal business activities, integrating the use of calculating machines as a tool. Theories of mathematics are applied to business activities emphasizing the use of concepts and procedures concerning payroll computations, ratios, discounts, interest, sales and property tax, pricing mark-up and mark-down, and annuities. Lect. 3 hrs. per wk.
- BUAD 130 Introduction to Credit Unions** (4 cr.)  
Systematic introduction to the credit union movement: history, characteristics, powers, operation, services, and nature of credit unions. Role and function of credit union management as well as the developing nature of these programs will be covered. Lect. 4 hrs. per wk.
- BUAD 134 Principles of Credit Union Operations I** (4 cr.)  
Prerequisite: BUAD 130. Deals with functions of teller transactions, loan granting, financial counseling, collections. Collections systems, delinquency control, current regulations and policies will be covered. Lect. 4 hrs. per wk.
- BUAD 135 Principles of Credit Union Operations II** (4 cr.)  
Prerequisite: BUAD 134. To develop an understanding of the financial management skills necessary to operate a credit union. Implications of risk management, insurance, investment procedures will be addressed. Lect. 4 hrs. per wk.
- BUAD 140 Introduction to Savings Association Business** (3 cr.)  
Examines the origins, nature and development of the savings association business; describes the legal environment for financial intermediaries; analyzes major competitive factors and institutions in the field of finance and investment; explains the organization, chartering and function of modern savings associations; and identifies current problems and trends in today's business world. Lect. 3 hrs. per wk.
- BUAD 146 Deposit Operations** (4 cr.)  
Examines the deposit operations of banks in the context of the U.S. payments system. Explores how banks operate relating to their deposit-taking activities and management of deposited funds. Lect. 4 hrs. per wk.
- BUAD 147 Teller Operations** (3 cr.)  
Prerequisite: BUAD 140. Examines the importance of the teller in creating and maintaining good customer relations; summarizes the requirements for check negotiability and acceptability; identifies the different types of savings account ownership and the requirements for each; describes routine and special transactions handled by tellers; and outlines recommended procedures to follow in the event of fire, robbery or cash shortage. Lect. 3 hrs. per wk.
- BUAD 164 Principles of Business Management I** (3 cr.)  
Prerequisite: BUAD 100. Management and management functions; planning, organizing, staffing, directing, and controlling. Management examined as both a science and art with emphasis on both the body of knowledge and the personal abilities to be successful as a manager. Lect. 3 hrs. per wk.
- BUAD 165 Principles of Business Management II** (3 cr.)  
Prerequisite: BUAD 164. The application of management principles to realistic management situations. The case method of study in analyzing management problems with emphasis on application to various types of business enterprises. Lect. 3 hrs. per wk.
- BUAD 167 Introduction to Labor Relations** (3 cr.)  
History of the labor movement, survey of labor legislation, labor problems, collective bargaining techniques and trends. Examination of labor relations from social, legal, and economic viewpoints. An analysis of public policy and the current state of the labor movement. Lect. 3 hrs. per wk.
- BUAD 174-175 Small Business Management I-II** (3 cr.) (3 cr.)  
A study of management problems that relate to the small-scale entrepreneur. Includes problems in initiating the business, financial and administrative control, marketing programs and policies, management of business operations, legal and governmental relationship. Also includes case studies involving actual business situations. Lect. 3 hrs. per wk.
- BUAD 180 Introduction to Commercial Lending** (3 cr.)  
An overview of the commercial lending function. Examines commercial lending, the lending process, portfolio management, and regulation and business development. Lect. 3 hrs. per wk.
- BUAD 197 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)
- BUAD 210 Introduction to International Business** (3 cr.)  
Role and function of international business in our economy. Topics include its importance and environment; marketing, production, and financial considerations; exports and imports; recent developments. Designed to develop student career interest. Lect. 3 hrs. per wk.
- BUAD 241 Business Law I** (3 cr.)  
An introduction to the field of law, how it developed and how it operates as a method of control study of the purpose of law in our present-day complex society, the law of contracts, and the law of the agency. Lect. 3 hrs. per wk.
- BUAD 242 Business Law II** (3 cr.)  
Prerequisite: BUAD 241. A continuation of Business Law I (BUAD 241). The main topic to be studied is the Uniform Commercial Code as adopted in the various states. Lect. 3 hrs. per wk.
- BUAD 243 Business Law III** (3 cr.)  
Prerequisite: BUAD 241-242. Continuation of Business Law I & II (BUAD 241-242). Employment, bailment, partnerships, corporations, property. Lect. 3 hrs. per wk.
- BUAD 246 Business Finance** (3 cr.)  
Prerequisite: ACCT 211. Problems involved in the acquisition and use of funds necessary to the conduct of business. Sources and instruments of capital and finance, financial organization, and financing of operations and adjustments. Lect. 3 hrs. per wk.
- BUAD 251 Business Statistics I** (3 cr.)  
Prerequisite: MATH 181-182-183, MATH 161-162-163, or MATH 191-192-193. Aspects of statistical methodology such as the collection, organization, presentation and analysis of data specific concentration with measures of central tendency, dispersion, probability concepts, the normal distribution, sampling distribution, and basic hypothesis testing such as T-test, Z-test, and Chi-Square. Lect. 3 hrs. per wk.
- BUAD 252 Business Statistics II** (3 cr.)  
Prerequisite: BUAD 251. Estimation of parametric values, advanced methods and techniques of hypothesis testing and experiment design. Statistical quality control, analysis of variance, linear regression and correlation analysis both simple and multiple measurement of business

and economics activity through index numbers, seasonal and secular variation; computer application where practical. Lect. 3 hrs. per wk.

**BUAD 253 Business Statistics III** (3 cr.)

Prerequisite: BUAD 252. The applications of statistical techniques and methodology in business. Includes expedited payoff, game theory, linear programming, transportation models, queuing theory, and demand estimations. Lect. 3 hrs. per wk.

**BUAD 254 Applied Business Statistics I** (3 cr.)

An introductory course in statistics. Collection, presentation, and analysis of data through ratios, percentages, and averages. Emphasis on the practical application of statistical measures to business situations. Lect. 3 hrs. per wk.

**BUAD 255 Applied Business Statistics II** (3 cr.)

Prerequisite: BUAD 254. A continuation of the application of principles taught in BUAD 254 with emphasis on the graphic presentation of data concerning business activity and some advanced statistical concepts such as probability and sampling. Lect. 3 hrs. per wk.

**BUAD 257 Home Mortgage Lending** (3 cr.)

A picture of the mortgage market is presented; the acquisition of a mortgage portfolio, mortgage plans and procedures, mortgage loan processing and servicing, and the obligations of the mortgage loan officer in overall portfolio management. Lecture 3 hours per week.

**BUAD 269 Purchasing and Materials Management** (3 cr.)

Principles of purchasing and management of inventories including determination of requirements, pricing, source selection, and inventory policy and control. Lect. 3 hrs. per wk.

**BUAD 276 Personnel Management** (3 cr.)

The problems and issues in the administration of personnel actions. Includes organization and tasks of personnel development, significant personnel considerations and an appraisal of labor in business today. Lect. 3 hrs. per wk.

**BUAD 287 Public Relations in Management** (3 cr.)

A survey of public relations as a management responsibility. Includes philosophy and techniques of public relations; application of employee, public, customer, and practical application. Lecture 3 hours per week.

**BUAD 297 Cooperative Education** (1-5 cr.)

(see General Usage Courses section)

**BUAD 298 Seminar and Project** (1-5 cr.)

(see General Usage Courses section)

**BUAD 299 Supervised Study** (1-5 cr.)

(see General Usage Courses section)

## CHEMISTRY

**CHEM 06 Chemistry** (1-5 cr.)

A developmental course in general chemistry designed to develop a basic understanding of inorganic and organic chemistry. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hrs.

**CHEM 99 Supervised Study** (1-5 cr.)

(see General Usage Courses section)

**CHEM 101-102-103 General Chemistry I-II-III** (4 cr.) (4 cr.) (4 cr.)

This is a beginning course for the non-science major, intended for students who will take no further chemistry courses. The experimental and theoretical aspects of the various branches of chemistry are discussed and emphasis is placed on the concepts and ideas of the science. Particular attention is given to introductory organic and biochemistry and the role of chemistry in human affairs is treated. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**CHEM 110 Horticultural Chemistry** (4 cr.)

Introduction to chemical principles, inorganic and organic structural chemistry and theory and practice of pH. The role of the chemical elements including trace elements in plant growth. Chemicals used such as fungicides, insecticides, fertilizers, and growth regulators. Chemical nomenclature, pH and other general and specific measurements will be practiced. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**CHEM 111-112-113 College Chemistry I-II-III** (4 cr.) (4 cr.) (4 cr.)

Prerequisite: high school chemistry or division approval and pre-test. This is a beginning course primarily for science and engineering majors. The course covers the fundamental laws & theories of chemistry. The student is expected to have a strong background in mathematics. Lect., 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**CHEM 114-115 General Inorganic Chemistry I-II** (6 cr.) (6 cr.)

Fundamental principles and laws underlying chemical action with special emphasis on the non-metals and their compounds, theories and problems. Laboratory for the first half of the course deals with the non-metallic elements and their compounds. The second half deals with the theories of qualitative analysis. Lect. 4 hrs., Lab. 5 hrs., Total 9 hrs. per wk.

**CHEM 140 Introduction to Organic Chemistry** (2 cr.)

Prerequisite: 1 year high school chemistry or the equivalent. Topics of modern organic chemistry which include the atoms, molecules and bonds of saturated and unsaturated hydrocarbons, alcohols, ethers, amines, thiols, halides, aldehydes, ketones and heterocyclic compounds. Special emphasis on stereoisomerism, mechanisms, and structure determination by spectral analysis. Lect. 2 hrs. per wk.

**CHEM 151-152 Health Science Chemistry I-II** (4 cr.) (4 cr.)

An introduction to chemistry for students in the health sciences. Principles of inorganic, organic and biological chemistry. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**CHEM 198 Seminar and Project** (1-5 cr.)

(see General Usage Courses section)

**CHEM 199 Supervised Study** (1-5 cr.)

(see General Usage Courses section)

**CHEM 221-222 Quantitative Analysis I-II** (4 cr.) (4 cr.)

Prerequisite: CHEM 113. Theory and practice in standard methods of gravimetric, volumetric, colorimetric, and electrometric analysis; special emphasis on equilibrium in acid-base and oxidation-reduction equations and stoichiometry of chemical reactions. The third quarter is devoted to instrumental analysis. Lect 2-2 hrs., Lab 6 hrs., Total 8-8 hrs. per wk.

**CHEM 241-242-243 Organic Chemistry I-II-III** (4 cr.) (4 cr.) (4 cr.)

Prerequisite: CHEM 103 or 113, or equivalent. The fundamentals of organic chemistry. The structure, physical properties, synthesis, and typical reactions of the various series of aliphatic, alicyclic and aromatic compounds with attention to reaction mechanisms. Representative carbon compounds are synthesized with emphasis on basic laboratory techniques. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**CHEM 246-247-248 Organic Chemistry I-II-III** (5 cr.) (5 cr.) (5 cr.)

Prerequisite: high school and freshman college chemistry or equivalent. The fundamentals of organic chemistry; chemical properties, bonding, synthesis, typical reactions, mechanisms and geometry of molecules. The laboratory includes basic techniques, organic synthesis, qualitative analysis and instrumentation. Lect. 3 hrs., Lab. 6 hrs., Total 9 hrs. per wk.

**CHEM 260 Instrumental Chemical Analysis** (2 cr.)

Prerequisite: approval of division. Introduction to the use of special apparatus in chemical analysis. Includes study and use of pH meter, visible and infrared spectrophotometers, gas chromatograph, refractometer, polarimeter, special balances. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.

**CHEM 266 Instrumental Analysis** (4 cr.)

Prerequisite: CHEM 113 or permission of division. Introduction to the principles and applications of special apparatus in chemical analysis. Includes the study of electrochemistry spectroscopy, chromatography, and radiochemistry. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**CHEM 299 Supervised Study** (1-5 cr.)

(see General Usage Courses section)

## CHINESE

**CHIN 101-102-103 Elementary Chinese (Mandarin) I-II-III** (4 cr.) (4 cr.) (4 cr.)

Elementary Chinese (Mandarin) is the basic course for beginners with major emphasis on learning to comprehend and speak the Chinese

(Mandarin) language within a limited context of vocabulary and structure. Intensive aural-oral drilling is used throughout. The development of skills is in the following order-comprehension, speaking, reading, writing. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

## CIVIL ENGINEERING

- CIVL 126 Topographic Drafting** (3 cr.)  
Prerequisites: DRFT 120, MATH 118. Development of the techniques used in topographic data computation, to include the drawing and interpretation of symbols used for cultural, hydrographic, soils and relief, and vegetation presentation on maps and charts. Preparation of maps from survey field data and terrestrial and aerial photography. The use of scale rectification and duplication equipment for map and chart preparation. The techniques for use of color in topographic presentation of special conditions. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- CIVL 140 Construction Planning** (3 cr.)  
Introduction to the equipment used in civil engineering construction and the principles of construction planning. Lect. 3 hrs. per wk.
- CIVL 169 Applied Soil Erosion and Sediment Control** (3 cr.)  
Provides instruction for those who will have responsibility for application, implementation, and inspection of Local Erosion and Sediment Control programs in accordance with the Virginia law and the Virginia Erosion and Sediment Control Handbook. Lect. 3 hrs. per wk.
- CIVL 181-182 Surveying I-II** (4 cr.) (4 cr.)  
Prerequisite: Plane Geometry and Basic Trigonometry. Introduction to surveying, chaining and pacing, direct and profile leveling, measurement of angles, transit-tape traversing, traverse analysis, calculation of areas, adjustment of instruments. Vertical curves, basic and complex horizontal curves, stadia surveying, topographic surveying, preparation and analysis of topographic maps. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- CIVL 197 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)
- CIVL 198 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- CIVL 201 Suburban Development I** (3 cr.)  
Prerequisite: CIVL 182. Preparation of preliminary plans, subdivision computations and preparation of record plats for residential areas. Lect. 2 hr., Lab. 2 hrs., Total 4 hrs. per wk.
- CIVL 202 Suburban Development II** (3 cr.)  
Prerequisite: CIVL 182. Corequisite: CIVL 281. Calculating flow quantities, design of sanitary sewer laterals, street grades and storm sewers as are pertinent to Virginia "3-B" Land Surveyor Registration laws. Preparation of plans and profiles. Lect. 2 hr., Lab. 2 hrs., Total 4 hrs. per wk.
- CIVL 203 Suburban Development III** (3 cr.)  
Prerequisite: CIVL 202. Preparation of residential development plans. Flood plain studies. Lect. 2 hr., Lab. 2 hrs., Total 4 hrs. per wk.
- CIVL 217 Structural Steel Design** (4 cr.)  
Prerequisite: ENGR 152 or equivalent. Design, investigation, and detailing of basic structural steel members. Lect. 4 hrs. per wk.
- CIVL 218 Reinforced Concrete Design** (4 cr.)  
Prerequisite: ENGR 152 or equivalent. Design, investigation and detailing of basic reinforced concrete structural members. Lect. 4 hrs. per wk.
- CIVL 227-228 Structural Drafting I-II** (2 cr.) (2 cr.)  
Fundamentals of structural drafting including the design and fabrication of frame connections, column detailing, welding connections, shop details, and general drafting room procedure. Laboratory includes drawings of timber, steel, and reinforced concrete structures. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.
- CIVL 246 Soil Mechanics** (3 cr.)  
Prerequisite or corequisite: MATH 122. Soil in its relationship to engineering construction. Includes soil weight-volume relationships, stress, shear and strain, bearing capacity, sampling procedures, consolidation, settlement, slope stability, with introduction to retaining walls, piles, underground conduits, and earthdams. Lect. 3 hrs. per wk.
- CIVL 247 Soil Mechanics Laboratory** (1 cr.)  
Corequisite: CIVL 246 or equivalent. Practical soil sampling, classification by Unified Soil Classification System and by ASTM and AASHTO specifications for classifying soils. Laboratory testing of soils to predict engineering performance. Lab. 3 hrs. per wk.
- CIVL 254 Civil Materials I (Concrete)** (3 cr.)  
Prerequisites or corequisites: CIVL 246 (or equivalent) and MATH 122. Properties of portland cement concrete, methods of mix design, use and placement of concrete. Lect. 3 hrs. per wk.
- CIVL 255 Civil Materials II (Asphalt)** (3 cr.)  
Prerequisite or Corequisite: CIVL 246 or equivalent. Properties of bituminous materials, particularly asphalt cement used in construction, methods of mix design, use and placement of asphalt. Lect. 3 hrs. per wk.
- CIVL 257 Concrete Laboratory** (1 cr.)  
Corequisite: CIVL 254. Mixing, curing, testing and quality control of concrete. Lab. 3 hrs. per wk.
- CIVL 258 Bituminous Laboratory** (1 cr.)  
Corequisite: CIVL 255. Testing and quality control of bituminous materials. Mixing, testing, and quality control of asphalt cements. Lab. 3 hrs. per wk.
- CIVL 281 Advanced Surveying I** (4 cr.)  
Prerequisite: CIVL 182. Layout of curves under complex field conditions, route surveying earthwork, slope stakes, land surveying, legal aspects of surveying, public land surveys, introduction to the use of the more sophisticated surveying instruments and traversing equipment, precise leveling. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- CIVL 282 Advanced Surveying II** (4 cr.)  
Prerequisite: CIVL 281. Plane table surveying, surveying astronomy and celestial observations, triangulation, introduction to photogrammetry, scratch pad computer programming of stereotyped surveying problems. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- CIVL 297 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)
- CIVL 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)

## COMPUTER INFORMATION SYSTEMS

- DAPR 106 Principles of Data Processing** (3 cr.)  
An introduction to principles, methods, and techniques of data processing, with emphasis on electronic data processing, capabilities and limitations of automatic data processing equipment; computer languages and applications; organization of data processing systems. Lect. 3 hrs. per wk.
- DAPR 120 Computers and Their Application** (1 cr.)  
An introduction to computational systems, analysis techniques, programming languages. The BASIC language will be used in problem solving. Not for Data Processing majors. Lect. 1 hr. per wk.
- DAPR 124 Structured Computer Programming Concepts (Logic)** (3 cr.)  
Prerequisite: DAPR 106 or division approval. Introduces student to fundamentals and logic underlying problem solving when using an electronic digital computer. Teaches methods and styles of structured or modular flowchart design. Introduces pseudo code as an alternative or supplement in planning the logic of a well structured program. Course utilizes a limited subset of the COBOL programming language as the vehicle to demonstrate problem solutions. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- DAPR 125 Structured Computer Programming (COBOL)** (4 cr.)  
Prerequisite: DAPR 124 or division approval. Designed for students who wish to learn COBOL programming. Incorporates the learning of COBOL with the methods and styles of "Structured" and "Modular" programming. Provides actual experience in the use of basic programming structures. COBOL logic, the basic COBOL language subset, auxiliary storage, and the program development process. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 138 Computer System Architecture** (3 cr.)

Prerequisite: DAPR 106. The study of computer system configuration and its operation under a control program. A detailed study of the components and operation of the CPU and of the interaction between I/O channels and the CPU to achieve overlap between processing and input/output. Lect. 3 hrs. per wk.

**DAPR 149 Computer Programming (Pascal)** (4 cr.)

Prerequisite: DAPR 124 or division approval. Designed for students who want to learn to program using a simple, high-level structured programming language that is being used on large computers as well as on microcomputers. Emphasis is not only on the syntax of Pascal, but also on programming techniques that are applicable to other languages, such as COBOL, FORTRAN and PL/I. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 170 Survey of Software for Microcomputers** (4 cr.)

A practical hands-on introduction to business software in general. Students will acquire an understanding of evaluation techniques through discussion of criteria used in comparing various types of program products. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 174 Data Base Management Systems Software** (4 cr.)

A practical hands-on introduction to microcomputer electronic file management software. Students will acquire a working knowledge of several major DBMS and the evaluation techniques and criteria to use in selecting a DBMS product for their own needs. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 175 Spreadsheet Software** (4 cr.)

A practical hands-on introduction to microcomputer electronic spreadsheet software. Students will acquire working knowledge of several major spreadsheet products and the evaluation techniques and criteria to use in selecting a spreadsheet product for their own purpose. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 179 Integrated Packages Software** (4 cr.)

A practical introduction to the manipulation of data with microcomputer integrated software. Students will acquire working knowledge of several major integrated packages and will learn evaluation techniques and criteria to use in selecting an integrated software product for their own needs. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 197 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)**DAPR 226 Microcomputers** (4 cr.)

Prerequisite: DAPR 106. Computer architecture, languages, and operating systems are studied as they relate to microcomputers. Peripheral equipment that may be used will be emphasized. Applications including the scope and variety of packaged programs will be discussed. Programming using a microcomputer will be required. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 227 Computer Programming (C)** (4 cr.)

Prerequisite: DAPR 124 or divisional approval and a high-level program language. A programming course in C. Topics include control of flow, functions and program structure, pointers and arrays, the UNIX system interface. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 236 Data Processing Management** (3 cr.)

Prerequisite: DAPR 106. Survey of ADP management, covering staff and operating functions; ADP planning, analysis of requirements, system selection, contractual consideration, lease/purchase studies, costing of tangible and intangible benefits. Lect. 3 hrs. per wk.

**DAPR 237 Data Base Management** (4 cr.)

Prerequisite: DAPR 125. Theory, concepts, and practical exercises that involve working with a data base system. Includes the study of several kinds of integrated data structures and the creation, maintenance, and use of an actual data base using the college's computer and data base software. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 246 Data Structures** (4 cr.)

Prerequisite: DAPR 149. Concepts of data items, their structure and the relationships between data items and the access functions that are used to store and retrieve the data items. Linear structures (sets, stacks, queues, lists) trees and graphs; arrays matrices and tables (hash tables). Use of algorithms to describe memory storage of data structures. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 256 Computer Programming (Advanced COBOL)** (4 cr.)

Prerequisite: DAPR 125. Experience in programming in an operating system environment. The characteristics of OS, use of job control language, files, utility programs, and analysis of error messages. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 258 Computer Programming: BASIC** (3 cr.)

Prerequisite: DAPR 106 or instructor's permission. The study and development of programming capabilities in Beginners' All-Purpose Symbolic Instruction Code (BASIC) including program logic, file manipulations, file development, solving of business oriented problems. The BASIC language is used in an interactive mode of communication with a computer. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**DAPR 266 Computer Programming (FORTRAN)** (4 cr.)

Prerequisite: DAPR 124 or division approval. The business applications of FORTRAN including input-output, floating point arithmetic, loop control, and functions. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 268 Computer Programming (PL/I)** (4 cr.)

Prerequisite: DAPR 124 or division approval. The study and development of programming capability in the IBM System 360 computer language PL/I. Provides student capability to program in this language. Includes relative advantages and disadvantages of this higher level language in installations using medium scale and large scale computer systems and continuation of the study of magnetic tape and random access programming. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 269 Computer Programming (Assembler)** (4 cr.)

Prerequisite: DAPR 124 or division approval. The study and development of a manufacturer's assembly language. The student will write and debug programs in an assembler language, and also be capable of employing this language in a total programming system. The principles of a de-bugging and core-dump reading will be given major emphasis. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 271 Computer Programming (Advanced Assembler)** (4 cr.)

Prerequisite: DAPR 269. A study of the development of programming capabilities utilizing peripheral devices in addition to the card reader/punch and the printer. Among the peripherals will be direct-access devices and magnetic tape devices. The study of typical applications essential for a business programmer to have a knowledge of the uses, the instructions, and programming techniques required to utilize these devices. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 276 Computer Programming (Advanced FORTRAN)** (4 cr.)

Prerequisite: DAPR 266. Experience in programming in a disk and/or tape environment. Modularization and overlay structure. Computational error processing and debugging techniques. Data management techniques. Extensive practical problem solution using control software and command language, assembly language subroutines, and utility packages. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 277 IBM OS/Job Control Language** (3 cr.)

Prerequisite: DAPR 124 or equivalent. Use and theory of IBM OS/JCL. Practical experience in coding several problems using JCL will be included. The course is oriented toward students currently working as programmers with a requirement for greater familiarity with JCL as well as advanced programming students preparing for programming careers. Lect. 3 hrs. per wk.

**DAPR 281 Systems Analysis** (3 cr.)

Prerequisite: DAPR 106. A study of the overall computer based system analysis and design process; information problems of business organization and the inter-relationship of functions; nature of business problem isolation and definition; initial phase of systems analysis and evaluation. Lect. 3 hrs. per wk.

**DAPR 286 Computer Program Applications** (4 cr.)

Prerequisite: DAPR 281. The characteristics and requirements of basic business applications. Design of a computer solution to an application as a case study. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**DAPR 287 Computer Software Systems** (3 cr.)

Prerequisite: DAPR 125 or division approval. A study of components, functions and relationships of computer operating systems and their interactions with user programs. Lect. 3 hrs. per wk.

**DAPR 290 Coordinated Internship** (1-5 cr.)  
(see General Usage Courses section)

- DAPR 297 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)
- DAPR 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- DAPR 299 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)

## COMPUTER SCIENCE

- CSCI 201 Principles of Computer Science I** (4 cr.)  
Corequisite: MATH 141 or Division Approval. An introductory course in problem solving methods in algorithmic development. The course will emphasize the use of good programming style and designing coding, debugging and documenting programs. Pascal or another appropriate high level programming language. Lect. 4 hrs. per wk.
- CSCI 202 Principles of Computer Science II** (4 cr.)  
Prerequisites: CSCI 201 and MATH 141. Structured programming and data structures. Continuing concepts of good programming style from CSCI I. Introduces second high level programming language such as FORTRAN or other appropriate language. Emphasizes structured programming concepts, algorithmic analysis, data structures and student development of programs. Lect. 4 hrs. per wk.
- CSCI 203 Principles of Computer Science III** (4 cr.)  
Prerequisite: CSCI 202. Data structures course which continues the concepts of good programming style and algorithmic analysis from CSCI II. Emphasizes basic aspects of processing computer data such as string processing, searching, sorting, linear and linked allocation and recursion. Extensive emphasis on student development of large programs. Lect. 4 hrs. per wk.
- CSCI 210 Computer Logic and Numeric Representation** (4 cr.)  
Prerequisite: CSCI 201. A course designed to introduce computer architecture, computer arithmetic and basic logic design. The mechanics of information transfer and control within a computer system will be examined. Basic hardware, logic, design, data representation and interaction between I/O channels and CPU are studied. Programming activities involving a high level programming language will be included. Lect. 4 hrs. per wk.
- CSCI 214-215 Computer Structure and Machine Language I-II** (5 cr.) (4 cr.)  
Prerequisites: ENGR 106 or CSCI 201. Courses in computer structure and machine language. The sequence examines the influence of computer architecture on machine languages. Emphasizes instruction in Assembly language and examines the use of macros and incorporates advanced Assembler techniques. Emphasis is placed on student program development. Lect. 5-4 hrs. per wk.
- CSCI 218 Organization of Programming Languages** (4 cr.)  
Prerequisites: CSCI 214 and CSCI 203. The course examines the organization of programming languages. Investigates language definition, data types and structures, control structures and data flow, run time behavior, and interpretive languages. Emphasizes student program development. Lect. 4 hrs. per wk.

## DECORATING

- DECO 104-105 Introduction to Interior Decorating I-II** (3 cr.) (3 cr.)  
Learning the principles and applications of residential interior decorating with emphasis on color theory and space planning as well as presentation methods. Lect. 3 hrs. per wk.

## DENTAL

- DENT 108 Introduction to Dental Health Care Delivery** (3 cr.)  
Introduction to dental profession and supporting personnel, history and development of dentistry; the role of the dental auxiliaries in clinical setting and to members of dental laboratory craft and others of the dental health team; dental ethics and jurisprudence; professional and educational opportunities. Lect. 3 hrs. per wk.

- DENT 116 Dental Laboratory Materials** (4 cr.)  
A study of the chemical composition, physical properties, and uses of metallic and non-metallic dental materials, denture and tooth resins, porcelain, waxes and duplicating materials. The lab exercises are designed to illustrate the properties and uses of the materials studied including their inherent limitations. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

- DENT 126 Oral Anatomy** (3 cr.)  
Prerequisite: Admission to Dental Hygiene Program. The study of the anatomy, structure, morphology and function of the oral structures including primary and permanent dentition. Laboratory procedures to include identification, eruption sequence, reproduction of tooth form through drawings, study of skulls, principles of occlusion and root anatomy with correlation of tooth form and position to intra-oral arch. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

- DENT 127 General and Oral Histology** (3 cr.)  
The minute structure of the tissues of the body with particular reference to the teeth and the supporting tissues. Morphology of different tissues, early embryonic development, histologic features of the structures of the oral cavity. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

- DENT 128 Head and Neck Anatomy** (2 cr.)  
The anatomy and physiology of the structures of the head and neck. Lect. 2 hrs. per wk.

- DENT 134 Dental Radiography I** (4 cr.)  
Prerequisite: Placement in Dental Assist. Program. An introduction to the principles of radiographic procedures used in dentistry. Emphasis on identification of hazards in taking radiographs, identification of x-ray films, exposure, development and mounting and operation of tube x-ray head, timer and control panel. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

- DENT 135 Dental Radiography II** (4 cr.)  
Prerequisite: DENT 134. The physics of radiation, practice in advanced specialized dental exposure techniques and recognition of anatomical landmarks and pathological lesions of the head and neck region. Lecture 2 hours, Laboratory 4 hours, Total 6 hours per week.

- DENT 136 Pharmacology** (2 cr.)  
The chemical therapeutic agents used in dentistry, including their preparation, effectiveness, and specific applications. Lect. 2 hrs. per wk.

- DENT 137 Dental Anatomy and Physiology** (4 cr.)  
Introduction to human anatomy and physiology. Emphasis on regions of the head and neck and the primary and permanent teeth. Laboratory exercises include: accurate scale drawings of all teeth except the permanent third molars; tooth carvings, coronal and root portions; and the four permanent teeth; maxillary central incisor, maxillary cuspid, maxillary first bicuspid, and maxillary first molar. Lect. 2 hrs., Lab. 6 hrs., Total 8 hrs. per wk.

- DENT 138 Community Dental Health** (4 cr.)  
Introduction of the dental hygienist to community health problems, public health, and related institutions. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

- DENT 141 Dental Laboratory Technology I** (7 cr.)  
Designed to assist students in acquiring the knowledge, understanding, appreciations and attitudes basic to effective construction of complete dentures. Beginning skills in dental laboratory technology methods are developed through planned laboratory exercises and other supervised activities. Lect. 3 hrs., Lab. 12 hrs., Total 15 hrs. per wk.

- DENT 142 Dental Laboratory Technology II** (7 cr.)  
An introduction to the procedures and methods used in the construction of cast removable partial dentures. Emphasis is on making of refractory models, waxing, spruing, burnout casting and the finishing and polishing of the partials. Lect. 3 hrs., Lab. 12 hrs., Total 15 hrs. per wk.

- DENT 143 Dental Laboratory Technology III** (7 cr.)  
The purpose of this course is to develop an understanding of, and some abilities in, the techniques of crown and bridge construction employed by the commercial laboratories in and around the area. Emphasis will also be placed on the construction of inlays and ceramic restorations. Lect. 3 hrs., Lab. 12 hrs., Total 15 hrs. per wk.



- DENT 144 Dental Hygiene I** (5 cr.)  
The introduction to clinical knowledge and skills for the performance of dental hygiene services and medical and dental emergencies, basic skill components, lab manikins, and patient practice. Lect. 3 hrs., Lab. 6 hrs., Total 9 hrs. per wk.
- DENT 145 Dental Hygiene II** (5 cr.)  
Prerequisite: DENT 144. Clinical performance of dental hygiene services includes the use and techniques of dental radiology. Lect. 2 hrs., Lab. 9 hrs., Total 11 hrs. per wk.
- DENT 146 Oral Radiographic Techniques** (3 cr.)  
A study of the nature, physical behavior, biological effects, methods of control, safety precautions, and techniques for exposing, processing and mounting x-rays. Laboratory procedures will include the application of these techniques. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- DENT 147 Nutrition** (3 cr.)  
Study of nutrition as it relates to dentistry and general health. The principles of nutrition as applied to the clinical practice of dental hygiene. Lect. 3 hrs. per wk.
- DENT 148 Office Practice and Ethics** (2 cr.)  
The principles of dental ethics and economics as they relate to the dental hygienist. The course will also include a study of jurisprudence and office procedures. Lect. 2 hrs. per wk.
- DENT 150 General and Oral Pathology** (3 cr.)  
Introduction to general pathology with consideration of the common diseases affecting the human body. Particular emphasis is given to the study of pathological conditions of the mouth, teeth and their supporting structures. Lect. 3 hrs. per wk.
- DENT 154-155 Periodontics for Dental Hygiene I-II** (2 cr.) (2 cr.)  
Introduction of periodontics to the dental hygienist-anatomy and physiology, periodontal pathology and clinical determination of cases. Techniques in prevention and management of periodontics and special patient problems. Lect. 2 hrs. per wk.
- DENT 166 Orthodontic and Pedodontic Appliances** (3 cr.)  
Prerequisite: DENT 142. An introductory self-paced course developing the student's ability to fabricate and repair pedodontic and orthodontic appliances. This laboratory-didactic course will utilize programmed instruction augmented by individualized assistance and demonstration. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- DENT 190 Coordinated Practice** (1-5 cr.)  
(see General Usage Courses section)
- DENT 198 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- DENT 238 Community Dental Health Education** (3 cr.)  
Prerequisite: DENT 138. Orientation to the educational materials, devices and techniques for group dental health instruction. Techniques of group presentations are studied including: educational methods and materials, communication skills and psychological approaches to modifying behavior as it relates to improving oral health. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- DENT 240 Introduction to Maxillo-Facial Prosthetics** (3 cr.)  
Prerequisite: DENT 142. Introductory maxillo-facial design and production. Emphasis will be placed on maxillo-facial procedures and techniques commonly utilized in health care institutions. Lect. 3 hrs. per wk.
- DENT 244 Dental Laboratory Technology IV** (7 cr.)  
A practical laboratory course designed to introduce the student to the study of articulation and occlusion and to the basic principles of surveying and designing cast removable partial dentures. Efforts will be made to produce, under the instructor's direction, a variety of restorations, in the specialty chosen by the student, which must closely parallel those cases found in the average dental practice. Lect. 3 hrs., Lab. 12 hrs., Total 15 hrs. per wk.
- DENT 245 Dental Laboratory Technology V** (8 cr.)  
An advanced and intensified study of the specialties covering areas diverging from the normal. The case and problem method is stressed. Lect. 3 hrs., Lab. 15 hrs., Total 18 hrs. per wk.
- DENT 246 Dental Laboratory Technology VI** (8 cr.)  
A continuation of DENT 245 in which the student is placed in an environment closely paralleling conditions found in the field. Emphasis will be placed on the construction of dental restorations requiring the efforts of 2 or more of the specialties. Lect. 1 hr., Lab. 21 hrs., Total 22 hrs. per wk.
- DENT 247 Dental Laboratory Technology Practice** (4 cr.)  
Prerequisite: DENT 245. Advanced instruction in five dental laboratory technology specialties including fixed (crown and bridge) appliances, complete denture appliances, removable partial denture appliances, orthodontic/pedodontic appliances, and dental ceramics. Each student will be expected to develop acceptable skills in at least two of these specialties. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- DENT 261 Dental Hygiene III** (6 cr.)  
Lecture to include oral surgery, anesthesia, endodontics, and seminars. Laboratory-Dental prophylaxis and oral hygiene preventive procedures to be performed on both children and adults in supervised clinic facilities. Care of patients with specific needs, and plaque control. Lect. 2 hrs., Lab. 12 hrs., Total 14 hrs. per wk.
- DENT 262 Dental Hygiene IV** (5 cr.)  
Lecture to include oral diagnosis, orthodontics and seminar. Laboratory-Dental prophylaxis and oral hygiene preventive procedures to be performed on both children and adults in supervised clinic facilities. Care of patients with specific needs, nutrition counseling and plaque control. Expanded duties limited to dental hygiene. Lect. 1 hr., Lab. 12 hrs., Total 13 hrs. per wk.
- DENT 263 Dental Hygiene V** (5 cr.)  
Lecture to include pedodontics and seminars. Laboratory-Dental prophylaxis and oral hygiene preventive procedures to be performed on both children and adults in supervised clinic facilities. Care of patients with specific needs, nutrition counseling and plaque control. Expanded duties limited to dental hygiene. Lect. 1 hr., Lab. 12 hrs., Total 13 hrs. per wk.
- DENT 264 Dental Hygiene VI** (5 cr.)  
Lecture to include dental research and seminars. Laboratory-Dental prophylaxis and oral hygiene preventive procedures to be performed on both children and adults in supervised clinic facilities. Care of patients with specific needs, nutrition counseling and plaque control. Expanded duties limited to dental hygiene. Lect. 1 hr., Lab. 12 hrs., Total 13 hrs. per wk.
- DENT 265 Dental Hygiene VII** (5 cr.)  
Prerequisite: Completion of six quarters in the Dental Hygiene program. Application of both basic and advanced dental hygiene skills as necessary in clinical practice. Instruction in phases of dental chairside assisting. The role of the dental hygienist in the practice of dental specialties is explored. Lect. 1 hr., Lab. 12 hrs., Total 13 hrs. per wk.
- DENT 290 Coordinated Practice** (1-5 cr.)  
(see General Usage Courses section)
- DENT 297 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)
- DENT 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- DENT 299 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)

## DIETETICS

- DIET 100 Introduction to Dietetics** (1 cr.)  
Orientation to the field of dietetics, roles and relationships within the profession, and interrelationships with other health professions. Lect. 1 hr. per wk.
- DIET 106 Dietetics and the Health Field** (3 cr.)  
A study of the role of the dietetic profession in the health care field, history of the growth and development of the profession; techniques of effective interaction with patients and other members of the nutritional care and health-care teams; ethics and standards of conduct; educational and career opportunities. Lect. 3 hrs. per wk.



- DIET 121-122-123 Nutrition Science I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Prerequisites: one unit of high school chemistry or biology or divisional approval. The interrelationships among chemistry/biology and human digestion, absorption and metabolism. Covers some aspects of cellular biochemistry. Also introduces applied and therapeutic nutrition concepts as related to physiological demands. Lect. 3 hrs. per wk.
- DIET 130 Nutritional Care** (3 cr.)  
A study of nutrition for both normal and basic modified diets as applied to food service supervision in schools, hospitals, nursing homes, and other health care facilities and institutions. Covers: Nutritional care throughout the life cycle and the application of such diet modification as high/low caloric, bland, controlled fat, low sodium, diabetic, etc. Lec. 3 hrs. per wk.
- DIET 134-135 Nutrition I-II** (3 cr.) (3 cr.)  
Food sources, digestion, absorption and metabolism of nutrients essential to the health of individuals and groups throughout the life cycle; the application of the principles of good nutrition to various segments of society in the community. Lect. 3 hrs. per wk.
- DIET 136 Current Concepts in Diet and Nutrition** (3 cr.)  
Basic course in general nutrition dealing with the relationship that proper diet has to good health and well-being in daily life. Includes such current topics as diet and weight control, fad diets, popular misconceptions in nutrition, diet and heart disease, and special and therapeutic diets. Considers sound eating patterns for good nutritional health for various age and physiological situations. Lect. 3 hrs. per wk.
- DIET 137 Basic Nutrition for School Children** (3 cr.)  
Covers basic principles of nutrition especially as applied to child feeding programs. Emphasis is on the importance of good nutrition to the health of the school child, as well as educational techniques to assist in teaching the development of wholesome food habits in children. Lect. 3 hrs. per wk.
- DIET 138 Community Nutrition** (3 cr.)  
Prerequisites: DIET 121, 122, 134. This course covers the relationship between community nutrition program and the health, well-being and productivity of individuals and families. It also covers community nutrition programs, nutrition problems needing intervention, nutrition education techniques and current issues. Lect. 3 hrs. per wk.
- DIET 140 Food Preparation and Management Systems** (3 cr.)  
A course in quality control applied to food service supervision in schools, hospitals, nursing homes, and other health care facilities. Includes principles of food preparation, recipe standardization, purchasing, equipment, sanitation and safety concepts of management, cost control, and merchandising. Lect. 3 hrs. per wk.
- DIET 146 Menu Planning for Nutrition Programs** (3 cr.)  
A course designed for persons currently employed or seeking employment in the field of nutrition. Menu planning based on guidelines for federally regulated nutrition programs with emphasis on nutritional adequacy and acceptability. Includes mechanics of menu planning, food preferences of school children, advantages and disadvantages of different types of systems, conventional and convenience foods, vending and satellite systems. Lecture 3 hours per week.
- DIET 147 Financial Management for Nutrition Programs** (3 cr.)  
Identification and allocation of costs in school food service programs. Course includes food service accounting, budgeting, fiscal information on total program and by-program basis, expenses, fiscal data, organizational data, and revenues. Lect. 3 hrs. per wk.
- DIET 190 Coordinated Practice** (1-5 cr.)  
(see General Usage Courses section)
- DIET 198 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- DIET 210 Food Services Computer Applications** (3 cr.)  
Prerequisites: DIET 134, 135, 140 or division approval. An applied course intended to allow students and in-service personnel to develop a knowledge of computer technology as applied to the effective operation of a food service department. Covers care of clients at different stages of the life cycle and in various disease states. Both management and nutritional care will be addressed as well as computer hardware, software, terminology, and applications. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- DIET 226 Nutritional Assessment and Planning** (3 cr.)  
Prerequisites: DIET 121, 122, 123, 134, 135. The principles of nutrition assessment; the procedures used in identifying individuals and groups at risk; and the planning, implementation, monitoring and evaluation of activities required to institute a successful nutritional intervention program. Lect. 3 hrs. per wk.
- DIET 234-235 Therapeutic Nutrition I-II** (4 cr.) (3 cr.)  
Prerequisite: DIET 135, or equivalent, or permission of division. Application of nutrition principles to the dietary treatment of hospital patients. Lect. 3-2 hrs., Lab. 3 hrs., Total 6-5 hrs. per wk.
- DIET 246 Quantity Food Production and Purchasing** (3 cr.)  
Principles of quality control in the production of large quantities of foods through the use of standardized recipes, accurate measuring and weighing techniques, and food purchasing and storage of quantity food production. Lect. 3 hrs. per wk.
- DIET 247 Training and Supervision of the Dietetic and School Food Service Worker** (3 cr.)  
Supervisory practice and training related to dietetic workers in health care institutions and school food service operations. Covers problems and methods required in training and directing activities related to equipment and food production, as well as methods of indoctrinating the unskilled worker in sound nutritional practices. Lect. 3 hrs. per wk.
- DIET 290 Coordinated Practice** (1-5 cr.)  
(see General Usage Courses section)
- DIET 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)

## DRAFTING

- DRFT 76 Welding Blueprint Reading** (2 cr.)  
Welding procedures and applications, structural steel, symbology, design, layout, and industrial symbols. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.
- DRFT 111 Technical Drafting I** (2 cr.)  
Introduction to the techniques and instruments required for success as a draftsman in industry. Use of instruments, lettering, simple descriptive and analytic geometry principles as applied to drafting and freehand sketching, basic principles of orthographic projection in the preparation of simple drawings. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.
- DRFT 112 Technical Drafting II** (2 cr.)  
Prerequisite: DRFT 111 or equivalent. Sections and conventions, threads and fasteners, pictorial drawings, auxiliaries and revolutions. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.
- DRFT 113 Technical Drafting III** (2 cr.)  
Prerequisite: DRFT 112 or equivalent. Assembly and detail drawings, working from the simple to the complex. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.
- DRFT 120 Introduction to Graphic Representation** (3 cr.)  
The use of instruments, lettering, sketching, and drawing conventions neat, legible drawings and the value of visual presentations in technology. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- DRFT 144 Automotive Drawing Interpretation I** (2 cr.)  
Reading and interpretation of automotive shop drawings, including assembly and exploded drawings of automotive assemblies. Lect. 2 hrs. per wk.
- DRFT 151-152 Engineering Drawing Fundamentals I-II** (3 cr.) (3 cr.)  
An introduction to mechanical engineering drawing from drafting fundamentals to advanced problems in industrial drafting practices. Includes lettering, geometric construction, technical sketching, orthographic projection, sections, intersections, developments, fasteners, theory and application of dimensioning and tolerancing, electrical and electronics drawings, shop practices, preparation of assembly and work drawings. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.
- DRFT 154 Advanced Technical Illustration I** (3 cr.)  
Prerequisite: DRFT 151, DRFT 231, or divisional approval. The development of isometric and axonometric projections and perspective drawing with the use of a computer-aided drafting system, along with

developing inking techniques on the drawing board. Lect. 1 hr., Lab., 6 hrs., Total 7 hrs. per wk.

**DRFT 155 Advanced Technical Illustration II** (3 cr.)

Prerequisite: DRFT 154. Emphasis will be placed on computer-aided drafting, mechanical and free-hand drawing of three-dimensional objects, development of schematic and diagram presentations, exploded illustrations and shading techniques. Lect. 1 hr., Lab 6 hrs., Total 7 hrs. per wk.

**DRFT 170 Electrical Drawing Interpretation** (2 cr.)

Designed for the appliance repair student. Reading and interpretation of electrical, electronic and electromechanical drawings, convention symbols, terminology, and principles used by the electrical and mechanical draftsman, wiring diagrams, schematic drawings, printed circuits. Lect. 2 hrs.

**DRFT 177 Architectural Blueprint Reading** (3 cr.)

Emphasis on reading, understanding and interpreting standard types of architectural drawings including plans, elevations, sections and details. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**DRFT 197 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)

**DRFT 198 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)

**DRFT 200 Introduction to Computer Aided Drafting** (3 cr.)

An overview of the concepts of computer aided drafting. Lect. 3 hrs. per wk.

**DRFT 206 Numerical Control Drafting** (3 cr.)

Prerequisite: DRFT 152. Graphical procedures as applied to numerical control, computer-assisted design and drafting equipment, and programming drafting problems. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**DRFT 211 Advanced Technical Drafting V** (3 cr.)

Prerequisite: DRFT 113. Use of drafting machines with emphasis on the knowledge and skill required for typical industrial drawing. Electrical and electronic symbols and drawings, piping, complicated gearing drawings, sections, and layout skill in lettering of all types. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.

**DRFT 212 Advanced Technical Drafting VI** (3 cr.)

Prerequisite: DRFT 211. Electronic and electromechanical drawings, sheet metal fabrication, radii, fillets, and tolerances; use of ink in lettering and ruling. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.

**DRFT 213 Advanced Technical Drafting VII** (3 cr.)

Prerequisite: DRFT 212. Design drafting in all aspects as a means of communication. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.

**DRFT 231 Computer Aided Drafting I** (3 cr.)

Prerequisite: Permission of instructor. Computer aided drafting concepts and equipment designed to develop a general understanding of components of a typical CAD system and its operation. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**DRFT 232 Computer Aided Drafting II** (3 cr.)

Prerequisite: DRFT 231. Intermediate operations and working drawings on CAD systems. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**DRFT 233 Computer Aided Drafting III** (3 cr.)

Prerequisite: DRFT 232. Advanced operation in Computer Aided Drafting. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**DRFT 256 Electronics Drafting** (2 cr.)

Fundamental principles, practices and methods of presenting electro-mechanical information through the graphic language. Principles of projection, fastening, materials and finishes, chassis design and fabrication, electronic symbology, diagrammatic drawings, printed circuit drawings and checking of electronic drawings. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.

**DRFT 266 Computer Graphics** (3 cr.)

The use of the digital plotter and the mini-computer in solving graphics problems by computer. BASIC language will be used to assist students in programming the computer to solve graphics problems: nomographs, bar graphs, simple machine drawings and electrical schematics. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**DRFT 297 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)

**DRFT 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)

## ECONOMICS

**ECON 147 Consumer Economics** (3 cr.)

Designed to foster an understanding of the American economic system and the individual's role as a consumer in that system. Lect. 3 hrs. per wk.

**ECON 160 American Economics** (3 cr.)

A survey of the history, principles, and policies of the American economic system. Some comparison with alternative economic systems. Lect. 3 hrs. per wk.

**ECON 198 Seminar and Project** (1-5 cr.)

Prerequisite: division permission.  
(see General Usage Courses section)

**ECON 211-212-213 Principles of Economics I-II-III** (3 cr.) (3 cr.) (3 cr.)

The principles of economics and the bearing of these principles on present American conditions, structural and functional aspects of the economy. Analysis, problems and issues relating to organization of business, labor and government institutions and economic stability and growth. Measurements of economic activity. Private enterprise, economic growth and stabilization policies, monetary and fiscal policy. International economic relationships, alternative economic systems. Lect. 3 hrs. per wk.

**ECON 214-215 Principles of Economics I-II** (5 cr.) (4 cr.)

The principles of economics and the bearings of these principles on present American conditions; structural and functional aspects of the economy. Analysis, problems and issues relating to the organization of business, labor, and government institutions and their economic stability and growth. Measurements of economic activity. Private enterprise, economic growth and stabilization policies, monetary and fiscal policy. International economic relationships, alternative economic systems. Lect. 5-4 hrs. per wk.

**ECON 241 Money and Banking I** (3 cr.)

A review of the history of American banking institutions; banking theories, principles and practices; emphasis is placed on relationship of finances to business structure, operation and organization; present-day financial structures, agents, problems and institutions are examined in depth. Lect. 3 hrs. per wk.

**ECON 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)

**ECON 299 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)

## EDUCATION

**EDUC 098 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)

**EDUC 100 Orientation to Childhood Development and Education** (2 cr.)

The course is designed to provide an entering overview of the basic theories, activities, responsibilities, and practice involved in Educational Services curricula at the community college level. Topics include program expectations, field placement responsibilities and guidelines, and career opportunities. Students will recognize and understand expectations and responsibilities of early childhood, educational associate, and special education fields. Lect. 2 hrs. per wk.

**EDUC 106 Language Arts for Young Children** (3 cr.)

The techniques and methods for encouraging the development of language skills in the young child. Improvement of vocabulary, speech and discussion stimulation will be emphasized. Surveys the best prose and verse; examines techniques of story telling, and stresses use of audio-visual materials. Lect. 3 hrs. per wk.

- EDUC 109 Early Intervention for the Physically Handicapped Preschooler** (3 cr.)  
Designed to introduce the student to, and enable the student to work with, the multiplicity of physical handicaps prevalent in the preschool age population. Emphasis on exploration of movement, gross and fine motor skills, play, recreational, and rhythmic activities as they pertain to the physically handicapped preschool age child. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- EDUC 111-112-113 Educational Techniques in Child Study I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Methods, skills, and techniques of gathering observational data on young children. Running records, timed observations, behavior checklists, sociograms and other techniques of observing children will be considered. Emphasis on understanding developmental patterns in the physical, social, emotional, and intellectual areas of a child's development through analysis of the records. Lect. 3 hrs. per wk.
- EDUC 116 Library Utilization for Instructional Aides** (3 cr.)  
Familiarization and utilization of library materials for preparation of instructional materials by instructional aides. Current literature and its application to the classroom. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- EDUC 117 Introduction to Reading Methods** (3 cr.)  
Introduction to the current practices of teaching reading in the elementary school. Familiarization with materials currently in use, observation of various reading techniques and trends in the classroom. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- EDUC 121-122-123 Childhood Education I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Theory and concepts of early childhood education (121) elementary age education (122), and adolescent education (123). Characteristics for each age group covering the following categories: general relations with adults; intellectual skills; physical growth; and relations with children in their own peer group. Lect. 3 hrs. per wk.
- EDUC 126 Learning Disabilities** (3 cr.)  
Designed for early childhood and primary grades personnel and primarily concerned with identification, assessment, and amelioration of specific learning problems from a preventive rather than remedial standpoint. Includes a survey of both in-depth and informal assessment procedures and devices, with application to "matching" differential diagnosis with specific instructional materials and strategies. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- EDUC 127 Problem Solving in Early Childhood Education** (3 cr.)  
Educational techniques to help the instructional aide to deal with emotional problems in the normal child in the classroom situation. Lect. 3 hrs. per wk.
- EDUC 128 Perceptual Motor Development of the Preschooler** (2 cr.)  
Content underlines the importance and implications of selected activities influencing the development of perceptual motor skills during the youngster's early years. Perceptual motor theory and practical application of theory in utilizing readily obtainable resources which will encourage the child's development. Lect. 2 hrs. per wk.
- EDUC 130 Instructional Equipment Laboratory** (1 cr.)  
The operation and use of standard instructional equipment with emphasis upon audiovisual equipment such as movie projectors, tape recorders, slide projectors, and tutorial machines; general procedures for obtaining films and other special learning materials. Lab. 3 hrs. per wk.
- EDUC 136 Materials and Equipment for Instructional Aides** (3 cr.)  
The preparation of view graphs, the construction of graphic charts, and other aides; how to select slides and develop material for classroom presentation. The operation, care and use of instructional equipment, including audiovisual equipment most used in the classroom. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- EDUC 137 Creative Activities for Children** (3 cr.)  
This course is designed to prepare individuals for working with young children in art and other creative activities. Emphasizes coverage of suitable materials and the laboratory application. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- EDUC 140 Modern Mathematics Concepts** (3 cr.)  
The techniques and materials used to develop mathematical patterns and concepts in pre-school and primary modern mathematics programs.
- Instructional aides will learn to prepare, collect and work with materials used to develop mathematical concepts in children. Lect. 3 hrs. per wk.
- EDUC 150 Modern Science Concepts** (3 cr.)  
The content and methods of teaching science in the elementary school, beginning with the everyday environment of the child and leading to basic generalizations in science. Lect. 3 hrs. per wk.
- EDUC 161-162 Educational Techniques I-II** (3 cr.) (3 cr.)  
Provides instructional assistants who are not already employed in a school situation with the supervised practical experience necessary for effective assistance to the classroom teacher. Supervised experience with children at selected schools, child care centers, and other institutions of learning to give prospective instructional assistants opportunities to observe, participate in & evaluate the interaction of teachers, instructional assistants and children. Lectures will include preparation for practicum experiences, and the review and evaluation of those experiences. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- EDUC 167 Education Skills for Urban Areas** (3 cr.)  
Designed to sensitize students to the needs of residents in urban areas by helping them understand the social, psychological and economic complexities of the urban environment while developing professional education skills to work in urban areas. Lect. 3 hrs. per wk.
- EDUC 174 Parent Education I** (3 cr.)  
An introduction to effective parent/child communication and interaction, with special emphasis on listening skills, responsibility, encouragement, growth, problem solving processes, and discipline. Also explored will be methods in working with parents. Lect. 3 hrs. per wk.
- EDUC 175 Parent Education II** (3 cr.)  
Prerequisite: EDUC 174. Advanced topics in parenting with special emphasis on group and individual concerns. Topics will be centered on pre-school and elementary age children. A family case study will be required, and techniques of working with parent groups will be demonstrated. Lect. 3 hrs. per wk.
- EDUC 176 Single Parent Families** (3 cr.)  
Discusses the issues surrounding single-parent families and the causal factors including: separation, divorce, death, teenage pregnancies and the effect on both the parent and the child. A study will be made to familiarize the student with services available in the community which support the single-parent family. Lect. 3 hrs. per wk.
- EDUC 178 Parents of the Special Needs Child** (3 cr.)  
This course will focus on guiding the parent to cope with special problems of the child including: mental retardation, learning disorders, and physical handicaps. An investigation of services available in the community which support both parent and child will be made. Lect. 3 hrs. per wk.
- EDUC 179 Deaf Education** (3 cr.)  
A comprehensive awareness of all aspects of deafness. Acquisition of language skills, principles, and techniques with the deaf. Materials evaluation, and instructional needs of the deaf. Communication with the deaf. Knowledge of the Alphabet system used in sign language. Lect. 3 hrs. per wk.
- EDUC 186 Child Study** (3 cr.)  
Prerequisite: PSYC 130. An advanced course in child development including methods of child study, theories of child development, implications for direct work with children, and a case study of an individual child. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- EDUC 190 Coordinated Internship** (1-5 cr.)  
(see General Usage Courses section)
- EDUC 197 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)
- EDUC 198 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- EDUC 210 Introduction to Special Education** (3 cr.)  
Prerequisites: PSYC 130 and EDUC 121. A brief overview of the history of special education. The role and responsibilities of the paraprofessional in special education. Emphasis will be on working with educationally and neurologically handicapped. Lect. 3 hrs. per wk.

**EDUC 217 Models of Child Development Programs (3 cr.)**

Study and discussion of purposes, licensing and staff requirements. Various models and theories of child care will be emphasized. Field trips to various child care centers. Lect. 3 hrs. per wk.

**EDUC 236 Child Development Programs Planning and Management (3 cr.)**

Prerequisites: PSYC 130 and EDUC 121. An intensive course in program planning, methods and materials for activities with young children including theoretical bases. An integral part of the course will be emphasis upon professionalism, personality, and interpersonal skills in the teacher-paraprofessional roles. Positive guidance techniques and classroom management and its relation to healthy personality development. Lect. 3 hrs. per wk.

**EDUC 246 Educational Law (3 cr.)**

The application of rules of law to the operation of the public schools in Virginia. Legal aspects of the principal instruments of school activities, rights and liabilities of school employees, legal aspects of negotiable instruments and securities. Lect. 3 hrs. per wk.

**EDUC 267 Diagnostic/Prescriptive Teaching (3 cr.)**

Prerequisites: PSYC 231, EDUC 121, and EDUC 126 or 128. Survey of the rationale, operational models, techniques, and problems relevant to implementation of Diagnostic/Prescriptive Teacher programs. Students will gain skills in implementing diagnostic prescriptions for learning disabled children. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**EDUC 297 Cooperative Education (1-5 cr.)**

(see General Usage Courses section)

**EDUC 298 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)

**ELECTRONICS TECHNOLOGY****ELEC 94 Practical Electricity I (3 cr.)**

The fundamentals of electricity, terminology and symbols, diagrams, the principles essential to the understanding of general practices, safety, and the practical aspects of residential and non-residential wiring and electrical installation. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**ELEC 98 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)

**ELEC 099 Supervised Study (1-5 cr.)**

(see General Usage Courses section)

**ELEC 110 Introductory Electricity (4 cr.)**

Principles of electricity covering voltage (AC and DC), resistance, and current. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 120 Tubes and Transistors (4 cr.)**

Prerequisite or corequisite: ELEC 169. A course concerned with how electronic devices work and the characteristics of these devices. Both tube and solid state device characteristics are covered. This course utilizes the mathematical tools as they become available and the ideas of electronic flow and circuit analysis as they are developed in the fundamentals of electricity course. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 122 AC Circuits (4 cr.)**

Study of capacitors, inductors and AC circuits. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 123 Advanced AC Circuits (4 cr.)**

A continuation of AC analysis. Includes AC power, resonance circuits, transformers and AC network theorems. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 124 Electronic Devices I (4 cr.)**

Corequisite: ELEC 169. A study of semiconductor and vacuum tube devices with the emphasis on theory of operation, performance characteristics and the physical concepts involved. Devices to be considered include semiconductor rectifiers, junction transistors, field effect transistors, special purpose diodes, four-layer devices, integrated circuits and vacuum tubes. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 125 Introduction to Electronics (5 cr.)**

Prerequisite or corequisite: ELEC 122. Prerequisite: ELEC 120. The theory, properties, and application of vacuum tube and solid state

devices, including power supplies. Lect. 4 hrs., Lab. 3 hrs., Total 7 hrs. per wk.

**ELEC 126 Amplifiers (5 cr.)**

Prerequisite: ELEC 125. Amplifiers, both transistor and tube types, with emphasis on methods of analysis and design procedures. Lect. 4 hrs., Lab. 3 hrs., Total 7 hrs. per wk.

**ELEC 159 Electronic Devices II (4 cr.)**

Prerequisites: ELEC 124 and MATH 121. Corequisites MATH 122 and ELEC 122. A second quarter course consisting of power supply theory and circuits JFET and Mosfet Circuits, and RC coupled amplifiers including hybrid parameters of transistors. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 161-162 Practical Electricity I-II (3 cr.) (3 cr.)**

The fundamentals of electricity, terminology, and symbols, diagrams, the principles essential to the understanding of general practices, safety, and the practical aspects of residential and non-residential wiring and electrical installation. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**ELEC 164-165 Solid State Electronics I-II (4 cr.) (4 cr.)**

Prerequisites: ELEC 169 and MATH 121. I. A study of semiconductor devices and their applications. Analytical and graphical techniques are used in applying diodes, transistors, and silicon-controlled rectifiers. II. Continuation of I with emphasis on design techniques for proper applications of linear and digital integrated circuits. State-of-the-Art devices will be analyzed. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 169 DC Circuits (4 cr.)**

Current flow in direct current circuits, including the nature of electricity, the laws relating volts, current, resistance and power and the concepts of equivalent circuits and network theorems. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 197 Cooperative Education (1-5 cr.)**

(see General Usage Courses section)

**ELEC 208 Digital Communication (4 cr.)**

A study of digital modulation techniques, codes, interfacing and network techniques. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 210 Video Techniques (3 cr.)**

The theory and electronic circuits needed to generate, process, reproduce and store video signals. Lect. 3 hrs. per wk.

**ELEC 221 Intermediate Electronics (4 cr.)**

Prerequisites: ELEC 123 and ELEC 165. Theory and application of linear solid state circuits including amplifier circuit configurations, amplifier classes, single-ended, differential, and power amplifiers, noise, distortion, and bandwidth, and principles of feedback. Both discrete and integrated circuit devices are studied. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 227 Pulse and Switching Circuits (3 cr.)**

Prerequisites: ELEC 123 and 126. Linear and non-linear wave shaping providing base for further study in the areas of computers and automatic controls. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**ELEC 229 Pulse, Switching and Logic Circuits (4 cr.)**

Prerequisite: ELEC 125. A study of circuits and devices used to form, shape and control pulses. Includes multivibrators and other oscillators, triggering circuits, sweep circuits and logic devices with emphasis on semiconductor devices and circuits. An introduction to logic theory. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 241 Communications I (4 cr.)**

Prerequisites: ELEC 123 and 126. A study of modulation and power in modulated waves; sinusoidal oscillations and oscillators, RF amplifiers and detectors, and AM receivers. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 242 Communications II (4 cr.)**

Prerequisite: ELEC 241. A study of transmitters and receivers. Topics included are FM receivers, RF power amplification, AM, SSB and FM transmitters, and an introduction to transmission lines and antennas. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 243 Communications III (4 cr.)**

Prerequisite: ELEC 242. A study of microwave systems. Topics included are microwave tubes, waveguides, antennas and measurements

at microwave frequencies. Also, an introduction to radar and television systems is presented. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 249 Television Electronics** (3 cr.)

Prerequisites: ELEC 242 and 227. A lecture-demonstration course dealing with the special devices and techniques associated with monochrome and color, broadcast and industrial television transmission and reception. Specifically included are the standards of American television electronics as set down by the National Association of Broadcasters (NAB). Cameras and television receivers are given special emphasis. Lect. 3 hrs. per wk.

**ELEC 250 Introduction to Computers** (4 cr.)

Prerequisite: ELEC 227. A general introduction to concepts and basic features of electronic computers. Topics include: fundamentals of internal operations; number systems, digital circuits, Boolean algebra, basic logical design techniques, analysis of input-output devices, control and arithmetic units, memory units and limited programming. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 251-252-253 Computer Electronics** (4 cr.) (4 cr.) (4 cr.)  
I-II-III

Prerequisite: ELEC 229. An introductory computer course covering number systems, programming fundamentals, and Boolean algebra; logic circuit in addition to the arithmetic and memory sections of the computer; computer equipment, computer organization, and advanced computer circuits. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 260 Control Circuits** (4 cr.)

Prerequisite: ELEC 227 and ELEC 250. Corequisite: ELEC 266. The principles and applications of electrical controllers are covered in this course, which serves as an introduction to automation. Devices for differentiation, integration and proportioning are studied in detail. Hardware and circuitry for AC and DC industrial control devices, including contractors, starters, speed controllers, time delays, limit switches and pilot devices. Application in the control of industrial equipment-motors, servo units and motor-driven actuators. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 261-262-263 Electromechanical Systems I-II-III** (4 cr.) (4 cr.) (5 cr.)

A study of electromechanical systems and components: electrical, electronic, mechanical and optical measuring and control devices. Survey of electro-mechanisms used as "building blocks" for various electromechanical systems: synchros, resolvers, servo-motors, generators, digitals, antilog converters. Analysis of various electromechanical systems: printers, teletypewriters, tape punches and readers, numerical controls. Lect. 3-3-4 hrs., Lab. 3 hrs., Total 6-6-7 hrs. per wk.

**ELEC 266 Introduction to Microprocessors** (4 cr.)

Introduction to microprocessor theory and applications. Topics include fundamentals of internal architecture and operation, system configuration, simple interfacing, machine language programming, memory and I/O organization, addressing and control and data acquisition. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 276 Instruments and Measurements** (4 cr.)

Corequisites or prerequisites: ELEC 227 and 241. A study of basic circuits in electronic measurements and application of these circuits in test instruments such as oscilloscopes, vacuum tube voltmeters and bridges. Further study concerned with the accuracy of measurements, how instruments work, proper use of instruments, and calibration technique. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ELEC 287 Advanced Circuits and New Devices** (2 cr.)

Prerequisite: division approval. Lectures and demonstrations concerned with the latest developments in electronics. Lect. 2 hrs. per wk.

**ELEC 290 Coordinated Internship** (1-5 cr.)  
(see General Usage Courses section)

**ELEC 297 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)

**ELEC 298 Seminar and Project** (1-5 cr.)  
Prerequisite: division approval.  
(see General Usage Courses section)

## EMERGENCY MEDICAL SERVICES TECHNOLOGY

**EMDT 110 Emergency Medical Services System Overview** (3 cr.)

An analysis of the history and development of emergency medical services systems, funding alternatives, system design alternatives, system components, and system evaluation. Consideration of the role of the EMS Councils, training levels for pre-hospital providers, hospital categorization, disaster plans, and public education needs. Lect. 3 hrs. per wk.

**EMDT 111 Emergency Medical Services Technology I** (4 cr.)

A study of the current status of the emergency medical system and the role and responsibilities of an Emergency Medical Technician/Ambulance (EMT/A). The anatomy and physiology of the chest, abdomen, and head are studied as well as the practical application of the techniques of patient assessment, basic life support, hemorrhage control, and the bandaging of soft-tissue trauma. Cardiopulmonary Resuscitation Certification by the American Heart Association will be included. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**EMDT 112 Emergency Medical Services Technology II** (4 cr.)

Prerequisite: EMDT 111, CPR Certification. A study of the musculoskeletal and central nervous systems with practical application of the techniques of immobilization of related trauma. Environmental and medical emergencies, childbirth, pediatric emergencies, vehicular extrication and the emergency vehicle laws are studied. At the completion of this course and EMDT 190, the student should be prepared to take the examination leading to State and National Registry Certification as an EMT/A. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**EMDT 156 Emergency Medical Technician/Ambulance Refresher** (3 cr.)

Prerequisite: EMT/A certification. A review of all of the materials covered in the basic emergency medical technician course. Emphasis will be placed upon a critique of the basic skills and recent developments in the area of emergency medical care. Required for Virginia recertification as an EMT/A every three years. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**EMDT 190 Coordinated Practice** (1-5 cr.)  
(see General Usage Courses section)

**EMDT 216 Principles of Extrication** (4 cr.)

Prerequisite: EMDT 112, EMT/A Certification. An in-depth study and practical application of the techniques utilized for gaining access, disentanglement, and transport of an injured individual. Techniques of vehicle extrication, ropes, forceable entry, cutting torches, electrical emergencies, bus and aircraft crashes, radiation hazards, and elevator accidents are included. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

**EMDT 217 Introduction to Cardiology** (4 cr.)

Prerequisite: EMDT 112 or equivalent. A review of the anatomy and physiology of the cardiovascular system covering the structure, function, and electrical conduction of the heart. Includes assessment of the suspected cardiac patient and pathophysiology of cardiovascular dysfunction, interpretation of the normal electrocardiogram, recognition and treatment of basic arrhythmias. Special emphasis on the electrophysiologic principles, ECG analysis and treatment. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**EMDT 226 Paramedic Procedures I** (7 cr.)

Prerequisite: EMDT 112 or equivalent, and EMDT 217. The role and responsibilities of the Emergency Medical Technician/Paramedic and the parameters under which they operate. Course includes medical history and physical assessment techniques, the pathophysiology and care techniques for shock, and a review of the anatomy and physiology of the respiratory system and the assessment and management of suspected respiratory distress. Lect. 5 hrs., Lab. 6 hrs., Total 11 hrs. per wk.

**EMDT 227 Paramedic Procedures II** (9 cr.)

Prerequisite: EMDT 226. A continuation of the pathophysiology, assessment, management of respiratory and circulatory distress. The assessment and management of central nervous system, soft-tissue, and musculo-skeletal trauma, as well as neonatal, pediatric, obstetrical and gynecological emergencies are studied. Lect. 5 hrs., Lab. 12 hrs., Total 17 hrs. per wk.

**EMDT 228 Paramedic Procedures III (6 cr.)**

Prerequisite: EMDT 227. A continuation of the assessment and management of musculoskeletal trauma. The pathophysiology, assessment, and management of various medical emergencies (i.e., diabetes, convulsive disorders, environmental emergencies, etc.), assessment and management of psychiatric emergencies. An introduction into inter-agency relationships, emergency vehicle operation and disaster management are included. Lect. 4 hrs., Lab. 6 hrs., Total 10 hrs. per wk.

**EMDT 290 Coordinated Practice (1-5 cr.)**

(see General Usage Courses section)

**EMDT 298 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)

**ENGINEERING****ENGR 100 Introduction to Engineering Technology (2 cr.)**

Professional fields of engineering; the work of the engineer, requirements of training and character, professional ethics, the division of industrial practice and competition. Pure and simple problems from the various schools of engineering are used with electronic digital calculator applications. Lect. 1 hr., Lab. 2 hrs., Total 3 hrs. per wk.

**ENGR 104 Introduction to Engineering (3 cr.)**

Prerequisite or corequisite: MATH 141 and ENGL 111. Introduction to professional fields of engineering; historical background; professional ethics and responsibilities of engineers. Application of hand calculator to engineering problem solving. Basic graphic techniques and U.S. customary and S.I. units and their conversions. Lecture 3 hours per week.

**ENGR 106 Computer Programming for Engineers (4 cr.)**

Prerequisite: ENGR 104. An introduction to EDP systems, the associated hardware and their function in solving typical engineering problems. The FORTRAN IV source program language will be covered with emphasis on writing FORTRAN programs and providing all input necessary to accomplish actual machine processing of engineering-type problems. Scientific subroutine packages along with special engineering programs such as ECAP, and STRESS will be introduced. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ENGR 116 Computer Applications for Engineering Technology (3 cr.)**

Prerequisite: MATH 121. Introduction to electronic computation and programming of the digital computer using BASIC language and other machine languages with emphasis on writing programs and computer applications to problems in engineering technology. Lect. 3 hrs. per wk.

**ENGR 124-125 Engineering Graphics I-II (3 cr.) (3 cr.)**

Fundamentals of drawing and theories of projection, Multiview drawings, pictorial drawings and sketching, geometric construction, lettering and auxiliary views. Applied spatial relationships including points, lines, planes, revolutions, connectors, intersections, and developments. A study and analysis of graphical representations and methods for solving engineering problems including: Perspectives, sections, conventions, dimensions, tolerances, fasteners, and working drawings. Lect. 2-1 hrs., Lab. 4-5 hrs., Total 6-6 hrs. per wk.

**ENGR 150 Engineering Mechanics (Statics) (3 cr.)**

Prerequisites: MATH 118-119. Principles of statics; resultants and equilibrium of force systems; trusses containing two-force members; structures containing three-force members; centroids; moments of inertia; dry friction. Lect. 3 hrs. per wk.

**ENGR 151 Mechanics I (Statics) (4 cr.)**

Corequisite: MATH 122 or MATH 119. Principles and applications of free body diagrams for force systems. Analysis of frames and trusses, methods of joints and sections, friction, centroids and moments of inertia of areas. Lect. 4 hrs. per wk.

**ENGR 152 Mechanics II (Strength of Materials) (3 cr.)**

Prerequisite: ENGR 151. Properties of materials, stress, strain, elasticity, shear and moment diagrams, design of statically determinate beams, and axially loaded columns. Lect. 3 hrs. per wk.

**ENGR 153 Mechanics III (3 cr.)**

Prerequisite: ENGR 151 or equivalent. The study of rigid body mechanics, including kinetics and kinematics. Lect. 3 hrs. per wk.

**ENGR 154 Mechanics Laboratory (1 cr.)**

Prerequisite or corequisite: ENGR 152. Laboratory experiments and solution of problems related to properties and strength of materials (ENGR 152). Lab. 3 hrs. per wk.

**ENGR 160 Applied Fluid Mechanics (3 cr.)**

Prerequisite: MATH 122 or equivalent. Properties of fluids and fluid flow, study of fluid statics and flow measuring devices and the use of Bernoulli's equation in flow of real fluids. Lect. 3 hrs. per wk.

**ENGR 197 Cooperative Education (1-5 cr.)**

(see General Usage Courses section)

**ENGR 198 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)

**ENGR 206 Engineering Economy (3 cr.)**

Economic decision process in the engineering design environment. Investment, financing, depreciation, manufacturing costs, economic selection replacement Lect. 3 hrs. per wk.

**ENGR 209 Numerical Methods (4 cr.)**

Prerequisites: MATH 242; ENGR 105 or 106. Computational methods for the numerical solution of a wide variety of problems which arise in engineering applications. Advanced application of the BASIC and FORTRAN languages to program solutions on the digital computer. Lect. 3 hrs., Lab 3 hrs., Total 6 hrs. per wk.

**ENGR 226 Basic Electric Circuits (4 cr.)**

Corequisite: MATH 242. Fundamentals of electrical circuits. Circuit quantities of charge, current, potential, power and energy. Resistive circuit analysis. Ohm's law and Kirchhoff's laws. Network analysis techniques; network theorems. RLC circuit transient analysis using circuit differential equations. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ENGR 227 Digital Integrated Electronic Circuits (4 cr.)**

Prerequisites: ENGR 226 and CSCI 210. The study of digital electronic devices. Semiconductors. Logical circuits, gates, and various digital integrated circuit technologies. Computer subsystem hardware registers, counters, and arithmetic circuits. Memories and mass-storage. The microprocessor; its units and communications. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ENGR 236 Basic Electric Circuits II (4 cr.)**

Prerequisite: ENGR 226. RLC Circuit transient analysis. AC steady state circuit analysis. Frequency domain analysis; resonance; Fourier Series. La Place transform applications; circuit transfer functions. Solution of typical circuit analysis problems on microcomputers. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**ENGR 241 Mechanics of Particles (3 cr.)**

Prerequisite: ENGR 246. Vector treatment of planar and three-dimensional kinematics and kinetics of particles; relative motion, Newton's laws, work and energy, impulse and momentum, vibration of particles. Lect. 3 hrs. per wk.

**ENGR 242 Dynamics of Rigid Bodies (3 cr.)**

Prerequisite: ENGR 241. Corequisite: MATH 243. Vector treatment using index notation of planar and three-dimensional kinematics and kinetics of rigid bodies; mass moments of inertia, Newton's laws, work and energy, impulse and momentum, vibration applied to rigid bodies. Lect. 3 hrs. per wk.

**ENGR 243 Mechanics of Deformable Solids (5 cr.)**

Prerequisite or corequisite: MATH 242. Structural mechanics applied to trusses, frames; introductory mechanics of continuous media; concepts of stress, strain, stress-strain relations; stress and deformation due to longitudinal loads, torsion, and bending; eccentric loads on short posts. Euler column theory. Lect. 5 hrs. per wk.

**ENGR 246 Statics of Particles and Rigid Bodies (4 cr.)**

Prerequisites: MATH 241, PHYS 221. A study of vector treatment of concepts of force, mass, space and time. Includes units of measurement, including both U.S. customary and SI units. Equilibrium of discrete force systems; centroids; moments of inertia; dry friction; distributive forces; truss and simple frame analysis. Lect. 4 hrs. per wk.

**ENGR 297 Cooperative Education (1-5 cr.)**

(see General Usage Courses section)

**ENGR 298 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)



**ENGR 299 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)

## ENGLISH

- ENGL 01 Verbal Studies Laboratory** (1-5 cr.)  
A developmental course in composition designed for students who need help in all areas of writing to bring their proficiency to the level necessary for entrance into their respective curricula. Emphasis on individualized instruction. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hrs.
- ENGL 02 Developmental Spelling Laboratory** (1-5 cr.)  
A developmental course designed to help students overcome spelling difficulties through the study of the sound-letter relationships in the English language and through familiarization with common spelling problems. Emphasis will be placed on the specific needs of the individual. Variable hrs.
- ENGL 003 Basic Skills in Reading I** (1-5 cr.)  
Prerequisite: departmental permission. An individualized course designed to help students improve basic comprehension and word attack skills. Students may re-register for this course in subsequent quarters as necessary until they complete the course objectives. Lect. 1-5 hrs. per wk.
- ENGL 004 Basic Skills in Reading II** (1-5 cr.)  
Prerequisite: departmental permission. Designed to help students improve reading rate and build such skills as finding and remembering facts, making inferences, drawing conclusions, and getting meaning from context. Students may re-register for this course in subsequent quarters as necessary until they complete the course objectives. Lect. 1-5 hrs. per wk.
- ENGL 05 English as a Second Language** (1-15 cr.)  
A developmental course in the English language for persons whose native language is not standard English. Emphasis on production of English phonemes, intonation patterns, structural patterns, grammar, vocabulary, and idioms. Students are expected to spend a minimum of 3 hours weekly in the language laboratory. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hrs.
- ENGL 06 Intensive Course in English for Speakers of Other Languages** (1-15 cr.)  
Enables speakers of other languages to become fluent in spoken and written English as rapidly as possible by providing the students with as much training and practice as is necessary to meet their individual needs. A student may re-register in subsequent quarters until his language skills are adequate to meet his needs. Variable hrs.
- ENGL 07 Verbal Expression** (1-5 cr.)  
A developmental course designed to improve the student's written and spoken communication. Review of effective writing practices. Emphasis on practical application; the writing of instructions, explanations, business letters, job applications, summary paragraphs, methods of informative writing outlining, reading for understanding, and vocabulary building unity, development and organization in writing. Practice in listening and speaking, giving and following instructions, short, informative talks. Intensified practice in varied speaking and writing problems. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hours.
- ENGL 08 Reading Improvement** (1-5 cr.)  
A developmental course using modern techniques, equipment, and materials to increase the student's comprehension, skill, and speed in reading. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hrs.
- ENGL 11-12-13 Communication Skills for the Foreign Born** (5 cr.) (5 cr.) (5 cr.)  
A preparatory course for students whose native language is not English. The course will emphasize the student's development of speaking, writing, reading, and listening skills in preparation for the student's admission to a college curriculum. Lect. 5 hrs. per wk.
- ENGL 44 Developmental Reading** (3 cr.)  
A course designed with the use of modern techniques, equipment, and materials to increase the student's comprehension and skills in reading. Training in effective listening and study is also provided. Laboratory techniques are used at all sessions. Lect. 3 hrs. per wk.
- ENGL 100 Occupational English** (3 cr.)  
Develops basic, practical English skills in oral and written communication. The emphases are basic organization principles, approaches to media analysis, job-related vocabulary building, listening, writing, and speaking skills. Practical skills such as handling customer complaints, writing various types of letters, preparation for a job interview are included. This course is intended for certificate students. Lect. 3 hrs. per wk.
- ENGL 110 English Grammar: Its Logic and Function** (3 cr.)  
The rules of grammar of the English language and their logic, system, and function will be examined in order to provide students with greater understanding and mastery in their use of grammar. Lect. 3 hrs. per wk.
- ENGL 111-112-113 English Composition I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Prerequisite: satisfactory score on appropriate English proficiency examinations and 4 units of high school English or equivalent. Expository and argumentative writing, ranging from single paragraphs to essays of some length and complexity. Study of logical, rhetorical, and linguistic structures; the methods and conventions of preparing research papers and the practical criticism of literary types. These courses must be taken in sequence. Lect. 3 hrs. per wk.
- ENGL 114-115 English Composition I-II** (5 cr.) (4 cr.)  
Prerequisite: satisfactory score on appropriate English proficiency examinations and 4 units of high school English or equivalent. Expository and argumentative writing, ranging from single paragraphs to essays of some length and complexity. Study of logical, rhetorical, and linguistic structures; the methods and conventions of preparing research papers and the practical criticism of literary types. Lect. 5-4 hrs. per wk.
- ENGL 118 Advanced Reading and Study Development** (3 cr.)  
A multi-level reading course with emphasis on structural analysis, critical reading, and study techniques for the development of individual skill; laboratory provides enrichment and application of techniques. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- ENGL 119 Critical Reading and Study Skills** (3 cr.)  
Development of skills necessary to succeed in college work, including, according to student needs, time management; effective listening; note taking from books, in books, and from lectures; previewing a textbook; critical textbook reading; applied study; use of the library; effective memory techniques; preparing outlines and summaries; and preparing for and taking examinations. Lect. 3 hrs. per wk.
- ENGL 126 Introduction to Journalism** (3 cr.)  
Prerequisite: freshman English or divisional approval. This course is designed to acquaint the student with the functions of the news media and the forces which shape them. It provides beginning instruction and practice in gathering, writing, and evaluating the news. It offers practice in copy preparation and production. Lect. 3 hrs. per wk.
- ENGL 128 Survey of Mass Media** (3 cr.)  
Prerequisite: freshman English or divisional approval. This is a survey of radio, television, newspapers, magazines, books and motion pictures. Emphasis is placed on the nature of change in, and the social implications of communications media today. Lect. 3 hrs. per wk.
- ENGL 137 Technical Writing** (3 cr.)  
Prerequisites: ENGL 100, 111, or divisional permission. Designed to develop writing proficiency in technical fields. Emphasis on collecting, organizing, and presenting materials applicable to various specialized areas. Lect. 3 hrs. per wk.
- ENGL 146 Literature for Children** (3 cr.)  
Surveys the history of children's literature, recognizes learning theory and developmental factors influencing reading and reading interests, and utilizes bibliographic tools in selecting books and materials for children. Emphasizes extensive reading and examination of books for recreational interests and educational needs of children. Lect. 3 hrs. per wk.



- ENGL 157 American Folklore** (3 cr.)  
Folklore of the various regions of America. Includes folk speech, proverbs, songs, beliefs and customs of various groups including American Indians, Louisianans, French, Spanish American, Pennsylvania Dutch, Appalachians and others. Lect. 3 hrs. per wk.
- ENGL 166 College Reading** (3 cr.)  
A course designed to facilitate college reading improvement in a variety of areas including rate of comprehension, vocabulary, study skills, and help in alleviating special problems in reading. Using modern equipment, materials, and techniques, the student will pursue a course of study set up between him and the instructor based on his needs, abilities, and goals as ascertained by test results and diagnostic interviews. Lect. 3 hrs. per wk.
- ENGL 167 College Grammar** (3 cr.)  
A college level review of grammar, usage, punctuation, and spelling, with additional emphasis on vocabulary building, essay analysis, and the writing of effective sentences and well-developed paragraphs which are unified and coherent. May be taken in partial fulfillment of English requirements for certificate or diploma candidates or as an elective by degree candidates prior to entry into English 101 or 111. Lect. 3 hrs. per wk.
- ENGL 180 Fundamentals of Business English** (3 cr.)  
An intensive study of the qualities and techniques required in the preparation of business correspondence, reports, articles, and memoranda. A practical course in the reading and writing of business-related materials with emphasis on comprehension, analysis, and organization of ideas in logical patterns. Lect. 3 hrs. per wk.
- ENGL 191-192-193 Workshop in Reporting and Writing** (3 cr.) (3 cr.) (3 cr.)  
Designed to provide instruction and practical experience in gathering, evaluating and writing news and feature stories for the college paper. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- ENGL 198 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- ENGL 199 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)
- ENGL 207 Film and Literature** (3 cr.)  
This course studies the translation of several works of literature into films. In doing so, it addresses the corresponding qualities of these two artistic forms, as well as qualities unique to each. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- ENGL 221 Journalism-News Writing** (3 cr.)  
Prerequisite: ENGL 126 or divisional approval. Intensive practice in reporting and news writing for local newspapers or the college newspaper under supervision of the journalism faculty and other professional journalists. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- ENGL 222 Journalism-Feature Writing** (3 cr.)  
Prerequisite: ENGL 126 or divisional approval. Intensive practice in writing feature articles for newspapers and magazines under the supervision of professional journalists and the journalism faculty. Articles will be submitted for publication. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- ENGL 223 Journalism-Editing** (3 cr.)  
Prerequisite: 9 hours of journalism and divisional approval. Qualified students will receive practical experience working with professional journalists in the preparation and production of copy. Emphasis on selective judgment, editing as a creative process, managerial functions of the editor. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- ENGL 227 Investigative Reporting** (3 cr.)  
Prerequisite: 9 hours of journalism and division approval. Qualified students will receive intensive practice in doing in-depth investigations of political, social, consumer and environmental problems, and in writing lengthy news stories based on their research. Lectures will familiarize the students with such areas of concern and will discuss techniques of exploring governmental agencies and other institutions for suitable topics of investigation. Lect. 3 hrs. per wk.
- ENGL 228 Creative Writing** (3 cr.)  
Prerequisites: ENGL 111, 112, 113 or division approval. Designed to introduce the student to the fundamentals of writing creatively, involving primarily the use of the imagination. Samples of creative writings will be studied to observe the methods employed in writing poetry, essays, and short stories. Lect. 3 hrs. per wk.
- ENGL 229 Creative Short Story Writing** (3 cr.)  
Designed to involve the student in the creative and imaginative writing of short stories as a form of literary expression. Lect. 3 hrs. per wk.
- ENGL 230 Creative Poetry Writing** (3 cr.)  
Designed to involve the student in the creative and imaginative writing of poetry as a form of literary expression. Lect. 3 hrs. per wk.
- ENGL 237 Freelance Writing** (3 cr.)  
Prerequisites: ENGL 111, 112, 113, or divisional approval. Instruction and practice in writing articles, features and reviews for newspapers and magazines. Analysis of assigned readings and preparation of manuscripts for publication. Lect. 3 hrs. per wk.
- ENGL 238 Non-Fiction Writing** (3 cr.)  
Prerequisite: ENGL 113 or divisional approval. Study and practice in one or more of the genres of non-fiction prose, such as autobiography, biography, non-fiction narrative, the essay. Lect. 3 hrs. per wk.
- ENGL 240 Backgrounds to Modern Drama** (3 cr.)  
A study of significant plays by authors of the 17th through 20th centuries, emphasizing dramatic techniques, influences on contemporary drama, and the historical and social backgrounds of the works. The intent of the course is to help introduce the beginning student to the drama and provide further reading for the more experienced student. Lect. 3 hrs. per wk.
- ENGL 244 Literature of Science Fiction** (3 cr.)  
The study of literary and social aspects of science fiction. Emphasis will be on ideas, themes, characteristics and trends as they have developed from the 1930s to the present. Lect. 3 hrs. per wk.
- ENGL 246 The Modern Novel** (3 cr.)  
Prerequisite: freshman English or divisional approval. A study of the modern novel. Emphasis on appreciation and interpretation of selected novels. Lect. 3 hrs. per wk.
- ENGL 247 The Modern Drama** (3 cr.)  
Prerequisite: freshman English or divisional approval. A study of the modern drama. Emphasis on the understanding and enjoyment of dramatic literature. Lect. 3 hrs. per wk.
- ENGL 248 The Modern Short Story** (3 cr.)  
Prerequisite: freshman English or divisional approval. A study of the short story as a literary form. Emphasis on appreciation and interpretation of selected stories. Lect. 3 hrs. per wk.
- ENGL 249 Modern Poetry** (3 cr.)  
Prerequisite: freshman English or divisional approval. A study of modern poetry. Emphasis on appreciation and interpretation of selected poems. Lect. 3 hrs. per wk.
- ENGL 250 Major American Writers** (5 cr.)  
Prerequisite: ENGL 113 or divisional approval. A study of selected American writers representative of various periods. Students may not receive credit for both Survey of American Literature (ENGL 251-252-253) and ENGL 250 nor any combination of ENGL 250 and ENGL 251-252-253. Lect. 5 hrs. per wk.
- ENGL 251-252-253 Survey of American Literature I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Prerequisite: ENGL 113 or divisional approval. A survey of American literature from Colonial times to the present. Emphasis on the ideas, themes, and characteristics of our national literature. Lect. 3 hrs. per wk.
- ENGL 257 Existential Literature** (3 cr.)  
A survey of existentialism as a literary movement. Emphasis is on short stories, poetry, drama and novels which express an existential attitude. Related essays in philosophy, theology and literary criticism may be included. Lect. 3 hrs. per wk.
- ENGL 259 Afro-American Literature** (3 cr.)  
An examination of selected works by Black writers in America from early times to the present with emphasis upon the twentieth century. Primary concern will be the tracing in these works of major themes which reveal the Black man's vision of America and his place in it. Lect. 3 hrs. per wk.

**ENGL 260 Major English Writers (5 cr.)**

Prerequisite: ENGL 113 or divisional approval. A study of selected English writers representative of various periods. Students may not receive credit for both Survey of English Literature (ENGL 261-262-263) and ENGL 260 nor any combination of ENGL 260 and ENGL 261-262-263. Lect. 5 hrs. per wk.

**ENGL 261-262-263 Survey of English Literature I-II-III (3 cr.) (3 cr.) (3 cr.)**

Prerequisite: ENGL 113 or divisional approval. A survey of major English writings from early times to the modern period. Emphasis on the ideas, themes, and characteristics of English literature. Lect. 3 hrs. per wk.

**ENGL 266-267-268 Shakespearean Plays I-II-III (3 cr.) (3 cr.) (3 cr.)**

A study of selected Shakespearean plays in conjunction with the PBS television series. Each play will be examined through viewing the television production, reading the text of the play, and class discussion. Staging, plot, characterization, and the use of language are discussed within the context of particular plays. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**ENGL 270 Major Writers in World Literature (5 cr.)**

Prerequisite: ENGL 113 or divisional approval. A study in depth of writers of various cultures. Students may not receive credit for both Survey of World Literature (ENGL 271-272-273) and ENGL 270 nor any combination of ENGL 270 and ENGL 271-272-273. Lect. 5 hrs. per wk.

**ENGL 271-272-273 Survey of World Literature I-II-III (3 cr.) (3 cr.) (3 cr.)**

Prerequisite: ENGL 113 or divisional approval. A course designed to familiarize the student with master works of world literature. Analytical reading and critical writing toward understanding of the periods, the writers, the literary works. Lect. 3 hrs. per wk.

**ENGL 278 Women in Modern Literature (3 cr.)**

An examination of selected female figures in fiction and drama as they search for identity and self-realization in the modern world. Parallel readings dealing with contemporary issues also will be examined in order to further explore the expanding role of women in society. Lect. 3 hrs. per wk.

**ENGL 291-292-293 Editing and Makeup I-II-III (4 cr.) (4 cr.) (4 cr.)**

Designed to provide instruction and practical experience in all production aspects of the college paper. Principles of editing, page design, photo display, handling advertising copy and paste-up will be emphasized, as well as the functions and responsibilities of page editors. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

**ENGL 298 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)

**ENGL 299 Supervised Study (1-5 cr.)**

(see General Usage Courses section)

**ENVIRONMENTAL SCIENCE****ENVR 40 Basic Certification Preparation (1 cr.)**

Prerequisite: instructor's permission. A workshop program to review materials which are normally associated with the Class IV or Class III level certification examinations. The program will utilize lecture, audio-visual, and workshop sessions to review the required material and to prepare the trainee to successfully complete the examinations. Lab. 2 hrs. per wk.

**ENVR 60 Basic Concepts for Water and Wastewater Treatment (3 cr.)**

Scientific and institutional principles necessary to operate water and wastewater treatment facilities. Lect. 3 hrs. per wk.

**ENVR 106 Introduction to Sanitation (3 cr.)**

A study of methods of disease transmission, hygienic excrete disposal, municipal and industrial wastewater removal and treatment, characteristics of water, water treatment, protection of ground water, insect and rodent control, solid waste collection and disposal, milk and food sanitation, swimming pool and industrial hygiene. Lect. 3 hrs. per wk.

**ENVR 108 Environmental Microbiology (4 cr.)**

The characteristics and activities of micro-organisms, showing their essential relation to diagnosis, treatment, and prevention of disease.

Fundamentals of bacteriology, mycology, and parasitology, emphasizing their relationships to individual community health. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

**ENVR 110 Introduction to Water and Wastewater Treatment Technology (3 cr.)**

Designed to provide entry level personnel with a general overview of the entire water supply and treatment system. Will trace the water supply from the raw state in the stream through treatment storage, distribution, use, waste collection, treatment, and discharge back to the environment. Historical and legal aspects of water supply and waste disposal together with basic aspects of public relations for water and wastewater treatment plant personnel. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**ENVR 120 Introduction to Air Pollution (3 cr.)**

Air pollution in relation to public health; study of the scientific, engineering, and legal aspects of pollution; sources and classifications of pollutants, pollution meteorology; sampling and measuring techniques; remedies and controls currently available. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**ENVR 146 Advanced Certification Preparation (1 cr.)**

Prerequisite: instructor's permission. The advanced Certification Examination program will be a workshop program to review the additional materials associated with the Class II or Class I level certification examinations. The program will consist of lecture, audio-visual, and workshop sessions to review the required material and to prepare the trainee to complete the examination. Lab. 2 hrs. per wk.

**ENVR 166 Wastewater Treatment Plant Operation (5 cr.)**

Environmental principles and practices and desired function and operation of a variety of wastewater treatment unit processes. The evaluation of operation of these processes by determination of the information and testing required for evaluation and performing the subsequent necessary calculations. Lect. 3 hrs., Lab. 4 hrs., Total 7 hrs. per wk.

**ENVR 167 Fundamentals of Solids Processing (4 cr.)**

The engineering principles and practices and the desired function and operation of a variety of solid waste and sludge treatment unit processes. The evaluation of the operation of these processes by determination of the information and testing required for evaluation and performing the subsequent necessary calculation. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**ENVR 168 Wastewater Treatment Plant Control (4 cr.)**

Analytical and control procedures required in the operation of the unit processes which will be used in wastewater treatment plants. The procedures to operate the treatment plants during routine and emergency conditions as well as use of these procedures to "trouble shoot" isolated or anticipated operational problems. Lect. 3 hrs. Lab. 3 hrs., Total 6 hrs. per wk.

**ENVR 216 Water Supply and Wastewater Collection (3 cr.)**

The engineering aspects of water supply, water distribution, waste water collections and waste water removal and disposal. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**ENVR 218 Industrial Waste Treatment (3 cr.)**

Principles and methods of contemporary industrial waste treatment; relationships between the characteristics of industrial wastes and their effects on receiving waters; differences and similarities between industrial and sanitary waste treatment. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**ENVR 297 Cooperative Education (1-5 cr.)**

(see General Usage Courses section)

**FIRE SCIENCE****FIRE 100 Introduction to Fire Science (3 cr.)**

History and philosophy of fire service at the local, state, and national level with emphasis on the organization of the individual fire department; analysis of the overall fire problem, communications, maintenance, training, company fire fighting capabilities, apparatus and equipment. Lect. 3 hrs. per wk.

**FIRE 106 Fundamentals of Fire Service Administration (3 cr.)**

A study of department and company organization and management, administrative procedures and methods, budgeting and reporting, control of resources, and maintenance of records. Lect. 3 hrs. per wk.

**FIRE 108 Fundamentals Of Fire Suppression (3 cr.)**

Basic concepts involved in fire suppression including fire behavior, principles of fire fighting as applied to small and large scale fires, problems involving the use of tactics, size-up, strategy and employment of equipment and manpower at various echelons. Lect. 3 hrs. per wk.

**FIRE 109 Fire Suppression Operations (3 cr.)**

Prerequisite: FIRE 108. The distribution and use of equipment, organization for major fires, pre-planning, command post operations, communications, equipment design and maintenance, and tactics. Lect. 3 hrs. per wk.

**FIRE 111 Hazardous Materials I (3 cr.)**

Identification and characteristics of materials contributing to fire hazards including chemical, gases, flammable liquids, and radiological materials, and an examination of their storage, handling and transportation, and related fire science problems. Lect. 3 hrs. per wk.

**FIRE 112 Hazardous Materials II (3 cr.)**

Prerequisites: FIRE 100 and FIRE 111. Hazardous materials covering storage, handling, laws, standards, and fire fighting techniques associated with chemicals, gases, flammable liquids, and radio-active materials. Lect. 3 hrs. per wk.

**FIRE 116 Fundamentals of Fire Prevention (3 cr.)**

An introduction to fire safety through study of fire causes, inspection and investigation procedures. Lect. 3 hrs. per wk.

**FIRE 119 Industrial Fire Protection (3 cr.)**

Prerequisite: FIRE 116, 120, or permission of division. A study of industrial fire protection that fits the needs of every industry, health care facility, business and educational institution. The course deals with organizing for fire safety, hazard control, prefire planning operations and fire control systems. Lect. 3 hrs. per wk.

**FIRE 120 Fire Protection Equipment and Systems (3 cr.)**

Topics covered are the examination and utilizing of portable extinguisher equipment, sprinkler systems, protection systems for special hazards, and fire alarm and protection systems. Opportunities for visits to local facilities having equipment and systems affording a critical appraisal. Lect. 3 hrs. per wk.

**FIRE 137 Fire Fighting Tactics and Strategy (3 cr.)**

Prerequisites: FIRE 100 and FIRE 108. Review of combustion and extinguishment. The problems during sizeup; developing and implementing tactics and strategy during fires; and the leadership required on the fire ground. Lect. 3 hrs. per wk.

**FIRE 141 Fire Administration (3 cr.)**

Prerequisite: FIRE 100. A study of the personnel responsibility of managers. Centers on line-staff relationships, social change, managerial attitudes and decisions, general organizational planning, and career development for managers. Lect. 3 hrs. per wk.

**FIRE 146 Fire Administration and Law (3 cr.)**

Application of guideposts relative to firemen and law. Includes introduction to law, the judicial system, city's liability for acts of the fire department, fire prevention bureaus, and general liabilities of firemen. Lect. 3 hrs. per wk.

**FIRE 147 Methods of Fire Instruction (3 cr.)**

This course is designed to prepare Fire Management Personnel who conduct the in-service training of fire fighters at local Fire Departments. Emphasis will be on development of training methods and aids, such as role-playing, small group discussion & development of individualized learning materials & methods. Each student will be required to develop and present a segment of the fire fighting curriculum of his local fire department. Lect. 3 hrs. per wk.

**FIRE 208 Water Distribution Systems (3 cr.)**

Principles, techniques, and application of water distribution systems in fire fighting. Emphasis on the use of underground mains, private water supplies, public water systems, hydrants, hose and standpipes. Laboratory equipment and materials will supplement lectures. Lect. 3 hrs. per wk.

**FIRE 211-212 Automatic Sprinkler System Design I-II (3 cr.) (3 cr.)**

Prerequisite: FIRE 216. A comprehensive treatment of automatic sprinkler systems including a study of sprinkler standards, design features, water supply adequacy, sprinkler limitations, code applications, computer applications to design systems. Lect. 3 hrs. per wk.

**FIRE 216 Fire Hydraulics and Equipment (4 cr.)**

Prerequisite: FIRE 100. Review of basic mathematics; laws and formulas applied to fire service hydraulics, development of mental ability to solve fire flow requirements, water supply needs, and consideration of equipment standards. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**FIRE 227 Building Construction and Codes (4 cr.)**

The various types of construction materials and their properties with emphasis on the effect of heat, water, and internal pressures generated under fire conditions. Familiarization with national, state and local ordinances and codes which influence the fire protection field. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**FIRE 228 Fire Codes and Ordinances (3 cr.)**

Familiarization with national, state and local laws; ordinances and codes which influence the field of fire prevention and protection; legal aspects of fire prevention and related problems. Lect. 3 hrs. per wk.

**FIRE 237 Arson Detection and Investigation (3 cr.)**

Prerequisite: FIRE 100. Introduction to arson laws and types of incendiary fires. Determining fire causes, recognizing and preserving evidence; interrogation of adults and juveniles; court procedures. Lect. 3 hrs. per wk.

**FIRE 239 Fire Protection Risk Analysis (3 cr.)**

Prerequisite: FIRE 100. A comprehensive study of various aspects of fire protection risk management as applied to business and industry. Includes methods of identifying, analyzing, and measuring risk and loss possibilities and how to both stabilize and minimize long and short term risk. Lect. 3 hrs. per wk.

**FIRE 247 Fire Station Management (3 cr.)**

Current and new concepts in dealing with fire station management problems. This includes involvement in problem areas such as communities, individual and group behavior, subordinate-supervisor relationships and the decision making process. Lect. 3 hrs. per wk.

**FIRE 258 Fire Protection Systems and Building Construction Plans Analysis (3 cr.)**

Prerequisites: FIRE 120 and FIRE 227 or divisional permission. The course concentrates on providing fundamental knowledge and techniques used in reviewing building plans prior to issuance of building permits. A general review of blueprints and commonly used symbols will be presented as each group of plans are introduced. Check lists will be presented and/or developed that introduce a systematic approach toward building plans analysis. Lect. 3 hrs. per wk.

**FIRE 266 Urban Fire Analysis (3 cr.)**

Prerequisite: FIRE 106. A study of current urban fire problems with emphasis on solutions based upon current available technology. Studies include master planning, analysis methodology and prior prediction. Second year students only. Lect. 3 hrs. per week.

**FIRE 290 Coordinated Internship (1-5 cr.)**

(see General Usage Courses section)

**FIRE 298 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)

**FOODS/FOOD SERVICE MANAGEMENT**

(See Hotel, Restaurant & Institutional Management)

**FORESTRY****FORE 117 Dendrology (4 cr.)**

A survey of the plant kingdom followed by a study of the commercially important trees of the United States. Emphasis upon field characteristics and environment of the trees of the Southeast. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**FORE 131 Wildlife and Fisheries Management** (4 cr.)  
An introduction to the principles of wildlife and fisheries management. Emphasis on practices in the southeastern United States. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**FORE 132 Forest Recreation** (4 cr.)  
A study of recreational use of forest resources including an understanding of the psychology of recreation, planning, and design of forest recreation areas. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

## FRENCH

**FREN 101-102-103 Introductory French I-II-III** (4 cr.) (4 cr.) (4 cr.)

Introductory training in the speaking, understanding, reading, and writing of French with emphasis on manipulation of the structure of the language. (French is used in the classroom.) Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk. *Not recommended for students who have, within the past two years, received two years high school or one year college credit for this language.*

**FREN 104-105 Introductory French I-II** (6 cr.) (6 cr.)  
The understanding, speaking, reading, and writing of French with emphasis on manipulation of the structure of the language. (French is used in the classroom.) Lect. 5 hrs., Lab. 3 hrs., Total 8 hrs. per wk.

**FREN 107-108-109 Conversation in French I-II-III** (3 cr.) (3 cr.) (3 cr.)

Prerequisite: FREN 103 or equivalent. Practice in speaking French, stressing correctness of structure, pronunciation, fluency, and the vocabulary of everyday situations. (May be taken out of sequence.) Lect 3 hrs. per wk.

**FREN 121 Conversational French I** (3 cr.)

An introductory course with major emphasis on oral communication, conversational communication and cultural mores and customs. Sufficient attention given to practical aspects of reading and writing. An activity-oriented course. Lect. 3 hrs. per wk.

**FREN 198 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)

**FREN 199 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)

**FREN 204-205 Intermediate French I-II** (6 cr.) (6 cr.)

Prerequisite: FREN 105 or successful completion of two years of high school French, and division permission. Advanced study in the understanding, speaking, reading, and writing of French. French used in the classroom. Lect. 5 hrs., Lab. 3 hrs., Total 8 hrs. per wk.

**FREN 206-207-208 Intermediate French I-II-III** (3 cr.) (3 cr.) (3 cr.)

Prerequisites: FREN 103 or successful completion of two years of high school French and divisional permission. Advanced study in the understanding, speaking, reading, and writing of French. French is used in the classroom. Lect. 3 hrs. per wk.

**FREN 231-232-233 Introduction to French Civilization and Literature I-II-III** (3 cr.) (3 cr.) (3 cr.)

Prerequisite: FREN 203 or equivalent. An introduction to the background of French life and culture and to the outstanding contributions of France to world civilization from medieval times to the present. Reading is in the original French and French is used in the classroom. Lect. 3 hrs. per wk.

**FREN 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)

**FREN 299 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)

## GENERAL

**GENL 98 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)

**GENL 100 Orientation** (1 cr.)

This course, required of all beginning college students, is designed essentially as an instrument of group guidance and deals with such

problems as adjustment to college; purposes and functions of the college; planning for the future and making the most of the college years and what the college has to offer. Particular emphasis is placed on experiences designed to improve study habits and skills such as reading, listening, and library activities. Lect. 1 hr., Lab. 1 hr., Total 2 hrs. per wk.

**GENL 106 New Directions for Women** (2 cr.)

Today's woman: Exploring individual interests, abilities and values through testing, discussion and group counseling. Lect. 2 hrs. per wk.

**GENL 107 Preparation for Employment** (1 cr.)

A course specifically designed for use by the general college population, covering the following topics: (1) self-preparation, (2) career information, (3) how and where to find job opportunities, (4) the letter of application and the resume, (5) preparation for the interview, (6) the interview process, (7) the follow-up process. Lect. 1 hr. per wk.

**GENL 108 Career Education** (3 cr.)

A survey of the career options available to individuals to facilitate more rational and valid career planning and preparation. The Career Education Program is sequenced and postured to optimize career development and should provide a broad base of understanding of self and the world of work. It is designed so students will have two options at several levels: continuing in higher education or seeking job satisfaction in employment. Lect. 3 hrs. per wk.

**GENL 116 Student Leadership Development** (3 cr.)

A course designed to provide an opportunity for students to learn leadership theory and skills for application in campus organizations, committees and groups. Lect. 3 hrs.

**GENL 297 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)

## GEOGRAPHY

**GEOG 240 Introduction to Physical Geography** (3 cr.)

A study of the major elements of the natural environment such as land forms, weather and climate, natural vegetation, and soils. Lect. 3 hrs. per wk.

**GEOG 250 Introduction to Cultural Geography** (3 cr.)

A survey of landscape modification through human agencies and the relationships of culture and geography. Lect. 3 hrs. per wk.

**GEOG 260 Introduction to Economic Geography** (3 cr.)

A geographic survey of primary production, manufacturing, mining, and trade, covering agriculture, forestry, and fishing. Lect. 3 hrs. per wk.

**GEOG 299 Supervised Study** (1-5 cr.)

Prerequisite: division approval.  
(see General Usage Courses section)

## GEOLOGY

**GEOL 101-102-103 General Geology I-II-III** (4 cr.) (4 cr.) (4 cr.)

Physical geology, the various modifying agencies at work upon the earth, and their effects. The composition and structure of the earth as a whole. Historical geology, the history of the earth and its plants and animals from the beginning to the present, with emphasis on the principles involved in interpreting geologic evidence. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**GEOL 104-105 General Geology I-II** (6 cr.) (6 cr.)

Physical geology, the various modifying agencies at work upon the earth, and their effects. The composition and structure of the earth as a whole. Historical geology, the history of the earth and its plants and animals from the beginning to the present, with emphasis on the principles involved in interpreting geologic evidence. Lect. 5 hrs., Lab. 3 hrs., Total 8 hrs. per wk.

**GEOL 131-132-133 Oceanography I-II-III** (4 cr.) (4 cr.) (4 cr.)

Prerequisite: one high school science and two math (algebra). An interdisciplinary course covering the principles and applications of physical, chemical, biological and geological oceanography. Field trips to nearby coastal areas. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

**GEOL 199 Supervised Study in Geology** (1-5 cr.)  
(see General Usage Courses section)

**GEOL 226 Minerals** (4 cr.)  
Prerequisite: GEOL 101. Introduction to the study of minerals. Crystalline state, mineral properties, genesis, occurrence, and uses of most important minerals. Mineral-collecting field trip. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**GEOL 228 Fossils** (4 cr.)  
Prerequisite: GEOL 103 or BIOL 103 or permission. Introduction to invertebrate and vertebrate fossils, their distribution through time, evolution, biostratigraphic and paleoecologic significance; field trip. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

## GERMAN

**GERM 17 German for the Tourist** (3 cr.)  
Designed to meet the minimum conversational needs of persons intending to travel to Germany and desiring an acquaintance with the German language and culture. Emphasis is on speaking and on the accurate interpretation of German in situations likely to be encountered by the traveller abroad. The purpose of the course is to provide structure which will enable the student to deal more comfortably with specific situations. Lect. 3 hrs. per wk.

**GERM 101-102-103 Introductory German I-II-III** (4 cr.) (4 cr.) (4 cr.)  
Introductory training in the understanding, speaking, reading, and writing of German with emphasis on manipulation of the structure of the language. (German is used in the classroom.) Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk. *Not recommended for students who have, within the past two years, received two years high school or one year college credit for this language.*

**GERM 104-105 Introductory German I-II** (6 cr.) (6 cr.)  
The understanding, speaking, reading, and writing of German with emphasis on manipulation of the structure of the language. (German is used in the classroom.) Lect. 5 hrs., Lab. 3 hrs., Total 8 hrs. per wk.

**GERM 107-108-109 Conversational German I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Prerequisite: GERM 103 or equivalent. Three-quarter sequence built around German language films, textbook and taped recordings. Basic conversational German as currently spoken. Includes use of language lab by individual students. (May be taken out of sequence.) Lect. 3 hrs. per wk.

**GERM 198 Seminar and project** (1-5 cr.)  
(see General Usage Courses section)

**GERM 199 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)

**GERM 206-207-208 Intermediate German I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Prerequisite: GERM 103 or successful completion of two years of high school German and divisional permission. Advanced study in the speaking, understanding, reading and writing of German. German is used in the classroom. Lect. 3 hrs. per wk.

**GERM 231-232-233 Introduction to German Literature I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Prerequisite: GERM 203 OR equivalent. Readings in selected works of German literature. German is used in the classroom. Lect. 3 hrs. per wk.

**GERM 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)

**GERM 299 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)

## GOVERNMENT

**GOVT 110 Survey of American Political Parties** (3 cr.)  
A survey of the development of American political parties. Emphasis on local, state, and federal organization of political parties, conventions, and elections. Lect. 3 hrs. per wk.

**GOVT 116 Political Resources of the Community** (3 cr.)  
The rights and responsibilities of participating in the decision-making processes of local, state and federal government, particularly in relation to the various governments and agencies within the community college districts. Resources available for development of sound child and family patterns. Lect. 3 hrs. per wk.

**GOVT 180 American Constitutional Government** (3 cr.)  
An introductory course in American government, including fundamental concepts and principles of our constitutional system at the national, state and local levels. Lect. 3 hrs. per wk.

**GOVT 185 Introduction to Local Government** (3 cr.)  
An introduction to the theory, structure, and function of local government in the United States, with particular emphasis on municipal government in Virginia. Lect. 3 hrs. per wk.

**GOVT 187 American National Government** (5 cr.)  
The organization, structure and functions of the national government in the United States. If credit was given for either GOVT 180, GOVT 186, or GOVT 281-282-283, credit cannot be obtained for this course. Lect. 5 hrs. per wk.

**GOVT 188 State and Local Government** (5 cr.)  
A study of the theory, structure and functioning of, and interrelationships among, state and local governments in the United States, with illustrations from Virginia jurisdictions. Lect. 5 hrs. per wk.

**GOVT 199 Supervised Study** (1-5 cr.)  
Prerequisite: division permission.  
(see General Usage Courses section)

**GOVT 211 International Relations I** (3 cr.)  
An analysis of the international political system. Includes an introduction to theoretical and analytical approaches to the understanding of the international system and an analysis of the economic, geographic, demographic, and ideological factors and problems affecting the behavior of states toward one another. Lect. 3 hrs. per wk.

**GOVT 212 International Relations II** (3 cr.)  
A study of international law and international organizations. The study examines both the origin and the functions of law and organization within the international state system. Lect. 3 hrs. per wk.

**GOVT 213 International Relations III** (3 cr.)  
An examination of the contemporary international political system, concentrating on the policies of the major powers, the motivations and goals of those policies, and the major problems of conflict and adjustment in the contemporary system. May be taken nonsequentially. Lect. 3 hrs. per wk.

**GOVT 281-282-283 United States Government I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Elements of political science, powers, organization and functions of the legislative, executive and judicial branches of the national, state and local governments in the United States; democracy, federalism, the Constitution and civil liberties. These courses need not be taken sequentially. Lect. 3 hrs. per wk.

**GOVT 284-285 United States Government I-II** (5 cr.) (4 cr.)  
Elements of political science, powers, organization, and functions of the legislative, executive, and judicial branches of the national, state and local governments in the United States; democracy, federalism, the Constitution, and civil liberties. Lect. 5-4 hrs. per wk.

**GOVT 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)

**GOVT 299 Supervised Study** (1-5 cr.)  
Prerequisite: division permission.  
(see General Usage Courses section)

## GREEK

**GREK 101-102-103 Introduction to Ancient Greek I-II-III** (3 cr.) (3 cr.) (3 cr.)  
A comprehensive introduction to the ancient Greek language designed to train the student for early readings in Hellenic or Hellenistic literature. Lect. 3 hrs. per wk.

**GREK 211-212-213****Intermediate Ancient Greek I-II-III** (3 cr.) (3 cr.) (3 cr.)

Prerequisites: GREK 101-102-103. A comprehensive introduction into the reading of Classical and Koine Greek with a review of Greek grammar, forms, and syntax. Lect. 3 hrs. per wk.

**GREK 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)**HEALTH****HLTH 100 Orientation to Allied Health Careers** (1 cr.)

An orientation to the interrelated roles and functions of various members of the health team. Lect. 1 hr. per wk.

**HLTH 101 Cardiopulmonary Resuscitation Modular System** (1 cr.)

Training in coordinated mouth-to-mouth artificial ventilation and heart compression based upon the American Red Cross approved method. Successful completion of all phases of the course results in Red Cross certification in CPR. Lect. 1 hr. per wk.

**HLTH 106 First Aid and Safety** (3 cr.)

The principles and techniques of safety and first aid according to accepted content of a standard first aid course. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HLTH 110 Concepts of Personal and Community Health and Safety** (3 cr.)

A course designed to study the concepts related to the maintenance of health, principles of safety, and the prevention of illness at the personal and community level. Lect. 3 hrs. per wk.

**HLTH 120 Medical Terminology** (5 cr.)

Provides an understanding of medical abbreviations and terms. Includes the study of prefixes, suffixes, stem words, and technical terms with emphasis on proper spelling and usage. Lect. 5 hrs. per wk.

**HLTH 124 Medical Terminology I** (3 cr.)

Provides an understanding of medical abbreviations and terms. Includes the study of prefixes, suffixes, stem words and technical terms with emphasis on proper spelling and usage. Lect. 3 hrs. per wk.

**HLTH 125 Medical Terminology II** (2 cr.)

A continuation of HLTH 124 for those students in health-related curriculums requiring additional understanding of medical terms. Lect. 2 hrs. per wk.

**HLTH 136 Human Sexuality** (3 cr.)

Designed to provide a basic understanding of human sexuality. Includes anatomy, physiology, pregnancy, family planning, venereal disease, sexual variation and others. Lect. 3 hrs. per wk.

**HLTH 146 Occupational Injury and Disease Control** (3 cr.)

Prerequisite: 1 unit each of high school chemistry and physics or divisional approval. A study of environmental energy, physical and chemical hazards, including gases, vapors, dusts, fumes and mists; the importance of personal protective equipment and contamination control methodology. Lect. 3 hrs. per wk.

**HLTH 150 Concepts of Disease** (3 cr.)

Prerequisite: NASC 113 or divisional permission. A survey course designed specifically for students enrolled in health technology programs. General principles classification, causes and treatment of selected disease processes are presented. Lect. 3 hrs. per wk.

**HLTH 156 Child Health and Nutrition** (3 cr.)

Understanding the physical needs of the pre-school child and the methods by which these are met. Emphasis upon health routines, hygiene, nutrition, feeding and clothing habits, childhood diseases, and safety as related to health growth and development. Lect. 3 hrs. per wk.

**HLTH 216 Infant-Toddler Development and Care** (3 cr.)

Prerequisite: HLTH 110 and PSYC 130. Growth and development during pre-natal period to toddlerhood. Various infant programs throughout the U.S. will be analyzed and discussed. The importance of good physical and psychological environment will be studied as related to overall development of child. Lect. 3 hrs. per wk.

**HLTH 226 General Pharmacology** (3 cr.)

General pharmacology for the health-related professions, covering the general principles of drug actions/reactions; major drug classes; specific

agents within each class; routine mathematical calculations needed to determine desired dosages. Lect. 3 hrs. per wk.

**HISTORY****HIST 101-102-103 History of Western Civilization I-II-III** (3 cr.) (3 cr.) (3 cr.)

The development of civilization from ancient times to the present. The second and third quarters deal with the survey of the periods from the Renaissance and Napoleonic Wars respectively. Preferable, but not mandatory, that courses be taken sequentially. Lect. 3 hrs. per wk.

**HIST 104-105 History of Western Civilization I-II** (5 cr.) (4 cr.)

The development of western civilization from ancient times to the present. Lect. 5-4 hrs. per wk.

**HIST 109 Genealogy** (3 cr.)

A study of the methodology for investigating ancestry and family history. Lect. 3 hrs. per wk.

**HIST 111-112-113 United States History I-II-III** (3 cr.) (3 cr.) (3 cr.)

A survey of United States history from its beginning in early colonial times to the present. Preferable, but not mandatory, that courses be taken sequentially. Lect. 3 hrs. per wk.

**HIST 114-115 United States History I-II** (5 cr.) (4 cr.)

A survey of the United States history from its beginning in early colonial times to the present. Lect. 5-4 hrs. per wk.

**HIST 121-122-123 History of Civilization I-II-III** (3 cr.) (3 cr.) (3 cr.)

Prerequisite: pre-test. A study of the genius of western man as he builds the nation-states of Europe, of eastern man as he molds the great dynasties of China and India, and of global man as he enriches the past. Provides new understanding of man by careful examination of his legacy in government and philosophy, in architecture and engineering, in the fine arts and literature, and in the sciences. Lect. 3 hrs. per wk.

**HIST 131-132-133 Survey of American Civilization I-II-III** (3 cr.) (3 cr.) (3 cr.)

The historical development of American society, culture, economics, science, education, and politics. Emphasis on the ways in which concepts, philosophies and interrelationships affected and were affected by the popular concerns and attitudes of the American People and their leaders. Lect. 3 hrs. per wk.

**HIST 160 Women in History** (3 cr.)

A survey of the role of women and attitudes towards women in the Western world, with emphasis on women in American History. An inquiry into the origins of these attitudes will be followed by a survey of the role of women in various societies. Finally, the contemporary women's movement will be examined in the light of historical perspective. Lect. 3 hrs. per wk.

**HIST 170 History of the American Indian** (3 cr.)

A survey study of Indians of North America, concentrating on Indians before Columbus, with a briefer look at contact with Europeans and present status. Special attention will be given to certain cultural aspects, including procurement of food, housing, religion, and tribal government. Lect. 3 hrs. per wk.

**HIST 187-188-189 Black History I-II-III** (3 cr.) (3 cr.) (3 cr.)

A survey of Black history, its relationships and contributions to the American society; the period of slavery; the period of caste subordination; the period of new mobility and growing Black protest. Preferable, but not mandatory, that courses be taken sequentially. Lect. 3 hrs. per wk.

**HIST 206 American History Since World War II** (3 cr.)

An in-depth investigation of modern history from 1945 to the present, with special emphasis on American involvement in international affairs. Lect. 3 hrs. per wk.

**HIST 215 American Revolution** (3 cr.)

A detailed examination of the factors that led to the separation of the American colonies from Great Britain, the war that ensued, the problems



facied by the revolutionary government, and the subsequent events leading to the adoption of the U.S. Constitution. Lect. 3 hrs. per wk.

**HIST 216 The American Civil War** (3 cr.)

A detailed examination of the factors that led to the rupture of the union, the war that ensued, the internal affairs of the United States and the confederate states, and the ultimate results of the conflict. Lect. 3 hrs. per wk.

**HIST 221-222 American Economic History I-II** (3 cr.) (3 cr.)

First quarter deals with economic history of the 19th century and early 20th century in the United States. The second quarter places emphasis on the 1920s and 1930s. Preferable, but not mandatory, that courses be taken sequentially. Lect. 3 hrs. per wk.

**HIST 231-232-233 Survey of Asian Civilization I-II-III** (3 cr.) (3 cr.) (3 cr.)

A survey of the civilizations of Asia, from their origins to the present day, with emphasis on their cultural aspects. The first quarter considers the Indian subcontinent; the second quarter, China, Japan, and Korea; and the third quarter, the countries of Southeast Asia. Preferable, but not mandatory, that courses be taken sequentially. Lect. 3 hrs. per wk.

**HIST 234-235-236 Middle East Civilization I-II-III** (3 cr.) (3 cr.) (3 cr.)

A survey of dominant intellectual, cultural, social, economic and religious patterns in the civilizations of Semitic, Indo-European and Turkic-speaking peoples of the Mid-East from pre-Islamic to modern times. Lect. 3 hrs. per wk.

**HIST 256-257-258 Survey of Russian History I-II-III** (3 cr.) (3 cr.) (3 cr.)

The history of Russia from the Kievan state to the present. Study includes the political, economic, social, and cultural aspects of Russia and its various ethnic groups. Lect. 3 hrs. per wk.

**HIST 261-262-263 History of England I-II-III** (3 cr.) (3 cr.) (3 cr.)

The history of England from Roman times to the present. The first quarter encompasses the period from Roman and Anglo-Saxon times through the Wars of the Roses; the second quarter, from 1485-1783; and the third quarter, from 1783 to the present. Lect. 3 hrs. per wk.

**HIST 271-272-273 The History of Virginia I-II-III** (3 cr.) (3 cr.) (3 cr.)

A survey of the cultural, political, economic history of the Commonwealth from its Elizabethan beginnings to the present. The first quarter covers the period ending in 1789; the second, from 1789 through 1900; the third, the twentieth century. Lect. 3 hrs. per wk.

**HIST 277-278 Family History I-II** (3 cr.) (3 cr.)

Equips students with the competencies needed to document their families' past and understand the families' responses to community, state or national developments. The emphasis is on data collection at various archival sites. Lect. 3 hrs. per wk.

**HIST 281-282-283 A Survey of Latin American Civilization I-II-III** (3 cr.) (3 cr.) (3 cr.)

A survey of Latin American civilization in its political, economic, and social aspects from Iberian and Pre-Columbian origins down to the present day. Preferable, but not mandatory, that courses be taken sequentially. Lect. 3 hrs. per wk.

**HIST 298 Seminar and Project** (1-5 cr.)

(see General Usage Courses section)

**HIST 299 Supervised Study** (1-5 cr.)

Prerequisite: division permission.  
(see General Usage Courses section)

## HORTICULTURE

**HORT 100 Introduction to Horticulture** (4 cr.)

An introduction to the commercial horticulture industry and an overview of horticultural technology including occupational opportunities. Survey of basic structures, equipment, facilities, and physical arrangements of nurseries, greenhouses and floral establishments. An introduction to growing, facility maintenance, transplanting and planting will form the laboratory experience. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**HORT 106 Fundamentals of Horticulture** (3 cr.)

A general study of plant growth and development, horticultural principles and practices, and horticultural crops with emphasis on ornamental crops. Lect. 3 hrs. per wk.

**HORT 107 Plant Propagation** (3 cr.)

Principles and applied practices of sexual and asexual methods of commercial and home propagation of horticultural plants. Skill-oriented emphasis placed on propagation techniques using seed, cuttings, grafting, budding, layering, and division. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 110 Tools and Equipment** (3 cr.)

Prerequisite: HORT 100 (May be waived with divisional approval). The tools and equipment currently in use in horticulture. Emphasis on the more complicated power-operated equipment including spreaders, sprayers, saws, and tractors. Safety, good maintenance and minor repair stressed. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 116 Professional Turf Care** (3 cr.)

Discusses careers in the turf industry. Stresses turfgrass identification, selection, culture and propagation from a commercial standpoint. Labs include turfgrass identification, field visits to various turf care operations, and use of common equipment. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 117 Turf Pests** (3 cr.)

Discusses principles of the identification, morphology and life cycles of insects and other animals, disease agents and weeds. Labs stress diagnosis and chemical and non-chemical control of specific turf pests. Prepares students for Category III Pesticide Applicator Certification. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 118 Irrigation Systems for Turf and Ornamentals** (3 cr.)

Explains why, when and how irrigation systems are used by the turf care industry. Includes component selection, and system design, installation, operation and maintenance. Labs allow students to see components and entire systems, as well as learning manual skills needed to design and install these systems. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 120 Soils** (4 cr.)

Theoretical and practical aspects of sound soil management in relation to production of horticultural crops. Includes soil identification, properties, analysis, fertilizers, pasteurization, potting mixtures, equipment used in soil tillage and soil conservation. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**HORT 126 Landscape Construction and Maintenance** (3 cr.)

Survey of construction materials and equipment used for commercial and residential landscaping. Includes preparation of bids and estimation costs of landscape maintenance and construction projects. Development of skills and competencies in practical application of landscape design theory. Lect. 1 hr., Lab 4 hrs., Total 5 hrs. per wk.

**HORT 130 Environmental Factors of Plant Growth** (3 cr.)

Examines environmental factors which affect plant growth, including natural and artificial light, rainfall and irrigation, humidity, temperature, wind root medium, nutrients, growth regulations, pesticides and pollutants. Discusses manipulation of these factors by horticulturists. Lect. 3 hrs. per wk.

**HORT 136 Interior Landscaping** (2 cr.)

Examines theoretical principles and applied practices of design, layout, selection, planting and maintenance of plant materials suitable for indoor use in residential and public buildings. Includes assessment of client needs; preparation of contracts and specifications and construction materials. Lect. 1 hr., Lab. 2 hrs., Total 3 hrs. per wk.

**HORT 137 Plantscaping for Interior Design** (3 cr.)

A survey course for the non-horticulture technology student which deals with the concepts, principles, and applied practices of innovative interior designing with plants for commercial and residential environments. Includes identification, selection, and cultural requirements and design characteristics of appropriate plant materials. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 146 Horticultural Botany** (4 cr.)

An elementary study of the principles of botany with application in commercial horticulture, considers fundamental aspects of taxonomy,

anatomy, reproduction, morphology, physiology, and genetics of plants. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**HORT 147 Horticulture for Recreation and Parks (3 cr.)**

Designed to introduce Recreation and Park students to horticultural methods and materials as they apply to the field of Recreation and Parks. The course will cover the types of plant materials used in Recreation and Parks, and methods developed for their use. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**HORT 148 Landscaping in Recreational Areas (3 cr.)**

Designed to give the students experience and knowledge in proper landscape design for recreation areas. Emphasis will be placed on proper design of plantings and environmental improvement. Lect. 1 hr., Lab., 4 hrs., Total 5 hrs. per wk.

**HORT 156 Greenhouse Crop Production (3 cr.)**

Examines commercial practices related to production of major floricultural crops. Consideration of production requirements, environmental control and management, and cultural techniques affecting production of pot plants and cut flowers. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 157 Fruit Production (3 cr.)**

Principles and applied practices of home and commercial production of soft and tree fruits. Considers selection, culture, handling, storage and processing of major fruit types. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 158 Vegetable Production (2 cr.)**

A study of principles and practices of home and commercial vegetable production; examines crops of major economic importance in regard to classification, culture, soil preparation, cultivation, weed control, crop rotation, insect and disease control, marketing, and storage. Lect. 2 hrs. per wk.

**HORT 190 Coordinated Internship (1-5 cr.)**  
(see General Usage Courses section)

**HORT 197 Cooperative Education (1-5 cr.)**  
(see General Usage Courses section)

**HORT 198 Seminar and Project (1-5 cr.)**  
(see General Usage Courses section)

**HORT 199 Supervised Study (1-5 cr.)**  
(see General Usage Courses section)

**HORT 211 Plant Pest Control (3 cr.)**

The current methods of controlling insect and fungal pests. The presently used pesticides, insecticides, and herbicides, studied from the standpoint of specificity, selectivity, and total ecological considerations regarding their use. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 216 Horticultural Entomology (3 cr.)**

Discusses principles of insect anatomy, life cycles, and chemical as well as nonchemical control measures; students learn to identify, control and diagnose plant damage caused by common horticultural insect pests. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 217 Horticultural Plant Pathology (3 cr.)**

A study of the major diseases which attack horticultural crops. Considers methods for accurate identification and diagnosis of disease problems and appropriate control measures. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs per wk.

**HORT 220 Nursery Management (3 cr.)**

The aspects of nursery work including plant growing, planting, transplanting, balling, burlaping, business methods in the nursery, buying and stocking the nursery and merchandising in this specialized area. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 226 Garden Center Management (3 cr.)**

The commercial practices of garden center operations. Examines planning, layout and landscaping of premises, the selection, buying, maintenance and display of plant materials for the home gardening market. The pricing and merchandising methods of plants, and customer relations. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 230 Greenhouse Management (3 cr.)**

The theoretical and applied practices of managing a greenhouse facility. Emphasis on greenhouse construction and design, environmental

control, energy conservation and other related topics. Lect. 2 hrs., lab. 2 hrs., Total 4 hrs. per wk.

**HORT 240 Turf Management (3 cr.)**

The study of turf grasses grown in this geographical area. Examines propagation and production, planting, and maintenance practices as well as the specialized equipment related to turf maintenance. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 250 Landscape Planning (2 cr.)**

The basic symbols used in landscape plans. Drafting and blue print reading, the preparation of simple landscape plans, and the interpretation of plans designed by a landscape architect. Includes the fundamentals of landscape design, planning areas, walks, drives, and the effective use of trees, lawn, shrubs, ground cover, and foundation planting. Lab. 4 hrs., Total 4 hrs. per wk.

**HORT 254 Planting Design I (3 cr.)**

Prerequisite: HORT 256. The application of landscape theory and principles of drawing in the planning of landscape designs for residential and small scale commercial projects. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.

**HORT 255 Planting Design II (3 cr.)**

The application of landscape theory and principles of landscape drawing in the planning of landscape designs for commercial, institutional and environmental projects. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.

**HORT 256 Woody Plants (3 cr.)**

Identification, culture, and uses of woody plants used in landscaping. Includes deciduous and evergreen, wild and cultivated shrubs and trees. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 257 Herbaceous Plants (3 cr.)**

Identification, culture and uses of annuals, biennials, and perennials used in landscaping. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 260 Flower Shop Management (3 cr.)**

A consideration of the principles of retail florist management. Includes layout and design of a flower shop, floral merchandising, pricing of floral designs, florist wire services, wholesale sources and other topics related to the operation of a flower shop. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 266 House and Conservatory Plants (3 cr.)**

Identification, culture, and propagation of pot and conservatory plants. Considers the environmental problems unique to the growth of indoor plants and their use in indoor landscaping. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HORT 270 Floral Design and Arranging I (2 cr.)**

A practical introduction to floral design. Student practice in the basic methods of design and in producing arrangements. Lab. 4 hrs. per wk.

**HORT 276 Floral Design and Arranging II (2 cr.)**

A continuation of floral design and arranging with emphasis on acquisition of basic skills related to floral designs created by retail florists. Students will design and create wreaths, baskets, sprays, wedding flowers and corsages in the laboratory. Lab. 4 hrs. per wk.

**HORT 290 Coordinated Internship (1-5 cr.)**  
(see General Usage Courses section)

**HORT 297 Cooperative Education (1-5 cr.)**  
(see General Usage Courses section)

**HORT 298 Seminar and Project (1-5 cr.)**  
(see General Usage Courses section)

## HOTEL, RESTAURANT, AND INSTITUTIONAL MANAGEMENT

**HRIM 100 Introduction to Hotel/Restaurant Management (3 cr.)**

A survey of the history, organization, opportunities, and problems of the hospitality industry. Includes departmental functions, personnel practices, credit procedures, security routines, and typical job requirements. Emphasis will be on current trends and developments in the industry. Lect. 3 hrs. perwk.

**HRIM 124-125 Principles of Food Preparation I-II** (4 cr.) (4 cr.)

Applications of scientific principles and techniques to food preparation. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**HRIM 126 Principles of Commercial Food Preparation** (4 cr.)

A study of the principles of commercial cooking in large quantities, use of equipment and cooking techniques. Presentation of the problems and potentials of cooking in large quantities to include: work flow, alternate cooking methods, different types of food establishments. Lect. 2 hrs., Lab. 4 hrs., Total 6 hrs. per wk.

**HRIM 156 Club Management** (3 cr.)

Problems peculiar to the organization and management of private clubs such as boards of directors, committee organization, legal aspects, and financial considerations. Lect. 3 hrs. per wk.

**HRIM 168 Executive Housekeeping** (3 cr.)

A detailed study of the housekeeping department with emphasis on organization, staffing and scheduling, staff development, work methods improvements, equipment, cleaning materials and cleaning procedures; maintenance and refurbishing, room design and safety engineering. Lect. 3 hrs. per wk.

**HRIM 170 Introduction to Cafeteria Management** (3 cr.)

Survey of the management functions of planning, organizing, staffing, directing, and controlling and their application to public school cafeterias. The case study method will be used to analyze cafeteria management problems. Lect. 3 hrs. per wk.

**HRIM 184-185 Hotel-Restaurant Organization and Management I-II** (3 cr.) (3 cr.)

The nature and scope of departmental functions in the hospitality industry with emphasis on operation practices and problems. Lect. 3 hrs. per wk.

**HRIM 186 Equipment Layout-Design** (3 cr.)

Design, layout and specification requirements of food service equipment. Work measurement studies applied to quantity food production and its interrelationship to manpower and equipment requirements. Lect. 3 hrs. per wk.

**HRIM 188 Marketing of Hospitality Services** (3 cr.)

Principles and practices of marketing the services of the Hotel & Restaurant Industry. Consideration of the marketing concept; methods leading to customer satisfaction with attention to internal and external stimulation of sales. Lect. 3 hrs. per wk.

**HRIM 190 Coordinated Internship** (1-5 cr.)

(see General Usage Courses section)

**HRIM 226 Menu Planning and Food Merchandising** (3 cr.)

Covers menu cycles, nutritional needs, geographical acceptance, costs, prices, holiday menus, and special occasions (birthdays, weddings). How to prepare display, and "sell" food to take the food out of the mediocre into the realm of artistry. Practice in menu planning, forecasting, and presentation. A look at the menu structure and how it communicates the ethnic menu. The relationship between menu planning and personnel. How to project your food so customer is satisfied from standpoint of total eating experience. Lect. 3 hrs. per wk.

**HRIM 227 Advanced Foods** (3 cr.)

Prerequisite: HRIM 126. Experimental techniques and procedures applied to standard recipe development, testing procedures and preparation techniques used in a commercial operation. Emphasis will be on sensory quality evaluation to determine general palatability and customer acceptance. In addition, modification of convenience food products, redi-food systems, and microwave techniques will be presented in the laboratory. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**HRIM 236 Sanitation** (3 cr.)

Prerequisite: high school general science, biology, or chemistry. The moral and legal responsibilities involved in assuring sanitary conditions in the food service establishment. Emphasis on the causes and prevention of food poisoning. Lect. 3 hrs. per wk.

**HRIM 246 Labor Cost Control** (3 cr.)

Prerequisite: HRIM 126. Control of payroll in the hospitality industry based on job analysis, individual and master work schedules to maximize the efficiency of the labor force in a manner consistent with the standards of quality and service established and to improve the profit potential of the operation. Lect. 3 hrs. per wk.

**HRIM 264-265 Food and Beverage Cost Controls I-II** (3 cr.) (3 cr.)

Pre-cost, pre-control methods relative to the menu, production control, purchasing, receiving, inventory control, and profit of food service system. Lect. 3 hrs. per wk. (HRIM 264 is the prerequisite to HRIM 265.)

**HRIM 266 Food Purchasing** (3 cr.)

Methods and procedures for purchasing food for hotels, restaurants and institutions; markets, federal and trade grades, governmental regulations, packaging, comparative versus price buying, yields and quality controls. Lect. 3 hrs. per wk.

**HRIM 277 Personnel Management and Training for Hotel, Restaurants, and Institutions** (3 cr.)

A course involving personnel management in the hospitality industry; a discussion of the sensitivities of management to the human problems of employees, the definition of goals, and the communication of enthusiasm toward these goals. Emphasis will be placed on the goal of proper training for services required in this industry. Lect. 3 hrs. per wk.

**HRIM 286 Catering** (3 cr.)

Prerequisite: division permission. An applied course in banquet planning. Emphasis is placed on menu planning, purchasing, preparation, service details, sanitation, analysis and management. Students fill typical employee/supervisory positions in the presentation of a series of banquets. Total 5 hrs. per wk.

**HRIM 287 Hotel/Motel Front Office Procedures** (3 cr.)

An analysis of the jobs in the hotel-motel front office and procedures involved in registering, accounting for, and checking out guests. Lect. 3 hrs. per wk.

**HRIM 289 Hotel and Motel Law** (3 cr.)

A study of the laws applicable to the ownership and operation of hotels and motels. The duties to guests, ejection of undesirables, liabilities for personal injuries, damage, arrest and detention of offenders. Lect. 3 hrs. per wk.

**HRIM 290 Coordinated Internship** (1-5 cr.)

(see General Usage Courses section)

**HRIM 297 Cooperative Education** (1-5 cr.)

(see General Usage Courses section)

**HRIM 298 Seminar and Project** (1-5 cr.)

(see General Usage Courses section)

**HUMAN SERVICES****HMSV 106 Introduction to Human Services** (3 cr.)

An overview of human service as a career field. Emphasis will be on developing the generalist concept and the role of the associate degree graduate to other human service personnel. Lect. 3 hrs. per wk.

**HMSV 128 Community Resources and Services** (3 cr.)

A study of federal, state, and local agencies, their functions, limitations and interrelationships. Emphasis is placed on determining stated purpose of an agency as related to delivery of human services, and procedures for referrals, team-building, and regional cooperation. Lect. 1 hr., Lab. 5 hrs., Total 6 hrs. per wk.

**HMSV 134-135 Helping Relationships I-II** (3 cr.) (3 cr.)

Development of skills needed to function effectively in helping relationships. A major emphasis will be to increase students self-awareness in order to enable them to relate and help others more effectively. Students will learn to identify personal skill strengths and deficits, to set goals, and to develop plans for achieving personal and program goals. Second quarter emphasis will be transfer of these skills to client needs. Helping Relationships I is prerequisite for Helping Relationships II. Lect. 3 hrs. per wk.

**HMSV 136 Helping Relationships III** (3 cr.)

Prerequisites: HMSV 134-135. Development of skills needed to function effectively in helping relationships. A major emphasis will be to increase students' self-awareness in order to enable them to relate and help others more effectively. Students will learn to identify personal skill strengths and deficits, to set goals, and to develop plans for achieving personal and program goals. Lect. 3 hrs. per wk.

**HMSV 144-145 Group Process I-II** (3 cr.) (3 cr.)

A study of the stages of group development, the role of the group leader and the various kinds of groups. Students will be introduced to various models of group processes that are involved in the helping process. Second quarter students will increase their skill development through increased experiences in group facilitating and leadership. Lect. 3 hrs. per wk.

**HMSV 146 Group Process III** (3 cr.)

Prerequisites: HMSV 144-145. A study of the stages of group development, the role of the group leader and the various kinds of groups. Students will be introduced to the various models of group processes that are involved in the helping process. Lect. 3 hrs. per wk.

**HMSV 201-202-203****Gerontology I-II-III** (3 cr.) (3 cr.) (3 cr.)

A study of the process of aging and its implications in relation to health, recreation, education, transportation, meaningful work or activity, and to community resources. Students will be provided opportunities for field experience and in-depth study of agencies concerned with senior adults. Emphasis will be on expanding awareness and knowledge in order to care for, and work with senior adults, both individuals and in agencies. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**HMSV 211-212-213 Alcohol/Drug Abuse Rehabilitation Programs I-II-III** (3 cr.) (3 cr.) (3 cr.)

A comprehensive 3-quarter course designed to provide knowledge, skills, and insight for working with drug and alcohol abuse programs. The courses will emphasize personal growth, goal and value assessment, development of helping relationships and counseling for individual and group needs. Students will be provided opportunities for field experience in treatment center. Lect. 3 hrs. per wk.

**HMSV 216 Adolescent Alcohol Use and Abuse** (3 cr.)

Prerequisites: HMSV 211-212-213. The study of adolescent developmental tasks and behavior and the concepts and principles related to this stage of human development. Examination of the adaptive and injurious effects of alcohol on the adolescent's development. Specific treatment modalities explored. Lect. 3 hrs. per wk.

**HMSV 217 Recreation Activities for Senior Adults** (3 cr.)

Provides competency in planning, evaluating and implementing programs and activities for senior adults, with special emphasis on awareness of limitations and aspirations for senior adults as individuals, in groups, and in institutions. Lect. 1 hr., Lab. 5 hrs., Total 6 hrs. per wk.

**HMSV 226 Functional Family Intervention** (3 cr.)

Prerequisites: HMSV 134,144, and MENT 104. Designed to give students an understanding of functions and dysfunctions within the family. Emphasis will be placed on developing effective skills via an interpersonal/interactional approach to helping/intervening with families in need. Lect. 3 hrs. per wk.

**HMSV 227 Helping Across Cultures** (3 cr.)

Designed to provide an historical overview of selected cultural and racial groups in the United States, and to promote counselor trainees; understanding of cultural and racial group differences and their impact on counseling service delivery. Lect. 3 hrs. per wk.

**HMSV 228 The Helper as a Change Agent** (3 cr.)

This course is designed to provide students with the skills needed to implement alternative models of change and influence, such as action research, problem solving, consultation, workshop development, and outreach and advocacy for diverse client populations.

**HMSV 246 Culture, Class, and Substance Abuse** (3 cr.)

An examination of the different characteristics of substance abuse for different groups of people. Emphasis placed on physical, psychological, and sociological stress factors as they relate to substance abuse and the different treatment modalities. Lect. 3 hrs. per wk.

**HMSV 247 Substance Abuse and the Family** (3 cr.)

Prerequisites: HMSV 211-212-213. Examines the theoretical constructs of working with families including a cause and effect approach and a systems theory approach. Models for working with families will be compared and contrasted and treatment modalities discussed. Students will familiarize themselves with resources in their own communities. Lect. 3 hrs. per wk.

**HMSV 248 Case Management and Substance Abuse** (3 cr.)

Prerequisites: HMSV 211-212-213. A study and analysis of interviewing substance abuse clients. Includes intake, assessment, handling denial, and ending the interview. Skills for writing short-term goals and treatment plans will be taught. Emphasis is placed on accountability of treatment goals. Various reporting devices will be examined. Lect. 2 hrs. Lab. 3 hrs., Total 5 hrs. per wk.

**HMSV 290 Coordinated Internship** (1-5 cr.)  
(see General Usage Courses section)**HMSV 297 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)**HMSV 298 Seminar and project** (1-5 cr.)  
(see General Usage Courses section)**HUMANITIES****HUMN 150 Explorations in Natural Living** (3 cr.)

An introductory study of the basic philosophical orientations associated with natural living. This course explores the values, rationale, means, and various expressions of the simple life. Lect. 3 hrs. per wk.

**HUMN 201-202-203 Survey of Western Culture I-II-III** (3 cr.) (3 cr.) (3 cr.)

A survey of the Western world which correlates the art, music and literature of the following periods: Greek and Roman, Middle Ages, Renaissance, Elizabethan, Neo-classical, Victorian and Modern. Lect. 3 hrs. per wk.

**HUMN 204-205 Survey of Western Culture I-II** (5 cr.) (4 cr.)

A survey of the Western world which correlates the art, music and literature of the following periods: Greek and Roman, Middle Ages, Renaissance, Elizabethan, Neo-Classical, and Modern. Lect. 5-4 hrs. per wk.

**HUMN 206 Creative Thinking** (3 cr.)

A study of creative and effective thinking processes with practical application in individual and group projects to solve business, scientific, and environmental problems. Analysis, "brainstorming," and the scientific method will be used. Lect. 3 hrs. per wk.

**INDUSTRIAL ENGINEERING****INDT 111-112 Materials and Processes of Industry I-II**(3 cr.) (3 cr.)

The objective of this course is to familiarize the student with the materials and processes of modern industry from the drafting and design point of view. The physical properties of industrial materials such as ferrous, non-ferrous metals, woods, plastics and clay products will be studied in terms of design application, processing and fabricating methods. Students will be introduced to cutting, cold forming, hot working, welding, foundry and chipless manufacturing processes which are widely employed in contemporary industry. In addition, the science of precision measurement as applied to inspection practices will be studied. Lect. 3 hrs. per wk.

**INDT 170 Industrial Management** (3 cr.)

A study of organizational structure: operational, financial, accounting and marketing activities, management responsibilities, planning, control, personnel, safety, labor relations, and factors essential to effective management. Lect. 3 hrs. per wk.

**INDT 190 Coordinated Internship** (1-5 cr.)  
(see General Usage Courses section)**INDT 198 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)**INDT 226 Plant Layout** (3 cr.)

Arrangement and layout of physical facilities for maximum efficiency of production including stock arrangement, machines, layout of aisles, use of space and techniques for model construction. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**INDT 286 Quality Control** (3 cr.)

Principles of inspection and quality control, with special emphasis on setting up, maintaining and interpreting control charts. Course content includes dimensional control, basic sizes, and applications of tolerances,

allowances, limits, precision measurements, comparison measurements, industrial applications, optical, electrical and air limit gauges, comparator inspection techniques, control charts, and statistics are introduced as quality control instruments. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**INDT 288 Production Planning and Control (3 cr.)**

The preparation and analysis of production, planning based on sales forecasts, operation sheets, routing, scheduling, dispatching, follow-up, inventory control, receiving stores and shipping, control forms and reports. Lect. 3 hrs. per wk.

## INTERIOR DESIGN

**INDG 104 Techniques of Interior Design (3 cr.)**

Evolution and development of an Interior Design problem. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**INDG 105 Drafting Techniques for the Interior Designer (3 cr.)**

Introduction to designing, drafting and rendering residential and commercial floor plans and the spatial arrangement of furnishings. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**INDG 106 Isometrics and Model Construction (3 cr.)**

Prerequisite: INDG 105. Projecting floor plans into three dimensions and techniques of constructing architectural models. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**INDG 107 Perspective and Rendering (3 cr.)**

One and two point perspective, elevations, and the execution of rendering for presentation. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**INDG 108 Color and Space Theories (3 cr.)**

Communication through Interior Design. The psychological implications of the use of color and space with related problem solving in color arrangements as they relate to the interaction of light and space. Lectures in the history and evolution of color theory. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**INDG 109 Styles in Furniture and Interiors (3 cr.)**

Prerequisite: ARTS 111-112. Lectures and discussion of trends in furniture design and interior treatments as they parallel trends in architecture. Lect. 3 hrs. per wk.

**INDG 206 Textiles, Floorcoverings, Wall and Window Treatments (3 cr.)**

Survey of styles, fibers, materials, and fabric production techniques with problem solving and research into related manufacturers and estimating. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**INDG 207 Furniture, Lighting Equipment and Accessories (3 cr.)**

Survey of styles in furniture, lighting, equipment and accessories, problem solving and research into related manufacturers and estimating. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**INDG 208 Advanced Drafting Techniques for Interior Designing (3 cr.)**

Prerequisite: INDG 107 or divisional approval. Advanced problems in commercial design, rendering and presentation techniques. Lect. 1 hr., Lab. 4 hrs., Total of 5 hrs. perwk.

**INDG 216 Business Procedures for Interior Design (3 cr.)**

Business procedures and practices, form, contracts, purchase orders, and billing with development and solving of problems in job estimating, measuring, pricing, and installation/labor techniques. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**INDG 217 Interior Design Trade Sources (3 cr.)**

Comparative analysis of the major sources of supply and their products. (Appropriate field trips required.) Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**INDG 218 Interior Designing of Commercial Space (3 cr.)**

Advanced problems in the handling of large scale interiors. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**INDG 219 Furniture Design, Construction & Upholstery (3 cr.)**

Solving of practical problems in furniture fabrication. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**INDG 226 Fabric Design and Weaving (3 cr.)**

Introduction to weaving and printing techniques for the Interior Designer. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**INDG 227 Fabrication & Construction of Wall & Window Treatments (3 cr.)**

Methods of design and construction of wall and window treatments. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**INDG 228 Antiques (3 cr.)**

Introduction to methods of evaluation, determining provenance and authenticity of antiques. Lect. 3 hrs. per wk.

**INDG 229 Modern Interiors and Designers (3 cr.)**

Philosophics and forms of modern architectural, interior, furniture and accessory design. Lect. 3 hrs. per wk.

**INDG 236 Advanced Rendering and Presentation (3 cr.)**

Prerequisite: INDG 208. Continuation of rendering and presentation techniques. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**INDG 290 Coordinated Internship (1-5 cr.)**

(see General Usage Courses section)

**INDG 297 Cooperative Education (1-5 cr.)**

(see General Usage Courses section)

**INDG 299 Supervised Study (1-5 cr.)**

(see General Usage Courses section)

## ITALIAN

**ITAL 114-115-116**

**Conversation in Italian I-II-III (3 cr.) (3 cr.) (3 cr.)**

Basic conversation in Italian, as currently spoken. Includes use of applicable grammar, vocabulary encountered in daily situations, and exercises in reading and writing the language. Italian is used in the classroom. Lect. 3 hrs. per wk.

**ITAL 201-202-203**

**Intermediate Italian I-II-III (3 cr.) (3 cr.) (3 cr.)**

Prerequisites: Two years of high school Italian or one year of college Italian and divisional permission. This course reviews grammatical concepts to cover a more detailed study of grammar. The four basic skills, listening, speaking, reading and writing, will continue to be emphasized and further developed. The target language is used in the classroom. Lect. 3 hrs. per wk.

**ITAL 221-222-223 Intermediate**

**Italian Conversation I-II-III (3 cr.) (3 cr.) (3 cr.)**

Prerequisite: ITAL 203 or equivalent. Additional training in understanding and speaking Italian with continued but specific emphasis on basic structure and idioms. Reading and writing are minimized. Italian is used in the classroom. May be taken out of sequence. Lect. 3 hrs. per wk.

## JAPANESE

**JAPN 101-102-103**

**Elementary Japanese I-II-III (4 cr.) (4 cr.) (4 cr.)**

Basic Japanese for beginners with major emphasis on learning to comprehend and speak the Japanese language within a limited context of vocabulary and structure. Intensive aural-oral drilling is used throughout. The development of skills is in comprehension, speaking, reading, writing. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

## LATIN

**LATN 101-102-103**

**Elementary Latin I-II-III (3 cr.) (3 cr.) (3 cr.)**

Essentials of Latin grammar and composition; introduction to the translation of Latin literature, with special selections from Caesar and other writers. Lect. 3 hrs. per wk.

**LATN 104-105 Introductory Latin I-II (6 cr.) (6 cr.)**

Essentials of Latin grammar and composition; introduction to the translation of Latin literature, with special selections from Caesar and other writers. Lect. 5 hrs., Lab. 3 hrs., Total 8 hrs. per wk.

**LATN 211-212-213****Intermediate Latin I-II-III (3 cr.) (3 cr.) (3 cr.)**

Prerequisites: Two years of high school Latin or one year of college Latin and divisional permission. A comprehensive introduction into the reading of classical Latin with a review of Latin grammar, forms, and syntax. Lect. 3 hrs. per wk.

**LATN 298 Seminar and Project (1-5 cr.)**  
(see General Usage Courses section)**LEGAL****LEGL 110 An Overview of the Legal Process (3 cr.)**

A review of the processes of basic American law as legal decisions are made by the judicial, legislative and administrative agencies. An overview of the American judicial system, the sources of law, and the general relationship between the federal and state court system. Lect. 3 hrs. per wk.

**LEGL 126 Legal Research (3 cr.)**

Provides an understanding of the function of the law library and will assist in developing research skills through the use of digests, encyclopedias, reporter systems and practice manuals. Lect. 3 hrs. per wk.

**LEGL 127 Legal Writing (3 cr.)**

Prerequisite: LEGL 126. A continuation of LEGL 126, incorporating and placing in practice research capabilities in preparing memoranda of law, briefs, reports, contracts, pleadings, and other legal documents. Lect. 3 hrs. per wk.

**LEGL 134 Domestic Relations (3 cr.)**

Elements of valid marriage, grounds for divorce and annulment, separation, defenses, custody, support, alimony, tax consequences out-of-state divorces and validity; jurisdiction and service. Review and analysis of separation and custody agreements, documents in divorce proceedings, change of name proceedings and adoptions. Lect. 3 hrs. per wk.

**LEGL 136 Law Office Management (3 cr.)**

Management principles and systems applicable to law firms, including record keeping, accounting, filing, work processing, time keeping, billing, administrative services, purchasing and procurement of supplies and equipment maintaining effective relationships between legal assistants, attorneys, clients, and secretarial staff; computer applications to legal systems; effective employment and supervision of lay personnel; legal ethics, related to law office management. Lect. 3 hrs. per wk.

**LEGL 221-222-223 Civil Trial and Appellate Practice I-II-III (3 cr.) (3 cr.) (3 cr.)**

A study of the fundamental principles of the law of torts, involving the preparation and use of pleadings and other documents involved in the trial and appeal of a civil action. Lect. 3 hrs. per wk.

**LEGL 226 Trial Practice (3 cr.)**

Includes a thorough study of the court system; federal, state and local. The student will be introduced to legal drafting, and will examine the commencement and trial of cases in detail, including drafting of the various pleadings, motions, and other matters, which are ordinary components of civil action. Lect. 3 hrs. per wk.

**LEGL 234 Estate Planning (3 cr.)**

An introduction to various devices used to plan estates, including wills, revocable and irrevocable trusts, joint ownership, powers of appointment, life insurance and the like. Students consider the utility of various plans, in the light of different property arrangements, family situations, and estate objectives of typical decedents. Lect. 3 hrs. per wk.

**LEGL 236 Real Estate Abstracting (3 cr.)**

Complete review of the aspects of abstracting titles to real estate: review and discussion of the record room; recordation of land transactions; priority of liens; dissent and distribution; descriptions of land; grantor-grantee indices; special liens on real estate assessed by localities; bankruptcy; title insurance; warranties; covenants; restrictions; dower and curtesy rights; petition suits; easements; adverse possession; and riparian rights. Lect. 3 hrs. per wk.

**LEGL 241 Legal Aspects of Business Organizations (3 cr.)**

The lawyer's role in the formation of business entities, including sole proprietorship, partnerships and corporations, and other business vehi-

cles. The fundamental principles of law applicable to each and the preparation of the documents necessary for organization and operation. Lect. 3 hrs. per wk.

**LEGL 246 Law of Income Taxation (4 cr.)**

A study of the law of income taxation-state, federal, and local-including preparation of income tax returns and related materials. A survey of the various administrative and judicial tribunals, and their jurisdiction, involved in the determination of income tax controversies. Lect. 4 hrs. per wk.

**LEGL 251 Legal Transactions (3 cr.)**

Commercial principles and practices, uniform commercial code. major emphasis on contracts, warrants, title, consideration, performance, parties, subject matter, and remedies for breach torts, sales, negotiable instruments; consumer protection; insurance; wills and inheritance; bankruptcy, statute of limitations. Lect. 3 hrs. per wk.

**LEGL 256 Legal Aspects of Real Estate (4 cr.)**

The law of real property and an in-depth survey of the more common types of real estate transactions and conveyances, such as deeds, contracts, leases, and deeds of trust, drafting problems involving these various instruments; special research projects; a study of the system of recording and search of public documents. Lect. 4 hrs. per wk.

**LEGL 258 Administration of Decedents' Estates (3 cr.)**

The course is designed to teach students how to administer an estate efficiently. It includes instruction on substantive areas of law, as well as instruction on preparation of forms and provides samples for the efficient administration of decedents' estates. Lect. 3 hrs. per wk.

**LEGL 290 Coordinated Internship (1-5 cr.)**  
(see General Usage Courses section)**LEGL 297 Cooperative Education (1-5 cr.)**  
(see General Usage Courses section)**LIBRARY SCIENCE****LBRY 126 Library Skills for Research (1 cr.)**

A basic course to introduce students to library skills and resources. A laboratory approach is employed to develop skills in use of library materials. General information is taught about library procedures, specific methods for utilizing varied reference materials, classification systems, the card catalog, and indexes. General topics on research paper preparation are presented. Lect. 1 hr., Lab. 1 hr., Total 2 hrs. per wk.

**MARKETING****MKTG 100 Principles of Marketing (3 cr.)**

The principles, methods, and problems involved in the distribution and marketing of goods and services. The various marketing agents: wholesaler, broker, agent, cooperative, and trade associations. Discussions of present day problems and policies connected with the distribution and sale of commodities, pricing, advertising and promotion, and buyer motivation. Lect. 3 hrs. per wk.

**MKTG 109 Principles of Salesmanship (3 cr.)**

The place of sales in a customer oriented marketing organization. The development of an effective sales presentation. Emphasis on sales principles, methods and standards. Study of consumer buying habits and methods. Lect. 3 hrs. per wk.

**MKTG 110 Fundamentals of Fashion (3 cr.)**

Develops an understanding of the principles and procedures involved in the production, distribution and consumption of fashion merchandise. Traces the history and development of fashion and how these changes effect the modern merchandising world. Emphasis on changing consumer characteristics which influence demand for fashion products and the effect that fashion marketing activities have on the economy. Lect. 3 hrs. per wk.

**MKTG 136 Retail Organization & Management (3 cr.)**

The organization of businesses to accomplish their goals in the most effective and efficient manner. Location, layout, internal management, policy development, methods of operation, merchandise control and protection, property maintenance, and analysis of results. Lect. 3 hrs. per wk.



- MKTG 150 Principles of Insurance** (3 cr.)  
A course in insurance principles and practices. Includes an examination of risks and applications in the principal fields of insurance including life, accident and health, fire, liability, surety, and property. Lect. 3 hrs. per wk.
- MKTG 180 Introduction to Food Marketing** (3 cr.)  
Study of food marketing organization, practices, and problems with emphasis on the supermarket. Topics included are: economic importance of food marketing; history and development of food retailing, role of trade groups, systems of food distribution, food industry surveys, supermarket organization and management, food industry issues, and the future of the food industry. Lect. 3 hrs. per wk.
- MKTG 197 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)
- MKTG 209 Sales Management** (3 cr.)  
From the viewpoint of management, study of the organization and operation of the sales division within the business enterprise. Planning, organizing, and controlling the total sales effort, use of the case method of learning. Lect. 3 hrs. per wk.
- MKTG 216 Merchandise Information** (3 cr.)  
A study of merchandise including durables as well as non-durables. Includes detailed analysis of construction, uses, care and related government regulations. Value and quality standards for consumer use are stressed. Emphasis placed on usefulness of product information as a merchandising tool. Lect. 3 hrs. per wk.
- MKTG 217 Color, Line and Design in Retailing** (3 cr.)  
The vital role played by color and design in almost every aspect of the marketing of consumer goods. Emphasis on styling, packaging, advertising, and professional layouts; basic sketching for art forms, balance and color harmony with recognition of basic period architecture as applied to consumer goods. Lect. 3 hrs. per wk.
- MKTG 218 Fashion Merchandising (Buying and Control)** (3 cr.)  
Develops an understanding of the major considerations involved with the buying and merchandising of fashion products. Emphasis is placed on the dynamics of fashion and consumer buying patterns and sources of buying information are analyzed and studied. Discusses fashion buying and inventory control in the merchandising cycle; techniques used in developing fashion buying plans; model stock, unit control and inventory systems. Merchandising selection policy and pricing for profit. Lect. 3 hrs. per wk.
- MKTG 219 Fashion Sales Promotion** (3 cr.)  
Designed to develop an understanding of the principles and procedures of selling fashion and simulates a creative approach to the promotion of fashion merchandising. Student studies sales promotion activities and selling appeals and approaches. Includes study of fashion advertisements, displays, publicity, and other sales promotion techniques involved in the merchandising of fashion items. Lect. 3 hrs. per wk.
- MKTG 225 Principles of Advertising** (3 cr.)  
Study of the functions, principles, and techniques of advertising, including the role of advertising in the marketing system. Lect. 3 hrs. per wk.
- MKTG 226 Merchandise Buying and Control** (3 cr.)  
The place of buying and inventory control in the merchandising cycle; the techniques used in developing merchandise plans, model stock, unit control, inventory systems, merchandise selection policy and pricing for profits. Lect. 3 hrs. per wk.
- MKTG 228 Sales Promotion and Customer Relations** (3 cr.)  
The scope and total activities of a sales promotion program designed to coordinate advertising, display and publicity. Effective use of the sales forces and store policies to develop favorable customer relationships. Institutional practices which develop goodwill for the store. Lect. 3 hrs. per wk.
- MKTG 297 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)
- MKTG 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- MKTG 299 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)

## MATHEMATICS

- MATH 01 Developmental Mathematics** (1-5 cr.)  
A developmental course which bridges the gap between a weak mathematical foundation and the knowledge necessary for the study of mathematical courses in technical and professional programs. Arithmetic, algebra, geometry and trigonometry will be covered. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hrs.
- MATH 05 Basic Arithmetic** (1-5 cr.)  
A developmental course in review of arithmetical principles and computations, designed to develop the mathematical proficiency necessary for selected curriculum entrance. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hrs.
- MATH 06-07 Basic Algebra I-II** (1-5 cr.)  
A developmental course in review of algebra, designed to develop the mathematical proficiency necessary for selected curriculum entrance. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hrs.
- MATH 08 Basic Geometry** (1-5 cr.)  
A developmental course in review of geometry, designed to develop the mathematical proficiency necessary for selected curriculum entrance. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hrs.
- MATH 09 Basic Trigonometry** (1-5 cr.)  
A developmental course in review of trigonometry, designed to develop the mathematical proficiency necessary for selected curriculum entrance. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hrs.
- MATH 99 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)
- MATH 101-102-103 Fundamentals of Mathematics I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Prerequisite: One unit of high school algebra or the equivalent, or permission of division. A study of concepts of numbers; fundamental operations with numbers, formulas and equations, graphical analysis, binary numbers, Boolean and Matrix algebra, linear programming, elementary concepts of statistics. Lect. 3 hrs. per wk.
- MATH 118-119 Introduction to Technical Mathematics I-II** (5 cr.) (5 cr.)  
Applications of arithmetic, algebra, geometry and trigonometry to technical problems. Lect. 5 hrs. per wk.
- MATH 121-122-123 Engineering Technical Mathematics I-II-III** (5 cr.) (5 cr.) (5 cr.)  
Prerequisites: Three units of high school mathematics including two units of algebra and one unit of geometry or MATH 119 or equivalent and a satisfactory score on a proficiency test. A course in algebra, geometry, trigonometry, and introductory calculus stressing technical applications. Topics include functions, systems of linear equations, right triangle trigonometry, logarithms, exponentials, trigonometric functions, conic sections, vectors, complex numbers, differentiation, and integration. Credit cannot be obtained for both this course and Math 161-162-163. Lect. 5 hrs. per wk.
- MATH 141-142-143 Introductory Mathematical Analysis I-II-III (calculus with analytic geometry)** (5 cr.) (5 cr.) (5 cr.)  
Prerequisites: Four units of high school mathematics including two units of algebra, one of geometry, one half unit of trigonometry or equivalent and satisfactory score on a proficiency test. Students not adequately prepared for MATH 141 should complete MATH 161-162 prior to enrolling in MATH 141. A unified course in analytic geometry and calculus. Topics include functions, limits, derivatives, differentials, definite and indefinite integrals, infinite series, and applications. Lect. 5 hrs. per wk.

**MATH 144-145 Introductory Mathematical Analysis A & B**

(8 cr.) (7 cr.)

Prerequisites: Four units of high school mathematics including two units of algebra, one of geometry, one half unit of trigonometry or equivalent and a satisfactory score on an entry skills test. Students not adequately prepared for MATH 144 should complete MATH 161-162 prior to enrolling in MATH 144. A unified course in analytic geometry and calculus. Topics include functions, limits, derivatives, differentials, definite and indefinite integrals, infinite series, and applications. Lect. 8-7 hrs. per wk.

**MATH 161-162 College Mathematics I-II**

(3 cr.) (3 cr.)

Prerequisites: Three units of high school mathematics including two units of algebra and one unit of geometry or equivalent and a satisfactory score on a proficiency test. A course in precalculus mathematics. MATH 161-162 with MATH 163 completes a unified sequence in algebra, trigonometry, analytic geometry, and an introduction to calculus. Topics include college algebra, functions, sequences and series, analytic geometry, logarithms, exponentials, matrices, trigonometry, and applications. Lect. 3 hrs. per wk.

**MATH 163 College Mathematics III**

(3 cr.)

Prerequisites: MATH 162 or four units of high school mathematics including two units of algebra, one unit of geometry, and one half unit of trigonometry or equivalent. MATH 163 with MATH 161-162 completes a unified sequence in algebra, trigonometry, analytic geometry, and an introduction to calculus. MATH 163 with MATH 261-262 provides a one year calculus sequence designed for students with majors other than mathematics, physical sciences, or engineering. Topics include limits, continuity, differentiation, and applications. Lect. 3 hrs. per wk.

**MATH 164-165 College Mathematics I-II**

(5 cr.) (4 cr.)

Prerequisite and content as for MATH 161-162-163. A two quarter version of MATH 161-162-163. Lect. 5-4 hrs. per wk.

**MATH 181-182-183 General College Mathematics I-II-III**

(3 cr.) (3 cr.) (3 cr.)

Prerequisites: Algebra I and either Algebra II or Geometry and a satisfactory score on appropriate mathematics proficiency examinations. Intended for students with majors other than mathematics, science or engineering. The first two quarters will include sets, the logic of algebra, the real numbers system, algebraic and transcendental functions, relations and graphs. The third quarter will include permutations, combination, probability, elementary statistics, and trigonometry. Lect. 3 hrs. per wk.

**MATH 191-192-193 Finite****Mathematics I-II-III**

(3 cr.) (3 cr.) (3 cr.)

Prerequisites: Three units of high school mathematics including two units of algebra and one unit of geometry or equivalent and a satisfactory score on a proficiency test. This course is intended for students with majors other than mathematics, physical sciences, or engineering. Topics include sets, logic, probability, statistics, matrices, markov chains, linear programming, game theory, and mathematical modeling. Lect. 3 hrs. per wk.

**MATH 198 Seminar and Project**

(1-5 cr.)

(see General Usage Courses section)

**MATH 199 Supervised Study**

(1-5 cr.)

(see General Usage Courses section)

**MATH 241-242-243 Advanced Mathematical Analysis I-II-III (multivariable calculus with analytic geometry differential equations)**

(4 cr.) (4 cr.) (4 cr.)

Prerequisite: MATH 143 or equivalent. The first two quarters comprise an integrated program of study in multivariable calculus and linear algebra. Topics include matrices, determinants, vector spaces, eigenvalues 3 dimensional analytic geometry, partial differentiation, multiple integration and applications. The third quarter consists of a program of study in differential equations. Topics include first order differential equations, linear differential equations, systems of differential equations, and applications. 4 class hrs. per wk.

**MATH 261-262-263 Advanced College****Mathematics I-II-III**

(3 cr.) (3 cr.) (3 cr.)

Prerequisite: MATH 163 or equivalent. A continuation of the calculus course begun in MATH 163 for students with majors other than mathematics, physical sciences, or engineering. Topics in the first two quarters

include differentiation and integration of algebraic, exponential, logarithmic, and trigonometric functions, calculus of three dimensions, and applications. The third quarter is an introduction to differential equations, including linear and first and second order differential equations and applications. Lect. 3 hrs. per wk.

**MATH 274 Applied Mathematics**

(4 cr.)

Prerequisite or corequisite: MATH 243 or division approval. Topics include power series, Laplace transform, partial differential equations, Legendre polynomials, and Fourier series. Lect. 4 hrs. per wk.

**MATH 281-282-283****Statistics I-II-III**

(3 cr.) (3 cr.) (3 cr.)

Prerequisite: MATH 161, 183, 192 or permission of division. Introduction to the fundamental ideas of statistics, including a brief treatment of elementary probability, descriptive statistics, distributions, problems of sampling, normal distributions, measures of central tendency, sampling variances, confidence intervals, estimation, testing of hypotheses, regression, correlation, and analysis of variance. Lect. 3 hrs. per wk.

**MATH 291-292-293 Probability and Statistics I-II-III**

(3 cr.) (3 cr.) (3 cr.)

Prerequisite: MATH 241. A first course in probability and statistics. Topics include probability, discrete and continuous distributions of one and several variables, moment generating functions, hypothesis testing, nonparametric statistics, interval estimation, regression, analysis of variance. Lect. 3 hrs. per wk.

**MATH 298 Seminar and Project**

(1-5 cr.)

(see General Usage Courses section)

**MATH 299 Supervised Study**

(1-5 cr.)

(see General Usage Courses section)

**MECHANICAL ENGINEERING****MECH 116-117****Numerical Control Programming I-II**

(4 cr.) (4 cr.)

The newer concepts of work handling and automatic machining processes. New techniques in metal forming and machine processes; analysis of electrosonic machining, electrolytic metal removal, numerical controls and simplified building block numerical control system. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**MECH 119 Jig and Fixture Design**

(3 cr.)

Fundamentals of the construction and design of various types of jigs and fixtures including milling, reaming, tapping, and drilling fixtures. Preparation of complete working drawings from layouts, for interchangeable manufacture computation of fits, limit dimensions, tolerances, tool drawing principles and methods, fundamentals of cutting tools and gauges. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**MECH 131 Machine Laboratory I**

(2 cr.)

Fundamental machine operations of drilling, reaming, turning between centers, chuck work, thread chasing shaper, layout, finishing, cutting speeds, tool care, tool grinding, surface grinder, milling machine operations and tools. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.

**MECH 132 Machine Laboratory II**

(2 cr.)

A continuation of Machine Lab I with greater emphasis on practical and industrial applications and setup will be included: inspection tools, gauges, tapers, gear cutting, square threads and fits will also be included. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.

**MECH 133 Machine Laboratory III**

(2 cr.)

Continued study in which the student will combine the knowledge and skills of the machining, tool, jig and machine design courses to build a simple machine and make the necessary tools for fabrication. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.

**MECH 187 Introduction to Instrumentation**

(4 cr.)

Broad introduction to use of industrial electromechanical equipment. Provides an understanding of the methods, techniques, and skills required for installation, services and operation of a variety of industrial control systems. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**MECH 197 Cooperative Education**

(1-5 cr.)

(see General Usage Courses section)

- MECH 198 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- MECH 237-238 Machine Design I-II** (4 cr.) (4 cr.)  
Prerequisites: ENGR 152 and 154. The analytical design of bearings, clutches, coupling, brakes, springs, gearing systems, and power shafting. Emphasis on methods of constructing machine parts and specifications of materials and manufacturing processes. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- MECH 246 Metallurgy I** (4 cr.)  
Prerequisite: INDT 112. Fundamentals of metallurgy, grain size, effect on carbon content, and harness testing devices. Different alloys will be tested to determine the effect of heat treatment. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- MECH 254 Robotics Applications I** (3 cr.)  
Prerequisites: ENGR 116, MATH 121, MECH 116. This course will introduce the student to robotic applications and programming methods. Students will develop an understanding of the role of industrial robots in manufacturing and methods of programming industrial robots. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- MECH 255 Robotics Applications II** (3 cr.)  
Prerequisite: MECH 254. This course will introduce the student to advanced robotic programming methods. Students will develop a proficiency in writing advanced programs to control various robotic components to include stepper motors, pneumatic devices, and hydraulic circuits. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- MECH 264 Thermodynamics I** (4 cr.)  
Prerequisite: MATH 122 or equivalent. Characteristics of gases: applied study of steam cycles and combustion processes. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- MECH 297 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)
- MECH 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
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- MEDICAL LABORATORY**
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- MDLB 100 Introduction to Medical Laboratory Technology** (3 cr.)  
Designed to orient the student to the medical laboratory by introducing the basic principles, techniques and vocabulary applicable to all phases of medical laboratory technology. It is principally a laboratory practicum taught in the hospital laboratories and includes venipuncture, specimen preparation, laboratory safety, laboratory glassware, laboratory and hospital organization and professional relationships. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- MDLB 116 Introduction to the Clinical Laboratory** (4 cr.)  
Prerequisite: MDLB 100. Introduction to the techniques and methods of venipuncture and urinalysis. Students will spend 6 hours a week in the clinical labs performing venipuncture and urinalysis techniques under the supervision of the lab staff. Lect. 2 hrs., Lab. 6 hrs., Total 8 hrs. per wk.
- MDLB 118 Introduction to Diagnostic Microbiology** (3 cr.)  
Prerequisite: BIOL 268. Introduction to the procedures performed in the medical microbiology lab for the purpose of preparing students for clinical internships. Emphasis on specimen preparation and pre-identification techniques. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.
- MDLB 126 Principles of Hematology** (4 cr.)  
Prerequisite: MDLB 100 or equivalent. The theory underlying procedures performed in the hematology laboratory and the relationship between these procedures and the diagnosis of disease. Laboratory instruction will include methods of examination including complete blood counts, platelet counts, sedimentation rates, miscellaneous hematology tests and basic coagulation. Lect. 2 hrs., Lab. 6 hrs., Total 8 hrs. per wk.
- MDLB 190 Coordinated Practice** (1-5 cr.)  
(see General Usage Courses section)
- MDLB 198 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- MDLB 225 Clinical Hematology II** (7 cr.)  
Prerequisite: MDLB 126. Advanced course in the study of blood. Includes coagulation studies, blood formation, abnormalities, and changes seen in various diseases. Lect. 2 hrs., Lab. 15 hrs., Total 17 hrs. per wk.
- MDLB 230 Blood Banking** (5 cr.)  
A fundamental course in blood grouping and typing, compatibility testing, antibody screening, component preparation, donor selection, and transfusion reactions and investigation. Included is a student laboratory and, after proficiency here, a supervised clinical experience in hospital medical laboratories. Lect. 3 hrs., Lab. 6 hrs., Total 9 hrs. per wk.
- MDLB 259 Diagnostic Microbiology** (4 cr.)  
Prerequisite: BIOL 176 or equivalent. Principles of medical microbiology, including theories of handling and identification of pathogenic species of bacteria. Introduction to medical parasitology, mycology, and virology including identification of those species infecting humans. Lect. 4 hrs. per wk.
- MDLB 264-265 Clinical Chemistry I-II** (5 cr.) (8 cr.)  
Prerequisite: CHEM 103. Instruction and practice in methods of performing biochemical analysis on biological fluids and clinical specimens. Students are supervised in developing good laboratory techniques and in recognizing technical problems. Lect. 4-3 hrs., Lab. 3-15 hrs., Total 7-18 hrs. per wk.
- MDLB 277 Clinical Microbiology** (6 cr.)  
Prerequisite: BIOL 176 or equivalent. Techniques, methods and procedures used in Clinical Microbiology, including bacteriology, parasitology and mycology. Emphasis on aseptic technique and identification of micro-organisms affecting humans. Lab. 18 hrs. per wk.
- MDLB 278 Clinical Laboratory Instrumentation** (2 cr.)  
Principles, operation and first echelon maintenance of basic laboratory instruments including standardization and troubleshooting. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.
- MDLB 287 Clinical Blood Banking and Serology** (7 cr.)  
Prerequisite: MDLB 230. Techniques, methods and procedures used in Clinical Blood Banking and Serology, including blood grouping, compatibility testing and diagnostic serology procedures. Lect. 2 hrs., Lab. 15 hrs., Total 17 hrs. per wk.
- MDLB 290 Coordinated Practice** (1-5 cr.)  
(see General Usage Courses section)
- MDLB 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
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- MEDICAL RECORDS**
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- MDRS 100 Medical Report Transcription** (3 cr.)  
Prerequisites: HLTH 120 or HLTH 124 and ability to type 40 w.p.m. This course is designed to give the student 1) a working knowledge of equipment used in the transcription of medical reports, 2) basic skills needed to transcribe medical reports and 3) a working knowledge of common medical references. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- MDRS 111 Medical Record Science I** (4 cr.)  
This course is designed to give the medical record technology student an introduction to the history of medicine and historical development of the health care field with emphasis on the organizational structure of federal, state and local governmental agencies and allied health associations. An introduction to the medical record department and an overview of the medical record professional association are included. In addition, the student will begin an indepth study of data sources for patient information systems and will develop skills in analyzing records for completeness and accuracy. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- MDRS 112 Medical Record Science II** (4 cr.)  
Prerequisite: MDRS 111. This course is designed to give the student an introduction to the numbering, filing, retention and storage systems involving health records. An emphasis is placed on developing supervisory skills and the use of data processing procedures in these areas. Also, the health record is evaluated as a legal document with special emphasis placed on the policies and procedures concerning the release of medical information. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

- MDRS 120 Introduction to Medical Science** (4 cr.)  
A study of the basic concepts, terminology, etiology and characteristics of pathological processes. Lect. 4 hrs. per wk.
- MDRS 126 International Classification of Diseases** (3 cr.)  
Prerequisite: HLTH 125. (May be waived with divisional approval.) Designed for beginning coders in offices and institutions. Provides instruction in ninth revision of the International Classification of Diseases. Emphasis on specific techniques in coding of physical diseases and mental disorders from pediatrics to geriatrics, including medicine and surgery. In the laboratory students will be given problem situations to code and also records of patients with particular diseases and conditions. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- MDRS 130 Introduction to Health Record Applications** (1 cr.)  
Prerequisites: MDRS 111 and HLTH 124. The application of microcomputer technology to health record assessment techniques. In a simulated clinical environment, the student assesses patients' health records and performs video terminal operations. Lab. 3 hrs. per wk.
- MDRS 190 Coordinated Practice** (1-5 cr.)  
(see General Usage Courses section)
- MDRS 213 Medical Record Science III** (4 cr.)  
Prerequisite: MDRS 112. This course is designed to give the student exposure to the various disease and operation classification systems and nomenclatures. Emphasis is placed on coding diagnoses and procedures using the ICD 9CM classification. The course also includes skill development in indexing diagnostic and procedural codes as well as retrieving medical information for research purposes. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- MDRS 214 Medical Record Science IV** (4 cr.)  
Prerequisite: MDRS 213. This course is designed to give the student an introduction to basic statistical principles as applied in the health care setting. Special emphasis is placed on developing analytical skills for patient care evaluation and utilization review activities. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- MDRS 215 Medical Record Science V** (4 cr.)  
Prerequisite: MDRS 214. Introduction to the Quality Assurance Concept. An in-depth study of medical care evaluation, utilization review, professional standards review organization, and risk management. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- MDRS 221 Clinical Practice I** (3 cr.)  
Prerequisite: MDRS 112. Supervised practice in a local hospital health record service. The student will perform functions in the admitting, patient index, filing, release of information and health record assessment areas. Lab. 9 hrs. per wk.
- MDRS 222 Clinical Practice II** (1 cr.)  
Prerequisite: MDRS 213. Supervised practice in the following health record functions: (1) cancer registries, (2) personnel supervision, (3) vital records, and (4) PSRO functions. Lab. 3 hrs. per wk.
- MDRS 223 Clinical Practice III** (1 cr.)  
Prerequisite: MDRS 215. Supervised practice in a hospital quality assurance program and exposure to health record functions in long-term care, mental health and ambulatory settings. Lab. 3 hrs. per wk.
- MDRS 231 Advanced Health Record Applications I** (3 cr.)  
Prerequisite: MDRS 100. The application of word processing techniques in preparing health records and reports. Major emphasis is placed upon the use of a text editor in preparing medical reports in a simulated clinical environment. Lab. 9 hrs. per wk.
- MDRS 232 Advanced Health Record Applications II** (3 cr.)  
Prerequisite: MDRS 213. The application of microcomputer technology to the collection and use of health care data. In a simulated clinical environment, the student reviews, codes and abstracts pertinent data from patients health records and performs videoterminal operations. Lab. 9 hrs. per wk.
- MDRS 233 Advanced Health Record Applications III** (3 cr.)  
Prerequisite: MDRS 215. The application of microcomputer technology to health care statistical computations. The collection and use of statistics for health research, registries, quality assurance and health care institutions and agencies is emphasized. In a simulated clinical environment, and using computer logic functions, the student completes a variety of problem-solving projects. Lab. 9 hrs. per wk.
- MDRS 235 Hospital Applications of Data Processing** (3 cr.)  
Prerequisite: DAPR 100 or DAPR 106. A study of the application of data processing techniques to the requirements of the medical audit, utilization analysis and diagnostic trend analysis. Lect. 3 hrs. per wk.
- MDRS 290 Coordinated Practice** (1-5 cr.)  
(see General Usage Courses section)
- MDRS 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)

## MENTAL HEALTH

### MENT 104-105 Introduction to Mental Health I-II (3 cr.) (3 cr.)

An examination of the concepts of mental health and mental illness. A study of the basic factors involved in any behavior and the quantitative relationship of mental health to mental illness. Laboratory includes observation and practice in various helping agencies. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

### MENT 110 Introduction to Abnormal Psychology (3 cr.)

An introductory study of the symptoms, causes and treatment of mental deficiency, neurosis, psychosis and character disorders, with specific relationship to the work of the mental health technologist. Lect. 3 hrs. per wk.

### MENT 116 Activities Therapies (3 cr.)

Prerequisite: MENT 104. The use of recreation, art crafts and music as therapeutic tools with the emotionally disturbed and mentally retarded. Planning social programs and special events for the needs of the individual and consistent with his overall treatment plan and/or social goals, current laws affecting activities, use of volunteers and use and care for audiovisual media. Laboratory will include participation in games, crafts, and other activities that could be used with various age groups and persons presenting particular problems. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

### MENT 166 Mental Retardation I (3 cr.)

Personality development of and therapeutic techniques for the mentally retarded. The dynamic structure of the personality of the retardate with emphasis on self-image, self-concept, and defense mechanisms. Alternative individual and group therapy techniques in counseling the disturbed adolescent and adult as well as a review of common social inadequacies among the mildly and moderately retarded. Lect. 3 hrs. per wk.

### MENT 167 Mental Retardation II (3 cr.)

Current problems and directive readings of the developmentally disabled. Major problems in working with the cerebral palsied, mentally retarded, and epileptic, their implications and possible alternative solutions. The legal rights of the developmentally disabled, love, dating, marriage, and birth control for the developmentally disabled, the occupational adjustment of the retardate, work and the need to belong, the normalization principle—its implications for the future, and community residences for the retarded. Lect. 3 hrs. per wk.

### MENT 168 Mental Retardation III (3 cr.)

Characteristics of parents and families of the developmentally disabled. Problems in the home, parental reactions and responses to the diagnosis of mental retardation and cerebral palsy, the developmentally disabled and their impact on the family, needs of parents of the developmentally disabled, overprotection and rejection by parents, rivalry between the retarded and normal siblings, problems of institutionalization, and concepts of parenthood effects of the social and psychological development and treatment of the developmentally disabled. Lect. 3 hrs. per wk.

### MENT 221-222-223

### Mental Health I-II-III (3 cr.) (3 cr.) (3 cr.)

Principles and methods of interviewing, observing, recording, summarizing, and communicating human reactions (including both verbal and non-verbal communication) and the underlying rationale for various methods. Includes a study of psycho-therapy, group skills (group dynamics, role playing, leadership of group activities, other teaching skills), behavioral modification and related therapies, use of milieu, family therapies, hospital treatment, drug therapies, community resources, mental health professions, coordination of treatment program and participation in development of treatment programs. Special empha-

sis is placed on therapeutic use of everyday experiences in development of therapeutic relationships. Lect. 3 hrs. per wk.

**MENT 230 Sociology of Mental Health (3 cr.)**

The study of mental disorders as social phenomena. Emphasis on the social personality and those social influences that disrupt or thwart the individual's activities and relationships and contribute to instability and mental disorders. Social definitions of mental illness and deviant behaviors, the social aspects of preventing mental disorders, of rehabilitating disordered persons, and of treating and caring for the mentally ill. Lect. 3 hrs. per wk.

**MILITARY SCIENCES**

**MSCI 114 Leadership Skills I (2 cr.)**

Introduction to the fundamentals of military leadership and management, with practical leadership application. Lect. 2 hrs., Lab. 1 hr., Total 3 hrs. per wk.

**MSCI 115 Leadership Skills II (2 cr.)**

Prerequisite: MSCI 114 or permission of instructor. Introduction to the various techniques of land navigation and topographic map reading, with field training exercises. Lect. 2 hrs., Lab. 1 hr., Total 3 hrs. per wk.

**MSCI 201 Military Science IV (American Military History) (2 cr.)**

Basic introduction to American military history. Principles of war, strategy, tactics and the impact of technology on these factors. Development of U.S. military policy and forces from the Revolutionary War through 1860. Field training exercise (FTX). Lecture 2 hrs., Lab. 1 hr., Total 3 hrs. per wk.

**MSCI 202 Military Science V (American Military History) (2 cr.)**

Continuation of MSCI 201, American military history from the Civil War to the present. Lecture 2 hrs. per wk.

**MSCI 203 Military Science VI (Tactics) (2 cr.)**

Organization and mission of the rifle squad; combat orders advanced land navigation leadership fundamentals. Field training exercise (FTX). Lecture 2 hrs., Lab 1 hr., Total 3 hrs. per wk.

**MUSIC**

**MUSC 08 Fundamentals of Music (3 cr.)**

Introduction to music theory designed to teach the beginner to read, write and understand the symbols of music notation. The approach is equally suited to those with no prior training in music as well as those who have learned to sing or play without training in fundamentals. A creative approach in music reading and listening to develop performance skills and proficiency in the language of music as well as in the assimilation of factual information. Students may re-register for the course in subsequent quarters as necessary until the course objectives are completed. Lect. 3 hrs. per wk.

**MUSC 101-102-103 Basic Musicianship (3 cr.) (3 cr.) (3 cr.)**

Designed to provide music knowledge and skills for the student who merely wishes to study basic rudiments of music, including notation, scales, keys, and intervals, with some sight reading and ear training. Lect. 3 hrs. per wk.

**MUSC 104-105 History of Instruments I-II (3 cr.) (3 cr.)**

The study of the evolution and construction of transitional instruments and how various components function in relation to sound production. Also, problems in sound production when using different and new materials in the construction and repair of modern instruments. Lect. 3 hrs. per wk.

**MUSC 109 Music for Children (3 cr.)**

A study of the selection and use of music for children's activities. Music for singing, rhythm, and movements. Use of the keyboard and autoharp. Emphasis on pre-school through elementary grades. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**MUSC 110 Choral Organization (3 cr.)**

The development of organizational skills necessary for directing a variety of choral ensembles and organizing choral groups, conducting rehearsals and building choral programs. Lect. 3 hrs. per wk.

**MUSC 111-112-113 Music Theory I-II-III (4 cr.) (4 cr.) (4 cr.)**

Elements of musical notation. Structure of scales, intervals, triads and chords. Development of ability to sing at sight and write from dictation melodies in all keys, clefs, and meters. Beginning analysis of the Bach chorale style and construction of cadential phrases in that style. Similar experience at the keyboard. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**MUSC 114-115 Instrument Repair I-II (3 cr.)**

Introduction to the principles of instrument maintenance and repair using modern diagnostic methods. The course includes theoretical and laboratory experiments designed to explain and illustrate the basics of modern electronic and mechanical diagnostic and remedial techniques. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**MUSC 116 Comprehensive Musicianship (4 cr.)**

Elements of musical notation including groupings and divisions of beats, scales, intervals, clefs, and performance indications. The course will also cover fundamentals of conducting, beat patterns, cues, upbeats, and fermatas. Transposing instruments will also be covered as will some problems common to both instrumental and vocal programs. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**MUSC 117-118 Choral Directing I-II (3 cr.) (3 cr.)**

Prerequisite: singing experience in high school, community chorus, or MUSC 138. Choral Directing I will deal with conducting techniques: beat patterns, score heading, functional use of each hand, discussion and study of musical terminology, tempos, dynamics and their relationship to each other. Students will use the class as a laboratory group to conduct and gain experience. Choral Directing II will deal with rehearsal technique, sub-division of conducting patterns, rehearsal routine and selection of music. Students will continue conducting class to gain experience. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**MUSC 120 Hymnology (3 cr.)**

A study of the development of hymns throughout different historical periods. Includes analysis and performance of different hymn styles for a variety of religious services throughout the liturgical year. Current trends in singing hymns and various accompanimental styles. Lect. 3 hrs. per wk.

**MUSC 121-122-123**

**Music Appreciation I-II-III (3 cr.) (3 cr.) (3 cr.)**

This course aims to increase the variety and depth of the student's interest in music and related cultural activities. Emphasis is upon the relation of music as an art to our daily lives and to society, to promote an understanding of the spirit of the art which will lead to the emotional and aesthetic development of the individual, and enable him to enjoy intelligent listening. Lect. 3 hrs. per wk.

**MUSC 124-125 American Music I-II (3 cr.) (3 cr.)**

The development of music in America from the Pilgrims to the present, in the light of the philosophical, political, geographical, and sociological developments of the country. Lect. 3 hrs. per wk.

**MUSC 128 Folk Music (3 cr.)**

An introductory survey study of traditional, Appalachian, and contemporary folk songs, instruments, and performers in American culture. No previous knowledge of music is required. Lect. 3 hrs. per wk.

**MUSC 130 Overview of the Recording Industry (1 cr.)**

Prerequisite: permission of instructor. Introduction to employment options in the different areas of the commercial music industry; provides an overview of the many different employment opportunities available and assists students in defining professional goals. Lect. 1 hr. per wk.

**MUSC 131-132-133 Class Voice I-II-III (2 cr.) (2 cr.) (2 cr.)**

An introduction to the many aspects of a singer from the physical act through the aesthetic experience. The course is designed for the average singer who desires vocal improvement and the voice major as an addition to and extension of skills and knowledge necessary for the artistic development. Lect. 1 hr., Lab. 2 hrs., Total 3 hrs. per wk.

**MUSC 134-135 Recording Systems Services I-II (3 cr.) (3 cr.)**

Introduction to the principles of recording systems and recording systems design services. The course is designed to provide students with theoretical understanding and practical experience for developing recording skills in studio and on-location situations. Includes a study of sound studio design and construction, production costs in recording, and distribution. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

- MUSC 136 Principles of Tuning** (3 cr.)  
Provides students with an understanding of the theoretical aspects and principles of piano tuning. Includes theory and laboratory experiments designed to explain and illustrate the principles of tuning pianos as well as the instruments of the orchestra and band. Lect. 3 hrs., Lab. 1 hr., Total 4 hrs. per wk.
- MUSC 137 Applied Music--Voice** (1-2 cr.)  
Singing, proper breath control, diction and development of tone. Standard vocal repertoire will be studied. Departmental permission required. One to two half-hour lessons per week, 4-8 hours practice (laboratory) required. (Estimated cost \$10.00 per half-hour.)
- MUSC 138 Chorus** (1 cr.)  
Courses in Ensemble consist of performance from the standard repertoires including study of ensemble techniques and interpretation. Departmental permission required. May be repeated for credit. Lab. 3 hrs. per wk.
- MUSC 139 Small Vocal Ensemble** (1 cr.)  
Courses in Ensemble consist of performance from the standard repertoires including study of ensemble techniques and interpretation. Departmental permission required. May be repeated for credit. Lab. 3 hrs. per wk.
- MUSC 140 Introduction to Recording Techniques** (3 cr.)  
Prerequisite: permission of instructor. Introduction to the theory of, and practices in, basic magnetic recording techniques. Provides a basic background in electronics as used in the recording process, equipment nomenclature and function, basic equipment maintenance and troubleshooting, as well as opportunities for hands-on experiences in recording activities. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- MUSC 141-142-143 Class Piano I-II-III** (2 cr.) (2 cr.) (2 cr.)  
Instruction in keyboard fundamentals, standard repertoire designed to give students the necessary proficiency to meet the basic keyboard requirement of a non-piano major in music, and for the student who desires improvement in keyboard technique. Lect. 1 hr., Lab. 2 hrs., Total 3 hrs. per wk.
- MUSC 146 Liturgical Music** (3 cr.)  
Familiarizes the student with the standard repertoire of vocal, instrumental and organ literature used in a variety of liturgical services. The study and performances of such repertoire from different historical periods. Lect. 3 hrs. per wk.
- MUSC 147 Applied Music-Keyboard** (1-2 cr.)  
Instruction in piano, organ or harpsichord. Standard repertoire will be studied. Departmental permission required. One to two half-hour sessions per week. 4-8 hours practice (laboratory) required. (Estimated cost \$10.00 per half-hour.)
- MUSC 148 Orchestra** (1 cr.)  
Courses in Ensemble consist of performance from the standard repertoires including study of ensemble techniques and interpretation. Departmental permission required. May be repeated for credit. Lab. 3 hrs. per wk.
- MUSC 149 Band** (1 cr.)  
Courses in Ensemble consist of performance from the standard repertoires including study of ensemble techniques and interpretation. Departmental permission required. May be repeated for credit. Lab. 3 hrs. per wk.
- MUSC 150 Introduction to Recording Electronics Theory** (3 cr.)  
Prerequisite: permission of instructor. Introduces the basic theories and concepts of electronics as they apply to typical positions within the recording industry. Provides a background in electronics at a level sufficient to cover the needs of the entry-level technician or apprentice recording engineer. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- MUSC 151-152-153 Class Woodwinds I-II-III** (2 cr.) (2 cr.) (2 cr.)  
An introduction to the fundamentals of woodwind instruments. The course is designed to give the student necessary proficiency to meet the basic requirements for playing in Woodwind Ensemble, Orchestra, or Band Organization. Designed primarily for the non-music major and for the student who desires improvement in technique. Lect. 1 hr., Lab. 2 hrs., Total 3 hrs. per wk.
- MUSC 154 Sound Studio Design** (3 cr.)  
Prerequisite: permission of instructor. Includes the theory and practice of acoustical and layout design in the sound studio. Provides a basic background in acoustics and acoustical properties of materials used in studio design and construction. Opportunities for practical layout of recording facilities will be provided. Lect. 2 hrs. Lab. 2 hrs., Total 4 hrs. per wk.
- MUSC 156 Advanced Recording Electronic Theory** (3 cr.)  
Introduces advanced recording electronic theory and applies it to the maintenance of equipment in the professional recording studio. Provides the student with knowledge and skills necessary to perform routine maintenance and repairs to recording and related equipment as necessary to keep the recording studio in a constant state of operational readiness. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- MUSC 157 Applied Music Woodwinds** (1-2 cr.)  
Instruction in fundamentals of the woodwind instruments. Standard repertoire will be studied. Departmental permission required. One to two half-hour lessons per week. 4-8 hours practice (laboratory) required. (Estimated cost \$10.00 per half-hour.)
- MUSC 158 Improvisational Techniques** (3 cr.)  
Introduction to the principles of improvisation using harmonic structures and progressions from the Period of Common Practice. Includes listening and performing music of the standard jazz and popular repertoire. Students develop performance skills utilizing specific improvisational devices employed in different historical periods. Lect. 3 hrs., Lab. 1 hr., Total 4 hrs. per wk.
- MUSC 159 Woodwind Ensemble** (1 cr.)  
Courses in Ensemble consist of performance from the standard repertoires including study of ensemble techniques and interpretation. Departmental permission required. May be repeated for credit. Lab. 3 hrs. per wk.
- MUSC 161-162-163 Class Strings I-II-III** (2 cr.) (2 cr.) (2 cr.)  
An introduction to the fundamentals of string instruments. The course is designed to give the student necessary proficiency to meet the basic requirements for playing in String Ensemble and Orchestra. Designed primarily for the non-music major and for the student who desires improvement in technique. Lect. 1 hr., Lab. 2 hrs., Total 3 hrs. per wk.
- MUSC 167 Applied Music-Strings** (1-2 cr.)  
Instruction in fundamentals of the string instruments. Standard repertoire will be studied. Departmental permission required. One to two half-hour lessons per week, 4-8 hours practice (laboratory) required. (Estimated cost \$10.00 per half-hour.)
- MUSC 168 Guitar Theory and Practice** (3 cr.)  
A study of the fundamentals of sound production, music theory, and harmony as it applies to guitar. Building proficiency in both the techniques of playing the guitar and in the application of music fundamentals to these techniques. Exposure to different types of guitars and related instruments. Music as entertainment and as a communications skill. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- MUSC 169 String Ensemble** (1 cr.)  
Courses in Ensemble consist of performance from the standard repertoires including study of ensemble techniques and interpretation. Departmental permission required. May be repeated for credit. Lab. 3 hrs. per wk.
- MUSC 171-172-173 Class Brass I-II-III** (2 cr.) (2 cr.) (2 cr.)  
An introduction to the fundamentals of brass instruments. The course is designed to give the student necessary proficiency to meet the basic requirements for playing in Brass Ensemble, Orchestra and Band Organization. Designed primarily for the non-music major and for the student who desires improvement in technique. Lect. 1 hr., Lab. 2 hrs., Total 3 hrs. per wk.
- MUSC 177 Applied Music-Brass** (1-2 cr.)  
Instruction in fundamentals of the brass instruments. Standard repertoire will be studied. Departmental permission required. One to two half-hour lessons per week. 4-8 hours practice (laboratory) required. (Estimated cost \$10.00 per half-hour.)
- MUSC 178 Music Copyright Law** (3 cr.)  
Prerequisite: permission of instructor. Introduction to the legal problems and conventions practiced in the commercial music industry.



Provides the student with a basic background in national and international music and copyright laws as they pertain to the recording artists. Lect. 3 hrs. per wk.

**MUSC 179 Brass Ensemble** (1 cr.)

Courses in Ensemble consist of performance from the standard repertoires including study of ensemble techniques and interpretation. Departmental permission required. May be repeated for credit. Lab. 3 hrs. per wk.

**MUSC 181-182-183 Class Percussion I-II-III** (2 cr.) (2 cr.) (2 cr.)

An introduction to the fundamentals of percussion instruments. The course is designed to give the student necessary proficiency to meet the basic requirements for playing in Percussion Ensemble, Orchestra, and Band Organization. Designed primarily for the non-music major and for the student who desires improvement in technique. Lect. 1 hr., Lab. 2 hrs., Total 3 hrs. per wk.

**MUSC 187 Applied Music-Percussion** (1-2 cr.)

Instruction in fundamentals of percussion instruments. Standard repertoire will be studied. Departmental permission required. One to two half-hour lessons per week. 4-8 hours practice (laboratory) required. (Estimated cost \$10.00 per half-hour.)

**MUSC 189 Percussion Ensemble** (1 cr.)

Courses in Ensemble consist of performance from the standard repertoires including study of ensemble techniques and interpretation. Departmental permission required. May be repeated for credit. Lab. 3 hrs. per wk.

**MUSC 198 Seminar and Project** (1-5 cr.)

Prerequisite: permission of instructor.  
(see General Usage Courses section)

**MUSC 199 Supervised Study** (1-5 cr.)

Preparation of concert material for recital, supervised by the instructor. (see General Usage Courses section)

**MUSC 201 Vocal Methods and Materials** (3 cr.)

A study of the problems, materials and techniques of the teaching of voice. Lect. 3 hrs. per wk.

**MUSC 203 Keyboard Methods and Materials** (3 cr.)

A study of problems, materials and techniques in keyboard teaching. Lect. 3 hrs. per wk.

**MUSC 206-207 Music for the Classroom Teacher I-II** (3 cr.) (3 cr.)

Designed for pre-education majors. Includes basic elements of music and instruction in autoharp, rhythm instruments, folk music, and other classroom songs. Lect. 3 hrs. per wk.

**MUSC 211-212-213**

**Advanced Music Theory I-II-III** (4 cr.) (4 cr.) (4 cr.)

Continuation of MUSC 111-112-113. Development of facility in the analysis and usage of diatonic and chromatic harmonies. Continued study in analysis of Bach style, sight-singing, ear-training, and keyboard harmony. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**MUSC 214-215 Composition I-II** (2 cr.) (2 cr.)

Prerequisite: MUSC 111-112-113 or departmental permission. Individually supervised practice in writing short compositions in specified small forms. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs., per wk.

**MUSC 220 The History of Jazz** (3 cr.)

A study of the underlying elements of jazz concentrating on its cultural and historical development from its earliest stages to the present. Illustrated by musical examples through recordings and other audiovisual devices. No previous knowledge of music is required. Lect. 3 hrs. per wk.

**MUSC 221-222-223 History of**

**Music I-II-III** (3 cr.) (3 cr.) (3 cr.)

Primarily for music majors. A chronological study of music styles from antiquity to the present time. Relationship of the historical development of music to parallel movements in art, drama, and literature. Development of techniques for listening analytically and critically to Music. I. Music to 1600. II. 1600 to 1820. III. 1820 to present. Lect. 3 hrs. per wk.

**MUSC 224-225 The History of Opera I-II** (3 cr.) (3 cr.)

Development of operatic style through the study of representative works from 1600 to present. Lect. 3 hrs. per wk.

**MUSC 226 Twentieth Century Music and Music Cultures** (3 cr.)

A general course on music that uses the twentieth century in all its social, political and cultural ramifications as a point of departure. Includes a study of both Western and non-Western folk, popular and classical music of the twentieth century. Lect. 3 hrs. per wk.

**MUSC 227 Multi-Channel Recording Techniques** (3 cr.)

Prerequisite: MUSC 140 or permission of instructor. Introduction to the theory of and practices in multi-channel recording techniques. Provides a background and hands-on experiences in the most common form of studio recording: the multi-channel system. Included are advanced techniques in microphone utilization, special equipment applications, equipment interfacing and mixdown techniques. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**MUSC 228 Editing and Mixdown Techniques** (3 cr.)

Prerequisite: Permission of instructor. Introduces the theory and practice of electronics and mechanical editing and advanced mixdown techniques using professionally prerecorded multi-track tapes. Provides techniques necessary to edit, mixdown, externally reprocess and otherwise manipulate multi-track originals into finished, release ready, master recordings. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**MUSC 229 Advanced Recording Techniques** (3 cr.)

Prerequisite: MUSC 227 or permission of instructor. Introduction to advanced studies and techniques in recording that lead to master release and demo. tapes. Also includes on-site recording problems. This course provides background and skills in the more refined techniques of multi-channel recording and mixdown leading to the creation of master release and demo. tapes. Includes the process involved in converting the finished master tape to phono. discs and prerecorded cartridges for retail release. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**MUSC 237 Advanced Applied Music-Voice** (1-2 cr.)

A continuation of MUSC 137.

**MUSC 238 Chorus** (1 cr.)

A continuation of MUSC 138.

**MUSC 239 Small Vocal Ensemble** (1 cr.)

A continuation of MUSC 139. Courses in ensemble consist of performance from the standard repertoires including study of ensemble techniques and interpretation. Departmental permission required. May be repeated for credit. Lab. 3 hrs. per wk.

**MUSC 244-245 Service Playing I-II** (3 cr.) (3 cr.)

A course designed to develop a broad perspective in the art of keyboard playing in a variety of liturgical services. Emphasis is given to developing knowledge and performance skills of basic keyboard repertoire use for different services during the liturgical year. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**MUSC 247 Advanced Applied Music Keyboard** (1-2 cr.)

A continuation of MUSC 147. (Estimated cost \$10.00 per half-hour.)

**MUSC 248 Orchestra** (1 cr.)

A continuation of MUSC 148. (Lab. 3 hrs. per wk.)

**MUSC 249 Band** (1 cr.)

A continuation of MUSC 149. (Lab. 3 hrs. per wk.)

**MUSC 257 Advanced Applied Music Woodwinds** (1-2 cr.)

A continuation of MUSC 157. (Estimated cost \$10.00 per half-hour.)

**MUSC 258 Advanced Improvisational Techniques** (3 cr.)

In addition to extended listening and performing standard jazz repertoire, students develop understanding and performance skills with improvisational techniques based on harmonic progressions, rhythmic patterns, and scalar and arpeggio patterns. Practical application of modal theory to standard jazz and popular repertoire. Lect. 3 hrs., Lab. 1 hr., Total 4 hrs. per wk.

**MUSC 259 Woodwind Ensemble** (1 cr.)

A continuation of MUSC 159. Lab. 3 hrs. per wk.

**MUSC 267 Advanced Applied Music-Strings** (1-2 cr.)

A continuation of MUSC 167. (Estimated cost \$10.00 per half-hour.)

**MUSC 269 String Ensemble** (1 cr.)

A continuation of MUSC 169.

**MUSC 277 Advanced Applied Music-Brass** (1-2 cr.)

A continuation of MUSC 177. (Estimated cost \$10.00 per half-hour.)

- MUSC 278 Multi-Channel Recording Workshop** (3 cr.)  
Prerequisite: permission of instructor. Provides the opportunity to improve and refine multi-channel recording techniques in a seminar and project workshop setting. Emphasis is placed on additional hands-on lab. experiences in multi-channel recording, overdubbing, and mixdown techniques. Lect. 3 hrs. per wk.
- MUSC 279 Brass Ensemble** (1 cr.)  
A continuation of MUSC 179.
- MUSC 287 Advanced Applied Music-Percussion** (1-2 cr.)  
A continuation of MUSC 187. (Estimated cost \$10.00 per half-hour.)
- MUSC 288 Recording Problems Seminar** (3 cr.)  
Prerequisite: permission of instructor. A seminar setting which includes discussion, with professionals from different phases of the commercial music industry, of special problems encountered in studio recording sessions. Introduction to the professional organizations, libraries, and journals common to the commercial music industry in general and the recording industry in particular. Lect. 3 hrs. per wk.
- MUSC 289 Percussion Ensemble** (1 cr.)  
A continuation of MUSC 189.
- MUSC 290 Coordinated Practice** (1-5 cr.)  
(see General Usage Courses section)
- MUSC 296 Recreation Music** (1 cr.)  
The role and integration of musical activities in recreation and park programs singing, instruments, rhythm and dance. Introduction to leadership skills, utilization and resource materials. Lab. 3 hrs. per wk.
- MUSC 297 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)

## NATURAL SCIENCE

- NASC 100 Survey of Science** (4 cr.)  
A general survey course designed to familiarize the student with the basic principles of biological and physical sciences. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.
- NASC 111-112-113 Health Science I-II-III** (4 cr.) (4 cr.) (4 cr.)  
An integrated approach to human anatomy and physiology, microbiology, pathology and bacteriology; study of organ tissues, body systems and functions, chemistry as it relates to physiology, principles of physics. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- NASC 121-122-123 Natural Sciences I-II-III** (4 cr.) (4 cr.) (4 cr.)  
This is a multidisciplinary course primarily for non-science majors. The course integrates the main fields of science, and emphasizes the motivations of the scientific disciplines and how these interact. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- NASC 130 Body Structure and Function** (3 cr.)  
A survey of the structure and function of the human body. Lect. 3 hrs. per wk.
- NASC 141-142-143 Fundamental Sciences for Respiratory Therapy I-II-III** (4 cr.) (4 cr.) (4 cr.)  
Prerequisite: admission to program. Focus upon the major fields of scientific study; inorganic, organic and physiological chemistry, physics of gases, fluids, and electricity and laboratory mathematics. Course integrates the scientific disciplines as they relate to respiratory therapy. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- NASC 154-155 Astronomy I-II** (3 cr.) (3 cr.)  
The history of astronomy and the development of astronomical thought leading to the birth of modern astronomy and its most recent developments. Particular stress will be placed on astronomical instruments and measuring techniques, along with an examination of the solar system with emphasis on the earth, moon and adjacent planets, the Milky Way galaxy, and extragalactic objects. Lect. 3-2 hrs., Lab. 0-2 hrs., Total 3-4 hrs. per wk.
- NASC 198 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- NASC 199 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)

## NURSING

- NURS 106 Elementary Nursing Skills** (4 cr.)  
Development of elementary nursing skills for the basic needs of patients; related theory and simulated practice; clinical orientation in cooperating health agencies. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- NURS 127 Nursing Process** (2 cr.)  
Reinforcement of the student's ability to utilize the components of assessment, planning, implementation, and evaluation as an organized system for providing patient care. Lect. 2 hrs. per wk.
- NURS 131 Foundations of Nursing I** (6 cr.)  
Prerequisite: Program placement in nursing. Corequisites: NASC 111 and NURS 160, Nursing Perspectives I. Introduction to fundamental nursing concepts and the nursing process is designed to address the basic bio-psycho-social needs of individuals throughout the life span. The clinical component of this course includes supervised practice in both the nursing skills laboratory and selected clinical agencies, and is designed for the application of the nursing process to the care of individuals in acute and long term care agencies. Lect. 4 hrs., Lab. 6 hrs., Total 10 hrs. per wk.
- NURS 132 Foundations of Nursing II** (7 cr.)  
Prerequisite: Completion of the first quarter of the nursing curriculum. Corequisite: NASC 112. Continuation of NURS 131, Foundations of Nursing I. Lect. 4 hrs., Lab 9 hrs., Total 13 hrs. per wk.
- NURS 133 Foundations of Nursing III** (9 cr.)  
Prerequisite: Completion of the first two quarters of the nursing curriculum. Corequisite: NASC 113. This course is a continuation of Foundations of Nursing II. Lect. 4 hrs., Lab 15 hrs., Total 19 hrs. per wk.
- NURS 160 Nursing Perspectives I** (1 cr.)  
Prerequisite: Program placement in nursing or permission of the Program Head. Corequisite: NURS 131, Foundations of Nursing I. Introduction to dimensions of the nursing profession. Emphasis is on historical aspects and selected current trends and issues as well as concerns and responsibilities of the Associate Degree Nurse. Lect. 1 hr. per wk.
- NURS 168 Principles of Medication Administration** (2 cr.)  
Elementary principles of medication administration including dosage calculation, major drug classifications, drug legislation, legal aspects of medication administration and drug action on specific body systems. Lect. 2 hrs. per wk.
- NURS 176 Drug Dosage Computations** (2 cr.)  
Apothecary, Metric, Household conversion; reading of drug orders and labels; a practical approach to learning to prepare dosages and solutions, including calculating intravenous flow rates and pediatric drugs. Lect. 2 hrs. per wk.
- NURS 198 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- NURS 199 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)
- NURS 227 Nursing Process** (3 cr.)  
A systematic approach to assessment, analysis, implementation and evaluation of nursing care. Emphasis will be given to distinguishing the professional nurse's role for the upgrading of licensed practical nurses. The overall objective of the course is to develop skills in nursing process to ensure quality nursing care and to meet the standards established by the American Nurses Association for professional nursing practice. Lect. 3 hrs. per wk.
- NURS 251 Nursing in Common Health Problems I** (9 cr.)  
Prerequisite: Completion of the first three quarters of the nursing curriculum. The nursing process is applied to the care of individuals/families throughout the life span who are experiencing health problems. The scope, prevention, diagnoses, treatment and control of selected health problems is addressed. The clinical component of this course provides for application of knowledge and further skill development through supervised practice in the nursing skills laboratory and in selected acute and long-term agencies. Lect. 4 hrs., Lab 15 hrs., Total 19 hrs. per wk.

**NURS 252 Nursing in Common Health Problems II (9 cr.)**

Prerequisite: Completion of the first four quarters of the nursing curriculum. Corequisite: NURS 261, Nursing Perspectives II. This course is a continuation of Nursing in Common Health Problems I. Lect. 4 hrs., Lab. 15 hrs., Total 19 hrs. per wk.

**NURS 253 Nursing in Common Health Problems III (9 cr.)**

Prerequisite: Completion of the first five quarters of nursing prefix courses. Corequisite: NURS 262, Nursing Perspectives III. This course is a continuation of Nursing in Common Health Problems II. Lect. 4 hrs., Lab. 15 hrs., Total 19 hrs. per wk.

**NURS 254 Nursing in Common Health Problems IV (9 cr.)**

Prerequisite: Completion of the first six quarters of nursing prefix courses. Corequisite: NURS 263, Nursing Perspectives IV. This course is a continuation of Nursing in Common Health Problems III. Lect. 4 hrs., Lab. 15 hrs., Total 19 hrs. per wk.

**NURS 261 Nursing Perspectives II (1 cr.)**

Prerequisite: Completion of the first four quarters of the nursing curriculum or permission of the Program Head. Corequisite: NURS 252, Nursing in Common Health Problems II. Continuation of Nursing Perspectives I. Lect. 1 hr. per wk.

**NURS 262 Nursing Perspectives III (1 cr.)**

Prerequisite: Completion of the first five quarters of nursing prefix courses or permission of the Program Head. Corequisite: NURS 253, Nursing in Common Health Problems III. Continuation of Nursing Perspectives II. Lect. 1 hr. per wk.

**NURS 263 Nursing Perspectives IV (1 cr.)**

Prerequisite: Completion of the first six quarters of nursing prefix courses or permission of the Program Head. Corequisite: NURS 254, Nursing in Common Health Problems IV. Continuation of Nursing Perspectives III. Lect. 1 hr. per wk.

**NURS 299 Supervised Study (1-5 cr.)**

(see General Usage Courses section)

**OFFICE ADMINISTRATION****OFAD 098 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)

**OFAD 198 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)

**OFFICE SYSTEMS TECHNOLOGY****OFTC 098 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)

**OFTC 099 Supervised Study (1-5 cr.)**

(see General Usage Courses section)

**OFTC 100 Office Skills Review (3 cr.)**

Designed to provide the educational secretary with the opportunity to review office skills based on individual needs such as typewriting, shorthand, machine transcription, and selected office machines. Lect. 3 hrs. per wk.

**OFTC 104 Personal Typewriting I (2 cr.)**

Designed to teach touch typing, using correct techniques; business letters and manuscript/report formats. Lect. 1 hr., Lab. 2 hrs., Total 3 hrs. per wk.

**OFTC 107 Typewriting Skill Building (3 cr.)**

Assistance in correcting weakness in typewriting speed and accuracy skills with emphasis on attaining standards necessary for employment and job promotion. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**OFTC 111 Typewriting I (3 cr.)**

Introduction to the keyboard with emphasis on good techniques, machine mastery, letter formats and styles, tabulation, centering, and reports. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**OFTC 112 Typewriting II (3 cr.)**

Prerequisite: OFTC 111 or divisional permission. Skill building through production typing with emphasis on employment competencies. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**OFTC 113 Typewriting III (3 cr.)**

Prerequisite: OFTC 112 or divisional permission. Continuation of skill building through production typing with emphasis on employment competencies. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**OFTC 116 Keyboarding for Information Processing (3 cr.)**

Develop proficiency with emphasis on speed and accuracy for use with a variety of keyboards found on electronic text-data entry devices. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**OFTC 121 Shorthand I (4 cr.)**

Shorthand principles with emphasis on reading and writing skills, associated vocabulary and grammar. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**OFTC 122 Shorthand II (4 cr.)**

Reinforcement of shorthand principles, further development of general business vocabularies and English usage, general business dictation. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**OFTC 123 Shorthand III (5 cr.)**

Prerequisite: OFTC 122 or equivalent. Increased speed in general business dictation, introduction of specialized business dictation with emphasis on vocabularies. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**OFTC 124 Shorthand IV (4 cr.)**

Prerequisite: OFTC 123 or equivalent. Speed building in typical business dictation with accuracy in transcription from shorthand notes. Use of dictation tapes for building speeds. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**OFTC 134 Speedwriting I (3 cr.)**

Designed to develop skill in an alphabetical shorthand system based on dominant sounds, high frequency letter groups, and prefixes and suffixes. The theory of speedwriting with some emphasis on dictation. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**OFTC 136 Filing and Records Management (3 cr.)**

Indexing principles, filing procedures and techniques as applied to filing systems, establishment of filing systems, selection of equipment and supplies, survey of system using electronics and micrographics, solution to records management problems. Lect. 3 hrs. per wk.

**OFTC 137 Office Procedures (3 cr.)**

Prerequisite: OFTC 112 or equivalent. General office routine such as work flow, time scheduling, filing, written and oral communications, mail responsibilities, telephone techniques, proofreading, and reprographics. Lect. 3 hrs. per wk.

**OFTC 139 Office Recordkeeping (3 cr.)**

Concentration on the types of recordkeeping duties performed by secretaries including financial, tax, payroll, personnel and inventory. Lect. 3 hrs. per wk.

**OFTC 144 Proofreading and Editing Skills (3 cr.)**

A comprehensive study of the skills essential to transcription effectiveness; mechanics of spelling, word differentiation, and punctuation; word syllabification, division, and capitalization; and mechanics of sentence structure. Lect. 3 hrs. per wk.

**OFTC 197 Cooperative Education (1-5 cr.)**

(see General Usage Courses section)

**OFTC 198 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)

**OFTC 199 Supervised Study (1-5 cr.)**

(see General Usage Courses section)

**OFTC 200 Introduction to Office Automation (3 cr.)**

Principles, methods, and techniques involved in office automation technology, with emphasis on equipment, personnel, procedures, ergonomics, and career opportunities. Lect. 3 hrs. per wk.

**OFTC 207 Executive Typewriting (3 cr.)**

Prerequisite: OFTC 113 or divisional permission. Development of decision-making skills, speed and accuracy in production typing on various equipment with emphasis on employment standards. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

- OFTC 211-212-213 Word Processing I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Prerequisite: One year of typewriting. OFTC 113 may be taken concurrently. A study of the concepts of word processing and information systems in today's electronic office with emphasis on personnel, equipment, and procedures. Includes hands-on operation of word processing equipment with emphasis on business applications. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- OFTC 216 Word Processing Equipment Operation** (3 cr.)  
Prerequisite: OFTC 113 or divisional permission. Instruction in use and operation of word processing equipment. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- OFTC 217 Advanced Word Processing Equipment Operation** (3 cr.)  
Prerequisite: OFTC 216. Advanced applications and use of word processing equipment. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- OFTC 218 Microcomputer Office Applications I** (3 cr.)  
Introduction to creation, revision, and reference applications of business documents using microcomputer workstations. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- OFTC 219 Microcomputer Office Applications II** (3 cr.)  
Prerequisite: OFTC 218. Advanced applications of business document software using microcomputer workstations. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- OFTC 221 Advanced Shorthand Transcription I** (3 cr.)  
Prerequisites: OFTC 123 or equivalent. Review of principles of shorthand, development of vocabulary and phrases, speed building on general business dictation and transcription skills. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- OFTC 222 Advanced Shorthand Transcription II** (3 cr.)  
Prerequisite: OFTC 221 or equivalent. Continuation of speed building with emphasis on particular areas of general business, developing special vocabularies, phrases, and shortcuts. Emphasis on spelling, grammar, and other transcription skills. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- OFTC 223 Advanced Shorthand Transcription III** (3 cr.)  
Prerequisite: OFTC 222 or equivalent. Speed building in typical business dictation with speed and accuracy in transcription from shorthand notes. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- OFTC 226 Medical Shorthand Transcription** (3 cr.)  
Prerequisite: OFTC 123 or equivalent. Medical secretary preparation. Skill in taking dictation and transcribing material involving medical shorthand forms and phrases. Proficiency in use of medical vocabulary, forms and procedures. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- OFTC 227 Advanced Office Skills** (3 cr.)  
Prerequisites: OFTC 113 and 123 or divisional permission. Further development of speed and accuracy on production typing with emphasis on employment standards, decision-making skills, and application of a wide variety of office tasks. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- OFTC 234-235 Machine Transcription I-II** (3 cr.) (3 cr.)  
Prerequisite: OFTC 113. Incorporates efficient operation and transcribing equipment, good listening techniques, grammar, punctuation, correct business English usage and business formats. Emphasis on production rates of mailable copy. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- OFTC 251-252-253 Office Systems and Procedures I-II-III** (4 cr.) (4 cr.) (4 cr.)  
Prerequisite: OFTC 113 or divisional permission. Study of work and time management, office communications, processing and presenting business data, and other topics associated with office technology. Extensive protocol experience in solving office problems. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.
- OFTC 257 Principles of Office Automation Management** (3 cr.)  
Introduction and analysis of the supervisor's role in the operation of the information processing cycle and its changing technology. Lect. 3 hrs. per wk.
- OFTC 258 Word Processing System Supervision** (3 cr.)  
Prerequisite: OFTC 217 or divisional permission. Supervisory or key operator training in operation procedures of a word processor shared-logic system. Learning the responsibilities of file and volume utilities, supervisory and control functions, system installation and initialization. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- OFTC 290 Coordinated Internship** (1-5 cr.)  
(see General Usage Courses section)
- OFTC 297 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)
- OFTC 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- OFTC 299 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)

## PHILOSOPHY AND RELIGION

- PHIL 101-102-103 Introduction to Philosophy I-II-III** (3 cr.) (3 cr.) (3 cr.)  
An introductory study of some philosophical issues concerning the perception and belief of man in society. Lect. 3 hrs. per wk.
- PHIL 104-105 Introduction to Philosophy I-II** (5 cr.) (5 cr.)  
An introductory study of some philosophical issues concerning the perception and belief of man in society. Lect. 5-4 hrs. per wk.
- PHIL 110 Logic** (3 cr.)  
The study of logic as the scientific investigation of valid reasoning. Lect. 3 hrs. per wk.
- PHIL 121 Logic** (3 cr.)  
Traditional Logic of Categorical Propositions, special emphasis on the more practical ways for mastering clear thinking (the proper use of terms, the principles of definition and classification). Lect. 3 hrs. per wk.
- PHIL 122 Logic** (3 cr.)  
Modern symbolic logic, special emphasis on more practical value for a mastery of straight thinking (valid uses of deductive inferences, truth-functional analysis, and Quantificational arguments). Lect. 3 hrs. per wk.
- PHIL 123 Logic** (3 cr.)  
Inductive logic, special emphasis on practical insights into the patterns of proof in scientific and judicial processes (reasoning by analogy, empirical verification, casual connections, the nature of probability, statistical methods). Lect. 3 hrs. per wk.
- PHIL 201-202-203 History of Western Philosophy I-II-III** (3 cr.) (3 cr.) (3 cr.)  
A historical survey of representative philosophers from the pre-Socratics to the present. Introduces the student to the development of philosophical thought through selected readings of original works and appropriate critical materials. Lect. 3 hrs. per wk.
- PHIL 210 Ethics** (3 cr.)  
Prerequisite: PHIL 201 or 202. Systematic study of representative ethical systems as they apply to present day living. Lect. 3 hrs. per wk.
- PHIL 211 Aesthetics I** (3 cr.)  
An examination of a variety of philosophical theories to define beauty and the norms of artistic taste. Attention is given to problems specific to particular art forms of classical, Hellenistic, Medieval, and the early modern periods. Lect. 3 hrs. per wk.
- PHIL 212 Aesthetics II** (3 cr.)  
An examination of a variety of philosophical attempts to define beauty and the norms of taste and criticism. Attention is given to problems specific to particular art forms of late Western culture. Lect. 3 hrs. per wk.
- PHIL 213 Aesthetics III** (3 cr.)  
An examination of recent philosophical attempts to define the norms of artistic taste. Attention is given to problems specific to art forms and to the general theories about the nature of art in the 19th and 20th centuries. Lect. 3 hrs. per wk.
- PHIL 216 Aesthetics** (3 cr.)  
An examination of a variety of attempts to define beauty and the norms of taste and criticism. Attention is given to problems specific to particular art forms as well as to the more general theories about the nature of art. Lect. 3 hrs. per wk.

- PHIL 217 Life and Teachings of Jesus** (3 cr.)  
Study of the major themes in the teachings of Jesus of Nazareth as recorded in the Gospels, and examination of the events of his life in light of modern Biblical and historical scholarships. Consideration of the relation of Jesus' life and teachings to modern life; reading of the four Gospels, and of other ancient and modern source materials. Lect. 3 hrs. per wk.
- PHIL 218 Current Problems and Issues in Christianity** (3 cr.)  
An examination of moral and theological problems which trouble Christian communities today, e.g. war and violence; personal faith and social action; Christianity and other religions, wealth, poverty, and material things; women in the church; abortion; work and play; revolution; community and individualism. Lect. 3 hrs. per wk.
- PHIL 221 Literature of the Bible I** (3 cr.)  
A study of the literature of the Old Testament. Lect. 3 hrs. per wk.
- PHIL 222 Literature of the Bible II** (3 cr.)  
A study of the literature of the New Testament. Lect. 3 hrs. per wk.
- PHIL 231 Comparative Religion I** (3 cr.)  
A survey of the religions of India and East Asia: Hinduism, Sikhism, Buddhism, and Zen. Lect. 3 hrs. per wk.
- PHIL 232 Comparative Religion II** (3 cr.)  
A survey of the religions of the Far East: Confucianism, Taoism, and Shinto. Lect. 3 hrs. per wk.
- PHIL 233 Comparative Religion III** (3 cr.)  
A survey of the religions of the West: Zoroastrianism, Islam, Judaism, and Christianity. Lect. 3 hrs. per wk.
- PHIL 236 Old Testament Prophetic Literature** (3 cr.)  
Prerequisite: PHIL 221. A study of the major and minor prophetic books of the Old Testament as literary works. The historical and social context in which they were written, their literary and theological purposes; and survey of the ways in which they have been interpreted from Pre-Christian times to the present. Lect. 3 hrs. per wk.
- PHIL 237 The Poetry and Wisdom Literature of the Old Testament** (3 cr.)  
Prerequisite: PHIL 221. A study of the poetry of the Old Testament as a part of the literary and religious heritage of Western Civilization. Four major types are considered: ancient heroic, secular, national, and individual religious poetry. The special poetic books called "Wisdom Literature" will be considered as a separate genre. Lect. 3 hrs. per wk.
- PHIL 246 Christianity** (3 cr.)  
Its origins and historical development; its basic metaphysical and theological assumptions; its essential doctrines and their origins; and the present state of the church in the modern world. Lect. 3 hrs. per wk.
- PHIL 271-272-273 Thanatology: Dimensions of Death and Dying** (3 cr.) (3 cr.) (3 cr.)  
A survey of man's attempts to understand the meaning of death, and of his ways of handling its personal and social implications. Examination of dying and death from a variety of perspectives, including psychological, sociological, cultural, and religious views. Lect. 3 hrs. per wk.
- PHIL 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- PHIL 299 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)
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- PHOTOGRAPHY**
- PHTG 101 Introduction to Photography** (3 cr.)  
An introduction to the basic principles of photography with laboratory work related to the student's major field of interest. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- PHTG 102 Intermediate Photography** (3 cr.)  
Prerequisite: PHTG 101. An intermediate level photography course designed to improve proficiency in the techniques of black & white photography with discussions and considerations of photo aesthetics. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- PHTG 103 Advanced Photography** (3 cr.)  
Prerequisites: PHTG 101-102. An advanced level course designed to improve proficiency in the techniques of black & white photography with greater discussion and consideration of photo aesthetics. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- PHTG 116 Visual Literacy: The Photographic Image** (3 cr.)  
Study and discussion of photographic images (photographs and films) as forces on 20th century thought. Open to students of all disciplines. Lect. 3 hrs. per wk.
- PHTG 117 Nature Photography** (3 cr.)  
Prerequisite: PHTG 101. Exploration of nature and other topics through the use of 35mm slides as a medium. Lect. 2 hr., Lab. 2 hrs., Total 4 hrs. per wk.
- PHTG 144-145 History of Photography I-II** (3 cr.) (3 cr.)  
Survey of the artistic achievements and innovations of photography and analysis of outstanding photographers and their works. Lect. 3 hrs. per wk.
- PHTG 146 History of American Photography** (2 cr.)  
An exploration of the various themes in American photography. The student becomes aware of the changing nature of the content, purposes, and techniques found in American photography. Students will understand the role of the viewer and the significance of the traditional American public acceptance of the accuracy of the camera image. The role of the photographer in creating the camera image will also be explained. Lect. 2 hrs. per wk.
- PHTG 147 Contemporary Trends** (3 cr.)  
The emphasis of this course is on the most contemporary work of the day. Students will become familiar with the individual photographers, the issues their work represents, and the historical influences that have made their work possible. Lect. 3 hrs. per wk.
- PHTG 174-175 Film Making I-II** (3 cr.) (3 cr.)  
Study of the techniques of shooting and editing, preparing documentaries, producing animated movies. Opportunity for students to create their own films. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- PHTG 201-202-203 Advanced Photography I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Prerequisites: PHTG 101, 102, 103, 144, 145. Advanced creative techniques in all areas of photography, stressing skill in lighting, portraiture, and commercial applications of photography. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.
- PHTG 206 Large Format Photography** (3 cr.)  
Prerequisites: PHTG 101, 102, 103, 144, 145. Photography with camera of 120 format or larger. Lecture on technique and special advantages and disadvantages of the large camera, combined with practical field exercises. Lect. 3 hrs. per wk.
- PHTG 207 Photographic Slides** (3 cr.)  
Prerequisites: PHTG 101, 102, 103, 144, 145, or by instructor permission. Study of color slides, their potential and possibilities for creative expression. Students will learn to process their own slides as well as to experiment with their images. Critiques and slide lectures will focus on current use of slides by well known photographers. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- PHTG 211-212-213 Color Photography I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Prerequisites: PHTG 101, 102, 103, 144, 145, 207. Introduction to color photography which includes general color theory, developing color slides and negatives, and printing color photographs. The first quarter emphasizes color slides, the second quarter emphasizes color negatives, and the third quarter emphasizes color printing. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- PHTG 224-225 Studio Lighting I-II** (3 cr.) (3 cr.)  
Prerequisites: PHTG 101, 102, 103, 144, 145, 206. The study and use of large format cameras and studio lighting for commercial use, advertising photography, and formal studio portraiture. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- PHTG 226-227 Commercial Photography I-II** (3 cr.) (3 cr.)  
Prerequisites: PHTG 101, 102, 103, 144, 145, 206, 224. Must be enrolled concurrently in Studio Lighting II. The student will photographically solve a wide range of professional problems relevant to the fields of

advertising, public relations, communications, and publishing. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**PHTG 228 Principles of Photographic Marketing** (3 cr.)

Prerequisites: 226 227. An advanced Commercial Photography course in which the student will become familiar with the techniques of small photographic business operations including portfolio preparation and presentation, basic marketing, techniques and casting methods. Topics will include the theory of marketing, costing procedures and problems, legal and accounting problems, copyright problems, and the fundamentals of small photographic business operation. Lecture 3 hours per week.

**PHTG 234-235 Photojournalism I-II** (3 cr.) (3 cr.)

Prerequisites: PHTG 101, 102, 103, 144, 145. Techniques of communicating through the photo essay and analysis of newspaper and magazine standards of selection. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**PHTG 267 Zone System in Photography** (3 cr.)

Prerequisites: PHTG 101, 102, 103, 144, 145. Advanced study of the technical processes of photography leading to total control of film, exposure, metering, and development, including accurate previsualization. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**PHTG 268**

**Communicating through the Photographic Sequence** (3 cr.)

Prerequisites: PHTG 101, 102, 103, 144, 145. This course, based on the concept that the experience of sequence in photography differs from the tradition of experiencing a single photograph, will involve the student in creating a picture book composed of images that have been placed in sequence that has special visual meaning. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**PHTG 269 Advanced Photographic Printing** (3 cr.)

Prerequisites: PHTG 101, 102, 103, 144, 145. Emphasis placed on developing individual style. Students required to produce a portfolio of high quality prints on subject matter of their choice. Lect. 1 hr., Lab. 4 hrs., Total 5 hrs. per wk.

**PHTG 297 Cooperative Education** (1-5 cr.)

(see General Usage Courses section)

**PHTG 298 Seminar and Project** (1-5 cr.)

(see General Usage Courses section)

**PHTG 299 Supervised Study** (1-5 cr.)

(see General Usage Courses section)

## PHYSICAL EDUCATION

**PHED 100 Fundamentals of Physical Activity** (1 cr.)

The role of physical activity in daily living; methods of personal evaluation of physical fitness and performance, meaningful interpretations of such evaluations, and the design of activity programs and patterns. Lect. 1 hr., Lab. 1 hr., Total 2 hrs. per wk.

**PHED 106 Physical Performance and Conditioning** (1 cr.)

Principles underlying the development of performance and conditioning factors such as strength, balance, power, agility, cardiovascular function, coordination. Lect. 1 hr., Lab. 1 hr., Total 2 hrs. per wk.

**PHED 108 Physical Activities for Children** (3 cr.)

Methods and materials for teaching simple rhythm, recreational games, singing games and other movement experiences. Emphasis on the pre-school through elementary ages. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk. This course cannot be taken to satisfy the physical education requirement for graduation.

**PHED 109 Exercise and Your Heart** (1 cr.)

The functions of the heart, the effects of exercise on the heart, and the revitalization of the heart through CPR. Lect. 1 hr., Lab. 1 hr., Total 2 hrs. per wk.

**PHED 110 Angling and Casting** (1 cr.)

The fundamentals of sport fishing, spinning, spin casting, bait casting and fly casting with the related knowledge of conservation and safety. Lab. 2 hrs. per wk.

**PHED 111 Archery** (1 cr.)

The fundamentals of target archery and/or field archery equipment, safety, and conservation. Lab. 2 hrs. per wk.

**PHED 112 Camping** (1 cr.)

Self-maintenance and survival out-of-doors; food selection, and maintenance; packing, preparation, preservation, and storage; shelter selection, construction, and maintenance; nature, conservation, camping facilities and equipment; application to varying age group; personal and group safety. Lab. 2 hrs. per wk.

**PHED 114 Equitation** (1 cr.)

Riding seats, and preparation for riding care and grooming of a horse; selection, use and care of equipment, and safety. Lab. 2 hrs. per wk.

**PHED 115 Ice Skating** (1 cr.)

The fundamentals of ice skating; figures, equipment, types of skating, and safety. Lab. 2 hrs. per wk. (Fee may be required-check current *Schedule of Classes* for actual fee.)

**PHED 116 Sailing** (1 cr.)

Prerequisite: appropriate skill in swimming. Equipment, descriptive and functional terminology, and safety. Lab. 2 hrs. per wk.

**PHED 117 Shooting and Firearm Safety** (1 cr.)

Shooting and firearm safety; arms, selection and care of equipment, forms of the sport of shooting; personal safety and survival in situations associated with hunting and sport shooting. Lab. 2 hrs. per wk.

**PHED 118 Snow Skiing** (1 cr.)

Snow skiing equipment and safety. Lab. 2 hrs. per wk.

**PHED 120 Game and Upland Bird Hunting** (1 cr.)

A course designed to introduce fundamental techniques of game and upland hunting in Virginia; hunting laws and regulations; equipment and personal conduct. Lab. 2 hrs. per wk.

**PHED 123 Whitewater Canoeing** (1 cr.)

An introduction to the history, techniques, and equipment related to whitewater canoeing with field experiences selected according to progress and ability. Lab. 2 hrs. per wk.

**PHED 124-125 Outdoor Environmental and Recreational Studies I-II** (3 cr.) (3 cr.)

The ethical role of the camper is emphasized in terms of practical conservation and ecology. This includes field experience involving the following: backpacking, general mountaineering, orienteering, flat water canoeing, climbing and rappelling, basic first aid techniques, natural floods, and natural habitats. Offered during one calendar week or three weekends for approximately 140 contact hours each. Lab. 9 hrs. per wk.

**PHED 127 Orienteering** (1 cr.)

A brief history of the sport, required equipment, map reading, compass use, orienteering techniques, and types of orienteering meets. Lab. 2 hrs. per wk.

**PHED 128 Hiking and Backpacking** (1 cr.)

Preparation for and planning a backpacking trip; equipment and clothing selection; personal and group safety; includes actual field practice and experience. Lect. 2 hrs. per wk.

**PHED 130 Badminton** (1 cr.)

Badminton equipment, strategy for play, and rules. Lab. 2 hrs. per wk.

**PHED 131 Bowling** (1 cr.)

A course designed to present the fundamentals of bowling equipment, rules and personal conduct. Lab. 2 hrs. per wk. (Fee may be required-check current *Schedule of Classes* for actual fee.)

**PHED 133 Golf** (1 cr.)

The fundamentals of golf equipment, rules, strategy for play, and personal conduct. Lab. 2 hrs. per wk. (Fee may be required-check current *Schedule of Classes* for actual fee.)

**PHED 135 Tennis** (1 cr.)

The fundamentals of tennis; rules, strategy for team and individual play, and personal dress and conduct. Lab. 2 hrs. per wk.

**PHED 137 Fencing** (1 cr.)

Study and practice in fundamentals of foil fencing. Lab. 2 hrs. per wk.

**PHED 139 Intermediate Tennis** (1 cr.)

Prerequisite: beginning tennis. Emphasis on improvement of basic stroke production; development of wide variety of strokes; improving strategy for singles and doubles play. Lab. 2 hrs. per wk.



**PHED 141 Weight Training (1 cr.)**

Introduction to basic techniques and practices; equipment; safety rules for both Olympic Lifts and Power-lifting. Lab. 2 hrs. per wk.

**PHED 142-143-144 Performance Conditioning I-II-III (1 cr.) (1 cr.) (1 cr.)**

Principles underlying the development of performance and conditioning factors such as strength, balance, power, agility, cardiovascular function, and coordination. During each successive quarter, performance and endurance levels are maintained and extended through a planned series of activities such as weight lifting, jogging, calisthenics, and gymnastics. Lab. 2 hrs. per wk.

**PHED 149 Racketball (1 cr.)**

The fundamentals of racketball, types of games, rules, equipment, and strategy for team and individual play. Designed to develop an appreciation of the values of the game as a recreational sport. Lab. 2 hrs. per wk. (Fee may be required-check current *Schedule of Classes* for actual fee.)

**PHED 151 Senior Life Saving (1 cr.)**

Prerequisite: appropriate skill in swimming. The fundamentals of rescue and survival in the water; first aid safety. Preparation for the examination for the Red Cross Senior Life Saving Certificate. Lab. 3 hrs. per wk. (Fee may be required-check current *Schedule of Classes* for actual fee.)

**PHED 152 Skin and Scuba Diving (1 cr.)**

The fundamentals of swimming; personal performance and safety. Lab. 3 hrs. per wk. (Fee may be required-check current *Schedule of Classes* for actual fee.)

**PHED 153 Swimming (1 cr.)**

The fundamentals of swimming; personal performance and safety. Lab. 3 hrs. per wk. (Fee may be required-check current *Schedule of Classes* for actual fee.)

**PHED 157 Intermediate Swimming (1 cr.)**

Continued development of swimming skills and endurance for students who have mastered the fundamentals of swimming. Lab. 2 hrs. per wk.

**PHED 158 Advanced Swimming (1 cr.)**

Prerequisite: PHED 157. Continued development of swimming skills and endurance for students who have mastered the intermediate skills of swimming and water safety. Lab. 2 hrs. per wk.

**PHED 160 Contemporary Dance (1 cr.)**

The fundamentals and techniques employed in dance as a creative art form; choreography and performance. Lab. 3 hrs. per wk.

**PHED 161 Folk Dance (1 cr.)**

The fundamental step patterns, rhythmic patterns, positions, and formations of the traditional and ethnic group and individual dances emphasizing those of foreign origin; dance forms, their cultural environment, social performance, and significance. Lab. 3 hrs. per wk.

**PHED 163 Social Dance (1 cr.)**

The fundamental step patterns, rhythmic patterns and positions of the social or ballroom dance forms; dance as a significant form of social behavior. Lab. 3 hrs. per wk.

**PHED 164 Square Dance (1 cr.)**

The fundamental step and movement patterns, rhythmic patterns, and formations of the American square dance; historical significance and development. Lab. 2 hrs. per wk.

**PHED 165 Beginning Tap Dance (1 cr.)**

The beginning tap dance course will cover tap patterns and coinciding body movements to various rhythms. Lab. 2 hrs. per wk.

**PHED 170 Basketball (1 cr.)**

Basketball; proper skills, techniques, teamwork and strategy in play, equipment, rules and safety. Lab. 2 hrs. per wk.

**PHED 172 Soccer (1 cr.)**

Soccer; proper skills, techniques, team play and strategy in play, rules, equipment and safety. Lab. 2 hrs. per wk.

**PHED 173 Softball (1 cr.)**

Softball; proper skills, techniques, teamwork and strategy in play rules, equipment and safety. Lab. 2 hrs. per wk.

**PHED 174 Volleyball (1 cr.)**

Volleyball; proper skills, techniques, team play, and strategy in play rules, equipment and safety. Lab. 2 hrs. per wk.

**PHED 179 Advanced Tennis (1 cr.)**

Prerequisites: Beginning and Intermediate Tennis. Emphasis on continued improvement of basic skills and perfection of strategies for singles and doubles play. Lect. 1 hr., Lab. 1 hr., Total 2 hrs. per wk.

**PHED 181 Self-Defense Tae Kwon Do I (1 cr.)**

Tae Kwon Do is an ancient Korean art of self-defense that literally means the art of hand and foot fighting. The primary behavioral objective is to develop a fundamental level of understanding and skill in order to progress from a white to a yellow belt. Lab. 2 hrs. per wk.

**PHED 182 Self-Defense Tae Kwon Do II (1 cr.)**

Prerequisite: PHED 181. Tae Kwon Do is an ancient Korean art of self-defense that literally means the art of hand and foot fighting. The primary behavioral objective is to develop a fundamental level of understanding and skill in order to progress from a yellow to a green tipped belt. Lab. 2 hrs. per wk.

**PHED 196 Beginning Jazz-Dance (1 cr.)**

The study of dance through contemporary jazz movement. Emphasis will center on floor stretches, isolation exercises, barre work, dance patterns to contemporary jazz music, progressive dance routines. Lab. 2 hrs. per wk.

**PHED 204 Officiating at Games (3 cr.)**

Application of rules and techniques of officiating team sports with emphasis on basketball, volleyball, and softball; includes practical experience in the intramural program. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**PHED 216 Intermediate Racquetball (1 cr.)**

Prerequisite: PHED 149 or permission of instructor. Continued development of basic racquetball skills with more emphasis on strategy and critical analysis of the game. Lab. 2 hrs. per wk.

**PHED 217 Dance Improvisation (1 cr.)**

An exploration into the creation of spontaneous movement experiences with emphasis on encouraging freedom of self-expression and creative awareness. Improvisational techniques will utilize the following: awareness of body movements, environment, group dynamics, performance and composition. Lab. 2 hrs. per wk.

**PHYSICAL THERAPY****PSTH 100 Introduction to Physical Therapy Assisting (2 cr.)**

Designed to introduce the health technology student to the field of physical therapy. Ethics, legal implications, job descriptions, and methods of health care delivery are discussed. Emphasis is on the team approach to patient care and the role of the physical therapist assistant within the therapeutic team. Lect. 2 hrs. per wk.

**PSTH 116 Emergency Situations and Procedures (2 cr.)**

The recognition of safety factors, potential hazards, and emergency situations in health care settings. Procedures and measures used for common emergency situations seen in a physical therapy department are outlined. Lect. 2 hrs. per wk.

**PSTH 120 Medical Reporting (2 cr.)**

Prerequisite: PSTH 132. Principles of medical reporting, including ability to abstract pertinent information from actual medical records. The writing of patient progress notes in standardized formats and medical terminology is emphasized. Lect. 2 hrs. per wk.

**PSTH 126 Kinesiology for the Physical Therapist Assistant (8 cr.)**

A detailed study of individual muscles and muscle functions, biomechanical principles of joint motion and gait patterns. Muscle testing procedures and application of kinesiological principles to therapeutic exercise. Lect. 5 hrs., Lab. 9 hrs., Total 14 hrs. per wk.

**PSTH 131 Therapeutic Procedures I (6 cr.)**

The development of elementary therapeutic skills for physical therapist assistants. Elements of patient care and elementary therapeutic procedures are presented and practiced. Lect. 3 hrs., Lab. 9 hrs., Total 12 hrs. per wk.

**PSTH 132 Therapeutic Procedures II (4 cr.)**

The further development of therapeutic skills for the physical therapist assistant. Use of specialized equipment and measuring tools are emphasized. Lect. 2 hrs., Lab. 6 hrs., Total 8 hrs. per wk.

**PSTH 181 Clinical Education I (5 cr.)**

Supervised instruction during administration of elementary therapeutic skills in a clinical setting. Emphasis is on development of oral and written communication skills and understanding of commonly seen disabilities. Experiences are provided in acute general hospitals or geriatric settings. Lect. 2 hrs., lab. 9 hrs., Total 11 hrs. per wk.

**PSTH 210 Psychological Aspects of Therapy (3 cr.)**

Prerequisite: PSTH 126. Concurrent enrollment in PSTH 282. A study of the psychological reactions and behavioral changes seen in patients and the techniques of effective interaction between the allied health worker and the patient. Reports based on observation and analysis of patient behavior and relationships in actual clinical practice are required. Lect. 3 hrs. per wk.

**PSTH 232 Therapeutic Procedures III (4 cr.)**

A continuation of therapeutic skills for the physical therapist assistant. Advanced skills related to respiratory, orthopedic and nervous system disorders are presented and practiced. Lect. 2 hrs., Lab. 6 hrs., Total 8 hrs. per wk.

**PSTH 246 Rehabilitation Procedures (4 cr.)**

The development of rehabilitation techniques utilized in the treatment of disabling conditions. Advanced exercise procedures, prosthetic and orthodontic devices and specialized pediatric techniques are emphasized. Lect. 2 hrs., Lab. 6 hrs., Total 8 hrs. per wk.

**PSTH 256 Pathological Conditions (2 cr.)**

Prerequisites: HLTH 150 and concurrent enrollment in PSTH 246 and PSTH 232. A study of specific pathological conditions commonly seen in physical therapy. Emphasis is on musculo-skeletal and neurological system conditions. Lect. 2 hrs. per wk.

**PSTH 266 Professional Trends and Administrative Procedures (3 cr.)**

A study of administrative procedures, changing practices in physical therapy, and controls on health care delivery. Discussions emphasize current trends and problems which emphasize the preparation of the student for his professional role upon completion of the educational program. Lect. 3 hrs. per wk.

**PSTH 282 Clinical Education II (7 cr.)**

Supervised instruction during administration of therapeutic skills in a clinical setting. Emphasis is on the total team approach to patient problems. Case histories and reports on pathological conditions are required. Experiences are provided in acute general hospitals, geriatric and orthopedic settings. Lect. 2 hrs., Lab. 15 hrs., Total 17 hrs. per wk.

**PSTH 283 Clinical Education III (8 cr.)**

Supervised instruction during administration of physical therapy. Emphasis is on the total therapy program including rehabilitation techniques and specialized problems. Experiences are provided in acute general hospitals, geriatric, orthopedic, pediatric, and other specialized settings. Includes case studies. Reports on specialized techniques and pathological conditions may be required. Lect. 1 hr., Lab. 21 hrs., Total 22 hrs. per wk.

**PHYSICS****PHYS 006 Physics (1-5 cr.)**

A developmental course in general physics designed to develop a basic understanding of physics. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hrs.

**PHYS 101-102 Introductory Physics I-II (4 cr.) (4 cr.)**

A study of general physics including mechanics, heat, sound, electricity, and light with practical applications for students in occupational programs. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**PHYS 111-112-113 Technical Physics I-II-III (4 cr.) (4 cr.) (4 cr.)**

Prerequisite: two units of high school mathematics or equivalent. Precision measurement, properties of matter, hydrostatics and hydro-

lics, force and motion, Newtonian mechanics, vectors and graphic solution, statics, dynamics, rotary motion, heat and thermodynamics, heat engines, sound acoustics; the theory of wave motion, light and optics, magnetism and electricity, DC and AC circuits and machines. An introduction to electronics and nuclear energy for industrial purposes. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**PHYS 114-115 Technical Physics I-II (6 cr.) (6 cr.)**

Prerequisite: two units of high school mathematics or equivalent. Precision measurement, properties of matter, hydrostatics and hydraulics, force and motion, Newtonian mechanics, vectors and graphic solutions, statics, dynamics, rotary motion, motion, light and optics, magnetism and electricity, DC and AC circuits and machines. An introduction to electronics and nuclear energy for industrial purposes. Lect. 5 hrs., Lab. 3 hrs., Total 8 hrs. per wk.

**PHYS 198 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)

**PHYS 199 Supervised Study (1-5 cr.)**

(see General Usage Courses section)

**PHYS 201-202-203****General College Physics I-II-III (4 cr.) (4 cr.) (4 cr.)**

Prerequisite: three units of high school mathematics or equivalent. General college physics for curricula not requiring calculus. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**PHYS 204-205 General College Physics I-II (6 cr.) (6 cr.)**

Prerequisite: three units of high school mathematics or equivalent. General college physics for curricula not requiring calculus. Lect. 5-4 hrs., Lab. 3-6 hrs., Total 8-10 hrs. per wk.

**PHYS 221-222-223-224 General University Physics I-II-III-IV (4 cr.) (4 cr.) (4 cr.) (4 cr.)**

Prerequisite: MATH 143 or corequisite MATH 241 or equivalent. General University Physics is designed for students in engineering, physics or mathematics. Includes mechanics, relativity, electro-magnetism, ray and wave optics, statistical quantum mechanics, solid state and nuclear physics. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**PHYS 298 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)

**PHYS 299 Supervised Study (1-5 cr.)**

(see General Usage Courses section)

**PLANNING****PLAN 100 Introduction to Planning (3 cr.)**

Material on many forms of planning is presented including planning theory, business and corporate planning, program planning, social service planning, facilities planning, financial planning, personnel planning, information and data systems for planning, and evaluation of plans and planning processes. Lect. 3 hrs. per wk.

**PLAN 106 Planning and Forecasting Methods (3 cr.)**

Qualitative and quantitative planning and forecasting techniques are surveyed including future scenarios, the Delphi method, prudent manager forecasts, estimating subjective probabilities, life cycle analysis, trend analysis, time series projection, econometric modeling, input-output analysis and social forecasting methods. Lect. 3 hrs. per wk.

**PLAN 107 Financial Planning (3 cr.)**

Financial planning information and methods are studied including goals of financial planning, tools of financial planning such as income producing assets, equity building assets, assets with stable or fluctuating yields and values, cash flow analysis, balance sheet analysis, estimating and projecting change in net worth, investment options, contingency planning, and evaluating financial plans. Lect. 3 hrs. per wk.

**PLAN 116 Corporate Planning (3 cr.)**

Systematic corporate planning philosophy and techniques are presented for profit making and other organizations, including organizing for planning, corporate objectives, strategic and implementational planning, target setting, planning technique, the gamut of strategies, and evaluation and training for planning. Lect. 3 hrs. per wk.

**PLAN 117 Urban Housing Planning (3 cr.)**

Marketing, financing, design, selection and process are discussed as elements of a human activity: Housing. Through an awareness of the dynamics of the urban housing process, the students will develop an implementable urban program. Lect. 3 hrs. per wk.

**PLAN 118 Planning Applications (3 cr.)**

Prerequisites: PLAN 102, 103, 105 or permission of instructor. Organizational planning, financial planning, and a variety of planning and forecasting methods are combined in a series of practical applications. Students develop sets of interrelated plans in a number of areas, critique and revise the work, and develop plans incorporating all aspects of planning studied to date. Lect. 3 hrs. per wk.

**PSYCHOLOGY****PSYC 110 Principles of Applied Psychology (3 cr.)**

The general principles of perception, learning, and conscious and unconscious motivation which are operative in all practical applications of psychology to life and work. Lect. 3 hrs. per wk.

**PSYC 116 The Psychology of Personal Adjustment (3 cr.)**

Characteristics of mental health. Psychological principles applied to the development of a mature personality and to the problems of everyday life. Effective methods in study and work. Lect. 3 hrs. per wk.

**PSYC 119 Psychology of Personality (3 cr.)**

Introduction to the psychology of self-understanding and the attainment of personal efficiency. Lect. 3 hrs. per wk.

**PSYC 120 Experiences in Personal Growth (3 cr.)**

An interdisciplinary approach designed to enable an individual to understand himself better in relation to his immediate environment, community and society. Simulation, role playing, and other experiential techniques will be used to accomplish this objective. Some of the experiences will take place off campus. Approval of division is required for admission. Lect. 3 hrs. per wk.

**PSYC 128 Human Relations (3 cr.)**

The study of human personality and its reaction upon other personalities. The application of psychology to problems in industry and private life. Some introduction to such matters as selection, training and placement of employees. Lect. 3 hrs. per wk.

**PSYC 129 Interpersonal Relationships (3 cr.)**

The theory and practice of self-discovery working with self, group discovery and relationships. Focalizing on human needs and human problems with emphasis upon attitude, values, motivation, leadership, communications, and group living. Lect. 3 hrs. per wk.

**PSYC 130 Child Growth and Development (3 cr.)**

The development of the child from one stage of growth to the next, concentrating on the physical, intellectual, social and emotional factors in his personality. Recent studies in child development will be presented. The course is designed to provide a background for those students who intend to become nurses, teachers, or enter other occupations involving continuous work with children. Lect. 3 hrs. per wk.

**PSYC 167 Psychology of Human Sexuality (3 cr.)**

A consideration of scientific investigation in the area of human sexuality and an explanation of the psychological and social implications of such research. A consideration of the various socio-cultural influences on sexual behavior will also be included. Lect. 3 hrs. per wk.

**PSYC 201-202-203****General Psychology I-II-III (3 cr.) (3 cr.) (3 cr.)**

PSYC 201 is the prerequisite for either PSYC 202 or 203. The principles of behavior relating experimental data to practical problems: the measurement of ability, sensory and perceptive processes, organic basis of behavior, hereditary, maturation, learning and thinking, motivation, emotion, personality and social factors in behavior. Lect. 3 hrs. per wk.

**PSYC 204-205 General Psychology I-II (5 cr.) (4 cr.)**

The study of human behavior relating experimental data to practical problems: the measurement of ability, sensory and perceptive processes, organic basic behavior, heredity, maturation, learning and thinking, motivation, emotion, personality and social factors in behavior. Lect. 5-4 hrs. per wk.

**PSYC 206 Personal Conflict and Crisis (3 cr.)**

The effective recognition and handling of personal and interpersonal conflicts and crises. The cooperative roles of public and private agencies. Management of family disturbance, child abuse, rape, suicide, and related cases. Lect. 3 hrs. per wk.

**PSYC 208 Psychology of Abnormal Behavior (3 cr.)**

Prerequisite: PSYC 203 or instructor's permission. Exploration of the range of human behavior known as abnormal. Emphasis placed on criteria of abnormality, individual and social causes of psychopathology, major categories for classification of behavior, possibilities for treatment and personal adjustment. Lect. 3 hrs. per wk.

**PSYC 210 Social Psychology (3 cr.)**

A study of the individual in social contexts, his social role and socialization process. Personal and social factors in perceptive attitudes toward individuals and groups: group structures and intergroup relations. Lect. 3 hrs. per wk.

**PSYC 217 Theories of Personality (3 cr.)**

Prerequisites: PSYC 202 or instructor's approval. A study of major personality theories (Psychoanalytic, Cognitive, Gestalt) in which students are encouraged to apply the theories to themselves and their experiences. From this application students will be asked to evaluate, criticize and discuss the theories. Lect. 3 hrs. per wk.

**PSYC 226 Psychological Aspects of Management (3 cr.)**

Prerequisite: PSYC 110. Psychological principles applied to business. Supervision, communication, employee relations, group dynamics, employee selection. Lect. 3 hrs. per wk.

**PSYC 231-232-233 Human Growth and Development I-II-III (3 cr.) (3 cr.) (3 cr.)**

The study and interpretation of human behavior through the life cycle. Concepts and principles describing the dynamics of human development and behavior and their relation to the work and purpose of the school. The scientific method, heredity, psychological development, perception, motivation, learning, emotions, cognitive processes, personality, frustration, intelligence, and mental processes. Lect. 3 hrs. per wk.

**PSYC 247 Educational Psychology (3 cr.)**

Prerequisite: PSYC 202 or 130. Certain facets of human behavior and learning as they relate to the education processes. Motivation, intelligence, knowledge and their significance for achieving educational goals. Lect. 3 hrs. per wk.

**PSYC 298 Seminar and Project (1-5 cr.)**

Prerequisite: division permission.  
(see General Usage Courses section)

**PSYC 299 Supervised Study (1-5 cr.)**

Prerequisite: division permission.  
(See General Usage Courses Section)

**PUBLIC SERVICE****PBSV 110 Introduction to Public Administration (3 cr.)**

Principles and concepts underlying the field of public administration in federal, state, and local government. Includes the role of government in modern society; the relationship of administrative and policy processes; organizational structure and relationships; new and emerging organizational forms and functions of government. Lect. 3 hrs. per wk.

**PBSV 116 Public Personnel Administration (3 cr.)**

Human resource development; historical development of public personnel administration, recruitment, selection, training, classification, grievance procedures, and related processes of public personnel administration; new concepts in personnel administration; manpower programs; overview of labor relations in government employment. Lect. 3 hrs. per wk.

**PBSV 117 Public Finance Administration (3 cr.)**

Organization and functions of fiscal administration; financial planning and control; analysis of the budgeting process; budget preparation; revenue sources; intergovernmental financial relationship; debt management; data processing applications in fiscal administration; analysis of the fiscal process in various government agencies; purchasing; special assessments; capital improvement budgeting. Lect. 3 hrs. per wk.

**PBSV 256 Interviewing Skills (3 cr.)**

A study and analysis of the technique of interviewing. Includes the significance of representing a government or private agency, human relations, confidentiality, beginning the interview, interchange of information, handling complaints and criticism, ending the interview. Lect. 3 hrs. per wk.

**PBSV 257 Group Leadership (3 cr.)**

The dynamics of individual behavior and the group process. How individuals function as group members, role of the leader; encouraging participation and group action for achieving group goals. Lect. 3 hrs. per wk.

**PBSV 258 Social Change Skills (3 cr.)**

Institutions and why they change or fail to change. The differing strategies for effecting change. Examination of techniques employed by people attempting change. Lect. 3 hrs. per wk.

**PBSV 259 Social Legislation (3 cr.)**

An examination of current and prospective programs dealing with legislation relevant to community service. Covers federal, state, and municipal programs; interrelationships among governmental agencies; authority and responsibility for administration. Lect. 3 hrs. per wk.

## RADIOGRAPHY

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**RADL 100 Introduction to Radiology and Protection (2 cr.)**

A brief history of the radiologic profession, the preliminary code of ethics and conduct for radiologic students, and the basic fundamentals of radiologic protection. The course also covers radiation production, physics, and elements of machine operation. Lect. 2 hrs. per wk.

**RADL 114 Principles of Exposure I (4 cr.)**

The control and use of radiation to produce safe levels of radioactive energies necessary for the production of radiographs; includes the elements of the developmental process. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**RADL 115 Principles of Exposure II (4 cr.)**

Prerequisite: RADL 114. The controlled use of radiation to produce diagnostic radiographs. The process and chemistry of developing is examined in detail. The causes and prevention of artifacts are introduced. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**RADL 124 Radiographic Procedures I (4 cr.)**

Positioning the patients' anatomical structures on the radiograph with emphasis on the extremities, chest, spinal column and gross examination of the abdomen. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**RADL 125 Radiographic Procedures II (4 cr.)**

Prerequisite: RADL 124. Emphasis on radiographic procedures such as inner-ear studies, skull and facial bones, pediatric radiology and other more complex examinations. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**RADL 136 Patient Care Procedures (2 cr.)**

The care and handling of the sick and injured patient in the radiology department. The course contains procedures for patient transportation, safety, personal conduct for radiographers, and aseptic technique. Lect. 2 hrs. per wk.

**RADL 190 Coordinated Practice (1-5 cr.)**

This course provides the student with clinical experience in an active radiology department. Access to an energized laboratory is provided where the student will observe demonstrations and execute those procedures which he/she has learned in lab and lecture. The course is required for each of the four (4) quarters of first year instruction. Clinical hours are: 10 hrs. per wk. during the first three quarters; 25 hrs. per wk. during the fourth quarter.

**RADL 210 Radiation Protection and Radiobiology (3 cr.)**

A comprehensive study of the methods and devices used for protection from ionizing radiation. Includes the theories of biological effects, cell and organism sensitivity, and the somatic and genetic effects of ionizing radiation. Current radiation protection philosophy will be related to protecting the patient and technologist. Lect. 3 hrs. per wk.

**RADL 216 Applied Radiation Physics (4 cr.)**

Prerequisite: RADL 114. The circuiting of and electronics of X-ray machines; the structure of radioactive generators and the resultant isotopes. Lect. 3 hrs., Lab. 3 hrs. Total 6 hrs. per wk.

**RADL 250 Radiologic Specialties (3 cr.)**

Prerequisite: PHYS 101. Introduction to the study and treatment of disease as it relates to nuclear medicine, radiation oncology, ultrasound, imaging modalities and other innovations in the field of Radiology. Special emphasis will be placed on theory, principles of operation and clinical application of these specialties. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**RADL 256 Special Procedures (3 cr.)**

Prerequisite: RADL 125. The use of special radiographic and surgical equipment employed in the more complicated investigation of internal conditions of the human body. Lect. 3 hrs. per wk.

**RADL 290 Coordinated Practice (1-5 cr.)**

Prerequisite: RADL 190. The course provides the student with more clinical experience in an active radiology department. Classroom lecture is developed in practice. Technical ability is further refined. Lab. (5th, 6th, and 7th quarters) 20 hrs. per wk.

**RADL 296 Applied Radiography (16 cr.)**

Prerequisite: completion of the first seven quarters of the Radiography curriculum. Practice of techniques and procedures on actual patients in a clinical setting utilizing energized radiographic equipment. More clinical experience in the radiography specialties. Lab. 40 hrs. per wk.

**RADL 298 Seminar and Project (1-5 cr.)**

Independent study in a field of interest directly related to the science of radiology. The seminar and project will be guided by the course instructor and a presentation made. Lab. 3 hrs. per wk. (4th, 5th, 6th, and 7th quarters only).

## REAL ESTATE

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**REAL 098 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)

**REAL 164 Principles of Real Estate I (3 cr.)**

Practical applications of real estate management principles. Includes a study of contracts, deeds, mortgages, bonds, leases, search, real property leasing and appraisal. Lect. 3 hrs. per wk.

**REAL 165 Principles of Real Estate II (3 cr.)**

Prerequisite: REAL 164. Continued examination of marketing fundamentals. Emphasis on techniques required for proper selection analysis and listing of real estate properties. How to determine needed data, how to analyze forms and records for recording and presenting data. Lect. 3 hrs. per wk.

**REAL 166 Real Estate Mathematics (3 cr.)**

Designed to apply fundamental mathematics principles to special real estate problems. This includes, but is not limited to allocation of areas of land, pricing land, computation of commissions, earnings on investment, calculation of escrow funds, and closing costs. Lect. 3 hrs. per wk.

**REAL 168 Real Estate Sales (3 cr.)**

The fundamentals of sales principles as they apply to real estate. The prospect, his motives, his needs, and his abilities to buy real estate. Lect. 3 hrs. per wk.

**REAL 266 Real Estate Brokerage I (3 cr.)**

Relations of broker and salesman, salesman and client, and community responsibilities. Writing contracts, closing and settlement, and follow-up relations. Lect. 3 hrs. per wk.

**REAL 267 Real Estate Appraisal (3 cr.)**

Fundamentals of real estate evaluation methods used in determining value; application of procedures and techniques by utilizing actual appraisals. Includes the opportunities available in the appraisal field of real estate activity. Lect. 3 hrs. per wk.

**REAL 268 Property Management (3 cr.)**

The field of property management; professional aspects of real estate brokerage, properties, neighborhood analysis, tenants and qualifications, aspects of maintenance and repair. Lect. 3 hrs. per wk.

**REAL 269 Real Estate Finance (3 cr.)**

Principles and practices of financing real estate sales and properties, analysis of various types of mortgage payments and contracts, financing homes and industrial properties and buildings; loan application, relations between correspondent and investor, construction loans. Lect. 3 hrs. per wk.

**REAL 276 Land Planning and Use (3 cr.)**

Land value and usage, planning, zoning regulations, building and site requirements, sanitation and utilities, highest and best use concept, population analysis, influence of market forces and public policies. Lect. 3 hrs. per wk.

**REAL 277 Legal Aspects of Real Estate (3 cr.)**

A study of Virginia real estate law including rights incident to property ownership and management, agency contract and application to real estate transfer, conveyancing, probate proceedings, trust transactions. Lect. 3 hrs. per wk.

**REAL 278 Real Estate Economics (3 cr.)**

Nature and classification of land economics, the development of property, construction and subdivision, economic values and real estate cycles and business fluctuations, residential market trends, rural property and special purpose property trends. Lect. 3 hrs. per wk.

**REAL 279 Real Estate Investments (3 cr.)**

An examination of real estate investments with emphasis on tax shelters, limited partnerships, syndications, exchanges and modern techniques or mortgage equity requirements and depreciation guidelines. Lect. 3 hrs. per wk.

**REAL 297 Cooperative Education (1-5 cr.)**  
(see General Usage Courses section)**RECREATION AND PARKS****RCPK 100 Introduction to the Recreation and Parks Field (3 cr.)**

Development of the recreation and parks movement. Theory of leisure and environmental awareness. The economic importance, type of areas and facilities. Career opportunities in public, private, and industrial agencies and institutions. Lect. 3 hrs. per wk.

**RCPK 101 Recreation and Parks Management I (3 cr.)**

Introduction to personnel management, supervision, planning and organization for the recreation and parks field. Community relations. Lect. 3 hrs. per wk.

**RCPK 102 Recreation and Parks Management II (3 cr.)**

Introduction to elements of fiscal planning and development, budget preparation, documentation and presentation of projects. Lect. 3 hrs. per wk.

**RCPK 103 Recreation and Parks Management III (3 cr.)**

Problems and practices in maintenance of buildings, areas and equipment. Tree pruning, safety and emergency procedures. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**RCPK 108 Recreation for Special Groups (3 cr.)**

Equips students with the competencies needed to direct recreation activities for special groups such as mentally retarded, physically handicapped, and hospitalized. Leadership techniques for conducting social recreation, drama, music, and sports are emphasized. Lect. 3 hrs. per wk.

**RCPK 110 Recreational Applied Arts Management (2 cr.)**

Planning and practical application of the basic skills of arts and crafts for adoption in the community recreation field. An overview or survey course which includes practical field work in crafts as well as the ordering and issuing of materials for programs and program supervision. Lect. 1 hr., Lab. 2 hrs., Total 3 hrs. per wk.

**RCPK 116 Social Recreation Leadership (3 cr.)**

The programs for recreation in the schools, home, church, youth groups, and other community organizations and institutions. Practical work in social and recreational activity leadership. Designed for those who may wish to engage or specialize in recreational leadership. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**RCPK 126 Natural Resources and the Urban Environment (2 cr.)**

Introduction to the wise use of natural resources in the urban situation. History and philosophy of conservation methods and techniques. Utilization of park facilities and interpretative programs. Interpretative techniques, the web of life. Lect. 2 hrs. per wk.

**RCPK 127 Park Planning (2 cr.)**

Designed to give the student experience in park design and planning with emphasis on design characteristics and structures, and in working with consultants and contractors. Lect. 1 hr., Lab. 2 hrs., Total 3 hrs. per wk.

**RCPK 136 Program Planning Organization and Group Leadership (2 cr.)**

Elements and principles of organizing, conducting, and evaluating various types of effective recreation programs for a variety of groups; playgrounds, recreation centers, parks, camps, and senior citizen groups. Lect. 2 hrs. per wk.

**RCPK 137 Organization and Management of Recreational Sports Activities (3 cr.)**

Officiating and instructional activities; aspects of recreational sports; game rules and administering of tournaments. Lect. 3 hrs. per wk.

**RCPK 138 Fundamentals of Camp Management and Operation (3 cr.)**

Principles of modern camping sites, equipment, programming. Managerial responsibility and operation, maintenance, supervision and planning of private and public camp grounds, and day camps. Organization and supervision of recreation group camping and private camps for various ages or family groups. Includes field trips. Lect. 3 hrs. per wk.

**RCPK 146 Community and Family Recreation (3 cr.)**

Survey of problems, functions and methods of recreation services for the community. Interpretation and importance of community recreation. Family recreational activities. Programs and leadership recreation services, standards, quality, coordination, and community organizations. Lect. 3 hrs. per wk.

**RCPK 150 Survey of Private, Commercial and Industrial Recreation (3 cr.)**

Designed to introduce the student to the specialized fields of private, commercial and industrial recreation. The course will emphasize career opportunities and specialized education needed to attain a position in this field. Lect. 3 hrs. per wk.

**RCPK 160 The Arts in Recreation (1 cr.)**

An introduction and survey of the cultural, creative and performing arts in recreation. Music, arts and crafts, drama, dance, and cultural programs will be surveyed as to the application and use in the field of recreation and parks. Lect. 1 hr., Lab. 1 hr., Total 2 hrs. per wk.

**RCPK 197 Cooperative Education (1-5 cr.)**  
(see General Usage Courses section)**RCPK 207 Recreational Drama (1 cr.)**

Prepares recreation leaders to direct informal creative dramatics, chiefly for children. Includes improvisation, pantomime, storytelling, charades, dramatic games, and acting combined with other art forms. Lab. 2 hrs. per wk.

**RCPK 224 Natural and Historical Interpretation in the Urban Environment I (2 cr.)**

Designed to introduce and give the student experience in the development of interpretative materials and use of interpretative methods; includes use of audiovisual equipment, photography, lettering, native trail design. Lect. 1 hr., Lab. 2 hrs., Total 3 hrs. per wk.

**RCPK 225 Natural and Historical Interpretation in the Urban Environment II (2 cr.)**

The theory of interpretation as it applies to the Urban Environment. Discuss various approaches to the philosophy of interpretations and the natural environment. Practice in sensitization and acclimatizing. Lect. 2 hrs. per wk.

**RCPK 290 Coordinated Internship (1-5 cr.)**  
(see General Usage Courses section)**RCPK 297 Cooperative Education (1-5 cr.)**  
(see General Usage Courses section)



- RCPK 298 Seminar and Project (1-5 cr.)  
(see General Usage Courses section)
- RCPK 299 Supervised Study (1-5 cr.)  
(see General Usage Courses section)

## RECREATION VEHICLE

- RVEH 116 Motorcycle Machine Laboratory (3 cr.)**  
The theory, practice and use of machinery equipment used in reconditioning and repairing motorcycles. Special emphasis will be placed on measuring instruments, valve refinishing, cylinder and piston reconditioning, use of dial indicator, resurfacing and welding. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- RVEH 120 Introduction to Motorcycle Mechanics (3 cr.)**  
The motorcycle, its systems, operating principles, problems and repair techniques. Introduction to tools, equipment, shop layout, general maintenance and diagnosis. Special emphasis is placed on shop safety and safe use of basic equipment. There is no prerequisite for this course. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- RVEH 124 Motorcycle Engines I (3 cr.)**  
Prerequisite: RVEH 120. This course will cover the proper disassembly and repair procedures for single cylinder, 2-stroke and 4-stroke motorcycle engines. Trouble shooting procedures for diagnosing common engine problems will be emphasized. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- RVEH 125 Motorcycle Engines II (3 cr.)**  
Prerequisite: RVEH 124. This course will cover the various designs and disassembly and repair procedures for multi-cylinder 4-stroke motorcycle engines. Proper diagnosis and inspection procedures will be emphasized. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- RVEH 126 Motorcycle Fuel Systems (3 cr.)**  
Analysis of motorcycle fuel systems to include tanks, valves, filters and carburetors (slide type, diaphragm, and conventional type) and fuel injection. Special emphasis will be placed on diagnosis and adjustment, especially jetting and needle positioning. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- RVEH 127 Motorcycle Electrical Systems (3 cr.)**  
Electricity and magnetism symbols and circuitry as applies to the motorcycle electrical system. Includes storage batteries, generators, alternators, regulating systems, starters, lighting systems. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- RVEH 140 Marine Cooling, Fuel, & Elect. Syst. (3 cr.)**  
Designed to give major technical training in the service and repair of marine cooling, fuel, and electrical support systems. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- RVEH 146 Outboard Engines (3 cr.)**  
Designed to give major technical training in the installation, service and repair of outboard power plants. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- RVEH 147 Inboard/Outdrives (3 cr.)**  
Designed to provide major technical training in the service, overhaul and repair of larger inboard power plants and stern drives. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- RVEH 148 Outboard Drive Trains (3 cr.)**  
Designed to provide major technical training in the design, operation, service, overhaul and repair procedures of outboard motor power units. Lecture 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- RVEH 149 Powerboat Rigging (3 cr.)**  
Designed to provide major technical training in the installation, operation, service, and repair of marine steering controls, transmission controls and engine speed controls. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- RVEH 156 Motorcycle Drive Trains (3 cr.)**  
The operation, design, construction and repair of power train components including primary drive systems (both gear and chain), clutches (wet, dry automatic and centrifugal), transmissions. Final drive systems (sprocket, chains, rings and pinion type). Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

- RVEH 176 Motorcycle Two-Stroke Engines (3 cr.)**  
Prerequisite or corequisite: RVEH 120. Analysis of piston, cylinder, rods, crankshafts, bearings, cases, lubrication systems. Special emphasis will be placed on diagnosis and rebuilding techniques. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- RVEH 177 Motorcycle Four-Stroke Engines (3 cr.)**  
Prerequisite or corequisite: RVEH 120. Analysis of piston and cylinder conditions, intake and exhaust valve mechanisms, bearings, crankshafts, rods, lubrication systems, and cooling systems. Special emphasis will be placed on diagnosis and rebuilding techniques. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- RVEH 190 Coordinated Internship (1-5 cr.)**  
(see General Usage Courses section)
- RVEH 198 Motorcycle Seminar and Project (1-5 cr.)**  
(see General Usage Courses section)
- RVEH 267 Motorcycle Suspensions (3 cr.)**  
Theoretical analysis, and practical service and repair of motorcycle frames, forms, wheels and brakes. Special emphasis will be placed on fork rebuilding, spoked wheel lacing and truing, and brake repairing. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.
- RVEH 290 Coordinated Internship (1-5 cr.)**  
(see General Usage Courses section)

## RESPIRATORY THERAPY

- RPTH 136 Fundamental Arts I (3 cr.)**  
Focus upon historical aspects leading to present status of modern day cardiorespiratory therapy. Also nursing arts relative to psychological, physical and special unit patient care and its interrelationship to therapy, general hospital safety. Lect. 3 hrs. per wk.
- RPTH 144 Fundamental Theory and Procedures I (4 cr.)**  
Focus upon gas, aerosol, and humidification therapies emphasizing the techniques, skills and understanding necessary to properly and effectively administer these therapy methods. Focus also upon cleaning, maintenance, storage and safety aspects of equipment involved. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- RPTH 145 Fundamental Theory and Procedures II (4 cr.)**  
Prerequisites: RPTH 144, or permission of Program Head. Focus is upon artificial ventilation therapy-controlled and or assisted or intermittent. All basic types of ventilator/respirators emphasizing all techniques, skills and understanding necessary to properly and effectively administer these methods. Focus also upon cleaning, maintenance, storage and safety aspects of equipment involved. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.
- RPTH 184 Clinical Instruction I (2 cr.)**  
Prerequisites: Previous RPTH courses. Introduction to the clinical setting. Offers clinical instruction in basic patient care practices, medical gases, humidifiers, aerosols and O<sub>2</sub> monitoring equipment. Students will also participate in sterilizing/cleaning and assembly of equipment. On-site instructors guide clinical experiences and aid practical application of classroom and laboratory work. Lab. 10 hrs. per wk.
- RPTH 185 Clinical Instruction II (2 cr.)**  
Prerequisites: All previous RPTH courses. Continuation of RPTH 184, Clinical Instruction I. Clinical instruction continues in aerosol and chest physiotherapy, IPPB and incentive spirometry. Students will participate in resuscitation efforts when appropriate and will complete basic life support CPR certification. Lab. 10 hrs. per wk.
- RPTH 231 Cardiopulmonary Science I (3 cr.)**  
Prerequisites: RPTH 145, or permission of Program Head. Pharmacological basis of drugs used in cardiovascular and respiratory therapy. Focus upon theory, origin, and source of drugs; prescriptions, mathematics of dosages and solutions, action, influencing conditions, preparation, administration. Lect. 3 hrs. per wk.
- RPTH 232 Cardiopulmonary Science II (4 cr.)**  
Focus upon anatomy and physiology as it relates to cardiovascular and respiratory systems. Basic normal and abnormal function and patterns of thorax and contents, basic embryology - comparing neonatal states to adult. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.



**RPTH 234-235 Cardiopulmonary Science IV-V (2 cr.) (2 cr.)**

Prerequisites: RPTH 231, RPTH 232 or permission of Program Head. Pathophysiology of cardiopulmonary diseases and disorders of the adult and child. Emphasis is upon current therapeutic modalities in the care of patients with cardiopulmonary diseases. Discussions of etiologic, symptomatic, diagnostic and prognostic facets of each disease presented. Lect. 2 hrs. per wk.

**RPTH 236 Fundamental Arts II (3 cr.)**

Focus upon administration, economics, planning and development of technical department management. Also ethics, professional behavior and responsibility, and legal considerations relative to therapy. Lect. 3 hrs. per wk.

**RPTH 241 Fundamental Theory and Procedures III (4 cr.)**

Prerequisites: RPTH 242, RPTH 232 or permission of Program Head. Focus upon advanced techniques of ventilatory management including respiratory monitoring, patient care plans, integration of team care. Emphasis on acute, intensive care patient cardio-respiratory problems. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**RPTH 242 Fundamental Theory and Procedures IV (4 cr.)**

Prerequisites: RPTH 145, RPTH 231, or permission of Program Head. Focus upon cardio-pulmonary resuscitation and air-way management plus management of emergencies involving cardio-respiratory problems in both adults and infants. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**RPTH 243 Fundamental Theory and Procedures V (4 cr.)**

Prerequisites: RPTH 241, or permission of Program Head. Focus upon pulmonary function testing and diagnostic, blood gas analysis and gas analysis emphasizing relation to physiological states and interpolation to patient care objectives. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**RPTH 258 Neonatal and Pediatric Respiratory Care (3 cr.)**

A survey of the etiology, pathophysiology, diagnosis, and treatment of the most frequently encountered clinical respiratory problems indigenous to the newborn and pediatric patient. Special emphasis will be given to problems frequently encountered in the newborn and pediatric intensive care units. Lect. 3 hrs. per wk.

**RPTH 286 Clinical Instruction III (5 cr.)**

Prerequisites: All previous RPTH courses. Advanced clinical instruction. The course covers the practical application of airway maintenance, care and use of resuscitation equipment and basic patient pulmonary assessment. Students also continue patient care in aerosol, IPPB and chest physiotherapies. Lab. 20 hrs. per wk.

**RPTH 287 Clinical Instruction IV (5 cr.)**

Prerequisites: All previous RPTH courses. Introduction to the critical care setting with emphasis on intensive respiration care skills, continuous mechanical ventilation and physiologic monitoring. Students will be under the supervision of an on-site clinical instructor. The course is a continuation of Clinical Instruction III. Lab. 20 hrs. per wk.

**RPTH 288 Clinical Instruction V (5 cr.)**

Prerequisites: All previous RPTH courses. Continuation of critical care clinical instruction with emphasis on intensive respiratory care skills, continuous mechanical ventilation and physiologic monitoring. Students will be under the supervision of an on-site clinical instructor. Lab. 20 hrs. per wk.

**RPTH 289 Clinical Instruction VI (5 cr.)**

Prerequisites: All previous RPTH courses. Final critical care rotation. The student is expected to function with minimal supervision as a critical care therapist. The student will be required to integrate previous classroom, laboratory and clinical experiences. Lab. 20 hrs. per wk.

**RPTH 290 Coordinated Clinical Practice (1-5 cr.)**

(see General Usage Courses section)

**RPTH 298 Seminar and Project (1-5 cr.)**

(see General Usage Courses section)

**RUSSIAN****RUSS 101-102-103****Introductory Russian I-II-III (4 cr.) (4 cr.) (4 cr.)**

Fundamentals of Russian grammar; elementary translation, conversation, and reading. Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk.

**SAFETY****SAFE 116 Instrumentation for Occupational Safety and Health (3 cr.)**

Prerequisite: HLTH 146. A practical course in the instrumentation utilized in occupational safety and health hygiene. A study of the working principles, calibration methods, and use of field instruments and sampling devices. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**SAFE 127 Safety and Health Standards, Regulations, and Codes (3 cr.)**

The development of safety standards and sources of standards, including an examination of government regulatory codes and and appraisal of consensus, advisory, and proprietary standards. Lect. 3 hrs. per wk.

**SAFE 130 Safety Program Organization and Administration (3 cr.)**

An introduction to the techniques of organizing and administering practical safety programs, emphasizing safety as a management function. Lect. 3 hrs. per wk.

**SAFE 134 Power Source Hazards Control I (3 cr.)**

An examination of the physical hazards of the work environment and methods of control. Application of guarding principles and techniques pertaining to mechanical, electrical, pneumatic and hydraulic processes. Lect. 3 hrs. per wk.

**SAFE 137 Material Handling and Storage (3 cr.)**

A comprehensive coverage of material-handling equipment (lift truck operation, rigging, elevators, conveyors), handling hazardous materials, safe storage, methods of preventing handling inquiries, and damage to equipment and materials. Lect. 3 hrs. per wk.

**SAFE 146 Introduction to Industrial Hygiene (3 cr.)**

Study of environmental energy, physical, and chemical hazards, including gases, vapors, dusts, fumes, and mists; the importance of personal protective equipment and contamination control methodology. Lect. 3 hrs. per wk.

**SAFE 176 Principles of Industrial Safety (2 cr.)**

Principles and practices of accident prevention, analysis of accident causes, mechanical safeguards, fire prevention, housekeeping, occupational diseases, first aid, safety organization, protection equipment, and general safety principles and the promotion of the same. Lect. 2 hrs. per wk.

**SAFE 180 Introduction to Industrial Health (3 cr.)**

The interrelationships of industrial medicine and industrial hygiene. A study of various occupational illnesses. Lect. 3 hrs. per wk.

**SAFE 206 Safety Program Evaluation (3 cr.)**

Prerequisite: SAFE 130. The application of quantifiable measures to safety program performance. Emphasis on the use of reliable and valid measurement techniques including inferential statistics to evaluate management performance, safety program effectiveness, and accident prevention strategies. Lect. 3 hrs. per wk.

**SAFE 225 Human Factors and Safety Psychology (3 cr.)**

A study of the stresses on the human system, both physiological and psychological, that contribute to the severity of industrial accidents. Lect. 3 hrs. per wk.

**SAFE 227 Industrial Sound and Noise (3 cr.)**

Prerequisite: HLTH 146. A study of the physics of noise, the physiology of hearing, and the impact upon the worker of noise in the industrial environment. Includes sound level measurement, analysis, principles of audiometry, hearing protection, and noise control techniques. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.

**SAFE 237 Preventative Maintenance (3 cr.)**

Various types of maintenance programs, including maintenance management schedules and controls, and the relationship of these operational matters to the prevention of accidents, injuries, and exposure to health hazards. Lect. 3 hrs. per wk.

**SAFE 251 Occupational Environment I (3 cr.)**

A study of sampling and analysis of chemical contaminants, especially vapor gases in the industrial environment. Includes sampling techniques and study of working principles and applications of field instruments and sampling devices. Lect. 3 hrs. per wk.

**SAFE 252 Occupational Environment II (3 cr.)**

Prerequisite: SAFE 251. A study of sampling and analysis of chemical aerosols and solid particulates in the occupational environment. Includes sampling techniques and study of working principles and applications of field instruments and sampling devices. Lect. 3 hrs. per wk.

**SAFE 253 Occupational Environment III (3 cr.)**

A study of measurement and analysis of the physical hazards posed by ionizing and non-ionizing radiation heat and light. Includes methodology for evaluating industrial exposure to these hazards and study of appropriate instrumentation and of measures for protection of personnel. Lect. 3 hrs. per wk.

**SAFE 254 Occupational Environment Laboratory I (1 cr.)**

Prerequisite: SAFE 251. Sampling and analysis of vapor and gaseous contaminants in the industrial environment. Emphasis on sampling devices and techniques and on instrumental analysis. Experiments and/or demonstrations. Lab. 3 hrs. per wk.

**SAFE 255 Occupational Environment Laboratory II (1 cr.)**

Prerequisite: SAFE 252. Sampling and analysis of chemical aerosols and solid particulates in occupational environment. Emphasis on sampling devices and techniques and on instrumental analysis. Experiments and/or demonstrations. Lab. 3 hrs. per wk.

**SAFE 256 Occupational Environment Laboratory III (1 cr.)**

Prerequisite: SAFE 253. Measurement and analysis of physical hazards posed by ionizing and non-ionizing radiation, heat stress, and work place illumination. Includes methodology and instruments for evaluating physical hazards and illumination levels. Experiments and/or demonstrations. Lab. 3 hrs. per wk.

**SAFE 297 Cooperative Education (1-5 cr.)**  
(see General Usage Courses section)**SOCIAL SCIENCE****SOSC 101-102-103 Contemporary American Civilization I-II-III (3 cr.) (3 cr.) (3 cr.)**

An analysis of the factors involved in the development of the American Society and American Culture to develop an understanding of American history. American government, American economics, and man's role in society. These courses need not be taken sequentially. Lect. 3 hrs. per wk.

**SOSC 121-122-123 Current American Social Problems I-II-III (3 cr.) (3 cr.) (3 cr.)**

A survey of contemporary America from the perspective of the Social Sciences designed to provide a basis for the forming of individual judgments on major American domestic issues. The Constitution of the United States provides a primary vehicle for exploration of problems underlying current political, economic, social and individual behavioral patterns and for discussions of relevant applications in the news of today. Lect. 3 hrs. per wk.

**SOSC 199 Supervised Study (1-5 cr.)**  
(see General Usage Courses section)**SOSC 201-202-203 Survey of Urbanization I-II-III (3 cr.) (3 cr.) (3 cr.)**

The three courses will focus on Old World Cities, New World Cities, and Third World Cities. An interdisciplinary perspective will be used drawing on concepts and findings from archeology, architecture, history, economics, sociology, urban geography, political science, psychology, and urban planning. Lect. 3 hrs. per wk.

**SOCIOLOGY****SOCI 101-102-103 Introductory Sociology I-II-III (3 cr.) (3 cr.) (3 cr.)**

SOCI 101 is prerequisite for either SOCI 102 or SOCI 103. The fundamental concepts and the general principles of sociology; social institutions, population study, human ecology and community study, culture, human nature and personality, social interaction and stratification, and social problems. Lect. 3 hrs. per wk.

**SOCI 104-105 Introductory Sociology I-II (5 cr.) (4 cr.)**

The fundamental concepts and the general principles of sociology; social institutions, population study, human ecology and community study, culture, human nature and personality, social interaction and stratification, and social problems. Lect. 5/4 hrs. per wk.

**SOCI 106 General Sociology (3 cr.)**

The study of various forms of human association, their structure, processes and products in terms of culture systems, human nature and personality. Lect. 3 hrs. per wk.

**SOCI 116 Child-Parent-Community Relations (3 cr.)**

This course is designed to assist the student in learning about and utilizing resources within a given community that are designed to create an environment suitable for the development of children. The course will focus on the standards and interrelationships within the community that influence children's developing concepts concerning education, religion, ethical values, and citizenship. Lect. 3 hrs. per wk.

**SOCI 141 Parents and Their Children I (3 cr.)**

A practical course to enable parents to deal more effectively with their pre-school and elementary children. Emphasis will be on those areas where parents influence the development of their children. Lect. 3 hrs. per wk.

**SOCI 142 Parents and Their Children II (3 cr.)**

A practical course to enable parents to deal more effectively with their teenage children. Emphasis will be on those areas where parents influence the development of their children. Lect. 3 hrs. per wk.

**SOCI 143 Seminar for Parents (3 cr.)**

Prerequisite SOCI 101. Discussion and study of problems and experiences encountered in raising children and teenagers in today's world. Attention will be given to the expectations and individual concerns parents have in dealing with their children. Lect. 3 hrs. per wk.

**SOCI 170 Introduction to Black American Culture (3 cr.)**

An introduction to the study of the Black person in America. Abroad historical view, population, family, economic and cultural trends; contributions of civic and political leaders, writers and artists. Lect. 3 hrs. per wk.

**SOCI 184-185 Contemporary Social Problems I-II (3 cr.) (3 cr.)**

Application of sociological concepts and methods to the analysis of current social problems in the United States including family and community disorganization, delinquency and crime, mental illness, and intergroup relations. Lect. 3 hrs. per wk.

**SOCI 188 Criminology (3 cr.)**

Volume and scope of crime, the background of criminal behavior in the American setting; organized crime and its affiliated problems; subjective theories and explanation of crime; the control, treatment and rehabilitation of the criminal offender. Lect. 3 hours per week. (This course is also offered as ADJU 176.)

**SOCI 211-212-213 Principles of Anthropology I-II-III (3 cr.) (3 cr.) (3 cr.)**

A survey of the physical, social, and cultural development and behavior of human beings since their appearance on earth. Included will be several interconnected fields: human evolution, physical anthropology, archaeology, cultural anthropology, ethnology, and scientific linguistics. Lect. 3 hrs. per wk.

**SOCI 236 Marriage and the Family (3 cr.)**

A study of comparative family systems and problems related to marriage and the family. Lect. 3 hrs. per wk.

**SOCI 237 Marriage and the Family (5 cr.)**

Prerequisite: SOCI 101, 104, or 185. A study of comparative family systems and problems related to marriage and the family. Lect. 5 hrs. per wk.

**SOCI 240 Introductory Anthropology (3 cr.)**

A study of the origin and evolution of man based upon the fossil record, and an analysis of the status of modern racial grouping. Lect. 3 hrs. per wk.



**SOCI 244 Physical Anthropology and Archaeology** (5 cr.)

A study of the origin and evolution of man based upon the fossil record, and an analysis of the status of modern racial grouping. Lect. 5 hrs. per wk.

**SOCI 246 Cultural Anthropology** (3 cr.)

The application of the concept of culture to the study of contemporary societies, both primitive and modern. Such institutional areas as magic and ritual, crime, custom, law, economy, courtship, marriage and childbearing will be analyzed cross-culturally. Lect. 3 hrs. per wk.

**SOCI 247 Cultural Anthropology** (5 cr.)

The application of the concept of culture to the study of contemporary societies both primitive and modern. Such institutional areas as magic and ritual, crime, custom, law, economy, courtship, marriage and childbearing will be analyzed cross-culturally. Lect. 5 hrs. per wk.

**SOCI 248 Case Studies in Cultural Anthropology** (3 cr.)

A comparative, in-depth study of the structure and organization of selected primitive societies. Lect. 3 hrs. per wk.

**SOCI 266 Death and Society** (3 cr.)

Prerequisites: SOCI 101-102-103 or equivalent or with division permission. An in-depth study of the theoretical, practical, and historical aspects of death. Attention will also be focused upon the student's own ideas, feelings, and attitude toward death, dying, and the significance and consequences of those attitudes. Lect. 3 hrs. per wk.

**SOCI 276 Social Problems** (5 cr.)

Prerequisites: SOCI 104 or SOCI 101, 102, and 103. Application of sociological concepts and methods to the analysis of current individual and group social problems in the U.S. Areas which might be considered would include: delinquency and crime, mental illness, drug addiction, alcoholism, sexual behavior, population, ethnic and race relations, poverty, human ecology, automation and cybernation, and war and peace. Lect. 5 hrs. per wk.

**SOCI 290 Coordinated Internship** (1-5 cr.)

(see General Usage Courses section)

**SOCI 298 Seminar and Project** (1-5 cr.)

Prerequisite: division permission.  
(see General Usage Courses section.)

**SOCI 299 Supervised Study** (1-5 cr.)

Prerequisite: division permission.  
(see General Usage Courses section.)

**SPANISH****SPAN 17 Spanish for the Tourist** (3 cr.)

A course designed to meet the minimum conversational needs of persons intending to travel in a Spanish-speaking country and desiring an acquaintance with the Spanish language and culture. Lect. 3 hrs. per wk.

**SPAN 101-102-103 Introductory Spanish I-II-III** (4 cr.) (4 cr.) (4 cr.)

Introductory training in the understanding, speaking, reading, and writing of Spanish with emphasis on manipulation of the structure of the language. (Spanish is used in the classroom.) Lect. 3 hrs., Lab. 2 hrs., Total 5 hrs. per wk. *Not recommended for students who have, within the past two years, received 2 years high school or one year college credit for this language.*

**SPAN 104-105 Introductory Spanish I-II** (6 cr.) (6 cr.)

The understanding, speaking, reading, and writing of Spanish with emphasis on manipulation of the structure of the language. (Spanish is used in the classroom.) Lect. 5 hrs., Lab. 3 hrs., Total 8 hrs. per wk.

**SPAN 107 Conversation in Spanish** (3 cr.)

Prerequisite: SPAN 103 or the equivalent. Practice in speaking in Spanish, stressing correctness of sentence structure, pronunciation, fluency, and the vocabulary of everyday situations. Lect. 3 hrs. per wk.

**SPAN 108-109 Conversation in Spanish** (3 cr.) (3 cr.)

Prerequisite: SPAN 107 or equivalent. Emphasizes the increasingly sophisticated development of oral skills in Spanish. The course provides an intensive review of the vocabulary of everyday situations and is designed for students who have had previous instruction in or consid-

erable experience with Spanish. (May be taken out of sequence.) Lect. 3 hrs. per wk.

**SPAN 134-135 Spanish for Health Professionals I-II** (3 cr.) (3 cr.)

An introductory course designed to integrate easily into varied health oriented curricula and/or serve as an enrichment elective. Emphasis is on oral communication and practical application coordinated with appropriate medical vocabulary and activities. The student will learn by "saying and doing" and will be tested accordingly. Lect. 3 hrs. per wk.

**SPAN 141-142-143 Conversational Spanish I-II-III** (3 cr.) (3 cr.) (3 cr.)

An introductory course with major emphasis on oral communication, conversational communication and cultural mores and customs. Sufficient attention given to practical aspects of reading and writing. An activity-oriented course. Lect. 3 hrs. per wk.

**SPAN 198 Seminar and Project** (1-5 cr.)

(see General Usage Courses section)

**SPAN 199 Supervised Study** (1-5 cr.)

(see General Usage Courses section)

**SPAN 204-205 Intermediate Spanish I-II** (6 cr.) (6 cr.)

Prerequisite: SPAN 105 or successful completion of two years of high school Spanish and division permission. Advanced study in the understanding, speaking, reading, and writing of Spanish. Spanish is used in the classroom. Lect. 5 hrs., Lab. 3 hrs., Total 8 hrs. per wk.

**SPAN 206-207-208 Intermediate Spanish I-II-III** (3 cr.) (3 cr.) (3 cr.)

Prerequisite: SPAN 103 or successful completion of two years of high school Spanish and divisional permission. Advanced study in the understanding, speaking, reading, and writing of Spanish. Spanish is used in the classroom. (May be taken out of sequence.) Lecture 3 hours per week.

**SPAN 221-222-223 Intermediate Spanish Conversation I-II-III** (3 cr.) (3 cr.) (3 cr.)

Prerequisite: SPAN 208 or equivalent. Additional training in understanding and speaking Spanish with continued but specific emphasis on basic structures and idioms. Reading and writing are minimized. Spanish is used in the classroom. (May be taken out of sequence.) Lect. 3 hrs per wk.

**SPAN 231-232-233 Survey of Spanish Literature and Civilization I-II-III** (3 cr.) (3 cr.) (3 cr.)

Prerequisite: SPAN 208 or equivalent. An introduction to Spanish life and culture and to the contributions of Spain to world civilization from medieval times to the present. Readings in the original Spanish. Spanish is used in the classroom. (May be taken out of sequence.) Lect. 3 hrs. per wk.

**SPAN 234-235-236 Hispanic Culture and Civilization I-II-III** (3 cr.) (3 cr.) (3 cr.)

Prerequisite: SPAN 103. An introduction to Hispanic Culture with emphasis on Latin American life and civilization and including literature survey. Spanish is used in the classroom. (May be taken out of sequence.) Lect. 3 hrs. per wk.

**SPAN 298 Seminar and Project** (1-5 cr.)

(see General Usage Courses section)

**SPAN 299 Supervised Study** (1-5 cr.)

(see General Usage Courses section)

**SPEECH AND DRAMA****SPDR 06 Developmental Speech** (1-5 cr.)

A developmental course designed for students who need help in oral communication. Emphasis, through oral, auditory and written exercises, will be placed on vocabulary, spelling, articulation, pronunciation, pitch and rate. Students may register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hours.

**SPDR 106-107 Introduction to the Theatre I-II** (3 cr.) (3 cr.)

The principles of drama; the study of the development of theatre production; study of selected plays as theatrical presentations. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

- SPDR 111-112-113 Acting I-II-III** (3 cr.) (3 cr.) (3 cr.)  
A study of styles of acting. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- SPDR 119 Theatre Workshop** (1-5 cr.)  
Organization and work in the various activities of a college production including: acting, set design, stage carpentry, sound, costumes, lights, stage managing, props, promotion, and stage crew. May be repeated for credit. Variable hrs.
- SPDR 130 Principles of Public Speaking** (5 cr.)  
Theory and principles of public address. Emphasis will be on preparation and delivery. Lect. 5 hrs. per wk.
- SPDR 136 Oral Communications** (3 cr.)  
A study of effective communication with emphasis on speaking and listening. Lect. 3 hrs. per wk.
- SPDR 137 Public Speaking** (3 cr.)  
Development of skill in speechmaking. Lect. 3 hrs. per wk.
- SPDR 140 Introduction to Speech Communication** (5 cr.)  
This course is designed to study speech communication (speaking and/or listening) at various levels. The perspectives include the individual, small group, public and mass communication contexts. Lect. 5 hrs. per wk.
- SPDR 141-142-143 Voice and Diction I-II-III** (3 cr.) (3 cr.) (3 cr.)  
A study through phonetics of the correct speech sounds; drills in pronunciation, enunciation, and voice usage. Lect. 3 hrs. per wk.
- SPDR 146 Introduction to Small Group Communication** (5 cr.)  
Emphasizes the development of presentational ability in a group, decision making, group maintenance, and leadership and participant skills. Preliminary study of group dynamics. Lect. 5 hrs. per wk.
- SPDR 151-152-153 Fundamentals of Speech Communication I-II-III** (3 cr.) (3 cr.) (3 cr.)  
Units in interpersonal, small group and public communication with emphasis on the theory and practice of communication in each of these three broad categories. Lect. 3 hrs. per wk.
- SPDR 158 Forensics** (5 cr.)  
This course is designed to provide students with an opportunity to improve their communication skills in speaking situations both within the classroom environment and outside of the classroom. The course includes instruction in the preparation and delivery of the various competitive speech activities including persuasive speaking, extemporaneous speaking, impromptu speaking and the oral interpretation of literature. This course may be repeated for credit. Lect. 5 hrs. per wk.
- SPDR 184 Industrial and Organizational Communication I** (3 cr.)  
The course examines the structure, methodology and application of communication theory in the industrial and organizational setting. Lect. 3 hrs. per wk.
- SPDR 198 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- SPDR 199 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)
- SPDR 201-202-203 History of Theatre I-II-III** (3 cr.) (3 cr.) (3 cr.)  
A survey of theory and history of the theatre from Greeks to the Modern. Lect. 3 hrs. per wk.
- SPDR 215-216 Rehearsal and Performance I-II** (4 cr.) (4 cr.)  
Additional hours necessary for rehearsal and performance of a college production being prepared (see SPDR 119 Theatre Workshop). Lab. 12 hrs. per wk.
- SPDR 218 Directing** (3 cr.)  
Fundamentals of stage direction. Lect. 3 hrs. per wk.
- SPDR 230 Advanced Public Speaking** (5 cr.)  
Prerequisite: either SPDR 130, 136, 137 or division approval. Preparation and delivery of the various advanced forms and methods of public address. Lect. 5 hrs. per wk.
- SPDR 256-257 Group Discussion I-II** (3 cr.) (3 cr.)  
Techniques and purposes of group discussion. Lect. 3 hrs. per wk.

- SPDR 266 The Art of the Film** (3 cr.)  
An introduction to the art of the film: a survey of the history of the film viewing, discussion and analysis of selected films; introduction to the film techniques of composition, shot sequence, lighting, visual symbolism, sound effects, editing. Lect. 2 hrs., Lab. 2 hrs., Total 4 hrs. per wk.
- SPDR 276 Oral Interpretation** (3 cr.)  
Introduction to the study of techniques and styles of oral reading. Lect. 3 hrs. per wk.
- SPDR 297 Cooperative Education** (1-5 cr.)  
(see General Usage Courses section)
- SPDR 298 Seminar and Project** (1-5 cr.)  
(see General Usage Courses section)
- SPDR 299 Supervised Study** (1-5 cr.)  
(see General Usage Courses section)

## TRAVEL

- TRAV 130 Principles of Travel Selling and Counseling** (4 cr.)  
Elements of successful selling strategies in a travel business. Analysis of selling techniques by types of travel clientele and their needs. Emphasis on the development of basic selling skills through role playing exercises and sales presentations. Lect. 4 hrs. per wk.
- TRAV 150 Introduction to the Travel Industry** (3 cr.)  
An overview of the structure and scope of the travel industry with emphasis on job categories and functions, basic vocabulary, and the interrelationships of the various components. Examines in-depth the retail travel agency's role in marketing travel as well as basic operating techniques. Lect. 3 hrs. per wk.
- TRAV 154 Geography of Tourism I** (3 cr.)  
Provides the student with the geographic knowledge necessary to provide efficient, effective service to clients of a travel agency. North America, Central America, the Caribbean and Western Europe will be studied to determine the following information: (1) important physical features, (2) climate, (3) areas of touristic importance, and (4) primary routings from the Washington area. Lect. 3 hrs. per wk.
- TRAV 155 Geography of Tourism II** (3 cr.)  
This is the second phase of the study of Geography of Tourism, designed to cover more distant destinations in South America, Eastern Europe, Asia, Africa, and the Western and Southwestern Pacific. The course will again emphasize features of touristic importance such as visit documentation, climate and physical features, accommodations and attractions, and accessibility. Lect. 3 hrs. per wk.
- TRAV 156 Geography of Tourism III** (3 cr.)  
Provides the student with the geographic knowledge necessary to provide effective, efficient service to clients. The study of major travel destinations will emphasize features of tourist importance, such as visit documentation, climate and physical features, accommodations and attractions, and accessibility. Lect. 3 hrs. per wk.
- TRAV 159 Ground Transportation, Tours, Cruises, and Services Planning** (3 cr.)  
Prerequisite: TRAV 150. A study of travel agency products and procedures to include steamship travel and cruises, rail travel, motor-coach travel, escorted and independent tours, hotel and resort features and procedures, car rentals, and assembling and selling complete travel packages. Lect. 3 hrs. per wk.
- TRAV 167 International Travel and Tourism** (3 cr.)  
An analysis of the international organization of tourism; the role of the physical environment and cultures; and tourism as a factor in the economic development of these societies. Lect. 3 hrs. per wk.
- TRAV 177 Domestic Air Travel Planning** (3 cr.)  
Prerequisite: TRAV 150. A study of basic domestic tariff and ticketing to include interpreting and preparing domestic itineraries, applying the domestic airline tariff, interpreting rules for fare construction, ticket preparation and issuance, procedures for credit sales, and explanation and use of ticket refund, exchange and reissue procedures. Lect. 3 hrs. per wk.



**TRAV 178 International Air Travel Planning (3 cr.)**

Prerequisite: TRAV 177. A study of basic international tariff and ticketing to include use of the worldwide O.A.G., the mileage system, normal, excursion and special fares, I.A.T.A. ticketing procedures, and interpreting the rules for calculating F.C.U.'s, add-ons, surcharges, and other government taxes. Lect. 3 hrs. per wk.

**TRAV 179 Principles of Group Travel Planning (3 cr.)**

Introduces the advanced travel student to those procedures and practices commonly used in the travel industry to plan travel programs for various sized groups. Studies how to set up a system and organization with a travel agency to handle group business. Lect. 3 hrs. per wk.

**TRAV 189 Marketing and Sales Management for Travel Industry (3 cr.)**

Applies marketing sales promotions and advertising theories and techniques to the sales problems of retail travel agencies. Emphasis is placed on the identification of new markets and methods suggested for reaching and selling these markets. Cases are drawn from tourist motivational organizations, such as travel agencies, tour companies, travel wholesalers, transport companies, travel publications, and governmental promotional organizations. Lect. 3 hrs. per wk.

**TRAV 190 Coordinated Internship (1-5 cr.)**  
(see General Usage Courses section)**TRAV 197 Cooperative Education (1-5 cr.)**  
(see General Usage Courses section)**TRAV 276 Introduction to Airline Computer Reservation Systems (3 cr.)**

Prerequisite: TRAV 177 or the equivalent. Study of airline computer terminal entry instructions and processes. Includes study of developing itineraries, building passenger name records, and accessing other standard airline and travel ticketing procedures. Also includes an introduction to the car rental, hotel reservations, and other functions of major computerized reservation systems. Lect. 3 hrs. per wk.

**WELDING****WELD 106 Pipe Welding (3 cr.)**

Prerequisites: WELD 021, 022, 023, or permission of program head after evaluation of welding experience. Shielded metal, arc welding processes including the welding of pressure piping in the horizontal, vertical, and horizontal-fixed positions. Practices will be in accordance with sections VIII and IX of the ASME code. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.

**WELD 115 Arc and Gas Welding (4 cr.)**

Prerequisite or corequisite for AUTO 160, 167, and 169. Arc and gas welding practices. Safety, general welding practices and effects of welding on metal. Lect. 3 hrs., Lab. 3 hrs., Total 6 hrs. per wk.

**WELD 130 Inert Gas Welding (3 cr.)**

Introduction and practical operations in the uses of inert-gas-shield arc welding. Equipment, safety operations, welding practice in the various positions; shielded gases, filler rods, process variations and applications; manual and semi-automatic welding in accordance with Aircraft and Missile Code MIL-STD-1595A. Lect. 2 hrs., Lab. 3 hrs., Total 5 hrs. per wk.

**WELD 131-132-133 Arc Welding I-II-III (3 cr.) (3 cr.) (3 cr.)**

The operation of AC transformers and DC motor generator arc welding sets; welding polarities, heats, and electrodes for use in joining various metal alloys by the arc welding process; running beads, butt and fillet welds in all positions in accordance with American Society of Mechanical Engineers and American Welding Society Codes; safety procedures emphasized. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.

**WELD 137 Oxyacetylene Welding and Cutting (3 cr.)**

Introduction to the history of oxyacetylene welding; the principles of welding and cutting, nomenclature of the equipment; development of the puddle, running flat beads, butt welding in the flat, vertical and overhead positions in accordance with Aircraft and Missile Code MIL-

STD-1595A; brazing, silver, and soft soldering, and heat treating of small tools; safety procedures in the use of tools and equipment. Lect. 1 hr., Lab. 6 hrs., Total 7 hrs. per wk.

**WELD 141-142-143 Welder Qualification Test I-II-III (2 cr.) (2 cr.) (2 cr.)**

Techniques and practices of testing welded joints through destructive and non-destructive tests: guided bend, discoloration heat tests, porous examinations, tensile, hammer and free bend tests, visual, magnetic and fluorescent tests in accordance with American Welding Society D1. 1-xxxx Code. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.

**WELD 146 Welding Quality Control (2 cr.)**

Techniques and practices of inspection; interpretation of tests and measurements. Radiographic tests of joints of unlimited thickness welded in the 3G and 4G positions in accordance with American Welding Society Codes. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.

**WELD 297 Cooperative Education (1-5 cr.)**  
(see General Usage Courses section)**WOODWORKING****WOOD 100 Introduction to Woodworking (2 cr.)**

An introductory course into the field of woodworking where emphasis is placed on safe working habits, basic woodworking practices and general planning procedures. General use of hand and power tools will be introduced. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.

**WOOD 101 Woodworking I - Hand Tools (3 cr.)**

An introductory course for the woodworker where emphasis will be placed on the identification, care and use of hand tools normally used in woodworking. Accuracy in work and safe working practices will be stressed. Basic joints used in furniture making and gluing techniques will be introduced. Lect. 1 hr., Lab. 5 hrs., Total 6 hrs. per wk.

**WOOD 102 Woodworking II - Power Tools (3 cr.)**

Prerequisite: WOOD 101. The identification, care and use of basic power tools and equipment used in woodworking, where emphasis will be placed on woodworking and safe working practices as they relate to the homeowner and to the furniture and cabinetmaking industries. Lect. 1 hr., Lab. 5 hrs., Total 6 hrs. per wk.

**WOOD 103 Woodworking III - Advanced Power Tools (3 cr.)**

Prerequisite: WOOD 102. The identification, care, and use of additional power equipment used in woodworking where emphasis will be placed on advanced operations and techniques and on safe working practices as they relate to furniture and cabinetmaking industries. Lect. 1 hr., Lab. 5 hrs., Total 6 hrs. per wk.

**WOOD 110 Basic Cabinetmaking (3 cr.)**

Prerequisite: WOOD 103. An introduction to basic cabinetmaking where emphasis will be placed on principles, practices, techniques and designs used in the furniture and cabinetmaking industries. Lect. 1 hr., Lab. 5 hrs., Total 6 hrs. per wk.

**WOOD 114-115 Wood Finishing Techniques I & II (2 cr.) (2 cr.)**

An introduction to finishes that are used in woodworking where emphasis will be placed on supplies, materials, various finishes, schedules, construction repairs, and spot finishing techniques. Material preparation, finish applications and special finishing techniques will be stressed. Lect. 1 hr., Lab. 3 hrs., Total 4 hrs. per wk.

**WOOD 116 Special Woodworking Techniques (3 cr.)**

Prerequisite: WOOD 103. Techniques and practices relating to bending, laminating, veneering, and inlaying of wood will be introduced. Emphasis on plastic laminates and working with plastics will also be included. Lect. 1 hr., Lab. 5 hrs., Total 6 hrs. per wk.

**WORD PROCESSING**

(See Office Systems Technology Section)

The five campuses are indicated as follows: AL, Alexandria; AN, Annandale; LO, Loudoun; MA, Manassas; WO, Woodbridge; and ELI, Extended Learning Institute. Those individuals with cross campus responsibilities are indicated as CS, College Staff.

- Adams, Joseph D.;** *Professor*; B.A., Franklin and Marshall Coll.; M.Ed., Shippensburg State Coll.; Ph.D., Lehigh Univ.; *English (AN)*
- Adamson, Alice L.;** *Instructor*; B.S., Maryville Coll.; M.S., California State Univ.; *Mathematics (AN)*
- Aiello, Nancy C.;** *Professor*; B.A., M.S., Syracuse Univ.; Ph.D., V.P.I. & S.U.; *Division Chairman, Natural & Applied Science (LO)*
- Alford, Terry;** *Professor*; B.A., M.A., Ph.D., Mississippi State Univ.; *History (AN)*
- Allaire, Ruth A.;** *Professor*; B.S., M.S., Univ. of Massachusetts; Ph.D., Univ. of Maryland; *Biology (WO)*
- Allen, W. Gordon;** *Assoc. Prof.*; A.A., Northern Virginia Community Coll.; B.S., U.S. Military Academy; M.B.A., George Washington Univ.; M.S., Southeastern Univ.; *Accounting (LO)*
- Allison, David;** *Ass't Prof.*; A.B., Wilmington Coll.; M.F.A., George Washington Univ.; *Photography (AL)*
- Anderson, Carol L.;** *Assoc. Prof.*; A.S., Ferrum Coll.; B.S., M.S., Virginia Commonwealth Univ.; *Accounting (AN)*
- Anderton, Lillie M.;** *Instructor*; B.A., Howard Univ.; M.S., V.P.I. & S.U.; *Business Management & Marketing (AN)*
- Archer, Chalmers, Jr.;** *Assoc. Prof.*; A.A., Saints Coll.; B.S., M.Ed., Tuskegee Inst.; Ed.D., Auburn Univ.; *Counselor, Financial Aid (AL)*
- Arrington, Pamela G.;** *Assoc. Prof.*; B.A., Spelman Coll.; M.A., Univ. of Michigan, *Coord., Affirmative Action & Grant Development (CS)*
- Atchison, Evelyn C.;** *Professor*; B.S.N., Duquesne Univ.; M.S.N., Catholic Univ. of America; *Nursing (AN)*
- Atwater, Thomas C.;** *Ass't Prof.*; B.S., M.A.C.T., Univ. of North Carolina; *Business Management (AL)*
- Avery, Fay;** *Professor*; B.A., Parsons Coll.; M.Ed., Univ. of Buffalo; *Division Chairman, Business (AL)*
- Bachtell, Janice E.;** *Professor*; M.S.N., Catholic Univ.; Ph.D., American University; *Nursing (AN)*
- Bailey, Haroldine;** *Ass't Prof.*; B.A., Colby Coll.; M.Ed., Howard Univ.; *Counselor (AL)*
- Bailey, Raymond C.;** *Professor*; A.B., Catawba Coll.; M.A., Ph.D., Univ. of Georgia; *History (MA)*
- Bailey, Sandra;** *Ass't Prof.*; B.S., Indiana Univ.; *Program Head, Medical Record Technology Program (AN)*
- Baldwin, Susan M.;** *Ass't Prof.*; B.A., Boston Coll.; M.A., Univ. of Ky.; *Foreign Languages (AN)*
- Ballmann, Gary E.;** *Assoc. Prof.*; B.A., Univ. of Missouri; M.S., Texas Christian Univ.; Ph.D., Univ. of Maryland; *Medical Laboratory Technology (AN)*
- Banas, Edward J.;** *Ass't Prof.*; B.A., Rutgers Coll.; M.B.A., Rutgers Univ.; *Accounting (WO)*
- Banks, Anne J.;** *Assoc. Prof.*; B.A., Wellesley Coll.; M.F.A., George Washington Univ.; *Program Head, Fine Arts (AL)*
- Banks, Karen;** *Ass't Prof.*; A.B., Youngstown State Univ.; C.A.G.S., M.A., American International Coll.; Ph.D., Univ. of Washington; *Education (AL)*
- Bannon, John E.;** *Ass't Prof.*; B.F.A., Maryland Inst. Coll. of Art; M.F.A., Univ. of Pa.; *Art (AN)*
- Barbaro, Ronald D.;** *Assoc. Prof.*; B.A., Providence Coll.; M.S., Univ. of Rhode Island; Ph.D., Rutgers Univ.; *Chemistry (MA)*
- Bassett, Max L.;** *Professor*; B.A., M.A., SUNY at Albany; M.S., Calif. State Coll. at L.A.; Ed.S., Ed.D., Univ. of Fla.; *Dean, Academic and Student Services (CS)*
- Baten, Abdul;** *Professor*; B. Com Hons, M. Com, Dacca Univ.; M.B.A., American Univ.; C.P.A.; *Accounting (MA)*
- Battaglia, Ann C.;** *Instructor*; B.A., Slippery Rock St. College; B.S., Univ. of Maryland; *Physical Therapy (AN)*
- Bausch, Denise;** *Instructor*; B.A., Ohio Univ.; M.A., Eastern Michigan Univ.; *English (WO)*
- Bausch, Robert;** *Instructor*; B.A., M.A., George Mason Univ.; *English (WO)*
- Bedont, Sally A.;** *Assoc. Prof.*; B.S., Rider College; M.Ed., Trenton State Coll.; *Office Systems Technology (MA)*
- Beeson, Sandra J.;** *Instructor*; B.A., Purdue Univ.; M.S.L.S., Catholic Univ.; *Media Processing Services (CS)*
- Begley, Elizabeth C.;** *Instructor*; R.R.T. A.A.S., Bergen Community Coll.; B.S., Univ. of Rhode Island; *Respiratory Therapy (AN)*
- Belmore, William E.;** *Professor*; B.S., State Univ. Coll. of N.Y.; M.S., Univ. of Oregon; Ed.D., Indiana Univ.; *Instructional Technologist (ELI)*
- Bennett, Marie A.;** *Ass't Prof.*; B.S., M.Ed., Virginia Commonwealth Univ.; *Coordinator, Student Aid and Benefits (CS)*
- Beougher, Barbara D.;** *Ass't Prof.*; B.S., Kansas State Coll. of Pittsburg; M.S., Golden Gate Univ.; *Ass't Coordinator, Cooperative Education (AL)*
- Berg, Lillian D.;** *Assoc. Prof.*; B.S., Birmingham Southern Coll.; M.S., Emory Univ.; *Chemistry (AN)*
- Bergeman, George W.;** *Ass't Prof.*; B.A., M.S., Univ. of Iowa; *Mathematics (LO)*
- Berger, Morton;** *Assoc. Prof.*; B.A., Brooklyn Coll.; M.A., Ph.D., Yeshiva Univ.; *Psychology (AL)*
- Berger, Pamela E.;** *Professor*; B.A., Univ. of Mich.; M.Phil., Ph.D., George Washington Univ.; *English (AN)*
- Bernhardt, Frances A.;** *Ass't Prof.*; A.E., St. Cloud State Coll.; B.S., M.A., Univ. of Minnesota; Post-M.L.S., Catholic University of America; *Coordinator, Library Services (AN)*
- Bernier, Joseph W.;** *Ass't Prof.*; B.S., Univ. of Maryland; D.D.S., Indiana Univ.; *Coordinator, Dentistry (AN)*
- Beyer, Betty Jane;** *Ass't Prof.*; B.A., Univ. of Western Ontario; M.A., Annenberg School of Communications, Univ. of Pennsylvania; *Director, Continuing Education & Community Services (LO)*
- Bigelow, John H.;** *Professor*; B.A., San Francisco State Coll.; M.A., Ph.D., Michigan State Univ.; *Economics (LO)*
- Billinson, Eileen C.;** *Ass't Prof.*; B.S., M.A., Syracuse Univ.; J.D., Syracuse Univ. Coll. of Law; *Speech (AN)*
- Billups, Fred H.;** *Professor*; B.A., Wake Forest Coll.; M.Div., Southern Baptist Theological Seminary; M.Ed., Coll. of William & Mary; Ed.D., Univ. of Va.; *Coordinator, Counseling Services (AN)*
- Bixler, Linda A.;** *Assoc. Prof.*; B.S., M.S., Radford Coll.; *English (AN)*
- Bizier, Patricia P.;** *Instructor*; B.S., Univ. of Maine; M.S.L.S., Catholic Univ. of America; *Librarian (MA)*
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Commencement Ceremony, 1986

**Northern Virginia Community College**  
**4001 Wakefield Chapel Road**  
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