

VIRGINIA
WESTERN
COMMUNITY
COLLEGE

CURRICULUMS

ACCOUNTING	42
AIR CONDITIONING AND REFRIGERATION	69
APPLIANCE REPAIR & SERVICING	71
ARCHITECTURAL DRAFTING	73
ARCHITECTURAL TECHNOLOGY	75
AUTOMOTIVE MECHANICS	77
AUTOMOTIVE TECHNOLOGY	79
BUSINESS ADMINISTRATION	44
CIVIL ENGINEERING TECHNOLOGY	82
CLERK-TYPIST	46
COMMERCIAL ART	110
DATA PROCESSING TECHNOLOGY	48
DENTAL ASSISTANT	101
DEVELOPMENTAL STUDIES PROGRAM	20
ELECTRICAL/ELECTRONICS ENGINEERING TECHNOLOGY	85
ELECTROMECHANICAL TECHNOLOGY	88
ENGINEERING	91
ENGINEERING/TECHNICAL ASSISTANT	94
FIRE FIGHTING & PREVENTION	121
INDUSTRIAL MANAGEMENT	96
LIBERAL ARTS	112
MANAGEMENT	50
MECHANICAL ENGINEERING TECHNOLOGY	98
MENTAL HEALTH TECHNOLOGY	103
MERCHANDISING	56
MUSIC	115
NURSING	105
POLICE SCIENCE	123
PRE-TEACHER EDUCATION	126
RADIO AND TELEVISION PRODUCTION TECHNOLOGY	129
RADIOLOGIC TECHNOLOGY	107
SCIENCE	118
SECRETARIAL SCIENCE	58
STENOGRAPHIC	65
TRAFFIC AND TRANSPORTATION MANAGEMENT	66

**VIRGINIA
WESTERN
COMMUNITY
COLLEGE
CATALOG**

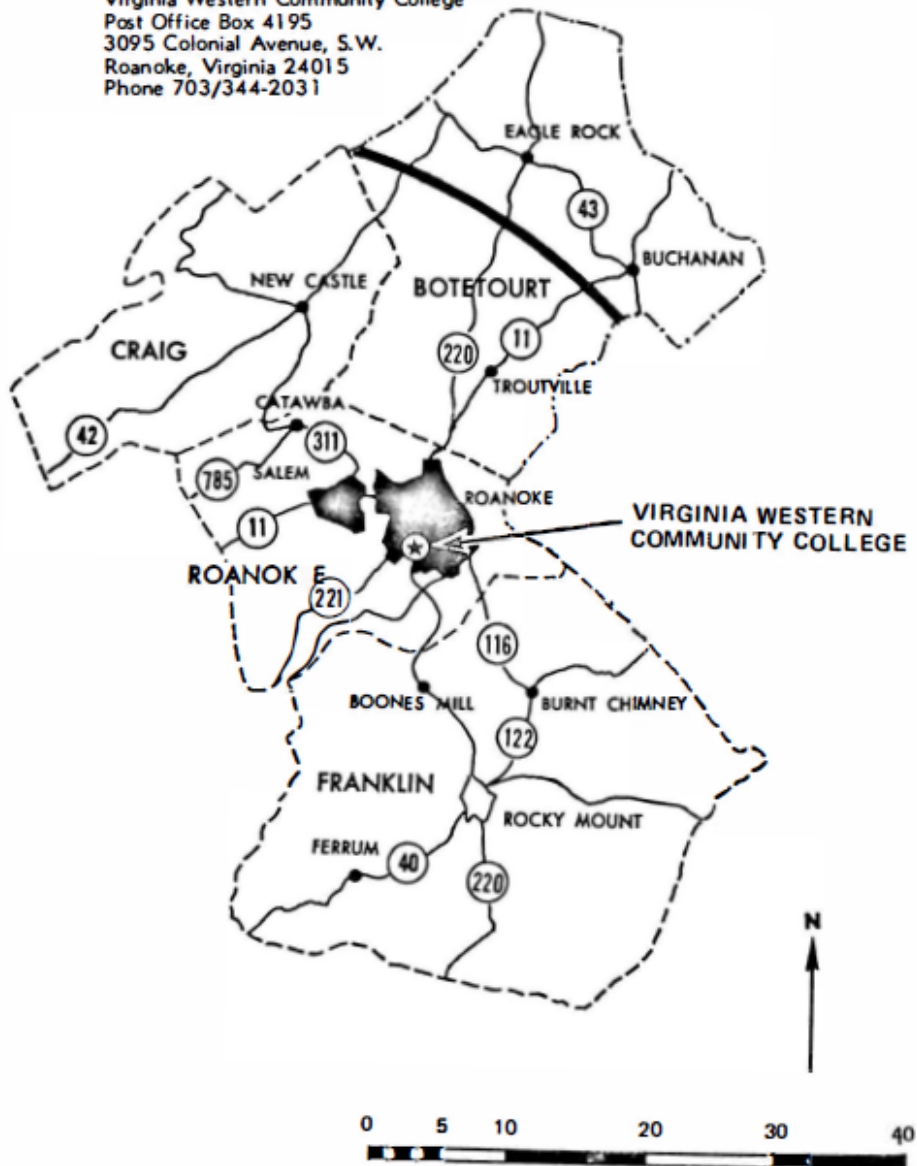


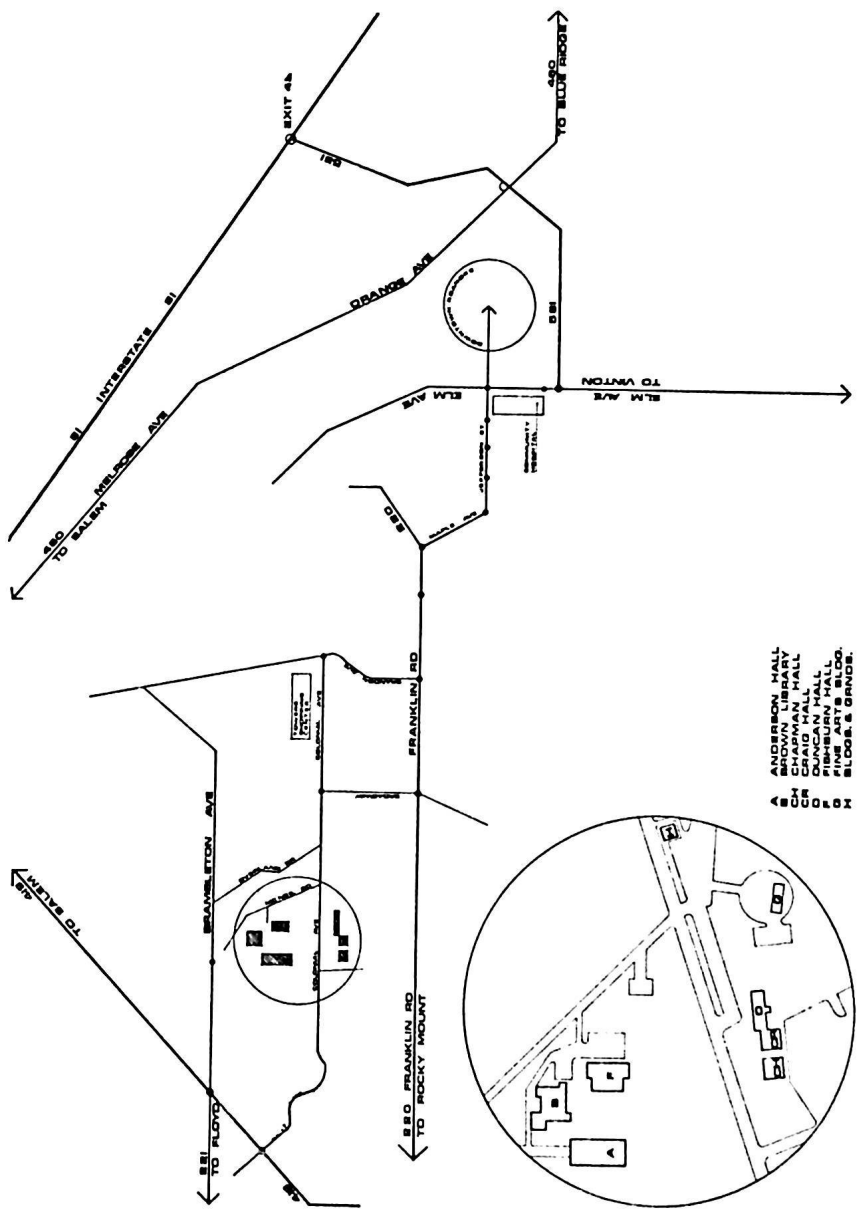
1973-74

**3095 Colonial Avenue, S. W.
Roanoke, Virginia 24015
Telephone (703) 344-2031**

ROANOKE AREA

Dr. Harold H. Hopper, President
Virginia Western Community College
Post Office Box 4195
3095 Colonial Avenue, S.W.
Roanoke, Virginia 24015
Phone 703/344-2031





VIRGINIA WESTERN COMMUNITY COLLEGE

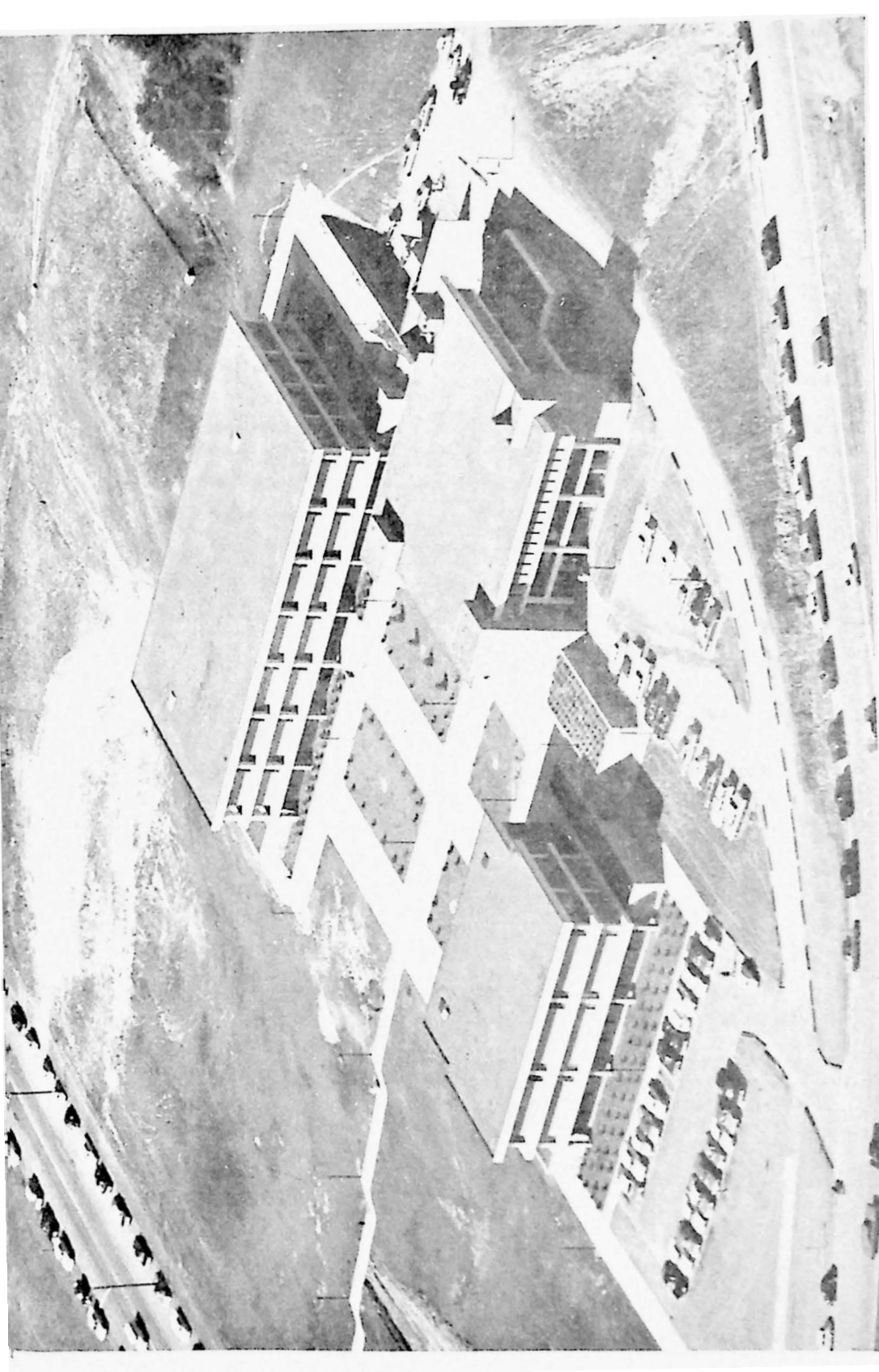
CONTENTS

Calendar	8
PART I—GENERAL INFORMATION	13
The College	13
Location and Facilities	13
History	15
Purpose	15
Recognition	17
PART II—ADMINISTRATIVE INFORMATION	19
Admission Requirements	19
General Admission to the College	19
Admission to Specific Curriculums	20
International Student—Admission Requirements	20
Developmental Studies Program	20
Residence Requirements	21
Students Transferring from Other Colleges	21
Students Applying for Credit or Waiver of Requirements	22
Auditing a Course	22
Classification of Students	22
Regular Student	22
Special Student	23
Full-time Student	23
Part-time Student	23
Freshman	23
Sophomore	23
Expenses	23
Application Fee	23
Tuition	23
Graduation Fee	24
Books and Materials	24
Refunds	24
Credits	25
Grading System	25
Grading Developmental Courses	26
Degrees, Diplomas, and Certificates	26
Graduation Requirements	27
Associate Degree Requirements	27
Diploma Requirements	27
Certificate Requirements	28
Academic Regulations	28
Attendance	28
Change of Registration	29
Academic Warning	29
Academic Probation	29
Academic Suspension	29
Academic Dismissal	30
Examinations	30
Normal Academic Load	30

PART III—STUDENT SERVICES	31
Counseling	31
Testing	31
CLEP	31
Orientation	32
Financial Aid	32
Application Procedures	33
Types of Financial Assistance	33
Federal Aid Programs	33
State of Virginia Aid Programs	34
Scholarships	34
Student Employment	34
Veterans—Office of Veteran Affairs	35
Health Services	35
Career Counseling	35
Lunch Room	35
Parking	35
Student Activities	36
Student Handbook	36
Student Conduct	36
PART IV—CURRICULUMS OF STUDY	39
Statewide Associate Degree Curriculum Available to All Qualified Students	40
Minimum Requirements for Associate Degrees	41
Curriculum Outlines	42
Business Science Division	42-68
Engineering/Industrial & Health Technologies Division	69-109
Humanities Division	110-117
Science & Mathematics Division	118-120
Social Science & Public Service Technology	121-131
PART V—DESCRIPTIONS OF COURSES	133
Continuing Education and Community Service Programs	133
General Course Information	133
Course Numbers	133
Course Credits	133
Course Hours	133
Course Prerequisites	134
Accounting	134
Air Conditioning and Refrigeration	135
Appliance Servicing	135
Architectural Technology	135
Arts	137
Automotive Technology	138
Biology	139
Broadcasting	141
Business Management and Administration	142
Chemistry	144
Civil Engineering Technology	145
Data Processing	146
Dental Assistant	148

Drafting	148
Economics	149
Electricity and Electronics	150
Engineering	151
English	153
Fire Science	154
French	155
General	155
Geography	156
Geology	156
German	156
Government	157
Health	157
History	158
Industrial Technology	158
Law Enforcement	159
Marketing	162
Mathematics	164
Mechanical	165
Mental Health	166
Music	167
Natural Science	169
Nursing	169
Philosophy and Religion	170
Physical Education and Recreation	170
Physics	170
Psychology	171
Radiology	172
Secretarial Science	173
Social Science	175
Sociology	175
Spanish	176
Speech and Drama	177
Welding	177
PART VI—STATE AND LOCAL ORGANIZATION	179
Governing Board, Commonwealth of Virginia	179
Virginia Western Community College Local Board	179
Administration	180
Faculty	181
Staff Personnel	192

It is the student's responsibility to become completely familiar with the College regulations and other important material in this catalog.



CALENDAR

FALL QUARTER 1973

Contract Period Begins	Sunday, September 16
Faculty Report	Monday, September 17
Orientation Day for New Students	Monday, September 17
Registration	Tuesday, September 18 Wednesday, September 19
Classes Begin	Monday, September 24
Last Day to Add or Change Classes	Friday, September 28
Last Day for Withdrawal Without Penalty	Friday, October 12
Thanksgiving Recess	Thursday-Saturday, November 22-24
Classes End	Tuesday, December 4
Registration Winter Quarter	Wednesday & Thursday, December 5-6
Final Exams	Friday, Monday & Tuesday, December 7, 10, 11
Faculty Work Day	Wednesday, December 12
Christmas Recess	December 13, 1973- January 1, 1974

1973

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WINTER QUARTER 1974

All Faculty Report	Wednesday, January 2
Registration for New Students	Thursday, January 3
Drop-Add for Registered Students Who Failed Fall Courses	Thursday, January 3
Classes Begin	Friday, January 4
Last Day to Add or Change Classes	Thursday, January 10
Last Day for Withdrawal Without Penalty	Wednesday, January 23
Classes End	Wednesday, March 13
Registration Spring Quarter	Thursday, March 14
Last Day for Graduation Application	Friday, March 15
Final Exams	Friday, Monday & Tuesday, March 15, 18, 19
Faculty Work Day	Wednesday, March 20

1973

DECEMBER						
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1974

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SPRING QUARTER 1974

Faculty Report	Wednesday, March 27
Registration for New Students and Drop-Add for Registered Students Who Failed Winter Courses...	Wednesday, March 27
Classes Begin	Thursday, March 28
Last Day to Add or Change Classes	Wednesday, April 3
Last Day to Withdraw Without Penalty	Wednesday, April 17
Classes End	Wednesday, June 5
Final Exams	Thursday, Friday & Monday, June 6, 7, 10
Faculty Work Day	Tuesday, June 11
Graduation	Saturday, June 15

1974

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SUMMER 1974 (FULL TEN WEEKS)

- Registration ----- Monday, June 17
- Classes Begin ----- Tuesday, June 18
- Last Day to Add or Change Classes ----- Monday, June 24
- Independence Day Holiday ----- Thursday, July 4
- Last Day to Withdraw Without Penalty ----- Tuesday, July 9
- Classes End ----- Tuesday, August 27
- Final Exams ----- Wednesday & Thursday,
August 28-29
- Faculty Work Day ----- Friday, August 30
- Graduation ----- Tuesday, September 3

1974

JUNE							JULY							AUGUST							
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9	10	11	12	13	14	15	14	15	16	17	18	19	20	11	12	13	14	15	16	17	
16	17	18	19	20	21	22	21	22	23	24	25	26	27	18	19	20	21	22	23	24	
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SUMMER QUARTER 1974 (TWO FIVE-WEEK TERMS WITH DOUBLE CLASS PERIODS)

FIRST TERM

Registration ----- Monday, June 17
 Classes Begin ----- Tuesday, June 18
 Last Day to Add or Change Classes ----- Monday, June 24
 Last Day for Withdrawal Without Penalty ----- Thursday, June 27
 Independence Day Holiday ----- Thursday, July 4
 Classes End ----- Tuesday, July 23
 Final Exams ----- Wednesday, July 24
 Faculty Work Day ----- Thursday, July 25

SECOND TERM

Registration ----- Thursday, July 25
 Classes Begin ----- Friday, July 26
 Last Day to Add or Change Classes ----- Thursday, August 1
 Last Day for Withdrawal Without Penalty ----- Monday, August 5
 Classes End ----- Thursday, August 29
 Final Exams ----- Friday, August 30
 Graduation ----- Tuesday, September 3

PART I

GENERAL INFORMATION

THE COLLEGE

Virginia Western Community College is a two-year institution of higher education established under a state-wide system of Community Colleges in the Commonwealth of Virginia, and serving an area within driving distance of the City of Roanoke. This includes the cities of Roanoke and Salem, the southern portion of Botetourt County, and the counties of Craig, Franklin, and Roanoke. The areas covered have a population of approximately two hundred and fifty thousand, with a heavy projected growth within the next 25 years.

The College operates under the policies established by the State Board for Community Colleges and with the support and advice of a local Community College Board. It is financed primarily by State funds supplemented by contributions from the various local political subdivisions, individuals, and businesses.

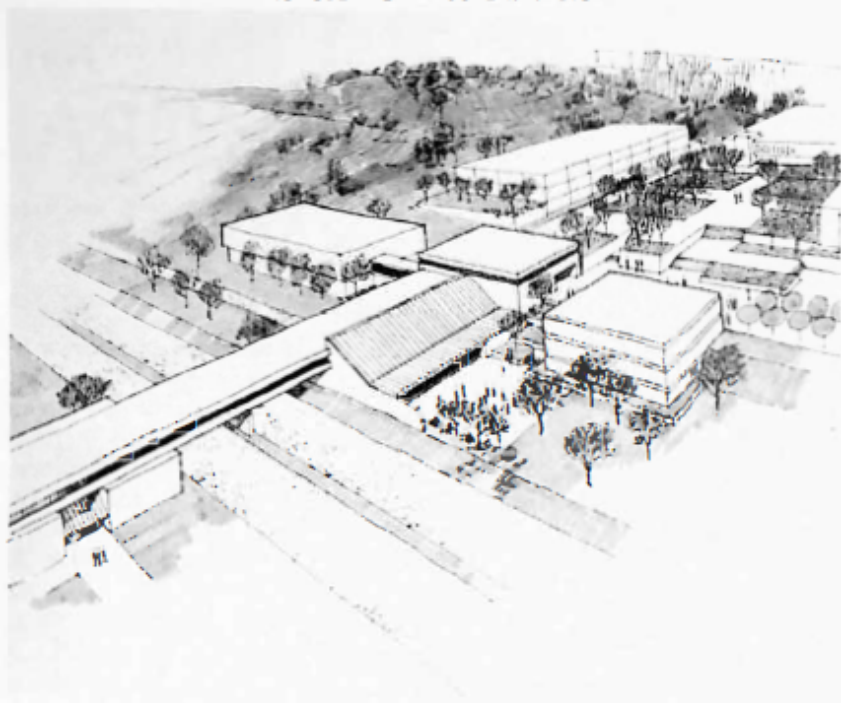
LOCATION AND FACILITIES

Virginia Western Community College is located in Southwest Roanoke at 3095 Colonial Avenue. The campus consists of 70 acres split roughly in half by Colonial Avenue.

The South Campus has four buildings which were acquired by Virginia Western from Roanoke Technical Institute in 1966. Chapman Hall houses laboratories for Civil, Electrical and Mechanical Technologies, Photography, and Radio and Television Production. The Electrical and Electronic Laboratories are located in Craig Hall. Duncan Hall contains mostly classrooms. The Fine Arts Center is occupied by the Music and Fine Arts Departments.

The North Campus has three buildings surrounding a mall planted with flowers and shrubs selected to bloom alternately in each of the four seasons. The smaller of these buildings, Fishburn Hall, is the Administration Building which also houses Business Science classrooms, the Office of Continuing Education, and the WVWR-FM Radio Station. Opposite is the Science Building, Anderson Hall, containing laboratories and equipment of the most modern design, a Dental Laboratory, Reading Laboratory, classrooms, and faculty and counselors' offices. In the center is Brown Library with its 33,500 volumes, a Learning Laboratory, Language Laboratory, Nursing Laboratory, and Auditorium on the second floor. The

PROPOSED CAMPUS EXPANSION



EXISTING CAMPUS



Admissions and Records Offices, Counseling Center, and the Bookstore are on the ground floor.

The campus was dedicated on October 23, 1969, and its buildings were named for men of Southwestern Virginia influential in education or in the development of the region.

HISTORY

Since 1927 the Extension Division of the University of Virginia, its programs under the direction and supervision of the University, has served students in the Roanoke Valley. In 1960 the area's educational opportunities were further expanded by establishment of the Roanoke Technical Institute, its programs an extension of Virginia Polytechnic Institute. In February of 1966 by authorization of the General Assembly of Virginia, these two existing facilities were combined into the comprehensive community college now known as Virginia Western Community College with the University of Virginia continuing to offer its upper division program.

PURPOSE

Virginia Western Community College is dedicated to the belief that each individual should be given a continuing opportunity for the development and extension of his skills and knowledge along with an opportunity to increase his awareness of his role and responsibility in society. The College is devoted to serving the educational needs of its community and assumes a responsibility to help meet the requirements for trained manpower in the region through a cooperative effort with local industry, business, professions, and government.

A variety of educational opportunities is provided for post high school age youth and adults. This includes high quality instructional programs at the associate degree level and at the preparatory or foundations level. A strong guidance and counseling program plus a number of other student services is also provided to help each student make sound decisions regarding his occupational, educational, and personal-social plans.

Virginia Western 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. Programs include:

1. **Occupational-Technical Education.** The occupational and technical education programs are designed to meet the increasing demand for technicians, semiprofessional workers, and skilled craftsmen for employment in industry, business, the professions, and government. The curricula are planned

primarily to meet the needs for workers in the region being served by the College.

2. **University Parallel-College Transfer Education.** The university parallel-college transfer program includes college freshman and sophomore courses in arts and sciences and pre-professional programs meeting standards acceptable for transfer to baccalaureate degree programs in four-year colleges and universities.
3. **General Education.** The programs in general education encompass the common knowledge, skills, and attitudes needed by each individual to be effective as a person, a member of a family, a worker, a consumer, and a citizen.
4. **Continuing Adult Education.** Adult education programs are offered to enable the adults in the region to continue their learning experiences. This work includes both degree credit and non-degree credit work during the day and evening hours.
5. **Special Training Programs.** Special training may be provided where specific job opportunities are available for new or expanding industries. This special training shall be coordinated with Virginia's economic expansion efforts and with the needs of employers.
6. **Developmental Programs.** Developmental programs are offered to help prepare individuals for admission to the occupational-technical program and to the university parallel-college transfer program in the community college. These programs are designed to help the individual develop the basic skills and understandings necessary to succeed in other programs of the community college.
7. **Specialized Regional and Community Services.** The facilities and personnel of the College are available to provide specialized services to help meet the cultural and educational needs of the region served by the community college. This service includes the non-classroom and non-credit programs, cultural events, workshops, meetings, lectures, conferences, seminars, and special community projects which are designed to provide needed cultural and educational opportunities for the citizens of the region.
8. **Broadcasting Service.** WVWR-FM, Virginia Western's new stereo non-commercial educational radio station, went on the air in the spring of 1973. The purposes of the station are to

extend the educational resources and activities of the College and the Virginia Community College System to the community, and to provide an educational, informational, and cultural service not presently available. The College's Broadcasting Service seeks to provide attractive, challenging programming that involves its listeners as completely as possible in the learning experience. The radio station offers programs such as news and public affairs from the National Public Radio Network, college courses for credit, educational enrichment programs, music ranging from jazz to classical, and discussions on important contemporary subjects. The radio station broadcasts every day of the year on 90.1 MHz. Studios and offices are located in Fishburn Hall on campus.

RECOGNITION

The College is a division of the Virginia Community College System and is approved by the State Board for Community Colleges and by the State Department of Community Colleges in Virginia. The Associate Degree Programs of the College have also been approved by the State Council of Higher Education for Virginia. The College was given full academic accreditation by the Southern Association of Colleges and Schools in December 1969.

The College has institutional membership in the American Association of Community and Junior Colleges and has been approved by the Veterans Administration for V.A. assistance and by the U. S. Office of Education for various federal funding programs.

The College is listed among the approved institutions of higher education in the Education Directory of the U. S. Office of Education.



ADMINISTRATIVE INFORMATION

ADMISSION REQUIREMENTS

This College does not discriminate on the grounds of race, color, or national origin and is in compliance with the Civil Rights Act of 1964.

General Admission to the College

Any person who has a high school diploma or the equivalent, or who is 18 years of age, and in any case is able to benefit from a program at the College may be admitted as a regular student when the following items have been received by the Office of Admissions:

1. A completed "Application for Admission as a Regular Student" (Note: Social Security Number is required);
2. A \$5.00 application fee (non-refundable unless the requested program or course is not offered);
3. Official transcripts from all high schools, colleges, and universities attended;
4. Regular health form.

For all special students, the following items are required:

1. A complete official application for admission (Note: Social Security Number is required);
2. A \$5.00 application fee (non-refundable unless the requested program or course is not offered);
3. Short health form.

The College reserves the right to evaluate special cases and to refuse admission to applicants when considered advisable in the best interest of the College.

Prior to admission every applicant will be required to meet with a College counselor (a) to discuss his educational interests, (b) to determine what additional tests may be needed, (c) to plan admission to a specific curriculum or program at the College, and (d) to examine other reasonable standards to insure that the applicant possesses the potential to meet program requirements.

All regular students entering the College may be required to

take the Comparative Guidance and Placement Test (CGP) unless they have previously attended college. The test battery is normally administered at the College prior to registration.

Persons wishing to apply for the non-credit community service programs should contact the College for additional information.

Admission to Specific Curriculums

The specific requirements for each curriculum in the College are listed in the Curriculum Offerings section of the College catalog. Persons who do not meet the requirements for a specific curriculum or course may be eligible to enter the curriculum or course after they have completed a developmental studies program.

International Student—Admission Requirements

In addition to the general requirements of the College, all international students must demonstrate proficiency in both written and oral English.

Written English proficiency may be demonstrated by submitting scores on either the "Test of English as a Foreign Language" (TOEFL—administered by the College Entrance Examination Board, Princeton, N.J.) or the Virginia Western English Placement Test, whichever is more convenient. Normally, the required score for acceptance on the TOEFL is 500 and on the English Placement Test the required score is 75. If these preliminary scores are acceptable, the applicant must also demonstrate, by personal interview at the College, oral proficiency both in speaking and understanding the English language. If a personal interview is not possible, a letter which testifies to the student's oral proficiency will be acceptable. This must be executed by an official of the U. S. Government residing in the student's native country.

Students should understand that in the event their test scores and interview results indicate minimum acceptable levels of proficiency they will be required to complete non-college credit developmental courses prior to acceptance to a particular curriculum.

As the policy of the U. S. Immigration Department states, international students must show proof of how financial responsibility will be met.

Developmental Studies Program

The Developmental Studies Program is offered to assist individuals in the acquisition of the necessary knowledge and skills for entry into one of the programs of the College. After a close analysis of the high school transcript, test scores, and a personal interview with a College counselor students are identified for inclusion in the Developmental Studies Program.

Specialized teaching methods permit students to progress through the area of their weakness at their own rate. Personnel in the Learning Laboratory and other faculty are available for individualized assistance to students.

A grade of "S" is awarded when all objectives required for each course are completed. A grade of "R" is awarded when students are making satisfactory progress but have not yet mastered all course objectives. Students receiving a grade of "R" must re-enroll for that course the following academic quarter. A grade of "U" indicates that students have failed to show interest or application in their studies. Students receiving a "U" will be required to discuss their program of studies with a counselor and may not be permitted enrollment the following two academic quarters.

DEVELOPMENTAL STUDIES PROGRAM

COURSE NUMBER	COURSE TITLE	CREDITS
ENGL 01	Verbal Studies	5
ENGL 08	Reading Improvement	5
MATH 01	Developmental Math	5
GENL 100	Orientation	1
	OR	
GENL 199	Supervised Study	3
		16-18

Residence Requirements

Applicants will be required to submit a residence affidavit to determine state residency eligibility for tuition purposes. Questions concerning residency requirements should be directed to the Coordinator of Admissions and Records.

When enrollments must be limited for any curriculum or course, first priority must be given to all qualified students who are residents of the political subdivision supporting the College, provided such students apply for admission to the program a reasonable length of time prior to registration. The priority list is as follows: (1) residents of the political subdivisions supporting the College, (2) other Virginia residents, (3) out-of-state and foreign students.

Students Transferring from Other Colleges

Usually a student transferring from another college who is eligible for reentrance at the last college shall also be eligible for admission to this College.

It is the role of the College to help each student succeed in a program from which he can benefit. Counseling and testing services

are available to help students select a program appropriate to his interests and abilities. If a transfer student is ineligible to return to a particular curriculum in a previous college, generally he will not be allowed to enroll in the same curriculum in the College until two quarters elapse or until he completes an approved developmental program at the College. The Admissions Committee of the College shall decide on each case and usually shall impose special conditions for the admission of such students, including placement or probation.

Each student transferring from another college should consult the Coordinator of Admissions and Records at the community college for an assessment of credits in order to determine his standing before registering for classes. Generally no credit will be given for courses with grades lower than "C". A transfer student may be advised to repeat courses if it is clearly to his advantage to do so in order to make satisfactory progress in his curriculum.

Students Applying for Credit or Waiver of Requirements

Students who have reason to believe that previous educational studies, training programs, work experience or test results may entitle them to an adjustment in the course requirements for a particular curriculum should contact the Coordinator of Admissions and Records to determine procedures before registering for classes.

Auditing A Course

Students desiring to attend a course without taking the examination or receiving credit for the course, may do so by registering to audit that course. Degree candidates usually may not audit required courses prior to taking the course for credit. Students desiring to audit a course will register during the first week of classes and pay the regular tuition. Audited courses carry no credit and do not count as a part of the student's course load. Students desiring to change status in a course from audit to credit or credit to audit must do so within the first week of the quarter. Permission of the instructional department is required to audit a course.

CLASSIFICATION OF STUDENTS

All students are classified according to the following categories:

Regular Student.

1. A full-time or part-time student working toward completion of an associate degree, diploma, certificate, or developmental program;
2. A full-time or part-time student taking credit courses for transfer to another college or university.

Special Student.

1. A part-time student taking course(s) as audit for no credit;
2. A high school senior who, with the permission of his high school principal, is concurrently enrolled in a college course;
3. A part-time student not enrolled in an associate degree, diploma, or certificate program who may be taking a course(s) for credit (such students may later apply to the College for admission to a program as a regular student);
4. A student who has not yet fulfilled all of the requirements as a regular student but who is admitted under special consideration by the Admissions Committee of the College. It is expected that such students would fulfill all requirements within three weeks of the commencement of the quarter or face dismissal from the College.

Full-time Student. A student is considered a full-time student if he is carrying 12 or more course credits.

Part-time Student. A student is considered a part-time student if he is carrying less than 12 course credits.

Freshman. A student is classified as a freshman until he has completed 45 course credits in his designated curriculum.

Sophomore. A student is considered a sophomore after he has successfully completed 45 or more course credits. Transferred credits are included providing they apply toward meeting the requirements of the student's curriculum.

EXPENSES**Application Fee**

An application fee of \$5.00 must accompany the application for admission to the College for each student. This fee is not applicable to tuition, nor refundable unless the requested program is not offered.

Tuition

Full-time Student (12 or more credits)

Virginia Resident	\$ 75.00
Out-of-State Resident	250.00

Part-time Student (less than 12 credits):

Virginia Resident	\$ 6.25 per credit (or equivalent)
Out-of-State Resident	21.00 per credit (or equivalent)

A Virginia resident is one who has been domiciled in, and is and has been an actual bona fide legal resident of Virginia, for a period of at least one year prior to the commencement of the term or quarter for which he is enrolling.

Payment of tuition also enables the student to use the library, bookstore, parking lot, student lounge and other facilities of the College. There are no special laboratory or library fees, but students are expected to pay charges for any college property which they damage or lose (such as laboratory or shop equipment, supplies, library books and materials). There may be special fees from time to time (such as Physical Education fees).

Graduation Fee

A graduation fee of \$10.00, payable at the beginning of the last quarter of instruction, is charged each graduating student to cover the cost of the rental of caps and gowns and the cost of the degree, diploma, or certificate.

Books and Materials

Students are expected to obtain their own books, supplies, and consumable materials needed in their studies. It has been estimated that the cost of these items will average \$50 per quarter for the average full-time student. The College operates a bookstore which maintains a complete stock of books and supplies to meet the needs of students.

Refunds

Authorized refunds will be as follows for students withdrawing from the College:

1. From the beginning until the passage of one-fifth of the course length of time, the refund will be two-thirds of the tuition.
2. From one-fifth until the passage of one-third of the course length of time, the refund will be one-third of the tuition.
3. After one-third of the course length of time has elapsed, no refund will be made.

If a course is cancelled, there will be a refund of tuition for that course. No refunds for tuition will be made after the first week of classes for individual course changes or for an individual class which is dropped. For part-time students who withdraw from the College, refunds will be prorated on the above schedule.

Official resignation for a student shall become effective on the date that written notification of intent to resign is received by the Office of Admissions and Records. The resignation date is not the date of the last class attended, unless the two dates coincide.

CREDITS

A credit is equivalent to one collegiate quarter hour credit or two-thirds of a collegiate semester hour credit. Usually, one credit for a course is given for approximately three hours of study **weekly** by each student as follows:

1. One hour of lecture plus on average of two hours of out-of-class study, or
2. Two hours of laboratory or shop study plus on average of one hour of out-of-class study, or
3. Three hours of laboratory or shop study with no regular out-of-class assignments.
4. Fixed credit and variable hours with behavioral objectives are assigned to each Developmental Studies Course (courses numbered 01-09).
5. Variable Credit (1-5 credits) is assigned to all Supervised Study, Seminar and Project, 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 per credit
S	Satisfactory	No grade point credit (applies to courses numbered 01 through 09, other specialized courses, and seminars) but course objectives completed.
U	Unsatisfactory	No grade point credit (applies to specialized courses and seminars) as student is not making satisfactory progress.
W	Withdrawal	No credit (A grade of withdrawal implies that the student was making satisfactory progress in the courses at the time of his withdrawal or that the withdrawal was officially made before the "deadline" date published in the college calendar).
I	Incomplete	No credit (A grade of incomplete is assigned only in cases of the student's absence from a limited number of class sessions near the end of a term or grading period and when the absence is for a verifiable unavoidable reason; i. e., sickness verified by medical statement, accident verified by police records, etc., or absence from final examination for a verifiable

and unavoidable reason. An "Incomplete" must be academically removed during the ensuing quarter following the issuance of that grade unless special permission for an extension of time is given by the Dean of Instruction or his designate).

- R Re-enroll No credit (Credit will be given when the course objectives are completed. To be used only for courses numbered 01 through 09.)
- X Audit No credit (Permission of the instructor and the Dean of Instruction is required to audit a class.)

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.

Grading-Developmental Courses

A grade of "S" (Satisfactory) shall be assigned for satisfactory completion of each Developmental Studies Course (courses numbered 01-09).

Students making satisfactory progress but not completing all of the behavioral objectives for a Developmental Course (courses numbered 01-09) shall be graded with an Administrative "R" (Re-enroll) and re-enrolled to complete the course objectives.

Students not making satisfactory progress in a Developmental Course (courses numbered 01-09) shall be graded "U" (Unsatisfactory), and counselors will recommend consultation with the instructor to determine the subsequent sequence of courses for the student who receives a grade of "U".

DEGREES, DIPLOMAS, AND CERTIFICATES

The College offers the following degrees, diplomas, or certificates for students who successfully complete approved programs at the College.

1. **Associate in Arts Degree (AA)** is awarded to student majoring in the Liberal Arts or Liberal Arts-Music. Students receiving an AA generally transfer to four-year colleges or universities.

2. **Associate in Science Degree (AS)** is awarded to students majoring in specialized curriculums such as business administration, pre-engineering, pre-teacher education, science, and other pre-professional programs. Students receiving an AS generally transfer to four-year colleges or universities.

3. **Associate in Applied Science Degree (AAS)** is awarded to students majoring in an occupational-technical curriculum. Stu-

dents receiving an AAS may elect to transfer to four-year colleges or universities.

4. **Diploma** is awarded to students who complete a two-year non-degree occupational curriculum.

5. **Certificate** is awarded to students who complete an approved, non-degree curriculum which is usually less than two years in length.

GRADUATION REQUIREMENTS

With the exception of Summer Quarter, if a student is out for two or more quarters and must reapply for admission, then normally the catalog under which he returns becomes the catalog under which he graduates.

Attendance at the formal graduation exercise is required of all students meeting the academic standards for an associate degree, diploma, or certificate program. Request for waiver of this requirement must be submitted in writing to the President of the College for his consideration.

Associate Degree Requirements

To be awarded an Associate Degree from the College, a student must:

1. Have fulfilled all of the course requirements of his curriculum as outlined in the College catalog;
2. Have been recommended for graduation by the appropriate instructional authority in his curriculum;
3. Have completed at least 97 credits applicable to an associate degree of which 45 classroom credits must be acquired at the College;
4. Have completed the general education requirements (study in Economics, English, Government, Orientation, and Psychology) for an associate degree;
5. Have earned a grade point average of at least 2.0 on all courses attempted which are applicable toward graduation in his curriculum;
6. Have filed an application for graduation in the Office of Admissions and Records;
7. Have resolved all financial obligations to the College and returned all library and other college materials;

Diploma Requirements

To be awarded a diploma from the College, a student must:

1. Have fulfilled all of the course requirements of his curriculum as outlined in the College catalog;
2. Have been recommended for graduation by the appropriate instructional authority in his curriculum;
3. Have completed at least 97 credits applicable to a diploma of which 45 classroom credits must be acquired at the College;
4. Have completed the general education requirements (study in Economics, English, Government, Orientation, and Psychology) for a diploma;
5. Have earned a grade point average of at least 2.0 on all courses attempted which are applicable toward graduation in his curriculum;
6. Have filed an application for graduation in the Office of Admissions and Records;
7. Have resolved all financial obligations to the College and returned all library and other College materials;

Certificate Requirements

If a student successfully completes a program of instruction which does not lead to an associate degree or diploma, he may be awarded a certificate. Also, if he pursues a degree or diploma program but is unable to complete the degree or diploma requirements, he may, upon the recommendation of the appropriate instructional division and the Dean of Instruction, be issued a certificate provided the portion of study successfully completed is equivalent to an approved certificate program offered at the College.

ACADEMIC REGULATIONS

Attendance

Registration in a course presupposes that regularly scheduled classes and laboratory sessions will be attended. When absence from a class becomes necessary it is the responsibility of the student to inform the instructor prior to the absence whenever possible. Frequent unexplained absences may result in dismissal from a course.

The student is responsible for making up all work missed during an absence. If a student fails to appear for a test or final examination he should contact the instructor. The granting of requests for late examinations is left to the discretion of the instructor involved.

The classroom and laboratory are central to the education programs of the College, and require regular attendance to achieve the learning goals of those programs. Any instruction missed and not made up may, regardless of the reason for the absence, affect the grade of the student concerned.

Change of Registration

In all cases students should follow established procedures for making any changes in their programs after registration. Failure to do so could place their college record in jeopardy.

1. Withdrawal from a course:

Withdrawal from a class without academic penalty may be made within the first three weeks after the beginning of a quarter. If a student's course work has been satisfactory up to that time, he will receive a grade of "W" for withdrawal. After that time the student may receive a grade of "W" if his course work has been satisfactory or will receive a failing grade of "F" if his course work has been unsatisfactory up to the time of official withdrawal. In all cases the word "Withdrawn" will be written on his permanent academic record.

2. Addition of a course:

In most cases a student may not enter a new class after the first week of a quarter. Any request for entry after that period may be approved by the instructor concerned and the Dean of Instruction.

3. Withdrawal from the College:

A student who wishes to withdraw from the College should contact a counselor to determine the appropriate procedure. Failure to follow established procedures could place the student's college record in doubt and prejudice his return to this or another college.

Academic Warning

Any student who fails to attain a minimum grade point average of 2.0 for any quarter, or who fails any course, will receive an Academic Warning. This action serves to alert the student that he is not making satisfactory academic progress.

Academic Probation

Any student who fails to maintain a cumulative grade point average of 1.5 will be placed on academic probation. The statement "Placed on Academic Probation", will be placed on the student's permanent record.

Any student on academic probation is expected to consult with his counselor and may be required to elect less than the normal academic course load in his next quarter following this action.

Academic Suspension

The student on academic probation who fails to attain a grade point average of 1.5 for the next quarter he is in attendance will

be subject to academic suspension. Academic suspension normally will be for two quarters unless the student reapplies, and is accepted, for readmission to another curriculum of the College. The statement "Placed on Academic Suspension" will be placed on the student's permanent record. The student must apply for readmission under all circumstances of academic suspension.

Academic Dismissal

A student who does not maintain at least a 2.0 average for the quarter following reinstatement to the College after having been on academic suspension will be academically dismissed from that curriculum. Academic dismissal normally is permanent unless, with good cause, the student reapplies, and is accepted under special consideration for readmission by the Admission Committee of the College. The statement "Placed on Academic Dismissal" will be placed on the student's permanent record.

Examinations

All students are expected to take their examinations at the regularly scheduled times. No exceptions will be made without the permission of the Dean of Instruction and the instructor of the class.

Normal Academic Load

The normal academic course load for a student is 15-17 credits. The minimum full-time load is 12 credits and the normal maximum full-time load is 18 credits. A student wishing to carry an academic load of more than 18 credits must ordinarily have a minimum average of 3.0 and must have the approval of the Dean of Instruction or the Dean of Student Services.

PART III**STUDENT
SERVICES****COUNSELING**

As a service to students and to the community, the College maintains a staff of professional counselors and faculty advisors in each instructional program.

The counseling office assists students in making intelligent decisions regarding their occupational, educational, and personal-social plans. As a part of this assistance, students have available appropriate tests, inventories, occupational and educational information, and information regarding financial assistance or employment.

The counseling service provides individual attention and both supplements and complements the instructional program of the College.

TESTING

A well-planned testing program for all students is coordinated by the Office of Counseling Services. The Comparative Guidance and Placement Test may be required for all students planning to enter one of the associate degree, diploma, or certificate programs unless they have previously attended college. This test battery is administered at the College, normally prior to registration. In addition, other special tests and inventories are available at the Counseling Office and may be used to help solve particular problems.

CLEP

Virginia Western is an "open" test center for the College-Level Examination Program, a comprehensive testing program with the broad purpose of establishing a national system of awarding college credit by examination. The program has grown in many different directions. Some of the ways in which CLEP is being used at present are:

To enable adults and unaffiliated students to demonstrate their knowledge and validate their learning by receiving college credit on the basis of examinations.

To assist transfer and continuing students in the transition to upper-division study.

To provide measures of college equivalency for use by business, industry, and other noncollegiate organizations.

To enable enrolled students to get placement and credit by examination.

To help meet licensing and certification requirements and to provide a means of qualifying for job advancement.

There are two types of examinations: the **General Examinations** designed to provide a comprehensive measure of undergraduate achievement in five basic areas of liberal arts (English composition, mathematics, natural sciences, humanities, social sciences-history) and the **Subject Examinations** designed to measure achievement in specified undergraduate courses. The CLEP is given at various times throughout the year. For specific information, interested persons should contact Counseling Services.

ORIENTATION

An orientation program has been established to acquaint new students with the purposes and programs of the College. The orientation program begins weeks before registration when the student will be asked to meet with a counselor at the College for an interview to discuss the student's educational interests, and to determine what additional tests he may need. The student will also meet with a counselor to plan his program and course of study.

A program is scheduled for all new students prior to the registration period for group orientation to the College and a discussion of student services and activities.

In addition, an orientation class, General 100, is provided for all first time students to aid them in their personal, social, and academic adjustments as well as career explorations. This class is required of all newly entering full-time regular students.

FINANCIAL AID

The basic philosophy of the Financial Aid Program at Virginia Western is that "no student shall be denied the opportunity of a post-secondary education because of a lack of financial resources of the student and/or his family." Paramount to this philosophy is that the parents and students are to provide, within their ability, all or part of the cost for a post-secondary education; however, should their funds be found insufficient to cover the cost of attendance, the student may then be eligible to receive financial assistance from the College.

APPLICATION PROCEDURES

To apply for financial assistance with Virginia Western Community College, students should follow procedures as outlined below:

1. File application for admission to Virginia Western Community College. Application forms are available upon request from the Office of Admissions and Records, Virginia Western Community College, Box 4195, 3095 Colonial Avenue, S.W., Roanoke, Virginia 24015. A financial aid brochure describing each program is mailed out with each application for admission.
2. Request an application for financial assistance with the Financial Aid Officer of Virginia Western Community College.
3. Request from your high school counseling department a "Parent's Confidential Statement" and submit this completed form to the College Scholarship Service, Box 176, Princeton, New Jersey, designating VWCC (Code 5868) to receive the analysis. "Parent's Confidential Statements" are also available from the Financial Aid Office at Virginia Western Community College.
4. If you claim self-supporting status and can establish your independence according to federal guidelines, then you may request these guidelines and a "Student's Financial Statement" in lieu of a "Parent's Confidential Statement" from the Financial Aid Office at Virginia Western Community College.

Determination of awards will be processed when the student's admission file and financial aid file are complete.

TYPES OF FINANCIAL ASSISTANCE

A brochure is available upon request in the Financial Aid Office describing the types of aid available with eligibility requirements.

Virginia Western Community College has available the following types of Financial Aid.

Federal Aid Programs

1. Grants
2. National Direct Student Loans
3. College Work-Study
4. Law Enforcement Educational Program
5. Nursing Loans

6. Nursing Grants
7. Mental Health Grants
8. Assistance with Veteran's Benefits
9. Federal Insured Student Loans through the Virginia State Educational Assistance Authority in cooperation with local banks.

State of Virginia Aid Programs

1. State Teacher's Scholarships
2. State Tuition Grants
3. The College cooperates with the State Department of Vocational Rehabilitation in providing education and training for persons with vocational handicaps.

Scholarships

The College has available a limited number of scholarships for students in Electrical Engineering Technology, Architecture, and College Parallel programs. These awards are made based upon a combination of a student's financial need and potential to maintain at least a "C" average.

Each year the College nominates a minority student who plans to transfer to any university with junior status to the College Entrance Examination Board for a scholarship. This scholarship is based upon need and will pay between 20% and 80% of costs to attend.

STUDENT EMPLOYMENT

Full-time students are committed to specific class schedules which require fifteen or more hours per week of class work. In addition, students are usually responsible for an average of two or more hours of study per week for each hour in the classroom.

These standards result in an average student workload of approximately forty-five hours, depending on the particular courses and course load of the student. Consequently, part-time employment, in addition to a full-time course load of fifteen or more credits, is not in the best interest of the student in terms of his academic progress or his health.

Although part-time employment is not encouraged for full-time students, it is evident that in some cases it is necessary. A student who is considering part-time employment should discuss the question with his counselor or faculty advisor prior to seeking a position. Extreme caution should be used in making a commitment for more than fifteen hours of part-time work per week. Students who must work more than fifteen hours should consider taking a reduced schedule of classes.

Full-time freshmen, in particular, are encouraged not to undertake any part-time employment during the Fall Quarter as experience has clearly shown that the first quarter of college is the most difficult. The adjustments to college work and to college life will require a student's best full-time efforts if he is to succeed.

VETERANS—OFFICE OF VETERAN AFFAIRS

Programs and courses of study at this College are approved by the Veterans Administration. A "Veteran's Application for Program of Education or Training" must be obtained from, completed and returned to the Veterans Administration. Once the program of study has been approved, the Veteran will receive a "Certificate of Eligibility" that must be submitted to the Office of Admissions and Records prior to the awarding of benefits.

The College maintains an Office of Veterans' Affairs which has the responsibility for veterans' outreach, recruitment, and special education programs, including educational, vocational, and personal counseling. Inquiries concerning eligibility, benefits, tutorial assistance, and other matters that may be of concern to veterans should be directed to personnel in this office.

HEALTH SERVICES

The College provides no facilities or staff for the treatment of students' health problems. Each student must make his own arrangements for caring for his health needs. Applications for student accident insurance are available in the office of the Dean of Student Services.

CAREER COUNSELING

The College maintains a career counseling service for the following: part-time employment, summer and vacation employment, and assistance in the selection of types of careers after graduation. This service will provide students with occupational information and the techniques of seeking employment, including the preparation of resumes, letters of application, and arranging and preparing for interviews.

LUNCH ROOM

The College provides a student lounge where light refreshments and foods are available at reasonable cost.

PARKING

In order to make most effective use of our limited parking fa-

cilities, students must register their vehicles at the time of registration for classes. All students are expected to comply with the parking regulations in force. A copy of these regulations is made available at registration, and they are also printed in the Student Handbook. Permits may be obtained in the Business Office at any time after the regular registration period. Students who change cars during the quarter must get a new permit.

STUDENT ACTIVITIES

The student activities program is designed to provide a variety of meaningful educational, cultural, and social experiences. Additional information is provided in the Student Handbook.

STUDENT HANDBOOK

A student handbook is available to provide additional information of interest to students. The handbook describes student activities and organizations and lists the College rules and regulations.

The Student Handbook may be obtained through the office of the Dean of Student Services or through Counseling Services.

STUDENT CONDUCT

Each College student is considered a responsible adult, and it is assumed that men and women of college age will maintain standards of conduct appropriate to membership in the college community. Emphasis is placed on standards of student conduct rather than on student limits or restrictions. Guidelines and regulations governing student conduct are developed by representatives of the students, faculty, counseling staff, and administration. The College refrains from imposing a rigid code of discipline but reserves the right to take disciplinary action compatible with its own best interest when it is clearly necessary. The **Statement of Student Rights, Responsibilities and Conduct** is contained in the Student Handbook.

Failure to meet standards of conduct acceptable to the College may result in disciplinary probation or dismissal, depending upon the nature of the offense. A disciplinary probation period, unless otherwise specified, is for the duration of one quarter. A student who is dismissed must reapply to the College and will normally be required to appear before a special committee before readmission can be granted.

The Virginia Community College System guarantees to each student the privilege of exercising his rights of citizenship under the Constitution of the United States without fear of prejudice. Special care is taken to assure due process and to spell out clearly-defined routes of appeal when a student feels his rights have been violated.

Basically, students of the Virginia community colleges are expected to conduct themselves as ladies and gentlemen, both within the colleges and elsewhere. For student conduct which tends to discredit or injure the College, the Chancellor is authorized by the State Board for Community Colleges to impose such penalty as he may deem appropriate, including expulsion from the College. This authority has been delegated by the Chancellor to the Administration of each community college, subject to review by the Chancellor or his delegated representative. When the penalty for misconduct is suspension or dismissal, the student may appeal the decision to the Local College Board. Final appeal may be made to the State Board for Community Colleges.

Any student found guilty of participating in or inciting a riot or an unauthorized or disorderly assembly is subject to suspension or dismissal.

To prevent misunderstanding, the Chancellor has issued the following clarification:

1. When an assembly on campus of students not authorized by the College has been requested to disband by the President or other designated officer, those refusing to comply will be subject to immediate suspension, and/or dismissal and legal action.
2. In the event that an assembly appears to be a demonstration related to grievances, those present should be advised that orderly procedures for the hearing of grievances are available and must be adhered to. College officials will not negotiate with such groups under condition of duress, such as unauthorized occupation of College property.
3. Any unauthorized occupation of buildings and/or College property constitutes reason for immediate suspension and/or dismissal from the institution of students who may be involved. Furthermore, legal action will be brought against any student involved in acts on community college property which are prohibited by law.
4. Any person currently not a student is not allowed to participate in demonstrations on the campus.



CURRICULUMS OF STUDY

BUSINESS SCIENCE DIVISION

Accounting (AAS)
 Business Administration (AS)
 Clerk-Typist (Certificate)
 Data Processing Technology (AAS)
 Management (AAS)
 Merchandising (AAS)
 Secretarial Science (AAS)
 Stenographic (Certificate)
 Traffic & Transportation Management (AAS)

ENGINEERING/INDUSTRIAL & HEALTH TECHNOLOGIES DIVISION

Engineering/Industrial Technology:
 Air Conditioning & Refrigeration (Certificate)
 Appliance Repair & Servicing (certificate)
 Architectural (AAS or certificate)
 Automotive (certificate or diploma)
 Civil (AAS)
 Electrical/Electronics (AAS)
 Electromechanical (AAS)
 Engineering (AS)
 Engineering/Technical Assistant (Certificate)
 Industrial Management (Certificate)
 Mechanical (AAS)
 Health Technology:
 Dental Assistant (certificate)
 Nursing (AAS)
 Mental Health (AAS)
 Radiologic (AAS)

HUMANITIES DIVISION

Commercial Art (AAS)
 Liberal Arts (AA)
 Music (AA)

SCIENCE AND MATHEMATICS DIVISION

Science (AS)

SOCIAL SCIENCE & PUBLIC SERVICE TECHNOLOGY DIVISION

Fire Fighting & Prevention (certificate)
 Police Science (AAS)
 Pre-Teacher Education (AS)
 Radio & Television Production Technology (AAS)

**STATEWIDE ASSOCIATE DEGREE CURRICULUMS AVAILABLE
TO ALL QUALIFIED STUDENTS**

Students interested in these special curriculums should contact the Admissions Office of this community college for further information.

Program	College
Agricultural & Natural Resources Technology Majors: Animal Science Forestry	Blue Ridge Dabney S. Lancaster
Arts & Design Technology Major: Crafts Production	Mountain Empire
Business Technology Majors: Aviation Administration Hotel-Restaurant-Institutional Management	Northern Virginia Northern Virginia Tidewater
Engineering/Industrial Technology Majors: Broadcast Engineering Chemical Furniture Production Instrumentation Marine Science Mining Textile Production	Northern Virginia John Tyler Patrick Henry New River Thomas Nelson Southwest Virginia Danville
Health Technology Majors: Dental Laboratory Medical Records Physical Therapy Mortuary Science Radiology Respiratory Therapy	J. Sargeant Reynolds Northern Virginia Central Virginia J. Sargeant Reynolds Northern Virginia Northern Virginia John Tyler Central Virginia J. Sargeant Reynolds Virginia Western Northern Virginia Piedmont Virginia
Public Service Technology Majors: Air Traffic Control Occupational Safety & Health Radio & Television Production	Northern Virginia Northern Virginia Thomas Nelson Virginia Western

MINIMUM REQUIREMENTS FOR ASSOCIATE DEGREES

Associate in Arts (AA)
 Associate in Science (AS)
 Associate in Applied Science (AAS)

	Number of Credits		(Quarter Hours)
	AA ¹	AS ¹	AAS
Humanities			
English Composition	9	9	0
Communication Skills	0	0	6-9
Literature (English, American, or World)	6-9	0-3	-
English or Speech	0-3	0-3	0-3
Art, Drama, Music, Humanities and/or Philosophy	0-6	0-3	
Foreign Language	12-24 ²		
Social Sciences			
History (American or Western Civilization)	9	3-9	
Economics	0-9	0-9	3
Government	0-9	0-9	3
Psychology or Human Relations	0-9	0-9	3
Sociology	0-9	0-9	
Natural Sciences and Mathematics			
Natural Sciences (Laboratory) (Biology, Chemistry, Geology, Physics)	12-15	12-24	
Mathematics	9	9	
Health, Physical Education or Recreation	3-6	3-6	3-6
Orientation	1	1	1
Electives and Other Major Requirements	<u>3-21</u> ¹	<u>48</u>	<u>75</u> ⁴
Minimum Total Number of Credits for Degree	97	97	97

¹ Each student is urged to acquaint himself with the requirements of the major department in the college or university to which transfer is contemplated and further to consult with the Counseling Department of the community college in planning his program and selecting his electives.

² Students who have successfully completed two years of a foreign language in high school may petition for advance placement to the sophomore level course of this foreign language.

³ In addition to the history requirements, the student shall complete a total of nine quarter-hours credit in the social sciences which may include economics, government, sociology, and/or psychology.

⁴ The Associate in Applied Science Degree programs should be organized approximately as follows:

Specialized courses in major field	50%
Supporting technical and theory courses in related fields	25%
General education courses	25%

ACCOUNTING

Degree: Business Technology (Accounting) (AAS)

Length: Six-quarter (two-year) curriculum

Purpose: With the rapid development of business and industry in Virginia, there is a great demand for qualified personnel to assist business management in this economic growth. The Associate in Applied Science Degree curriculum in Accounting is designed for persons who seek full-time employment in the Accounting field immediately upon completion of the community college curriculum. Both persons who are seeking their first employment in an accounting position and those presently in accounting who are seeking a promotion may benefit from this curriculum.

Occupational Objectives: Accounting Trainee
Accounting Technician
Auditing Trainee
Management Trainee
Junior Accountant
Accountant

Admission Requirements: In addition to the admission requirements established for the college, entry into the Accounting program requires a minimum of two units of high school mathematics, one of which must be algebra or the equivalent, and proficiency in high school English. Students with deficiencies will require Developmental Studies

Program Requirements: The first three quarters of the Accounting program are similar to other curriculums in business. In the second year each student will pursue his specialty in Accounting. The curriculum will include technical courses in accounting, courses in related areas, general education and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in accounting. Students are urged to consult with the counseling office and their faculty advisor in planning their program and selecting electives.

ACCOUNTING

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ACCT 111*	Accounting I	3	2	4
BUAD 100	Introduction to Business	3	0	3
ECON	Economics ²	3	0	3
ENGL 101	Communication Skills I (or ENGL 111)	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Introduction to Business Mathematics I	3	0	3
Total				17

* ACCT 211-212-213 may be substituted.

² A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
SECOND QUARTER				
ACCT 112*	Accounting II	3	2	4
BUAD 164	Principles of Business Management	3	0	3
ENGL 102	Communication Skills II (or ENGL 112)	3	0	3
MATH 152	Introduction to Business Mathematics II	3	0	3
SECR 111	Typewriting ¹ (or Elective)	2	3	3
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			17-19
THIRD QUARTER				
ACCT 113*	Accounting III	3	2	4
BUAD 165	Prin. of Bus. Mgmt. II	3	0	3
MATH 153	Business Math by Machines	3	0	3
PSYC	Psychology ²	3	0	3
	English or Speech	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			17-19
FOURTH QUARTER				
ACCT 221	Intermediate Accounting	4	0	4
ACCT 234	Cost Accounting I	3	0	3
BUAD 241	Business Law I	3	0	3
ENGL 180	Business English	3	0	3
GOVT	Government ²	3	0	<u>3</u>
	Total			16
FIFTH QUARTER				
ACCT 222	Intermediate Accounting II	4	0	4
ACCT 244	Business Taxes I	3	0	3
BUAD 242	Business Law II	3	0	3
BUAD 254	Applied Business Statistics I	3	0	3
DAPR 106	Principles of Data Processing	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			17-19
SIXTH QUARTER				
ACCT 223	Intermediate Accounting III (or Acct Elective	4	0	4
ACCT 229	Auditing (or Business Elective)	3	0	3
ACCT 298	Seminar and Project			3
BUAD 246	Business Finance (or Bus. Elective)	3	0	3
DAPR 144	Computer Concepts I (or Elective)			<u>3-4</u>
	Total			16-17

Total Minimum Credits for the Accounting Degree..... 97

* ACCT 211-212-213 may be substituted.

¹ Students who have completed prior training in typewriting may petition for course waiver.

² A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

BUSINESS ADMINISTRATION

Degree: Associate in Science (Business Administration) (AS)

Length: Six-quarter (two-year) curriculum

Purpose: With the rapid development in business and industry in Virginia, there is a great demand for qualified personnel in business administration to provide leadership for this economic growth. 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.

Admission Requirements: In addition to the admission requirements established for the college, entry into the Business Administration program requires the 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 studies. Students with deficiencies will require Developmental Studies. Students are urged to check the mathematics requirements of the four-year college or university to which they plan to transfer to determine the proper mathematics courses to be taken in the community college.

Program Requirements: The modern business world demands that its staff be knowledgeable in fields over and beyond every-day business technology. Thus, this curriculum requires courses in the humanities, natural sciences, and social sciences in addition to the principles of economics and accounting usually required in the first two years of a baccalaureate business administration curriculum. Students are urged to acquaint themselves with the requirements of the major department in the institution to which transfer is contemplated and also to consult with the counseling office of the community college in planning their program and selecting electives. In order to prepare for junior class standing at a four-year college or university, the student usually must complete a program at the community college which is comparable in length and course content to the first two years of the program at the four-year institution.

BUSINESS ADMINISTRATION

Associate in Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ENGL 111	English Composition I	3	0	3
GENL 100	Orientation	1	1	1
HIST	American History or Hist. of West. Civ.	3	0	3
MATH 161	Mathematics	3	0	3
	Natural Science (Lab.)	3	3	4
	Elective ¹	3	0	<u>3</u>
Total				17

¹ Electives must be selected from Humanities, Natural Sciences, Social Sciences.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
SECOND QUARTER				
ENGL 112	English Composition II	3	0	3
HIST	American History or Hist. of West. Civ.	3	0	3
MATH 162	Mathematics	3	0	3
	Natural Science (Lab.)	3	3	4
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Elective ¹	3	0	<u>3</u>
	Total			17-19
THIRD QUARTER				
ENGL 113	English Composition III	3	0	3
HIST	American History or Hist. of West. Civ.	3	0	3
MATH 163	Mathematics	3	0	3
	Natural Science (Lab.)	3	3	4
	Health, Physical Education, or Recreation			1-3
	Elective ¹	3	0	<u>3</u>
	Total			17-19
FOURTH QUARTER				
ACCT 211	Principles of Accounting I	3	0	3
ECON 211	Principles of Economics I ²	3	0	3
ENGL	Literature	3	0	3
	Health, Physical Education, or Recreation			1-3
	Electives ¹	6	0	<u>6</u>
	Total			16-18
FIFTH QUARTER				
ACCT 212	Principles of Accounting II	3	0	3
ECON 212	Principles of Economics II ²	3	0	3
ENGL	Literature	3	0	3
	Electives ¹	<u>6</u>	<u>0</u>	<u>6</u>
	Total			15
SIXTH QUARTER				
ACCT 213	Principles of Accounting III	3	0	3
ECON 213	Principles of Economics III ¹	3	0	3
	Literature or Speech	3	0	3
	Electives ¹	<u>6</u>	<u>0</u>	<u>6</u>
	Total			15

Total Minimum Credits for the Business Administration Degree----- 97

¹ Electives must be selected from Humanities, Natural Sciences, Social Sciences.

² In addition to the Economics requirement for the community colleges, students are advised to complete a Government and Psychology course, or a full year of a sophomore social science if required by the four-year college or university to which they plan to transfer.

CLERK-TYPIST CERTIFICATE PROGRAM

Degree: Clerk-Typist Certificate

Length: Three-quarter (one-year) program

Purpose: The one-year clerk-typist course of study and practice is to provide training in the art and skills of clerical practice.

Occupational Objectives: Clerk-Typist
Typist
File Clerk
Receptionist
General Office Work

Admission Requirements: Applicant must meet the general requirements for admission to the College.

Program Requirements: This curriculum requires the student to take English, and speech, in addition to required courses needed by qualified clerks or general office personnel.

CLERK-TYPIST CERTIFICATE

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
BUAD 100	Introduction to Business	3	0	3
BUAD 108	Business Machines (or MATH 153)	1	2	2
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
GOVT 180	American Constitutional Government ²	3	0	3
SECR 111	Typewriting I ¹	2	3	<u>3</u>
	Total			15
SECOND QUARTER				
ENGL 102	Communication Skills II	3	0	3
ECON 160	American Economics ²	3	0	3
PSYC 128	Human Relations ²	3	0	3
SECR 39	Recordkeeping	3	0	3
SECR 112	Typewriting II	2	3	3
SPDR 137	Speech	<u>3</u>	<u>0</u>	<u>3</u>
	Total			18
THIRD QUARTER				
DAPR	DAPR Elective (or BUAD/SECR Elective)	3	0	3
SECR 113	Typewriting III	2	3	3
SECR 136	Filing & Records Management	3	0	3
SECR 138	Office Recordkeeping	2	2	3
SECR 139	Clerical Procedures	2	2	3
SECR 157	Machine Transcription	<u>2</u>	<u>2</u>	<u>3</u>
	Total			18
Total Minimum Credits for Clerk-Typist Certificate -----				51

¹ Student may petition for waiver by examination and substitute an elective.² A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

DATA PROCESSING TECHNOLOGY

Computer Programming

Degree: Business Technology (Data Processing) (AAS)

Length: Six-quarter (two-year) program

Purpose: The Data Processing Technology curriculum with specialization in computer programming is designed to provide the types of education and training which will be required by both industry and business. Specifically, this includes the skills, knowledges, attitudes, and abilities which will enable employees to function in positions of responsibility in the current employment market. Education of the student will include the use of data processing devices and equipment, and formal instruction which will provide an understanding of the employment environment.

Occupational Objectives: Computer Programmer, Business
Computer Programmer, Trainee
Related Data Processing Occupations

Admission Requirements: In addition to the admission requirements established for the college, entry into the Data Processing Technology curriculum requires a minimum of two units of high school mathematics, one of which must be algebra or the equivalent, and proficiency in high school English. Students with deficiencies will require Developmental Studies.

Program Requirements: The curriculum will include technical courses in data processing, courses in related areas, general education, and electives. Instruction will include both theoretical concepts and practical applications needed for future success in data processing technology. Students are urged to consult with the counseling office and their faculty advisor in planning their program and selecting electives.

DATA PROCESSING TECHNOLOGY

(Computer Programming)

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ACCT 111*	Accounting I	3	2	4
BUAD 100	Introduction to Business	3	0	3
DAPR 106	Principles of Data Processing	3	0	3
ENGL 101	Communication Skills I (or ENGL 111)	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Intro. to Bus. Math. I (or MATH Elective)	<u>3</u>	<u>0</u>	<u>3</u>
Total				17

* ACCT 211-212-213 may be substituted.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
SECOND QUARTER				
ACCT 112*	Accounting II	3	2	4
BUAD 164	Principles of Business Management	3	0	3
DAPR 144	Computer Programming (Computer Concepts I)	2	3	3
ENGL 102	Communication Skills II (or ENGL 112)	3	0	3
MATH 152	Intro. to Bus. Math. II (or MATH Elective)	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			17-19
THIRD QUARTER				
ACCT 113*	Accounting III	3	2	4
DAPR 147	Computer Programming (Cobol)	2	3	3
ECON	Economics ¹	3	0	3
PSYC	Psychology [†]	3	0	3
	English or Speech	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			17-19
FOURTH QUARTER				
BUAD 254	Applied Business Statistics I	3	0	3
DAPR 130	Operating Systems	3	2	3
DAPR 256	Computer Programming (Advanced Cobol)	3	2	4
DAPR 281	Systems Analysis I	3	0	3
ENGL 180	Business English (or Elective)	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			16-18
FIFTH QUARTER				
BUAD 255	Applied Business Statistics II	3	0	3
DAPR 282	Systems Analysis II	3	0	3
DAPR 286	Computer Programming Applications	3	2	4
DAPR	Computer Programming Elective	3	2	4
	Elective	<u>3</u>	<u>0</u>	<u>3</u>
	Total			17
SIXTH QUARTER				
DAPR 298	Seminar and Project			3
DAPR	Computer Programming Elective	3	2	4
GOVT	Government ¹	3	0	3
	Electives	6	0	<u>6</u>
	Total			16
Total Minimum Credits for the Data Processing Technology (Computer Programming) Degree-----				97

* ACCT 211-212-213 may be substituted.

¹ A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

MANAGEMENT

Majors: Management
Real Estate
Banking and Finance

Degree: Business Technology (Banking and Finance) (AAS)
Business Technology (Management) (AAS)
Business Technology (Real Estate) (AAS)

Length: Six-quarter (two-year) curriculum

Purpose: With the rapid development of business and industry in Virginia, there is a great demand for qualified personnel to assist business management in this economic growth. The Associate in Applied Science Degree curriculum in Management is designed for persons who seek full-time employment in business immediately upon completion of the community college curriculum. Both persons who are seeking their first employment in a managerial position and those presently in management who are seeking promotion may benefit from this curriculum.

Occupational Objectives:

Management Trainee	Real Estate Sales
Supervisor	Real Estate Broker
Department Head	Real Estate Planning
Office Manager	Real Estate Finance
Manager of Small Business	Financial Management
Branch Manager	Retail Credit
Administrative Assistant	

Admission Requirements. In addition to the admission requirements established for the college, entry into the Management program requires a minimum of two units of high school math (one of which must be algebra) or the equivalent and proficiency in high school English. Students with deficiencies will require Development Studies.

Program Requirements: The first three quarters of the curriculum in Management are similar to other curriculums in business. However, in the second year each student will include technical courses in business, courses in related areas, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in business. Students are urged to consult with the counseling office and their faculty advisor in planning their program and selecting electives.

MANAGEMENT

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ACCT 111*	Accounting I	3	2	4
BUAD 100	Introduction to Business	3	0	3
ECON	Economics ²	3	0	3
ENGL 101	Communication Skills I (or ENGL 111)	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Introduction to Business Mathematics I	3	0	3
Total				17

* ACCT 211-212-213 may be substituted.

² A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
SECOND QUARTER				
ACCT 112*	Accounting II	3	2	4
BUAD 164	Principles of Business Management I	3	0	3
ENGL 102	Communication Skills II (or ENGL 112)	3	0	3
MATH 152	Introduction to Business Mathematics II	3	0	3
SECR 111	Typewriting I ¹	2	3	3
	Health, Physical Education, or Recreation			<u>1-3s</u>
	Total			17-19s
THIRD QUARTER				
ACCT 113*	Accounting III	3	2	4
BUAD 165	Principles of Business Management II	3	0	3
MATH 153	Business Math by Machines	3	0	3
MKTG 100	Principles of Marketing	3	0	3
	English or Speech	3	0	3
	Health, Physical Education, or Recreation			<u>1-3s</u>
	Total			17-19s
FOURTH QUARTER				
BUAD 241	Business Law I	3	0	3
DAPR 106	Principles of Data Processing	3	0	3
ENGL 180	Business English	3	0	3
GOVT	Government ²	3	0	3
	Business Elective	3	0	3
	Health, Physical Education, or Recreation			<u>1-3s</u>
	Total			16-18s
FIFTH QUARTER				
ACCT 244	Business Taxes I	3	0	3
BUAD 242	Business Law II	3	0	3
BUAD 254	Applied Business Statistics	3	0	3
DAPR 144	Computer Concept I (or Business Elective)	2	3	3
	Business Elective	3	0	<u>3</u>
	Total			15
SIXTH QUARTER				
BUAD 246	Business Finance	3	0	3
BUAD 276	Personnel Management	3	0	3
BUAD 298	Seminar and Project	3	0	3
PSYC	Psychology ²	3	0	3
	Electives	<u>6</u>	<u>0</u>	<u>6</u>
	Total			18

Total Minimum Credits for the Business Technology Degree ----- 97

¹ Students who have completed prior training in typewriting may petition for course waiver.

² A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

* ACCT 211-212-213 may be substituted.

MANAGEMENT**(Real Estate)****Associate in Applied Science Degree**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ACCT 111*	Accounting I	3	2	4
BUAD 100	Introduction to Business	3	0	3
ECON	Economics ²	3	0	3
ENGL 101	Communication Skills I (or ENGL 111)	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Introduction to Business Math I	3	0	<u>3</u>
Total				17
SECOND QUARTER				
ACCT 112*	Accounting II	3	2	4
BUAD 164	Principles of Business Management I	3	0	3
ENGL 102	Communication Skills II (or ENGL 112)	3	0	3
MATH 152	Introduction to Business Math II	3	0	3
SECR 111	Typewriting ¹	2	3	3
	Health, Physical Education, of Recreation			<u>1-3</u>
Total				17-19
THIRD QUARTER				
ACCT 113*	Accounting III	3	2	4
BUAD 165	Principles of Business Management	3	0	3
MATH 153	Business Math by Machines	3	0	3
MKTG 100	Principles of Marketing	3	0	3
	English or Speech	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
Total				17-19
FOURTH QUARTER				
BUAD 241	Business Law I	3	0	3
DAPR 106	Principles of Data Processing	3	0	3
ENGL 180	Business English	3	0	3
GOVT	Government ²	3	0	3
MKTG 164	Principles of Real Estate	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
Total				16-18

¹ Students who have completed prior training in typewriting may petition for course waiver.² A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

* ACCT 211-212-213 may be substituted.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
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FIFTH QUARTER

ACCT 244	Business Taxes I	3	0	3
BUAD 242	Business Law II	3	0	3
MKTG 165	Principles of Real Estate	3	0	3
BUAD 254	Applied Business Statistics	3	0	3
MKTG 268	Property Management (or Marketing Elective)	3	0	<u>3</u>
Total				15

SIXTH QUARTER

BUAD 269	Real Estate Finance	3	0	3
BUAD 276	Personnel Management	3	0	3
MKTG 298	Seminar and Project	3	0	3
PSYC	Psychology ²	3	0	3
MKTG 277	Real Estate Law (or Marketing Elective)	3	0	3
MKTG 150	Insurance (or Marketing Elective)	3	0	<u>3</u>
Total				18

Total Minimum Credits for the Business Technology (Management) Degree__ 97

²A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

MANAGEMENT**(Banking & Finance)****Associate in Applied Science Degree**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ACCT 111*	Accounting I	3	2	4
BUAD 100	Introduction to Business	3	0	3
ECON	Economics ²	3	0	3
ENGL 101	Communication Skills I (or ENGL 111)	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Introduction to Business Math I	3	0	<u>3</u>
Total				17
SECOND QUARTER				
ACCT 112*	Accounting II	3	2	4
BUAD 164	Principles of Business Management I	3	0	3
ENGL 102	Communication Skills II (or ENGL 112)	3	0	3
MATH 152	Introduction to Business Math II	3	0	3
SECR 111	Typewriting I ¹	2	3	3
	Health, Physical Education, or Recreation			<u>1-3</u>
Total				17-19
THIRD QUARTER				
ACCT 113*	Accounting III	3	2	4
BUAD 165	Principles of Business Management	3	0	3
MATH 153	Business Math by Machines	3	0	3
MKTG 100	Principles of Marketing	3	0	3
	English or Speech	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
Total				17-19
FOURTH QUARTER				
BUAD 241	Business Law I	3	0	3
DAPR 106	Principles of Data Processing	3	0	3
ENGL 180	Business English	3	0	3
GOVT	Government ²	3	0	3
BUAD 117	Principles of Security Investments	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
Total				16-18

¹ Students who have completed prior training in typewriting may petition for course waiver.² A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

* ACCT 211-212-213 may be substituted.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIFTH QUARTER				
ACCT 244	Business Taxes I	3	0	3
BUAD 242	Business Law II	3	0	3
BUAD 157	Principles of Bank Operation	3	0	3
BUAD 254	Applied Business Statistics	3	0	3
BUAD 258	Installment Credit (or Business Elective)	3	0	<u>3</u>
Total				15
SIXTH QUARTER				
BUAD 246	Business Finance	3	0	3
BUAD 276	Personnel Management	3	0	3
BUAD 298	Seminar and Project	3	0	3
PSYC	Psychology ²	3	0	3
BUAD 256	Trust Functions (or Business Elective)	3	0	3
ECON 246	Money & Banking	3	0	<u>3</u>
Total				18
Total Minimum Credits for the Business Technology (Management) Degree...				97

² A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

MERCHANDISING

Degree: Business Technology (Merchandising) (AAS)

Length: Six-quarter (two-year) program

Purpose: With the rapid development of business in Virginia, there is a great demand for qualified personnel to assist management in this economic growth. The Associate in Applied Science Degree curriculum in Merchandising is a middle management program designed for persons who seek full-time employment in merchandising and related occupations immediately upon completion of the curriculum.

Occupational Objectives: Manager or Manager Trainee
Sales Supervisor
Assistant Manager
Department Manager
Sales Representative
Buyer and Assistant Buyer

Admission Requirements: In addition to the admission requirements established for the college, entry into the Merchandising program requires a minimum of two units of high school math (one of which must be algebra) or the equivalent and proficiency in high school English. Students with deficiencies will require Developmental Studies.

Program Requirements: The first three quarters of the curriculum in Merchandising are similar to other curriculums in business. However, in the second year each student will pursue his specialty in Merchandising. The curriculum will include technical courses in merchandising, courses in related area, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in merchandising occupations. Students are urged to consult with the counseling office and their faculty advisor in planning their program and selecting electives.

MERCHANDISING

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ACCT 111*	Accounting I	3	2	4
BUAD 100	Introduction to Business	3	0	3
ECON	Economics ²	3	0	3
ENGL 101	Communication Skills I (or ENGL 111)	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Introduction to Business Math I	3	0	<u>3</u>
Total				17

* ACCT 211-212-213 may be substituted.

² A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
SECOND QUARTER				
ACCT 112*	Accounting II	3	2	4
BUAD 164	Principles of Business Management	3	0	3
ENGL 102	Communication Skills II (or ENGL 112)	3	0	3
MATH 152	Introduction to Business Math II	3	0	3
SECR 111	Typewriting ¹	2	3	3
	Health, Physical Education, or Recreation			<u>1-3</u>
Total				17-19
THIRD QUARTER				
ACCT 113*	Accounting III	3	2	4
MKTG 136	Retail Organization & Management	3	0	3
MATH 153	Business Math by Machines	3	0	3
MKTG 100	Principles of Marketing	3	0	3
	English or Speech	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
Total				17-19
FOURTH QUARTER				
BUAD 241	Business Law	3	0	3
DAPR 106	Principles of Data Processing	3	0	3
MKTG 109	Salesmanship	3	0	3
GOVT	Government ²	3	0	3
MKTG 225	Principles of Advertising	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
Total				16-18
FIFTH QUARTER				
ACCT 244	Business Taxes I (or Business Elective)	3	0	3
BUAD 242	Business Law II	3	0	3
MKTG 226	Merchandising Buying & Control (or Marketing Elective)	3	0	3
BUAD 254	Applied Business Statistics	3	0	3
MKTG 290	Coordinated Internship ³		5-25	<u>1-5</u>
Total				13-17
SIXTH QUARTER				
MKTG	Marketing Elective	3	0	3
BUAD 276	Personnel Management	3	0	3
MKTG 298	Seminar and Project	3	0	3
PSYC	Psychology ²	3	0	3
MKTG 290	Coordinated Internship ³		5-25	<u>1-5</u>
Total				13-17
Total Minimum Credits for the Merchandising Degree -----				97

¹ Students who have completed prior training in typewriting may petition for course waiver.
² A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.
³ Students who have completed sufficient and appropriate occupational experience or who may be unable to participate in the cooperative phase of this curriculum may substitute appropriate courses in the fifth and sixth quarters.
 * ACCT 211-212-213 may be substituted.

SECRETARIAL SCIENCE

Specializations: Executive Secretary
 Legal Secretary
 Medical Secretary

Degree: Business Technology (Secretarial Science) (AAS)

Length: Six-quarter (two-year) program

Purpose: With the rapid development of business, industry, and government in Virginia, there is a great demand for qualified personnel in office occupations. The Associate in Applied Science Degree curriculum in Secretarial Science is designed to prepare persons for full-time employment immediately upon completion of the community college program. Both persons who are seeking their first employment in an office position and those who are seeking promotion may benefit from this curriculum.

Occupational Objectives:

Executive Secretary	Medical Secretary	Administrative Assistant
Legal Secretary	Stenoographer	Related Office Occupations

Admission Requirements: In addition to the admission requirements established for the college, entry into the Secretarial Science program requires a minimum of two units of high school mathematics, one of which must be algebra or the equivalent, and proficiency in high school English. Students with deficiencies will require Developmental Studies. In addition, students who have completed training in shorthand and advanced typewriting, may petition for advance placement.

Program Requirements: The two-year curriculum in Secretarial Science combines instruction in the many areas required for competence as a secretary in business, government, industry, law offices, and other organizations. The curriculum will include courses in secretarial science, related areas, general education and electives. Students will be required to repeat shorthand or typewriting courses in which grades lower than "C" are received. The first year of the Secretarial Science curriculum is similar for all students. In the second year, students may select a specialty in either the Executive, Legal, or Medical Secretary curriculums. Students are advised to consult with their faculty advisor and the counseling office in planning their program and selecting electives.

SECRETARIAL SCIENCE**(Executive Secretary)****Associate in Applied Science Degree**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
BUAD 100	Introduction to Business	3	0	3
ENGL 101	Communication Skills I (or ENGL 111)	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Introduction to Business Mathematics I	3	0	3
SECR 111	Typewriting I ¹	2	3	3
SECR 121	Shorthand I ¹	<u>3</u>	<u>2</u>	<u>4</u>
	Total	15	6	17
SECOND QUARTER				
BUAD 164	Principles of Business Management	3	0	3
ENGL 102	Communication Skills II (or ENGL 112)	3	0	3
MATH 152	Introduction to Business Mathematics II	3	0	3
SECR 112	Typewriting II	2	3	3
SECR 122	Shorthand II	3	2	4
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			17-19
THIRD QUARTER				
ACCT 114	Applied Accounting	2	2	3
SECR 113	Typewriting III	2	3	3
SECR 123	Shorthand III	3	2	4
SECR 136	Filing & Records Management	3	0	3
	English or Speech	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			17-19
FOURTH QUARTER				
ENGL 180	Business English	3	0	3
MATH 153	Business Mathematics by Machines	3	0	3
PSYC	Psychology ²	3	0	3
SECR 216	Executive Typewriting	2	2	3
SECR 221	Transcription I	2	2	3
SECR 241	Secretarial Procedures I	2	2	<u>3</u>
	Total			18

¹ Students who have completed prior training in shorthand or typewriting may petition for advanced placement.

² A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIFTH QUARTER				
BUAD 241	Business Law	3	0	3
ECON	Economics ²	3	0	3
SECR 222	Transcription II	2	2	3
SECR 242	Secretarial Procedures II	2	2	3
SECR 256	Machine Transcription	2	2	3
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			16-18
SIXTH QUARTER				
GOVT 180	Government ²	3	0	3
SECR 217	Skill Building	2	3	3
SECR 223	(General) Transcription	2	2	3
SECR 243	Secretarial Procedures III	2	2	3
SECR 298	Seminar and Project	3	0	<u>3</u>
	Total			15
Total Minimum Credits for the Secretarial Science (Executive Secretary) Degree -----				97

² A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

SECRETARIAL SCIENCE

(Legal Secretary)

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
BUAD 100	Introduction to Business	3	0	3
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Introduction to Business Mathematics	3	0	3
SECR 111	Typewriting I ¹	2	3	3
SECR 121	Shorthand I ¹	3	2	<u>4</u>
Total				17
SECOND QUARTER				
BUAD 164	Principles of Business Management	3	0	3
ENGL 102	Communication Skills II	3	0	3
MATH 152	Introduction to Business Mathematics II	3	0	3
SECR 112	Typewriting II	2	3	3
SECR 122	Shorthand II	3	2	4
	Health, Phys. Ed., or Recreation			<u>1-3</u>
Total				17-19
THIRD QUARTER				
ACCT 114	Applied Accounting	2	2	3
SECR 113	Typewriting III	2	3	3
SECR 123	Shorthand III	3	2	4
SECR 136	Filing & Records Management	3	0	3
	English or Speech	3	0	<u>3</u>
Total				16
FOURTH QUARTER				
BUAD 241	Business Law	3	0	3
ECON	Economics ²	3	0	3
ENGL 180	Business English	3	0	3
SECR 216	Executive Typewriting	2	2	3
SECR 221	Transcription I	2	2	3
SECR 241	Secretarial Procedures	2	2	<u>3</u>
Total				18

¹ Students who have completed prior training in typewriting may petition for course waiver.

² A year sequence in Social Science 101-102 103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIFTH QUARTER				
BUAD 242	Business Law II	3	0	3
GOVT	Government ²	3	0	3
SECR 222	Transcription II	2	2	3
SECR 256	Machine Transcription	2	2	3
SECR 242	Secretarial Procedures II	2	2	3
	Health, Phys. Ed., or Recreation			<u>1-3</u>
Total				16-18
SIXTH QUARTER				
BUAD 243	Business Law III (or Business Elective)	3	0	3
PSYC	Psychology ²	3	0	3
SECR 224	Legal Transcription I	2	2	3
SECR 264	Legal Secretarial Procedures I	2	2	3
SECR 298	Seminar and Project	3	0	3
	Health, Phys. Ed., or Recreation			<u>1-3</u>
Total				16-18
Total Minimum Credits for the Secretarial Science (Legal Secretary) Degree--				97

² A year sequence in Social Science 101-102 103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

SECRETARIAL SCIENCE

(Medical Secretary)

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
BUAD 100	Introduction to Business	3	0	3
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Introduction to Business Mathematics I	3	0	3
SECR 111	Typewriting I ¹	2	3	3
SECR 121	Shorthand I ¹	3	2	<u>4</u>
Total				17
SECOND QUARTER				
BUAD 164	Principles of Business Management	3	0	3
ENGL 102	Communication Skills II	3	0	3
MATH 152	Introduction to Business Mathematics II	3	0	3
SECR 112	Typewriting II	2	3	3
SECR 122	Shorthand II	3	2	4
	Health, Phys. Ed., or Recreation			<u>1-3</u>
Total				17-19
THIRD QUARTER				
ACCT 114	Applied Accounting I	2	2	3
SECR 113	Typewriting III	2	3	3
SECR 123	Shorthand III	3	2	4
SECR 136	Filing & Records Management	3	0	3
	English or Speech	3	0	3
	Health, Phys. Ed., or Recreation			<u>1-3</u>
Total				17-19
FOURTH QUARTER				
ENGL 180	Business English	3	0	3
GOVT	Government ²	3	0	3
HLTH 124	Medical Terminology	3	0	3
MATH 153	Business Math by Machines	3	0	3
SECR 221	Transcription I	2	2	3
SECR 241	Secretarial Procedures I	2	2	<u>3</u>
Total				18

¹ Students who have completed prior training in shorthand or typewriting may petition for advanced placement.

² A year sequence in Social Science 101-102 103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIFTH QUARTER				
BUAD 241	Business Law	3	0	3
PSYC	Psychology ²	3	0	3
SECR 222	Transcription II	2	2	3
SECR 256	Machine Transcription	2	2	3
SECR 242	Secretarial Procedures II	2	2	3
	Health, Phys. Ed., or Recreation			<u>1-3</u>
	Total			16-18
SIXTH QUARTER				
ECON	Economics ²	3	0	3
SECR 227	Medical Transcription	2	2	3
SECR 274	Medical Secretarial Procedures	2	2	3
SECR 298	Seminar and Project	3	0	3
	Elective	3	0	<u>3</u>
	Total			15
Total Minimum Credits for Secretarial Science (Medical Secretary) Degree				97

² A year sequence in Social Science 101-102 103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

STENOGRAPHIC CERTIFICATE PROGRAM

Degree: Stenographic Certificate

Length: Three-quarter (one-year) program

Purpose: The one-year stenographic course of study and practice is to provide training in the art and skills of clerical and stenographic practice.

Occupational Objectives: Stenographer
Typist
File Clerk
General Office Work

Admission Requirements: Applicant must meet the general requirements for admission to the College.

Program Requirements: This curriculum requires the student to take English and mathematics in addition to required courses needed by qualified stenographers.

STENOGRAPHIC CERTIFICATE PROGRAM

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
BUAD 100	Introduction to Business	3	0	3
ENGL 101	Communications Skills I	3	0	3
GENL 100	Orientation	1	1	1
MATH 50	Business Mathematics I (or Math 151)	2	2	3
SECR 111	Typewriting I ¹	2	3	3
SECR 121	Shorthand I ¹	3	2	4
Total				17
SECOND QUARTER				
ECON 160	American Economics ²	3	0	3
ENGL 102	Communications Skills II	3	0	3
PSYC 128	Human Relations ²	3	0	3
SECR 112	Typewriting II	2	3	3
SECR 136	Filing and Records Management	3	0	3
SECR 122	Shorthand II	3	2	4
Total				19
THIRD QUARTER				
BUAD 108	Business Machines (or MATH 153)	1	2	2
SECR 113	Typewriting III	2	3	3
SECR 123	Shorthand III	3	2	4
SECR 139	Clerical Office Procedures	2	2	3
SECR 157	Machine Transcription	2	2	3
GOVT 180	American Constitutional Government ²	3	0	3
Total				18
Total Minimum Credits for Stenographic Certificate.....				54

¹ Student may petition for waiver by examination and substitute an elective.

² A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

TRAFFIC AND TRANSPORTATION MANAGEMENT

Degree: Business Technology (Traffic & Transportation) (AAS)

Length: Six-quarter (two-year) program

Purpose: With the rapid development of business and industry in Virginia, there is great demand by carriers and by companies using transportation services for qualified personnel to assist business management in this growth. Transportation represents 20% of the gross national product, and the traffic profession has become a highly skilled and specialized area since World War II. The Associate in Applied Science Degree curriculum in Traffic and Transportation Management is designed both for persons who seek full-time employment in transportation upon completion of the community college curriculum and for those already employed who seek promotion.

Occupational Objectives: Traffic Representative
Dispatcher
Rate Analyst
Operational Supervisor
Other related traffic and transportation occupations

Admission Requirements: In addition to the admission requirements established for the college, entry into the Traffic and Transportation Management curriculum requires a minimum of two units of high school mathematics, one of which must be algebra or the equivalent, and proficiency in high school English. Students with deficiencies will require Developmental Studies.

Program Requirements: The first three quarters of the Traffic and Transportation Management curriculum fulfills the basic requirements common to all curricula in business, but are supplemented with introductory courses in Traffic and Transportation and the Economics of Transportation. In the second year, students will develop greater expertise in their specialty. Instruction will include both the theoretical concepts and the practical applications needed for future success in traffic and transportation occupations. Students are urged to consult with the counseling office and their faculty advisor in planning their program and selecting electives.

TRAFFIC AND TRANSPORTATION MANAGEMENT

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ACCT 111	Accounting	3	2	4
BUAD 100	Introduction to Business	3	0	3
ENGL 101	Communication Skills I (or ENGL 111)	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Introduction to Business Mathematics	3	0	3
MKTG 131	Traffic and Transportation I	3	0	<u>3</u>
	Total			17
SECOND QUARTER				
BUAD 164	Principles of Business Management	3	0	3
ECON	Economics ²	3	0	3
ENGL 102	Communication Skills II (or ENGL 112)	3	0	3
MKTG 132	Traffic and Transportation II	3	0	3
SECR 111	Typewriting I ¹	2	3	3
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			16-18
THIRD QUARTER				
DAPR 106	Principles of Data Proc. (or DAPR Elective)	3	0	3
SPDR 137	Public Speaking	3	0	3
MKTG 100	Principles of Marketing	3	0	3
MKTG 133	Traffic and Transportation III	3	0	3
MKTG 134	Economics of Transportation I	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			16-18
FOURTH QUARTER				
BUAD 254	Applied Business Statistics I	3	0	3
MKTG 135	Economics of Transportation II	3	0	3
MKTG 231	Interstate Commerce Law I	3	0	3
MKTG 236	Physical Distribution	3	0	3
	Elective			3
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			16-18

¹ Students who have completed prior training in typewriting may petition for course waiver.

² A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIFTH QUARTER				
BUAD 276	Personnel Management (or Bus. Elective)	3	0	3
GOVT	Government ²	3	0	3
MKTG 232	Interstate Commerce Law II	3	0	3
MKTG 238	Traffic Management	3	0	3
PSYC	Psychology ²	3	0	3
	Elective	3	0	<u>3</u>
	Total			18
SIXTH QUARTER				
MKTG 233	Interstate Commerce Law III	3	0	3
MKTG 239	Problems in Transportation	3	0	3
MKTG 298	Seminar and Project			3
	Electives	6	0	<u>6</u>
	Total			15
Total Minimum Credits for a Traffic and Transportation Management Degree_ 97				

² A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

* AIR CONDITIONING AND REFRIGERATION

Degree: Certificate in Air Conditioning and Refrigeration

Length: Six-quarter (part-time) program

Purpose: With the rapid growth of industry in Virginia, there is a growing demand for trained personnel in the Air Conditioning and Refrigeration field. This certificate program is designed to meet the needs of persons employed full-time and who wish to improve their competency in the Air Conditioning and Refrigeration field.

Occupational Objectives: Air Conditioning Service Technician
Refrigeration Service Technician
Controls Service Technician
Air Conditioning Installation Technician
Refrigeration Installation Technician

Admission Requirements: In addition to the admission requirements established for the College, entry into the air conditioning and refrigeration program requires proficiency in high school English, mathematics and sciences including one unit of algebra. Students entering the program are also required to show satisfactory mechanical aptitude as measured by appropriate tests.

Program Requirements: This course is designed to provide both the practical experience and technical knowledge required for competence as a service technician in the air conditioning and refrigeration industry. Laboratory experiences give the student the skill and know-how that he needs in order to plan, install and service air conditioning and refrigeration systems. The related classes include electricity and trouble shooting as applied to air conditioning and refrigeration equipment. The curriculum also includes basic courses in humanities to assist the student in social and business communications and to prepare the student to meet the obligations of the citizen in our democratic society.

AIR CONDITIONING AND REFRIGERATION

*Certificate Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
AIRC 11	Air Conditioning I	2	2	3
ELEC 11	Electricity I	4	0	4
MATH 99	Supervised Study (optional)**	2	0	<u>0-2</u>
Total				7-9

*Requires part-time enrollment over a two-year period.

** Required for students having an inadequate background in general mathematics.

ENGINEERING/INDUSTRIAL &
HEALTH TECHNOLOGIES DIVISION

Course Number		Course Title	Lecture Hours	Lab Hours	Course Credits
SECOND QUARTER					
AIRC	12	Air Conditioning II	2	2	3
ELEC	12	Electricity II	4	0	4
MATH	99	Supervised Study (optional)**	2	0	<u>0-2</u>
Total					7-9
THIRD QUARTER					
AIRC	13	Air Conditioning III	2	2	3
ELEC	13	Electricity III	4	0	4
MATH	99	Supervised Study (optional)**	2	0	<u>0-2</u>
Total					7-9
FOURTH QUARTER					
AIRC	14	Air Conditioning IV	2	2	3
ELEC	74	Electric Power	4	0	<u>4</u>
Total					7
FIFTH QUARTER					
AIRC	15	Air Conditioning V	2	2	3
ELEC	75	Electrical & Control Systems	4	0	<u>4</u>
Total					7
SIXTH QUARTER					
AIRC	16	Air Conditioning VI	2	2	3
ELEC	17	Electronic Controls	4	0	<u>4</u>
Total					7

Additional required courses that may be taken any quarter:

ECON	160	Survey of American Economics***	3	0	3
ENGL	101	Communicaton Skills I	3	0	3
GOVT	180	American Constitutional Government***	3	0	3
PSYC	128	Human Relations***	3	0	3

Total Minimum Credits for Air Conditioning Refrigeration Certificate_____ 54

** Required for students having an inadequate background in general mathematics.

*** SOSC 101-102-103 Contemporary American Civilization I-II-III or basic occupational courses in equivalent subject area may be substituted.

APPLIANCE REPAIR AND SERVICING

Degree: Certificate in Appliance Repair and Servicing

Length: Six quarters (part-time)

Purpose: The proper training of appliance service technicians is most important at a time when the average American home includes an estimated fifteen major and portable appliances. Realizing the increasing need for more and better skilled service technicians, this certificate program is designed to meet the needs of persons employed full-time and who wish to improve their competence in major appliance servicing.

Occupational Objectives: Home Appliance Technician
Industrial Appliance Technician

Admission Requirements: In addition to the admission requirements established for the college (as listed in the section on admission requirements in Part II of the catalog), entry into the certificate curriculum in Appliance Servicing requires proficiency in high school English, Mathematics and Science. Students who are not proficient in these subject areas will be required to correct their deficiencies in a Developmental Studies program before entering the curriculum.

Curriculum Requirements: The curriculum in Appliance Repair and Servicing is a six-quarter (part-time) curriculum encompassing such areas as basic technical mathematics, basic electricity, and appliance servicing. Upon completion of the six-quarter curriculum, the student will be awarded a certificate in Appliance Repair and Servicing.

APPLIANCE REPAIR AND SERVICING***Certificate Program**

Course Number		Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER					
ELEC	11	Electricity I	4	0	4
MATH	99	Supervised Study**	3	0	<u>3</u>
Total					7
SECOND QUARTER					
ELEC	12	Electricity II	4	0	4
MATH	99	Supervised Study**	3	0	3
ELEC	118	Introduction to Electrical Shop I	0	3	<u>1</u>
Total					8
THIRD QUARTER					
ELEC	13	Electricity III	4	0	4
MATH	99	Supervised Study**	3	0	3
ELEC	119	Introduction to Electrical Shop II	0	3	<u>1</u>
Total					8
FOURTH QUARTER					
APPL	11	Appliance Repair I	3	3	4
APPL	26	Test Equipment	2	0	<u>2</u>
Total					6
FIFTH QUARTER					
APPL	12	Appliance Repair II	3	3	4
SIXTH QUARTER					
APPL	13	Appliance Repair III	3	3	4
Additional required courses that may be taken any quarter:					
ECON	160	Survey of American Economics***	3	0	3
ENGL	101	Communication Skills I	3	0	3
GOVT	180	American Constitutional Government***	3	0	3
PSYC	128	Human Relations***	3	0	3
Total Minimum Credits for Appliance Repair Servicing Certificate					<u>49</u>

* Requires part-time enrollment over two-year period.

** Credit may be granted by exam.

*** SOSC 101-102-103 Contemporary American Civilization I-II-III or basic occupational courses in equivalent subject area may be substituted.

* ARCHITECTURAL DRAFTING

Degree: Certificate in Architectural Drafting

Length: Six-quarter (part-time) program

Purpose: The certificate program in Architectural Drafting is designed to train persons for full-time employment immediately upon completion of the Community College program.

Occupational Objectives: Architectural Aide
Architectural Draftsman

Admission Requirements: In addition to the admission requirements established for the College, entry into the Architectural Drafting program requires proficiency in high school English, mathematics including one unit of algebra and science.

Program Requirements: This program is designed to provide both the practical experience and technical knowledge required for entry into a career in Architectural Drafting. The curriculum includes Architectural Drafting and related technical courses, and basic courses in humanities, the social sciences and business communications.



* Requires part-time enrollment over a two-year period.

ARCHITECTURAL DRAFTING**** Certificate Program**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ARCH 100	Introduction to Architecture	2	0	2
ARCH 111	Architectural Drafting I Mathematics Elective	1	6	3 <u>3-5</u>
Total				8-10
SECOND QUARTER				
ARCH 112	Architectural Drafting II	1	6	3
ENGL 101	Communication Skills I Mathematics Elective	3	0	3 <u>3-5</u>
Total				9-11
THIRD QUARTER				
ARCH 113	Architectural Drafting III	1	6	3
ECON 160	Survey of American Economics*** Elective	3	0	3 <u>3-5</u>
Total				9-11
FOURTH QUARTER				
ARCH 211	Architectural Drafting IV	1	6	3
GOVT 180	American Constitutional Government***	3	0	3
PSYC 128	Human Relations***	3	0	<u>3</u>
Total				9
FIFTH QUARTER				
ARCH 212	Architectural Drafting V Architectural Elective		6	3 <u>3</u>
Total				6
SIXTH QUARTER				
ARCH 213	Architectural Drafting VI Architectural Elective		6	3 <u>3</u>
Total				6
Total minimum credits for Architectural Drafting Certificate -----				47

** Requires part-time enrollment over a two-year period.

*** A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

ARCHITECTURAL TECHNOLOGY

Degree: Engineering Technology (Architecture) (AAS)

Length: Six-quarter (two-year) program

Purpose: The program in Architectural Technology is both creative and practical; students are exposed to design, construction details and methods, and working drawings. Emphasis is placed on development of drafting ability and comprehension of construction methodology. The program is designed to prepare students for full-time employment immediately upon completion of the community college program.

Occupational Objectives: Successful graduates of this program are presented with varied job opportunities in architectural offices, with building contractors, as factory representatives, and with industries related to Architectural Technology.

Admission Requirements: In addition to the admission requirements established for the college, entry into the Architectural Technology curriculum requires completion of the following high school units or their equivalent as a minimum: 4 units of English, 3 units of mathematics (2 units of algebra and 1 unit of geometry or trigonometry), 1 unit of laboratory science (preferably physical science), and 1 unit of social studies. Students with deficiencies will require Developmental Studies.

Program Requirements: The two-year curriculum in Architectural Technology combines instruction in the many areas required for competence as a draftsman and as an assistant to an architect. Approximately one-half of the curriculum will include courses in architectural technology with the remaining courses in related areas, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in architectural technology. Students are advised to consult with their faculty advisor and the counseling office in planning their program and selecting electives.

ARCHITECTURAL TECHNOLOGY

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ARCH 100	Introduction to Architecture	3	0	3
ARCH 111	Architectural Drafting I	1	6	3
ENGL 101	Communication Skills I	3	0	3
ENGR 100	Introduction to Engineering Technology	1	2	2
GENL 100	Orientation	1	1	1
MATH 121	Engineering Technical Mathematics I	5	0	5
Total				17

ENGINEERING/INDUSTRIAL &
HEALTH TECHNOLOGIES DIVISION

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
SECOND QUARTER				
ARCH 112	Architectural Drafting II	1	6	3
ARCH 141	Materials and Methods of Construction	2	3	3
ENGL 102	Communication Skills II	3	0	3
MATH 122	Engineering Technical Mathematics II	5	0	5
PHYS 111	Technical Physics I	3	3	<u>4</u>
Total				18
THIRD QUARTER				
ARCH 113	Architectural Drafting III	1	6	3
ARCH 142	Materials and Methods of Construction II	3	0	3
ENGL 137	Technical Writing (or SPDR 137)	3	0	3
MATH 123	Engineering Technical Mathematics III	5	0	5
PHYS 112	Technical Physics II	3	3	<u>4</u>
Total				18
FOURTH QUARTER				
ARTS 121	Theory and Practice of Drawing	1	4	3
ARCH 211	Architectural Drafting IV	1	6	3
ARCH 237	Building Mechanical Equipment	3	0	3
ECON 160	Survey of American Economics*	3	0	3
ENGR 151	Mechanics I (Statics)	4	0	4
	Health or Physical Education			<u>1-3</u>
Total				17-19
FIFTH QUARTER				
ARTS 122	Theory and Practice of Drawing II	1	4	3
ARCH 212	Architectural Drafting V	1	6	3
ARCH 236	Building Electric Equipment (or MATH 221)	3-4	0	3-4
ARCH 276	Construction Estimating	3	0	3
ENGR 152	Mechanics II (Strength of Materials)	3	0	3
ENGR 154	Mechanics Laboratory	0	3	1
	Health or Physical Education			<u>2-0</u>
Total				18-17
SIXTH QUARTER				
ARCH 213	Architectural Drafting VI		6	3
ARCH 278	Building Codes, Contract Documents and Professional Office Practices (or MATH 222)	3-4	0	3-4
ARCH 298	Seminar and Project (or ARCH 290)			2
CIVL 181	Surveying I	3	3	4
GOVT 180	American Constitutional Government*	3	0	3
PSYC 128	Human Relations*	3	0	<u>3</u>
Total				18-19
Total Minimum Credits for a Degree in Architectural Technology-----				105
* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.				

AUTOMOTIVE MECHANICS

Degree: Certificate

Length: Four-quarter (one-year) program

Purpose: Complexity in automotive vehicles increases each year because of scientific discovery, new engineering, and new federal regulations. There is a great demand for qualified automotive mechanics to help service the growing number of automobiles in our society.

The Automotive Mechanics curriculum is designed to advance the individual's mechanical knowledge of the principles of operation and theory of modern automobiles, to develop his mechanical skills to a point where he had attained a high degree of proficiency and to develop his interest in an automotive industry career. The curriculum is designed primarily for persons who seek full-time employment in the automotive field immediately upon completion of the community college program.

Occupational Objectives:

Automotive Diagnostician
Repair Service Estimator
Repair Service Writer

Repair Technician
Service Manager

Admission Requirements: In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), a good understanding of mathematics is usually required for entry into the program, as well as results of any tests that may be required by the Counseling Department. Students who do not meet these requirements will be required to correct their deficiencies in Developmental Studies.

AUTOMOTIVE MECHANICS**One-Year Certificate Program**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
AUTO 111	Automotive Engines I	3	3	4
AUTO 136	Automotive Lubrication & Cooling Systems	2	3	3
DRFT 144	Automotive Drawing Interpretation I	2	0	2
ENGL 101	Communication Skills	3	0	3
GENL 100	Orientation	1	1	1
MATH 99	Supervised Study	3	0	3
WELD 27	Arc Welding	1	3	<u>2</u>
Total				18
SECOND QUARTER				
AUTO 112	Automotive Engines II	3	3	4
AUTO 121	Automotive Fuel Systems I	3	3	4
GOVT 180	American Constitutional Government*	3	0	3
MATH 99	Supervised Study	3	0	3
MECH 20	Machine Shop Practice	0	6	2
PHYS 14	Applied Physics I	2	0	<u>2</u>
Total				18
THIRD QUARTER				
AUTO 122	Automotive Fuel Systems II	3	3	4
AUTO 151	Automotive Power Trains I	2	6	4
AUTO 290	Coordinated Internship	0	10	2
ECON 160	Survey of American Economics	3	0	3
PSYC 128	Human Relations	3	0	3
WELD 57	Oxyacetylene Welding & Cutting	1	3	<u>2</u>
Total				18
FOURTH QUARTER				
AUTO 267	Automotive Suspension & Braking Systems	3	3	4
AUTO 241	Automotive Electricity I	3	3	4
AUTO 254	Automatic Transmissions I	3	3	4
AUTO 284	Automotive Service Procedures	2	3	3
AUTO 290	Coordinated Internship	0	10	<u>2</u>
Total				17
Total Minimum Credits for Automotive Mechanics Certificate.....				71

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

AUTOMOTIVE TECHNOLOGY

Degree: Diploma

Length: Six-quarter (two-year) program

Purpose: Complexity in automotive vehicles increases each year because of scientific discovery, new engineering and new federal regulations. There is a great demand for qualified automotive technicians and diagnosticians to help service the growing number of automobiles in our society.

The Automotive Technology curriculum is designed to advance the individual's mechanical knowledge of the principles of operation and theory of modern automobiles, to develop his mechanical skills to a point where he has attained a high degree of proficiency and to develop his interest in an automotive industry career. The curriculum is designed primarily for persons who seek full-time employment in the automotive field immediately upon completion of the community college program. For one to advance successfully in this program of study, a thorough understanding of automobile basic operating principles, repair techniques, and repair skills is required. The curriculum is designed to provide a two-phase approach to automotive career development. The first develops his knowledge of the operating principles of automobile components, repair techniques, and operation of an automotive repair business. The second phase develops his ability to intelligently and effectively analyze automobile defects, repair and adjustment needs, along with the estimation of customer cost for the repairs and adjustments.

Occupational Objectives:

Automotive Diagnostician	Repair Service Salesman
Automotive Technician	Repair Service Writer
Auto Parts Sales and Service	Repair Technician
Customer Service Representative	Service Manager
Repair Service Estimator	Tune-up Specialist

Admission Requirements: In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), a good understanding of mathematics is usually required for entry into the program, as well as results of any tests that may be required by the Counseling Department. Students who do not meet these requirements will be required to correct their deficiencies in Developmental Studies.

AUTOMOTIVE TECHNOLOGY**Two-Year Diploma Program**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
AUTO 111	Automotive Engines I	3	3	4
AUTO 136	Automotive Lubrication & Cooling Systems	2	3	3
DRFT 144	Automotive Drawing Interpretation I	2	0	2
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
MATH 99	Supervised Study			3
WELD 27	Arc Welding	1	3	<u>2</u>
Total				18
SECOND QUARTER				
AUTO 112	Automotive Engines II	3	3	4
AUTO 121	Automotive Fuel Systems I	3	3	4
ENGL 102	Communication Skills II (optional)			0.3
MATH 99	Supervised Study			3
PHYS 14	Applied Physics I	2	0	2
WELD 57	Oxyacetylene Welding & Cutting	1	3	2
Total				15-18
THIRD QUARTER				
AUTO 122	Automotive Fuel Systems II	3	3	4
AUTO 154	Automotive Power Trains I	3	3	4
AUTO 199	Supervised Study			2
PHYS 16	Applied Physics III	3	0	3
MECH 20	Machine Shop Practice	0	6	2
SPDR 137	Public Speaking (optional)			<u>0.3</u>
Total				15-18
FOURTH QUARTER				
AUTO 241	Automotive Electricity I	3	3	4
AUTO 254	Automatic Transmissions I	3	3	4
AUTO 267	Automotive Suspension & Braking Systems	3	3	4
AUTO 287	Shop Management I	3	0	3
GOVT 180	American Constitutional Government*	3	0	<u>3</u>
Total				18

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

ENGINEERING/INDUSTRIAL &
HEALTH TECHNOLOGIES DIVISION

81

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIFTH QUARTER				
AUTO 242	Automotive Electricity II	3	3	4
AUTO 255	Automatic Transmissions II	3	3	4
AUTO 284	Automotive Service Procedures & Tune Up I	2	3	3
AUTO 288	Shop Management II	3	0	3
ECON 160	Survey of American Economics*	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			18-20
SIXTH QUARTER				
AUTO 238	Automotive Air Conditioning	3	0	3
AUTO 268	Automotive Alignment	1	3	2
AUTO 285	Automotive Service Procedures & Tune Up II	2	3	3
AUTO 290	Coordinated Internship (or AUTO 298)			3
PSYC 128	Human Relations*	3	0	3
	Health, Physical Education, or Recreation			<u>2-3</u>
	Total			16-17
Total Minimum Credits for Automotive Technology Diploma-----				100

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

CIVIL ENGINEERING TECHNOLOGY

Degree: Engineering Technology (Civil) (AAS)

Length: Six-quarter (two-year) program

Purpose: The Associate in Applied Science Degree program in Civil Engineering Technology is designed to develop qualified engineering technicians for the field of civil technology. The technician will learn to communicate mathematically, scientifically, and linguistically with craftsmen to supplement and assist in the work of the engineer and scientist. Typical among the array of semiprofessional functions performed by the technologist are: drafting, design, development, research, supervision, technical sales, testing, and engineering aide.

Occupational Objective: Civil Engineering Technician

Admission Requirements: In addition to the admission requirements established for the college, entry into the Civil Engineering Technology curriculum requires completion of the following high school units or their equivalent as a minimum: 4 units of English, 3 units of mathematics (2 units of algebra and 1 unit of geometry or trigonometry), 1 unit of laboratory science (preferably physical science), and 1 unit of social studies. Students with deficiencies will require Developmental Studies.

Program Requirements: Approximately one-half of the curriculum will include courses in Civil Engineering Technology with the remaining courses in related areas, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in civil engineering technology. Students are advised to consult with their faculty advisor and the counseling office in planning their program and selecting electives.

CIVIL ENGINEERING TECHNOLOGY

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
CIVL 140	Construction Planning	3	0	3
DRFT 111	Technical Drafting I	1	3	2
ENGL 101	Communication Skills I	3	0	3
ENGR 100	Introduction to Engineering Technology	1	2	2
GENL 100	Orientation	1	1	1
MATH 121	Engineering Technical Mathematics	5	0	5
	Health, Physical Education, or Recreation			<u>1-3</u>

Total

17-19

ENGINEERING/INDUSTRIAL &
HEALTH TECHNOLOGIES DIVISION

83

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
SECOND QUARTER				
CIVL 124	Civil Engineering Drafting I	1	3	2
ENGL 102	Communication Skills II	3	0	3
GOVT 180	American Constitutional Government*	3	0	3
MATH 122	Engineering Technical Mathematics II	5	0	5
PHYS 111	Technical Physics I	3	3	4
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			18-20
THIRD QUARTER				
CIVL 125	Civil Engineering Drafting II	1	3	2
ENGR 151	Mechanics I (Statics)	4	0	4
MATH 123	Engineering Technical Mathematics III	5	0	5
PHYS 112	Technical Physics II	3	3	4
ENGL 137	Technical Writing or SPDR 137	3	0	<u>3</u>
	Total			18
FOURTH QUARTER				
CIVL 181	Surveying I	3	3	4
CIVL 246	Soil Mechanics	3	0	3
CIVL 247	Soil Mechanics Laboratory	0	3	1
CIVL 254	Civil Materials I (Concrete)	3	0	3
CIVL 257	Concrete Laboratory	0	3	1
ENGR 152	Mechanics II (Strength of Materials)	3	0	3
ENGR 154	Mechanics Laboratory	0	3	1
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			17-19
FIFTH QUARTER				
CIVL 182	Surveying II	3	3	4
CIVL 230	Structural Analysis	3	0	3
ECON 160	Survey of American Economics*	3	0	3
	Technical Electives			<u>8</u>
	Total			18
SIXTH QUARTER				
PSYC 128	Human Relations*	3	0	3
	Technical Electives			<u>15-16</u>
	Total			18-19

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

Technical Electives**Fifth Quarter**

CIVL 268	Water and Sewage Systems (3 cr.)
CIVL 276	Traffic & Transportation Technology (4 cr.)
MATH 221	Advanced Engineering Technical Mathematics I (4 cr.)

Sixth Quarter

CIVL 217	Structural Steel Design (4 cr.)
CIVL 218	Reinforced Concrete Design (4 cr.)
CIVL 255	Civil Materials II (3 cr.)
CIVL 258	Bituminous Laboratory (1 cr.)
CIVL 284	Route Surveying and Highway Design (4 cr.)
MATH 222	Advanced Engineering Technical Mathematics II (4 cr.)

Total Minimum Credits for Civil Engineering Technology Degree -----106

ELECTRICAL/ELECTRONICS ENGINEERING TECHNOLOGY

Degree: Engineering Technology (Electrical/Electronics) (AAS)

Length: Six-quarter (two-year) program

Purpose: The rapidly expanding electronics industries have created a great demand for qualified engineering technicians. In recent years the fields of electrical science and electronics have overlapped until today the two are extremely similar. Because of this similarity the educational requirements for students entering these fields are similar.

In order to provide the flexibility required by the large variety of positions available in the electronics industries, the curriculum offers a solid foundation in mathematics, science, and electronics. The Electrical/Electronics Engineering Technology curriculum is designed for persons seeking employment in electrical and electronics engineering technology immediately upon completion of the community college program.

Occupational Objectives: Communication Electronics
Electrical/Electronics Engineering Technician
Industrial Electrical/Electronics

Admission Requirements: In addition to the admission requirements established for the college, entry into the curriculum in Electrical/Electronics Engineering Technology requires the satisfactory completion of the following high school units or their equivalent as a minimum: 4 units of English, 3 units of mathematics (2 units of algebra, 1 unit of geometry or trigonometry), 1 unit of laboratory science (preferably a physical science), and 1 unit of social studies. Students with deficiencies will require Development Studies.

Program Requirements: Approximately one-half of the curriculum will include courses in electrical/electronics engineering technology with the remaining courses in related areas, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in electrical and electronics engineering technology. Students are advised to consult with their faculty advisor and the counseling office in planning their program and selecting electives.

In order to specialize in the second year each student may select an option as follows: Communications (ELEC 241-242-243), or Power (ELEC 211-212-213).

**ELECTRICAL/ELECTRONICS ENGINEERING
TECHNOLOGY****Associate in Applied Science Degree Program**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ELEC 111	Electrical Circuits I	3	3	4
ENGL 101	Communication Skills I	3	0	3
ENGR 100	Introduction to Engineering	1	2	2
GENL 100	Orientation	1	1	1
GOVT 180	American Constitutional Government*	3	0	3
MATH 121	Engineering Technical Mathematics I	5	0	<u>5</u>
Total				18
SECOND QUARTER				
ELEC 112	Electrical Circuits II	5	3	6
ENGL 102	Communication Skills II	3	0	3
MATH 122	Engineering Technical Mathematics II	5	0	5
PHYS 111	Technical Physics I	3	3	<u>4</u>
Total				18
THIRD QUARTER				
ELEC 125	Introduction to Electronics	4	3	5
ENGL 137	Technical Report Writing (or SPDR 137)	3	0	3
MATH 123	Engineering Technical Mathematics III	5	0	5
PHYS 112	Technical Physics	3	3	4
	Health, Physical Education, or Recreation			<u>1-3</u>
Total				18-20
FOURTH QUARTER				
DRFT 158	Electrical/Electronics Drafting	1	3	2
ELEC 118	Electrical Shop	0	3	1
ELEC 201	Electrical Engineering Technology	5	3	6
ELEC 276	Instruments and Measurements	3	3	4
	Technical Option	3	3	4
	Health, Physical Education, or Recreation			<u>1-3</u>
Total				18-20

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

ENGINEERING/INDUSTRIAL &
HEALTH TECHNOLOGIES DIVISION

87

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
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FIFTH QUARTER

ELEC 119	Electrical Shop II	0	3	1
ELEC 202	Electrical Engineering Technology II	5	6	7
PSYC 128	Human Relations*	3	0	3
	Technical Option	3	3	4
	Technical Elective			<u>3-4</u>
	Total			18-19

SIXTH QUARTER

ECON 160	Survey of American Economics*	3	0	3
ELEC 203	Electrical Engineering Technology III	5	3	6
ELEC 298	Seminar and Project	0	0	1
	Technical Option	3	3	4
	Technical Elective			3-4
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			18-21

Technical Options

ELEC 241	Communications I (4 cr.)
ELEC 242	Communications II (4 cr.)
ELEC 243	Communications Systems (4 cr.)
ELEC 211	Electrical Machines (4 cr.)
ELEC 212	Electrical Machines and Industrial Controls (4 cr.)
ELEC 213	Advanced Industrial Controls (4 cr.)

Technical Electives

ELEC 145	Introduction to Electrical Machines (4 cr.)
ELEC 248	Microwave Techniques (3 cr.)
ENGR 206	Engineering Economy (3 cr.)
INDT 170	Industrial Management (3 cr.)
MATH 221	Engineering Technical Mathematics I
MATH 222	Engineering Technical Mathematics II

Total Minimum Credits for Electrical/Electronics Engineering Technology Degree -----108

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

*ELECTROMECHANICAL TECHNOLOGY

Degree: Associate in Applied Science

Length: Twelve-quarter (part-time) program

Purpose: Recent developments in industrial techniques have created certain occupations in which a knowledge of the electronics and mechanical interrelationships is compulsory. The Electromechanical Technology curriculum is designed to afford specialized training by providing a broad base of mathematics and science with applications in both the electronics and mechanical fields.

Occupational Objectives: The Electromechanical Technician has employment opportunities with industry and business in maintenance, production, research or sales as a field service engineer, sales representative, engineering technician or quality control technician.

Admission Requirements: In addition to the admission requirements established for the college, entry into the curriculum in Electromechanical Technology requires the satisfactory completion of the following high school units or equivalent as a minimum: 4 units of English; 2 units of mathematics (other than general mathematics).

Program Requirements: The Electromechanical Technology curriculum has been developed with emphasis on electrical and mechanical principles rather than on specific applications of these principles. Where applications have been incorporated in the course, electrical and mechanical systems are studied together and not as separate entities. Basic courses in the humanities are included to assist the student to meet the obligations of the citizen in our democratic society. Approximately one-half of the curriculum will include courses in Electromechanical Technology with the remaining courses in related areas, general education, and electives. Students are advised to consult with their faculty advisor and the counseling office in planning their program and selecting electives.

ELECTROMECHANICAL TECHNOLOGY

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ENGR 100	Introduction to Engineering Technology	1	2	2
MATH 111	Technical Mathematics I	3	0	<u>3</u>
	Total			5
SECOND QUARTER				
MATH 112	Technical Mathematics II	3	0	3
PHYS 111	Technical Physics I	3	3	<u>4</u>
	Total			7
THIRD QUARTER				
MATH 113	Technical Mathematics III	3	0	3
PHYS 112	Technical Physics II	3	3	<u>4</u>
	Total			7
FOURTH QUARTER				
ELEC 114	Fundamentals of Direct Current	3	3	4
MATH 211	Advanced Technical Mathematics	3	0	<u>3</u>
	Total			7
FIFTH QUARTER				
ELEC 115	Fundamentals of Alternating Current	3	3	4
ENGR 151	Mechanics	4	0	<u>4</u>
	Total			8
SIXTH QUARTER				
ELEC 116	Introduction to Circuit Analysis	3	3	4
ENGR 152	Mechanics II	3	0	<u>3</u>
	Totals			7
SEVENTH QUARTER				
DRFT 199	Supervised Study	2	2	3
ELEC 121	Solid State Electronics	3	3	<u>4</u>
	Totals			7

ENGINEERING/INDUSTRIAL &
HEALTH TECHNOLOGIES DIVISION

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
EIGHTH QUARTER				
MECH 156	Mechanisms	1	3	2
MECH 267	Fluid Mechanics	3	3	<u>4</u>
	Total			6
NINTH QUARTER				
MECH 131	Machine Laboratory I	1	3	2
MECH 269	Hydraulics and Pneumatics	3	3	<u>4</u>
	Total			6
TENTH QUARTER				
ELEC 261	Electromechanical Systems	3	3	4
MECH 264	Thermodynamics I	3	0	<u>3</u>
	Totals			7
ELEVENTH QUARTER				
ELEC 262	Electromechanical Systems II	3	3	4
WELD 100	Fundamentals of Welding	1	3	<u>2</u>
	Total			6
TWELFTH QUARTER				
ELEC 263	Electromechanical Systems II	4	3	5
Additional required courses that may be taken any quarter:				
ECON 160	Survey of American Economics	3	0	3
ENGL 101	Communication Skills I	3	0	3
ENGL 102	Communication Skills II	3	0	3
ENGL 137	Technical Writing or SPDR 137 Public Speaking	3	0	3
GOVT 180	American Constitutional Government	3	0	3
HLTH 110	Concepts of Personal and Community Health	3	0	3
PSYC 128	Human Relations	3	0	3
Total Minimum Credits for Electromechanical Technology -----				99

ENGINEERING

Degree: Associate in Science (Engineering) (AS)

Length: Six-quarter (two-year) program

Purpose: The demand for technically trained people is increasing rapidly in Virginia as well as throughout the world. The engineer is a most important member of the technical team which includes the scientist, technician, and skilled craftsman. Opportunities are unlimited for men and women in the field of engineering. Science is so diversified now that one may enter almost any specialization and find employment. The preparation for the engineering profession is based on a vigorous program especially in mathematics and science.

The Associate in Science Degree program in Engineering is designed for persons who plan to transfer to a four-year college or university to complete a baccalaureate degree program in one of the following fields:

Aerospace	Chemical	Mechanical
Agriculture	Civil	Metallurgical
Architecture	Electrical	Mining
Ceramics	Industrial	Nuclear

Admission Requirements: In addition to the admission requirements established for the college, entry into the Engineering curriculum requires satisfactory completion of the following high school units or equivalent as a minimum: 4 units of English; 4 units of mathematics (2 units of algebra, 1 unit of plane geometry, 1 unit of advanced math or trigonometry and solid geometry); 1 unit of a laboratory science; and 1 unit of social studies. Students with deficiencies will require Developmental Studies.

Program Requirements: This program includes the courses usually required in the first two years of a baccalaureate engineering curriculum. Students are urged to acquaint themselves with the requirements of the major department in the college or university to which transfer is contemplated and also to consult with the counseling office of the community college in planning their program and selecting electives. In order to prepare for junior class standing at a four-year college or university, the student usually must complete a program at the community college which is comparable in length and course content to the first two years of the program at the four-year institution.

ENGINEERING*Associate in Science Degree**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
CHEM 111	General Inorganic Chemistry I	3	3	4
ENGL 111	English Composition	3	0	3
ENGR 101	Introduction to Engineering	1	2	2
ENGR 121	Engineering Graphics I	1	3	2
GENL 100	Orientation	1	1	1
MATH 141	Introductory Mathematical Analysis I	5	0	5
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			18-20
SECOND QUARTER				
CHEM 112	General Inorganic Chemistry II	3	3	4
ENGL 112	English Composition	3	0	3
ENGR 102	Introduction to Engineering Methods	1	2	2
ENGR 122	Engineering Graphics II	1	3	2
MATH 142	Introductory Mathematical Analysis II	5	0	5
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			17-19
THIRD QUARTER				
CHEM 113	General Inorganic Chemistry III	3	3	4
ENGL 113	English Composition	3	0	3
ENGR 103	Conceptual Design and Analysis	1	2	2
ENGR 123	Engineering Graphics III	1	3	2
MATH 143	Introductory Mathematical Analysis III	5	0	5
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			17-19
FOURTH QUARTER				
ECON	Economics* *	3	0	3
ENGR 201	Mechanics of Particles	5	0	5
HIST	History (or Elective)			3-4
MATH 241	Advanced Mathematical Analysis I	4	0	4
	Elective			3
	Total			18-19

* The Engineering student is encouraged to take approximately 18 hours each quarter so he may obtain full Junior standing upon transfer.

** A year sequence of Social Science is recommended in lieu of the Government-Economics-Psychology requirement.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIFTH QUARTER				
ENGR 202	Mechanics of Deformable Solids	5	0	5
ENGR 206	Engineering Economy (or Elective)	3	0	3
MATH 242	Advanced Mathematical Analysis II	4	0	4
PHYS 222	General University Physics II	3	3	4
	Elective			<u>2-3</u>
	Total			18-19
SIXTH QUARTER				
ENGR 203	Dynamics of Rigid Bodies	3	0	3
MATH 243	Advanced Mathematical Analysis III	4	0	4
PHYS 223	General University Physics III	3	3	4
PSYC	Psychology**	3	0	3
GOVT	Government**	<u>3</u>	<u>0</u>	<u>3</u>
	Total	16	3	17
Total Minimum Credits for Engineering Degree -----				105

** A year sequence of Social Science is recommended in lieu of the Government-Economics-Psychology requirement.

ENGINEERING/TECHNICAL ASSISTANT

Degree: Certificate

Length: Three-quarter (one-year) program

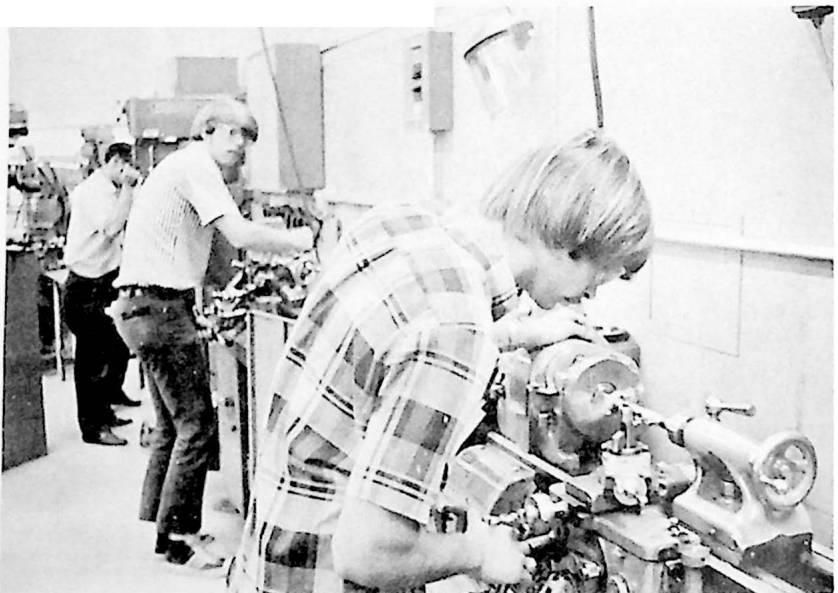
Purpose: This program is designed to provide persons with the necessary background to continue their education and training by:

1. Accepting immediate employment that would offer on-the-job training in a technically oriented type of position such as Engineering Assistant or Aid.
2. Enrolling in an associate degree program in Architectural Technology, Civil Engineering Technology, Electrical/Electronics Engineering Technology, Mechanical Engineering Technology, or Pre-Engineering. A significant amount of course work could be considered for transfer credit towards those associate degree programs.

Occupational Objectives: Engineering Assistant or Aid

Admission Requirements: Admissions to the program, in addition to the requirements for general admission to the college, requires that the student show satisfactory aptitude for the engineering technology field as measured by aptitude tests administered by the college counseling office.

Program Requirements: The Engineering/Technical Assistant program is designed to prepare students to enter into one of the engineering technology curricula, pre-engineering, or to work as an engineering assistant or aid. Approximately one-half of the curriculum will include courses in engineering technology subjects and the remaining courses in related subjects and general education.



ENGINEERING/TECHNICAL ASSISTANT

One-Year Certificate Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
DRFT 111	Technical Drafting I (or Technical Elective)			2-3
ECON 160	Survey of American Economics*	3	0	3
ENGL 101	Communication Skills I	3	0	3
MATH	Mathematics			3-5
	Technical Elective			<u>3-4</u>
	Total			14-18
SECOND QUARTER				
DRFT 112	Technical Drafting II (or Technical Elective)	1	3	2-3
ENGL 102	Communication Skills II	3	0	3
GOVT 180	American Constitutional Government*	3	0	3
MATH	Mathematics			3-5
	Technical Elective			<u>3-4</u>
	Total			14-18
THIRD QUARTER				
DRFT 113	Technical Drafting (or Technical Elective)	1	3	2-3
ENGL 137	Technical Writing	3	0	3
ENGR 100	Introduction to Engineering Technology	1	2	2
MATH	Mathematics			3-5
PSYC 128	Human Relations*	3	0	3
	Technical Elective			<u>3-4</u>
	Total			16-20

Total Minimum Credits for Engineering/Technical Assistant Certificate ----- 45

Technical Electives:

ARCH 141	Materials and Methods of Construction I (3 cr.)
ARCH 142	Materials and Methods of Construction II (3 cr.)
CIVL 124-125	Civil Engineering Drafting I-II (2 cr.) (2 cr.)
CIVL 140	Construction Planning (3 cr.)
CIVL 181	Surveying I (4 cr.)
DRFT 158	Electrical-Electronics Drafting (2 cr.)
ELEC 11-12-13	Electricity I-II-III (4 cr.) (4 cr.) (4 cr.)
ELEC 118-119	Introduction to Electrical Shop I-II (1 cr.) (1 cr.)
INDT 111-112	Materials and Processes of Industry I-II (3 cr.) (3 cr.)
MECH 131-132	Machine Laboratory I-II (2 cr.) (2 cr.)
WELD 27	Arc Welding (2 cr.)
WELD 57	Oxyacetylene Welding & Cutting (2 cr.)
Weld 115	Arc & Gas Welding (4 cr.)
	Others with departmental approval

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

INDUSTRIAL MANAGEMENT

Degree: Certificate

Length: Three-quarter (one-year) program

Purpose: With the rapid growth of the business, machine, and manufacturing industries in the local area and in Virginia, a shortage of well-trained, qualified personnel to assist in plant management has developed. This certificate program is designed primarily for those presently employed in an industrial occupation, who are operating in management capacity, or for those who may be seeking a promotion and have potential for a management position. The program purpose is to develop fundamental skills, knowledge, attitudes and experiences, which will enable the graduate to function in positions of responsibility.

Occupational Objectives: Time Study Technician
Methods Study Technician
Materials Control
Supervisor of Production
Foreman

Admission Requirements: In addition to the admissions requirements (as listed in the catalogue) entry into the Industrial Management program requires a high school diploma or equivalent. Students who do not meet these requirements may be permitted to correct their deficiencies in the Developmental Studies program.

Program Requirements: This program is designed to offer general education courses along with special courses in the field of Industrial Management which are essential for the success of the graduate.

INDUSTRIAL MANAGEMENT

One-Year Certificate Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
DRFT 171	Blueprint Reading I (or DRFT Elective)	1	3	2
ECON 160	Survey of American Economics*	3	0	3
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
INDT 111	Materials & Processes of Industry I (or Elective)	3	0	3
INDT 176	Industrial Safety	2	0	2
MATH	Mathematics Elective			<u>3-5</u>
	Total			17-19
SECOND QUARTER				
ENGL 137	Technical Writing	3	0	3
GOVT 180	American Constitutional Government*	3	0	3
INDT 112	Materials & Processes of Industry II (or Elective)	3	0	3
INDT 170	Industrial Management	3	0	3
MATH	Mathematics Elective			3-5
MECH 131	Machine Laboratory I (or Elective)	1	3	<u>2</u>
	Total			17-19
THIRD QUARTER				
DAPR 106	Principles of Data Processing	3	0	3
MECH 132	Machine Laboratory II (or Elective)	1	3	2
PSYC 128	Human Relations*	3	0	3
	Technical Electives			<u>9</u>
	Total			17
Total Minimum Credits for Industrial Management Certificate.....				51

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

MECHANICAL ENGINEERING TECHNOLOGY

Degree: Engineering Technology (Mechanical) (AAS)

Length: Six-quarter (two-year) program

Purpose: The Associate in Applied Science Degree curriculum in Mechanical Engineering Technology is designed to prepare young men and women for industrial employment as mechanical engineering technicians immediately upon the completion of the community college program. The field embraces the manufacture and production of mechanical products and the tools, machines, and processes by which they are made. In a broad sense, mechanical technology is the creation and utilization of mechanical power which enters into every business, industrial, and community activity.

Occupational Objectives: The Mechanical Engineering Technician usually serves as a liaison between the engineering and production departments working with the design and development of engineering plans. He may serve as a draftsman or drafting supervisor. His responsibilities may include estimating, inspecting and testing engineering equipment; operating, maintaining, and repairing engineering plants; research and development; sales and representation; consumer advice; training and education.

Admission Requirements: In addition to the admission requirements established for the college, entry into the Mechanical Engineering Technology program requires satisfactory completion of the following high school units or equivalent as a minimum: 4 units of English; 3 units of mathematics (2 units of algebra and 1 unit of geometry or trigonometry); 1 unit of laboratory science (preferably a physical science); and 1 unit of social studies. Students with deficiencies will require Developmental Studies.

Program Requirements: Approximately one-half of the curriculum will include courses in Mechanical Engineering Technology with the remaining courses in related areas, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in mechanical engineering technology. Students are advised to consult with their faculty advisor and the counseling office in planning their program and selecting electives.

MECHANICAL ENGINEERING TECHNOLOGY**Associate in Applied Science Degree**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
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FIRST QUARTER

DRFT 111	Technical Drafting I	1	3	2
ENGL 101	Communication Skills I	3	0	3
ENGR 100	Introduction to Engineering Technology	1	2	2
GENL 100	Orientation	1	1	1
INDT 111	Materials and Processes of Industry I	3	0	3
MATH 121	Engineering Technical Mathematics	5	0	5
MECH 131	Machine Laboratory	1	3	<u>2</u>
Total				18

SECOND QUARTER

DRFT 112	Technical Drafting II	1	3	2
ENGL 102	Communication Skills II	3	0	3
INDT 112	Materials and Processes of Industry II (or INDT Elective)	3	0	3
MATH 122	Engineering Technical Mathematics II	5	0	5
PHYS 111	Technical Physics I Health, Physical Education, or Recreation	3	3	4
				<u>1-3</u>
Total				18-20

THIRD QUARTER

DRFT 113	Technical Drafting III	1	3	2
ENGL 137	Technical Writing or SPDR 137 Public Speaking	3	0	3
ENGR 151	Mechanics I (Statics)	4	0	4
MATH 123	Engineering Technical Mathematics III	5	0	5
PHYS 112	Technical Physics II	3	3	<u>4</u>
Total				18

FOURTH QUARTER

ECON 160	Survey of American Economics*	3	0	3
ELEC 214	Electricity	3	3	4
ENGR 152	Mechanics II (Strength of Materials)	3	0	3
ENGR 154	Mechanics Laboratory	0	3	1
MECH 156	Mechanisms	1	3	2
MECH 267	Fluid Mechanics Health, Physical Education, or Recreation	3	3	4
				<u>1-3</u>
Total				18-20

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

ENGINEERING/INDUSTRIAL &
HEALTH TECHNOLOGIES DIVISION

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIFTH QUARTER				
MECH 237	Machine Design	3	3	4
MECH 246	Metallurgy	3	3	4
MECH 264	Thermodynamics	3	3	4
PSYC 128	Human Relations*	3	0	3
	Technical Elective			<u>3-4</u>
	Total			18-19
SIXTH QUARTER				
GOVT 180	American Constitutional Government*	3	0	3
MECH 298	Seminar and Project			2
	Technical Electives			12
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			18-20

Technical Electives**Fifth Quarter**

ENGR 206	Engineering Economy (3 cr.)
INDT 170	Industrial Management (3 cr.)
MATH 221	Engineering Technical Mathematics I (4 cr.)

Sixth Quarter

MATH 222	Engineering Technical Mathematics II (4 cr.)
MECH 238	Machine Design II (4 cr.)
MECH 265	Thermodynamics II (4 cr.)
WELD 115	Arc and Gas Welding (4 cr.)

Total Minimum Credits for the Mechanical Engineering Technology Degree... 108

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

DENTAL ASSISTANT

Degree: Certificate in Dental Assistance

Length: Four-quarter (one-year) program

Purpose: The program will enable the student to become a Trained Dental Assistant. In addition to specialized preclinical science courses, the student will receive instruction in clinical science courses. The students will have access to clinical facilities where they will work with dentists, learning the newer techniques of four-handed dentistry.

Occupational Objectives: Employment opportunities for the dental assistant include:

Private Dental Practice	Hospital Dental Service
Group Dental Practice	Government Service
Dental Specialty Practice	Dental Assisting Education

Admission Requirements: In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of the catalog), entry into the Certificate curriculum in Dental Assistance requires the satisfactory completion of the following high school units or their equivalent as a minimum:

- 4 units English
- 1 unit Mathematics
- 2 units Social Studies
- 1 unit of Laboratory Science (preferably Biology)

One unit of high school chemistry is also strongly recommended.

Students who do not meet these requirements may be permitted to correct their deficiencies in Developmental Studies. A personal interview by the Counseling Department and Dental faculty is required.

Program Requirements: Upon admission, and during the course of the program the dental faculty will carefully observe and evaluate the student's suitability for dental assisting. If, in the opinion of the Dental Assistant faculty, the student does not exhibit appropriate demeanor, she may be asked to withdraw from the dental assistant program.

Students will be totally responsible for transportation to and from the College and health agencies utilized for clinical experiences. The purchase of items such as uniforms and accessories are the financial responsibility of the individual student.

DENTAL ASSISTANT**One-Year Certificate Program**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
DENT 100	Introduction to Dental Auxiliaries	2	3	3
DENT 101	Dental Science I	2	4	4
DENT 110	Introduction to Dental Materials	2	4	4
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
HLTH 100	Orientation to Allied Health Careers	1	0	1
SECR 156	Personal Development	3	0	<u>3</u>
Total				19
SECOND QUARTER				
DENT 102	Dental Science II	2	4	4
DENT 111	Clinical Procedures I	2	4	4
DENT 121	Chairside Assisting I	2	6	4
GOVT 180	American Constitutional Government**	3	0	3
SPDR 137	Public Speaking	3	0	<u>3</u>
Total				18
THIRD QUARTER				
DENT 103	Dental Science III	2	4	4
DENT 112	Clinical Procedures II	2	4	4
DENT 122	Chairside Assisting II	2	6	4
PSYC 128	Human Relations**	3	0	3
SECR 138	Office Recordkeeping	2	2	<u>3</u>
Total				18
FOURTH QUARTER				
DENT 190	Coordinated Practice	0	15	5
DENT 198	Seminar & Project	2	3	3
ECON 160	American Economics**	3	0	3
SECR 111	Typewriting I*	2	3	3
SECR 139	Clerical Procedures	2	2	<u>3</u>
Total				17
Total Minimum Credits for Dental Assistant Certificate -----				72

* With typing proficiency demonstrated, elective may be substituted.

** A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

MENTAL HEALTH TECHNOLOGY

Degree: Health Technology (Mental Health) (AAS)

Length: Six-quarter (two-year) program

Purpose: The two-year Associate Degree Mental Health Technology program is designed to prepare selected students to qualify as contributing members of the mental health team, rendering direct patient/client care as "people-workers" who counsel and guide the patients/clients through therapeutic, remedial, and rehabilitative treatment activities.

Occupational Objectives: Employment opportunities for the Mental Health Associate include staff positions in: community mental health centers; consultation and education programs; day care programs, halfway houses; institutions for the mentally retarded; mental health associations; psychiatric clinics; psychiatric units of general hospitals; sheltered workshops; and state mental hospitals.

Admission Requirements: In addition to the admission requirements established for the college, entry into the Mental Health Technology program requires evidence of the applicant's absence of disqualifying personality problems and an interest in and aptitude for relating comfortably to others in a therapeutic manner. Students with deficiencies will require Developmental Studies.

Program Requirements: Coordinated practice will be provided in the local Veterans Administration hospital and in various social and health agencies in the community college region.

If, in the opinion of the faculty responsible for this curriculum, the student does not exhibit appropriate demeanor or fails to demonstrate the requisite personality characteristics sought in this type worker, he/she may be asked to withdraw from the program.

Each student is responsible for his transportation to and from the health and social agencies utilized for clinical experiences.

MENTAL HEALTH TECHNOLOGY

Associate in Applied Science Degree

FIRST QUARTER

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
ENGL	English	3	0	3
GENL 100	Orientation	1	1	1
GOVT	Government*	3	0	3
HLTH 100	Orientation to Allied Health Careers	1	0	1
HLTH 104	First Aid I	1	2	2
MENT 104	Introduction to Mental Health I	2	3	3
PSYC 130	Child Growth & Development	3	0	3
Total				16

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 129.

ENGINEERING/INDUSTRIAL &
HEALTH TECHNOLOGIES DIVISION

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
SECOND QUARTER				
ENGL	English	3	0	3
MENT 105	Introduction to Mental Health II	2	3	3
MENT 190	Coordinated Practice			1-5
PHED 102	Recreational Therapy Activities	1	1	1
PSYC 110	Principles of Applied Psychology	3	0	3
SOCI 101	Introductory Sociology I	3	0	<u>3</u>
Total				14-18
THIRD QUARTER				
ENGL	English	3	0	3
MENT 190	Coordinated Practice			1-5
NASC 100	Survey of Natural Science	3	2	4
PSYC 116	The Psychology of Personal Adjustment	3	0	3
PSYC 199	Supervised Study	3	0	3
SOCI 102	Introductory Sociology II	3	0	<u>3</u>
Total				17-21
FOURTH QUARTER				
MENT 221	Mental Health I	3	0	3
MENT 290	Coordinated Practice			1-5
SOCI 103	Introductory Sociology III	3	0	3
SOCI 186	Social Problems I	3	0	3
SOCI 236	Marriage and the Family	3	0	<u>3</u>
Total				13-17
FIFTH QUARTER				
ECON	Economics*	3	0	3
MENT 222	Mental Health II	3	0	3
MENT 290	Coordinated Practice			1-5
SPDR 137	Speech Communications	3	0	3
	Electives			<u>3-6</u>
Total				13-20
SIXTH QUARTER				
MENT 223	Mental Health III	3	0	3
MENT 290	Coordinated Practice			1-5
MENT 298	Seminar and Project			1-5
	Electives			<u>3-6</u>
Total				8-19

Total Minimum Credits for the Mental Health Technology Degree ----- 97

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

NURSING

Degree: Health Technology (Nursing) (AAS)

Length: Seven-quarter (two-year) program

Purpose: The Associate in Applied Science Degree curriculum is designed to prepare selected students to qualify as contributing members of the health team rendering direct patient care as beginning practitioners of nursing in a variety of health service facilities. At the successful completion of the program, students will be eligible to take SBTP examination leading to licensure as a registered Nurse (R.N.).

Occupational Objectives: Employment opportunities for the Registered Nurse include staff positions in hospitals, nursing homes, health departments, physicians' offices, clinics, day care centers, and civil service.

Admission Requirements: High school courses must include 1 unit of biology and 1 unit of algebra. One unit of high school chemistry is strongly recommended. The student's high school record of achievement must reflect a minimum "C" average in academic courses excluding foreign language. Students with deficiencies will require Developmental Studies. Satisfactory performance on the appropriate test battery is required.

The Nursing program is open to both male and female applicants. Applicants must demonstrate intellectual, emotional and physical capacity indicative of successful performance as a nurse practitioner.

Applicants are required to submit a health certificate signed by a physician as evidence of good health.

It is required that students have personal interviews with the Nursing faculty before being accepted into the program.

Students majoring in nursing are admitted annually in September; therefore, early application is desirable.

Program Requirements: Upon admission, and during the course of the program the nursing faculty will carefully observe and evaluate the student's suitability for nursing. If, in the opinion of the nursing faculty, the student does not exhibit appropriate demeanor, he may be asked to withdraw from the nursing program.

Any student who receives a final grade lower than "C" in any of the courses in the nursing sequence must obtain permission from the nursing director to continue the major in nursing and must then repeat the course and earn a final grade of "C" or higher before taking the next course in the sequence.

Selected learning experiences will be provided in a number of health agencies located within the geographical area served by the college such as general hospitals, nursing homes, clinics, nursery schools and day care centers. The purchase of items such as student uniforms and accessories and Nursing Student Liability Insurance are the financial responsibility of the individual student.

NURSING**Associate in Applied Science Degree**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ENGL 111	English Composition I	3	0	3
GENL 100	Orientation	1	1	1
HLTH 100	Orientation to Allied Health Careers	1	0	1
BIOL 154	Anatomy and Physiology I	3	3	4
NURS 111	Fundamentals of Nursing I	3	6	5
PSYC 201	General Psychology I	<u>3</u>	<u>0</u>	<u>3</u>
Total		14	10	17
SECOND QUARTER				
ENGL 112	English Composition II	3	0	3
BIOL 155	Anatomy and Physiology II	3	3	4
NURS 112	Fundamentals of Nursing II	3	9	6
PSYC 202	General Psychology II	<u>3</u>	<u>0</u>	<u>3</u>
Total		12	12	16
THIRD QUARTER				
ENGL 113	English Composition III	3	0	3
BIOL 176	Microbiology	3	3	4
NURS 113	Fundamentals of Nursing III	4	12	8
PSYC 203	General Psychology III	<u>3</u>	<u>0</u>	<u>3</u>
Total		13	15	18
FOURTH QUARTER				
NURS 221	Nursing in Major Health Problems I Elective (Optional)	4	12	8 <u>0.5</u>
Total		4	12	8-13
FIFTH QUARTER				
NURS 222	Nursing in Major Health Problems II	4	12	8
SOCI 101	Introductory Sociology I	3	0	3
ECON 160	Survey of American Economics	<u>3</u>	<u>0</u>	<u>3</u>
Total		10	12	14
SIXTH QUARTER				
NURS 223	Nursing in Major Health Problems III	4	12	8
SOCI 102	Introductory Sociology II	3	0	3
GOVT 180	American Constitutional Government	<u>3</u>	<u>0</u>	<u>3</u>
Total		10	12	14
SEVENTH QUARTER				
NURS 224	Nursing in Major Health Problems IV	4	12	8
SOCI 103	Introductory Sociology III	3	0	3
NURS 288	Seminar Elective	3 <u>3</u>	6 <u>0</u>	5 <u>3</u>
Total		13	18	19

Total Minimum Credits for the Nursing Degree -----106

RADIOLOGIC TECHNOLOGY PROGRAM

Degree: Health Technology (Radiology) (AAS)

Length: Seven-quarter (two-year) program with an additional six (6) months of practical experience in a radiology department to complete requirements for certification.

Purpose: To prepare selected students to qualify as contributing members of the allied health team, who will care for patients under the supervision of qualified physicians. Successful completion of the program and experience will qualify the student to gain employment as a Radiologic Technologist. Upon completion of the program, the student is eligible to write the National Registry Examination leading to certification as a Registered Radiologic Technologist.

Occupational Objectives: Employment opportunities for the well-trained registered radiologic technologist are excellent at this time in many areas of the profession. Technologists who have properly prepared themselves are in great demand for various positions in hospitals, education, industry, government agencies and private offices.

Admission Requirements: Applicants must be high school graduates or the equivalent, and must reflect a "C" average in academic courses. To meet the general requirements, the applicant must have 2 units of science (Biology, Chemistry, or Physics), and 2 units of math (Algebra I, Algebra II, or Geometry). Special consideration will be given to students who have high academic grades and scores, but do not meet the general requirements. Students who have deficiencies may be required to take Developmental Studies.

Applicants are required to submit a health certificate signed by a physician as evidence of good health.

It is required that students have personal interviews with the radiologic faculty before being considered for acceptance into the program.

Program Requirements: Upon admission, and during the course of the program, the radiologic faculty will carefully observe and evaluate the student's suitability for the profession. If in the opinion of the radiologic faculty the student does not exhibit appropriate demeanor, he may be asked to withdraw from the program.

Students who receive a final grade lower than "C" in any of the courses in the radiologic technology sequence must obtain permission from the Dean of Instruction and instructional department to continue the major in radiologic technology.

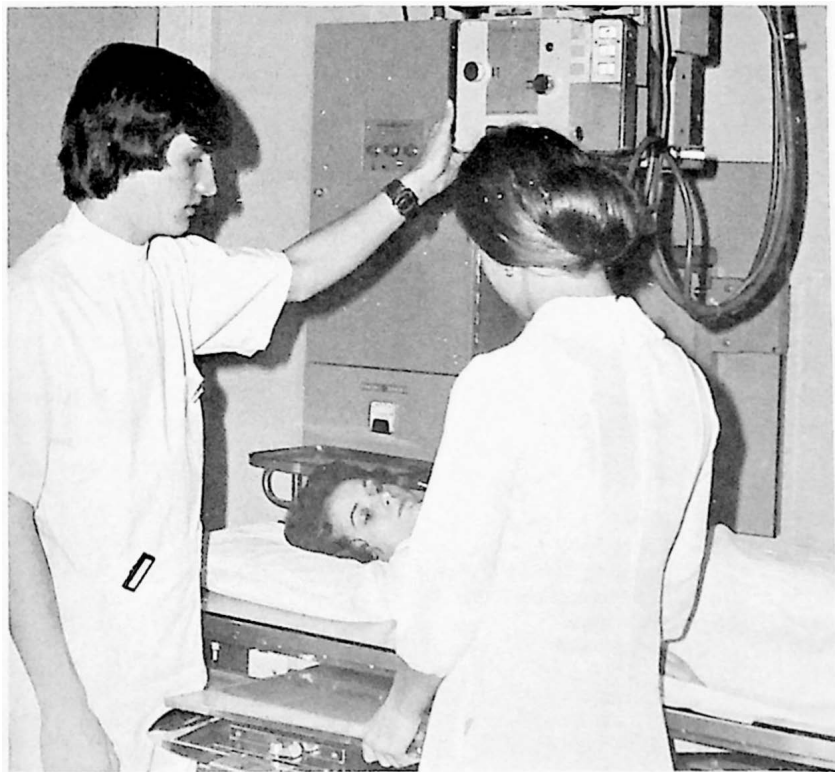
Selected learning experiences will be provided at the cooperating hospitals within the geographic area served by the college for a total of 2400 hours of practicum.

The purchase of items such as student uniforms and accessories and Liability Insurance are the financial responsibility of the individual student. Upon satisfactory completion of the seven-quarter program, the graduate may write the National Registry Examination for certification after an additional six months of clinical experience.

RADIOLOGIC TECHNOLOGY**Associate in Applied Science Degree**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ENGL	English	3	0	3
GENL 100	Orientation	1	1	1
HLTH 100	Orientation to Allied Health Careers	1	0	1
HLTH 124	Medical Terminology	3	0	3
MATH 111	Mathematics I	3	0	3
RADL 100	Introduction to Radiology & Protection	2	0	2
RADL 136	Patient Care Procedures	2	0	<u>2</u>
	Total			15
SECOND QUARTER				
BIOL 154	Human Anatomy and Physiology I	3	3	4
ENGL	English	3	0	3
MATH 112	Mathematics II	3	0	3
RADL 114	Principles of Exposure I	3	3	4
RADL 124	Radiographic Positioning I	3	3	<u>4</u>
	Total			18
THIRD QUARTER				
BIOL 155	Human Anatomy and Physiology II	3	3	4
ENGL	English	3	0	3
MATH 113	Mathematics III	3	0	3
RADL 115	Principles of Exposure II	3	3	4
RADL 125	Radiographic Positioning II	3	3	<u>4</u>
	Total			18
FOURTH QUARTER				
BUAD 276	Personnel Management	3	0	3
ECON 160	American Economics	3	0	3
GOVT 180	American Government	3	0	3
PSYC 128	Human Relations	3	0	3
RADL	Elective (Required)			<u>3-5</u>
	Total			15-17
FIFTH QUARTER				
PHYS 121	Physics	3	3	4
RADL 210	Protection & Patient Safety	2	0	2
RADL 256	Special Procedures	3	0	3
RADL	Elective (Required)	3		3-5
	Elective			<u>0-3</u>
	Total	11		12-17

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
SIXTH QUARTER				
PHYS	Physics	3	3	4
RADL 240	Introduction to Radionuclides	2	0	2
RADL 276	Departmental Administration	2	0	2
RADL	Elective (Required)			4-5
	Elective			<u>0-3</u>
	Total			12-16
SEVENTH QUARTER				
RADL 216	Radiation Physics	3	3	4
RADL 246	Introduction to Therapy	2	0	2
RADL 298	Seminar and Project	3	0	3
RADL	Elective (Required)			3-5
	Elective			<u>0-3</u>
	Total			12-17
Total Minimum Credits for Radiologic Technology Degree				102



COMMERCIAL ART

Degree: Arts & Design Technology (Commercial Art) (AAS)

Length: Six-quarter (two-year) program

Purpose: The Associate in Applied Science Degree curriculum in Commercial Art is designed primarily for persons who seek full-time employment in the commercial art fields (such as advertising, illustrating, printing, and packaging) immediately upon completion of the community college program.

Occupational Objectives: Commercial Artist
Designer
Illustrator
Photographer

Admission Requirements: In addition to the admission requirements established for the college, entry into the Commercial Art curriculum requires proficiency in high school English and a satisfactory aptitude for drawing. Applicants may be required to submit for approval several sample drawings before final admission is granted. Students with deficiencies will require Developmental Studies.

Program Requirements: Approximately one-half of the curriculum will include courses in commercial art with the remaining courses in related areas, general concepts and practical applications needed for future success in commercial art. Students are urged to consult with the counseling office and their faculty advisor in planning their program and selecting electives.

COMMERCIAL ART

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ARTS 111	History and Appreciation of Art	3	0	3
ARTS 121	Theory and Practice of Drawing	1	4	3
ARTS 151	Fundamentals of Design	1	4	3
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
GOVT	Government*	3	0	3
Total				16

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
SECOND QUARTER				
ARTS 112	History and Appreciation of Art II	3	0	3
ARTS 122	Theory and Practice of Drawing II	1	4	3
ARTS 152	Fundamentals of Design II	1	4	3
ARTS 166	Fundamentals of Lettering	1	4	3
ENGL 102	Communication Skills II	3	0	3
	Health, Physical Education, or Recreation			1
	Total			16
THIRD QUARTER				
ARTS 113	History and Appreciation of Art III	3	0	3
ARTS 123	Theory and Practice of Drawing III	1	4	3
ECON	Economics	3	0	3
ARTS 180	Introduction to Photography	1	3	2
PSYC	Psychology*	3	0	3
	English or Speech	3	0	3
	Total			17
FOURTH QUARTER				
ARTS 221	Advanced Drawing I	0	6	2
ARTS 231	Theory and Practice of Painting	1	4	3
ARTS 261	Advertising Design I	2	3	3
ARTS 271	Graphic Techniques I	1	4	3
ARTS 281	Photography Workshop	0	3	1
	Elective	3	0	3
	Health, Physical Education, or Recreation			1
	Total			16
FIFTH QUARTER				
ARTS 222	Advanced Drawing II	0	6	2
ARTS 232	Theory and Practice of Painting II	1	4	3
ARTS 262	Advertising Design II	2	3	3
ARTS 272	Graphic Techniques II	1	4	3
ARTS 282	Photography Workshop II	0	3	1
	Health, Physical Education, or Recreation			1
	Arts Elective			3
	Total			16
SIXTH QUARTER				
ARTS 223	Advanced Drawing III	0	6	2
ARTS 233	Theory and Practice of Painting III	1	4	3
ARTS 263	Advertising Design III	2	3	3
ARTS 273	Graphic Techniques III	1	4	3
ARTS 283	Photography Workshop III	0	3	1
ARTS 298	Seminar and Project			1-5
	Elective	3	0	3
	Total			16

Total Minimum Credits for the Commercial Art Degree----- 97

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

LIBERAL ARTS

Degree: Associate in Arts (Liberal Arts) (AA)

Length: Six-quarter (two-year) program

Purpose: The Associate in Arts Degree program in Liberal Arts is designed for persons who plan to transfer to a four-year college or university to complete a baccalaureate degree program, usually the Bachelor of Arts degree, in the liberal arts or social sciences. Students in this program may wish to major in the following fields:

Economics	Library Science
Education	Literature
English	Philosophy
Foreign Language	Pre-Law
Government (Political Science)	Psychology
History	Sociology
Humanities	Teacher Education
Journalism	

Admission Requirements: In addition to the admission requirements established for the College, entry into the Associate in Arts Degree program in Liberal Arts requires the satisfactory completion of the following high school units or equivalent as a minimum: 4 units of English; 2 units of college preparatory mathematics; 1 unit of laboratory science; and 1 unit of history. The remaining units are elective courses, but at least two units of a foreign language are recommended. Students are urged to check the mathematics requirements of the four-year college or university to which they plan to transfer to determine the proper mathematics courses to be taken in the community college. Students with deficiencies will require Developmental Studies.

Program Requirements: This curriculum consists of courses in the humanities including a foreign language, natural sciences, and social sciences usually required in the first two years of a baccalaureate liberal arts curriculum. Students are urged to acquaint themselves with the requirements of the major department in the institution to which transfer is contemplated and also to consult with the counseling office of the community college in planning their programs and selecting electives. To prepare for junior class standing at a four-year institution, students usually must complete a program at the community college which is comparable in length and course content to the first two years of the program at the four-year college or university.

LIBERAL ARTS**Associate in Arts Degree**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ENGL 111	English Composition I	3	0	3
GENL 100	Orientation	1	1	1
HIST	American History (or Hist. of West. Civ.)	3	0	3
MATH	Mathematics I (MATH 161 or 181)	3	0	3
	Foreign Language ¹	3	2	4
	Natural Science (Lab.)	3	3	<u>4</u>
	Total			18
SECOND QUARTER				
ENGL 112	English Composition II	3	0	3
HIST	American History (or Hist. of West. Civ.)	3	0	3
MATH	Mathematics II (MATH 162 or 182)	3	0	3
	Foreign Language ¹	3	2	4
	Natural Science (Lab.)	3	3	4
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			18-20
THIRD QUARTER				
ENGL 113	English Composition III	3	0	3
HIST	American History (or Hist. of West. Civ.)	3	0	3
MATH	Mathematics III (MATH 163 or 183)	3	0	3
	Foreign Language ¹	3	2	4
	Natural Science (Lab.)	3	3	<u>4</u>
	Total			17
FOURTH QUARTER				
ENGL	English or American Literature	3	0	3
GOVT	Government ²	3	0	3
	Foreign Language	3	2	4
	Electives	6	0	6
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			17-19

¹ Students who have satisfactorily completed two years of a foreign language in high school may petition for advanced placement into the second year of the foreign language at the college.

² A year sequence of Social Science is recommended in lieu of the Government-Economics-Psychology requirement.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIFTH QUARTER				
ENGL	English or American Literature	3	0	3
PSYC	Psychology ²	3	0	3
	Foreign Language	3	2	4
	Health, Physical Education, or Recreation			1-3
	Electives	6	0	<u>6</u>
	Total			17-19
SIXTH QUARTER				
ECON	Economics ²	3	0	3
ENGL	English or American Literature	3	0	3
	Foreign Language	3	2	4
	Electives	6	0	<u>6</u>
	Total			16
Total Minimum Credits for the Liberal Arts Degree ----- 103				

² A year sequence of Social Science is recommended in lieu of the Government-Economics-Psychology requirement.

MUSIC

Degree: Associate in Arts (Music) (AA)

Length: Six-quarter (two-year) program

Purpose: The Associate in Arts Degree curriculum 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.

Admission Requirements: In addition to the admission requirements established for the college, entry into the Music program requires the 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 studies. Students with deficiencies will require Developmental Studies. An audition and interview by the music faculty is necessary prior to final acceptance in this program. Students are urged to check the mathematics requirements of the four-year institution to which they plan to transfer to determine the proper mathematics courses to be taken in the community college.

Program Requirements: The major emphasis in the Music curriculum is on performance and basic musical knowledge. All music majors must display the ability to sight read simple piano accompaniments, play scales, arpeggios and cadences in all major and minor keys, and play pieces equivalent in difficulty to standard classical sonatinas and the little preludes of Bach. These requirements may be satisfied by successfully completing six quarter hours of Applied Music 147 and 247, or by satisfactorily completing a proficiency examination. A student satisfying the piano requirements in less than six quarter hours may either continue in Applied Music or use the remaining hours as music electives. Applied Music students will be required to demonstrate performance proficiency before the music faculty at the end of the academic year. This may be in the form of a jury examination and/or a student recital at the discretion of the instructor.

In order to prepare for junior class standing at a four-year college or university, the student usually must complete a program at the community college which is comparable in length and course content to the first two years of the program at the four-year institution. Students are urged to acquaint themselves with the requirements of the major department in the institution to which transfer is contemplated and also to consult with the counseling office of the community college in planning their program and selecting electives.

MUSIC

Associate in Arts Degree¹

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ENGL 111	English Composition	3	0	3
GENL 100	Orientation	1	1	1
HIST	History	3	0	3
MATH	Mathematics	3	0	3
MUSC 111	Music Theory	3	2	4
MUSC	Applied Music (Major instrument)			2
MUSC	Applied Music (Minor instrument)			1
MUSC	Ensemble (Vocal or Instrument)	0	3	1
	Total			18
SECOND QUARTER				
ENGL 112	English Composition II	3	0	3
HIST	History	3	0	3
MATH	Mathematics	3	0	3
MUSC 112	Music Theory II	3	2	4
MUSC	Applied Music (Major instrument)			2
MUSC	Applied Music (Minor instrument)			1
MUSC	Ensemble (Vocal or Instrumental)	0	3	1
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			18-20
THIRD QUARTER				
ENGL 113	English Composition III	3	0	3
HIST	History	3	0	3
MATH	Mathematics	3	0	3
MUSC 113	Music Theory III	3	2	4
MUSC	Applied Music (Major instrument)			2
MUSC	Applied Music (Minor instrument)			1
MUSC	Ensemble (Vocal or Instrumental)	0	3	1
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			18-20
FOURTH QUARTER				
ECON	Economics ²	3	0	3
MUSC 211	Advanced Music Theory I	3	2	4
MUSC	Applied Music (Major instrument)			2
MUSC	Applied Music (Minor instrument)			1
MUSC	Ensemble (Vocal or Instrumental)	0	3	1
	Natural Science (Lab)	3	3	4
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			16-19

¹ Foreign language degree requirement optional.

² A year of Social Science recommended for Economics-Government-Psychology.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIFTH QUARTER				
GOVT	Government ²	3	0	3
MUSC 212	Advanced Music Theory II	3	2	4
MUSC	Applied Music (Major instrument)			2
MUSC	Applied Music (Minor instrument)			1
MUSC	Ensemble (Vocal or Instrumental)	0	3	1
	Natural Science (Lab)	3	3	<u>4</u>
	Total			15
SIXTH QUARTER				
MUSC 213	Advanced Music Theory III	3	2	4
MUSC	Applied Music (Major instrument)			2
MUSC	Applied Music (Minor instrument)			1
MUSC	Ensemble (Vocal or Instrumental)	0	3	1
PSYC	Psychology ²	3	0	3
	Natural Science (Lab)	3	3	<u>4</u>
	Total			15
Total Minimum Credits for the Music Degree -----				100



² A year of Social Science recommended for Economics-Government-Psychology.

SCIENCE

Degree: Associate in Science (Science) (AS)

Length: Six-quarter (two-year) program

Purpose: The Associate in Science Degree Program in Science 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	Geology	Pharmacy
Biology	Home Economics	Physical Therapy
Chemistry	Mathematics	Physics
Pre-Dentistry	Pre-Medicine	Science Education
Forestry	Nursing	Pre-Veterinary

Admission Requirements: In addition to the admission requirements established for the college, entry into the Science program requires 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, and 1 unit of social science. Students with deficiencies will require Developmental Studies.

Program Requirements: Although the major emphasis in this curriculum is on mathematics, the biological sciences, and the physical sciences, the curriculum also includes courses in humanities and social sciences. Electives are provided so that the student can select the appropriate courses for his pre-professional or scientific program as required in the first two years of the four-year college or university. Students are urged to acquaint themselves with the requirements of the major department in the college or university to which transfer is contemplated and also to consult with the counseling office of the community college in planning their program and selecting electives. In order to prepare for junior class standing at a four-year college or university, the student usually must complete a program at the community college which is comparable in length and course content to the first two years of the program at the four-year institution.

SCIENCE**Associate in Science Degree**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ENGL 111	English Composition I	3	0	3
GENL 100	Orientation	1	1	1
HIST 101	History of West. Civ. (or HIST 111)	3	0	3
MATH 161	College Mathematics (or MATH 141)	3-5	0	3-5
	Science with Laboratory	3	3	4
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			15-19
SECOND QUARTER				
ENGL 112	English Composition II	3	0	3
HIST 102	History of West. Civ. (or HIST 112)	3	0	3
MATH 162	College Mathematics (or MATH 142)	3-5	0	3-5
	Science with Laboratory	3	3	4
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			14-18
THIRD QUARTER				
ENGL 113	English Composition III	3	0	3
HIST 103	History of West. Civ. (or HIST 113)	3	0	3
MATH 163	College Mathematics (or MATH 143)	3-5	0	3-5
	Science with Laboratory	3	3	4
	Health, Physical Education, or Recreation			1-3
	Elective	3	0	<u>3</u>
	Total			17-20
FOURTH QUARTER				
MATH 271	Calculus I (or MATH 241) (or Elective)	4	0	4
	Science with Laboratory	3	3	4
	Social Science ¹	3	0	3
	Elective	3	0	3-4
	English, Humanities or Speech Elective	3	0	<u>3</u>
	Total			17-18

¹ A year sequence of Social Science is recommended in lieu of the Government, Economics and Psychology requirement. Students are advised to check this requirement at the four-year school to which they plan to transfer.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIFTH QUARTER				
MATH 272	Calculus II (or MATH 242) (or Elective)	4	0	4
	Science with Laboratory	3	3	4
	Social Science ¹	3	0	3
	Electives			<u>6-7</u>
	Total			17-18
SIXTH QUARTER				
MATH 273	Calculus III (or MATH 243) (or Elective)	4	0	4
	Science with Laboratory	3	3	4
	Social Science ¹	3	0	3
	Electives			<u>6-7</u>
	Total			17-18
Total Minimum Credits for the Associate in Science Degree -----				97

¹ A year sequence of Social Science is recommended in lieu of the Government, Economics and Psychology requirement. Students are advised to check this requirement at the four-year school to which they plan to transfer.

FIRE FIGHTING AND PREVENTION

Degree: Certificate in Fire Fighting & Prevention

Length: Three quarters (one year)

Purpose: The certificate program is designed for practitioners in fire science occupations who wish to upgrade and broaden their professional abilities and for others who are preparing themselves to enter the fire science field.

Occupational Objectives: Training for positions in fire prevention and suppression, fire protection engineering, safety engineering, insurance inspection and investigation, industrial safety, and building inspection.

Admission Requirements: In addition to requirements for general admission to the College, a personal interview with an official member of a regional fire department is recommended.

Curriculum Requirements: The program combines training in advanced fire protection and fire fighting techniques and management with selected arts and science courses which have direct application to fire sciences and others which contribute to the advancement of social understanding and communication.

FIRE FIGHTING & PREVENTION**One-Year Certificate Program**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ENGL		3	0	3
FIRE 106	Fire Protection Organization	3	0	3
FIRE 108	Fundamentals of Fire Suppression	3	0	3
SOSC 101	Contemporary American Civilization I	3	0	3
ELECTIVE*				<u>3-4</u>
Total				15-16
SECOND QUARTER				
FIRE 107	Blueprint Reading for Fire Science	3	0	3
FIRE 111	Hazardous Materials I	3	0	3
FIRE 137	Fire Fighting Tactics and Strategy	3	0	3
SOSC 102	Contemporary American Civilization II	3	0	3
ELECTIVE*				<u>3-4</u>
Total				15-16
THIRD QUARTER				
FIRE 146	Fire Administration and Law	3	0	3
FIRE 216	Fire Hydraulics and Equipment	3	2	4
FIRE 237	Arson Detection and Investigation	3	0	3
SOSC 103	Contemporary American Civilization III	3	0	3
ELECTIVE*				<u>3-4</u>
Total				16-17

Total Minimum Credits required for the Fire Fighting & Prevention Certificate 46

* Electives offered will be based upon individual needs of the student. Those who may wish to eventually consider an Associate Degree program should select electives which would be compatible to such a program (additional English—6 cr., Chemistry—8 cr., Mathematics—6 cr., or Physics—4 cr.). Students interested only in the certificate program might wish to consider additional courses in Fire Science as well as courses in other subject areas.

POLICE SCIENCE

Degree: Public Service Technology (Police Science) (AAS)

Length: Six-quarter (two-year) program

Purpose: The curriculum in Police Science has been designed to prepare individuals for career services in law enforcement and related occupations. Supported by a broad general education, training is given to develop professional competence in the fields of law enforcement administration, police science, the prevention and control of delinquency and crime, correctional administration, industrial security administration, and traffic administration. This curriculum is applicable to both the preparatory student and the experienced officer.

Occupational Objectives: Commercial and Industrial Security Officer
Local, State, and Federal Enforcement Officers
Police Officer
Private or Government Investigator

Admission Requirements: In addition to the general requirements for admission to the college, entry into the Police Science program requires the following:

1. A written statement from the city or county law enforcement agency having jurisdiction in the applicant's area of residence as to the applicant's record. Satisfactory results on required tests.
2. **Special Requirements:** For employment with law enforcement agencies, the following qualifications are prerequisites: (a) Excellent physical condition free from any physical or mental condition which might adversely affect acceptance or performance as a law enforcement officer; (b) Normal hearing, color vision, and eye functions with visual acuity not less than 20/40 in either eye without correction; (c) Weight in proportion to height. (Very few law enforcement agencies will accept male applicants who are less than 5'8" in height); and (d) Excellent moral character—no convictions in any crime involving moral turpitude or any felony and no excessive number of traffic citations. (Background investigation will be conducted by the employing agency to confirm the foregoing.)

Program Requirements: Approximately one-half of the curriculum will include courses in law enforcement with the remaining courses in related areas, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in law enforcement or related activities. Students are urged to consult with their faculty advisor and the counseling office in planning their program and selecting electives.

POLICE SCIENCE**Associate in Applied Science Degree**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
BIOL 101	General Biology I (or Elective)			3-4
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
ECON	Economics*	3	0	3
LWNF 100	Introduction to Law Enforcement	3	0	3
SOCI 101	Introductory Sociology I (or SOCI Elective)			<u>3</u>
Total				16-17
SECOND QUARTER				
BIOL 102	General Biology II (or Elective)			3-4
ENGL 102	Communication Skills II	3	0	3
LWNF 114	Police Organization & Administration	3	0	3
PSYC	Psychology*	3	0	3
SOCI 102	Introductory Sociology II (or SOCI Elective)	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
Total				16-19
THIRD QUARTER				
BIOL 103	General Biology III (or Elective)			3-4
LWNF 115	Police Organization & Administration II	3	0	3
LWNF 166	Police Comm. & Records (or LWNF Elective)	3	0	3
SOCI 103	Introductory Sociology (or SOCI Elective)	3	0	3
	English or Speech	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
Total				16-19
FOURTH QUARTER				
GOVT 281	U. S. Government I (or GOVT Elective)	3	0	3
LWNF 126	Prevention & Control of Juvenile Delinquency	3	0	3
LWNF 134	Criminal Law I	3	0	3
LWNF 176	Criminology	3	0	3
LWNF 246	Principles of Criminal Investigation	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
Total				16-18

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

SOCIAL SCIENCE &
PUBLIC SERVICE TECHNOLOGY DIVISION

125

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
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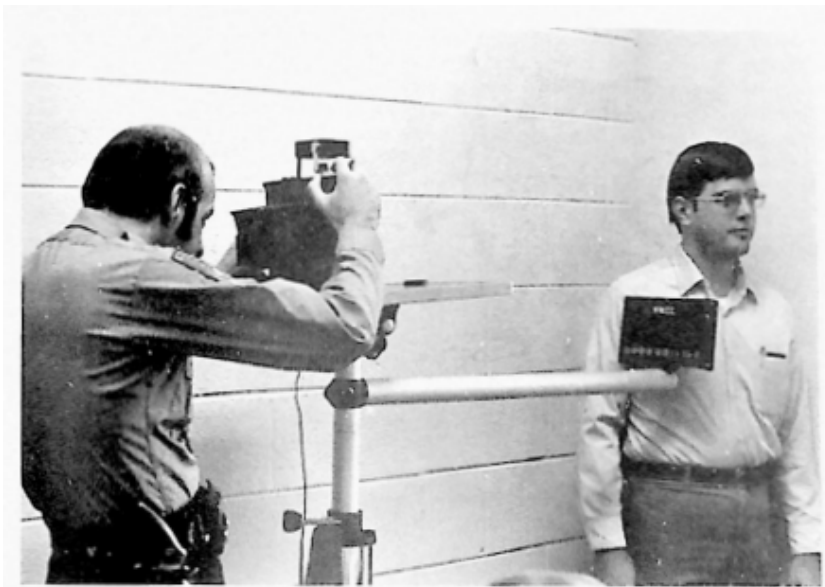
FIFTH QUARTER

GOVT 282	U. S. Government II (or Elective)	3	0	3
LWNF 135	Criminal Law II	3	0	3
LWNF 136	Legal Evidence	3	0	3
LWNF 247	Advanced Criminal Investigation	3	0	3
SOCI 186	Social Problems I (or Elective)	3	0	3
	Elective	3	0	<u>3</u>
Total				18

SIXTH QUARTER

GOVT	Government*	3	0	3
LWNF 117	Special Enforcement Problems (or LWNF Elective)	3	0	3
LWNF 187	Traf. Admin. & Control (or LWNF Elective)	3	0	3
LWNF 237	Admin. of Justice (or LWNF Elective)	3	0	3
LWNF 298	Seminar and Project			2
SOCI 187	Social Problems II (or Elective)	3	0	<u>3</u>
Total				17

Total Minimum Credits for the Police Science Degree ----- 99



* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

PRE-TEACHER EDUCATION

Degree: Associate in Science (Education) (AS)

Length: Six-quarter (two-year) program

Purpose: With the rapid development and emphasis on education in Virginia, there is a great demand for qualified teachers and other educational specialists to help provide leadership for the schools. The Associate in Science Degree program in Pre-Teacher Education is designed for persons who plan to transfer to a four-year college or university to complete a baccalaureate degree program in Teacher Education.

Admission Requirements: In addition to the admission requirements established for the college, entry into the Pre-Teacher Education program requires the satisfactory completion of the following high school units or equivalent as a minimum: 4 units of English; 2 units of college preparatory mathematics; 1 unit of laboratory science; and 1 unit of social science. Students are urged to check the mathematics requirements of the four-year college or university to which they plan to transfer to determine the proper mathematics courses to be taken in the community college. Students with deficiencies will require Developmental Studies. Eligible students may qualify for the State Teacher's Scholarships.

Program Requirements: The world of modern education demands that its teachers and staff be knowledgeable both in their teaching field and in general education. Thus, this curriculum requires courses in the humanities, natural sciences, mathematics, social sciences, and health and physical education in addition to general psychology usually required in the first two years of a baccalaureate teacher education curriculum. Students are urged to acquaint themselves with the requirements of the major department in the college or university to which transfer is contemplated and to consult with the counseling office of the community college in planning their program and selecting electives. In order to prepare for junior class standing at a four-year college or university, the student usually must complete a program at the community college which is comparable in length and course content to the first two years of the program at the four-year institution.

PRE-TEACHER EDUCATION

Associate in Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ENGL 111	English Composition I	3	0	3
GENL 100	Orientation	1	0	1
HIST 111	American History I (or HIST 101)	3	0	3
MATH	Mathematics (MATH 161 or 181)	3	0	3
	Natural Science (Lab)	3	3	4
	Elective	3	0	<u>3</u>
	Total			17
SECOND QUARTER				
ENGL 112	English Composition II	3	0	3
HIST 112	American History II (or HIST 102)	3	0	3
MATH	Mathematics (MATH 162 or 182)	3	0	3
	Natural Science (Lab)	3	3	4
	Elective	3	0	<u>3</u>
	Total			16
THIRD QUARTER				
ENGL 113	English Composition III	3	0	3
HIST 113	American History III (or HIST 103)	3	0	3
MATH	Mathematics (MATH 163 or 183)	3	0	3
	Natural Science (Lab)	3	3	4
	Health, Physical Education, or Recreation			1-3
	Elective	3	0	<u>3</u>
	Total			17-19
FOURTH QUARTER				
ENGL	Literature	3	0	3
GOVT	Government ¹	3	0	3
PSYC 201	General Psychology I (or PSYC 231)	3	0	3
	Health, Physical Education, or Recreation			1-3
	Humanities Elective	3	0	3
	Elective	3	0	3
	Total			16-18

¹ In addition to the Psychology requirements, students will be advised to complete a Government and Economics course or a full year of sophomore level social science if required by the four-year college or university to which they plan to transfer.

SOCIAL SCIENCE &
PUBLIC SERVICE TECHNOLOGY DIVISION

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIFTH QUARTER				
ENGL	Literature	3	0	3
ECON	Economics ¹	3	0	3
PSYC 202	General Psychology II (or PSYC 232)	3	0	3
	Health, Physical Education, or Recreation Elective	3	0	1.3 <u>3</u>
	Total			13-15
SIXTH QUARTER				
ENGL	Literature (or Elective)	3	0	3
PSYC 203	Gen. Psych. III (or PSYC 233)	3	0	3
SOCI	Sociology (or Elective)	3	0	3
SPDR 137	Public Speaking (or Elective)	3	0	3
	Elective	3	0	3
	Elective	3	0	<u>3</u>
	Total			18
Total Minimum Credits for a Pre-Teacher Education Degree-----				97

¹ In addition to the Psychology requirements, students will be advised to complete a Government and Economics course or a full year of sophomore level social science if required by the four-year college or university to which they plan to transfer.

RADIO AND TELEVISION PRODUCTION TECHNOLOGY

Degree: Public Service Technology (Radio & Television Production) (AAS)

Length: Six-quarter (two-year) program

Purpose: With the growth of commercial and educational broadcasting in Virginia, the need for personnel trained in radio and television is expanding. The purpose of this program is to meet this growing need. The curriculum is designed primarily for persons seeking employment in radio and television upon graduation.

Occupational Objectives: Advertising Agency Assistant
Broadcast Announcer
Radio Program Producer
Script and Continuity Writer
Television Production Assistant
Television Director
Television Studio Technician

Admission Requirements: In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the curriculum requires a proficiency in high school English and some artistic orientation. Students who are not proficient in English will be required to correct their deficiencies in Developmental Studies.

Students are required to have personal interviews with the broadcasting faculty before being considered for acceptance into the curriculum.

Program Requirements: Approximately two-thirds of the curriculum will include courses in broadcasting with the remaining courses in related subjects, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in the broadcasting industry. Each student is advised to consult with his faculty advisor and the Counseling Department in planning his program and selecting his electives.



**RADIO AND TELEVISION PRODUCTION
TECHNOLOGY****Associate in Applied Science Degree**

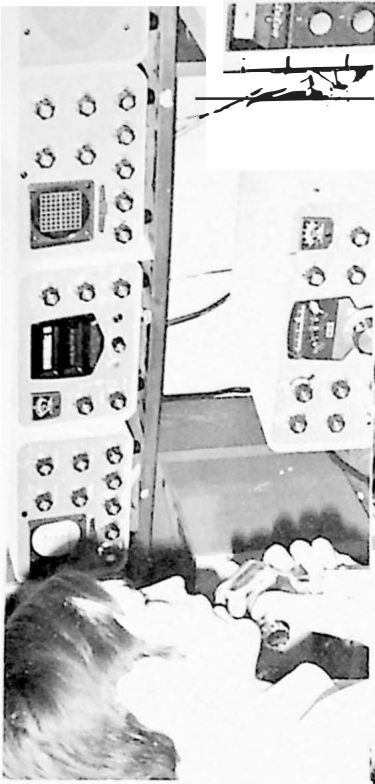
Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
BCST 110	Introduction to Radio/TV	3	0	3
BCST 121	Radio/TV Production I	0	6	3
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
SOCI 101	Introductory Sociology	3	0	3
SPDR 137	Public Speaking	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			17-19
SECOND QUARTER				
BCST 122	Radio/TV Production II	0	6	3
BCST 134	Speech for Radio/TV I	2	3	3
BCST 138	TV Studio Art I	2	3	3
ECON 160	Survey of American Economics*	3	0	3
ENGL 102	Communication Skills II	3	0	3
	Health, Physical Education, or Recreation			<u>1-3</u>
	Total			16-18
THIRD QUARTER				
BCST 123	Radio/TV Production III	0	6	3
BCST 135	Speech for Radio/TV II	2	3	3
BCST 139	TV Studio Art II	2	3	3
GOVT 180	American Constitutional Government*	3	0	3
PSYC 128	Human Relations*	3	0	3
SPDR 106	Introduction to Theatre Arts (or Elective)	2	3	<u>3</u>
	Total			18
FOURTH QUARTER				
ARTS 180	Introduction to Photography	1	3	2
BCST 214	Technical Problems of Radio/TV	2	3	3
BCST 226	Writing for Radio/TV	3	0	3
BCST 281	Advanced Radio/TV Production I	3	6	5
BUAD 100	Introduction to Business (or Elective)	3	0	<u>3</u>
	Total			16

* A year sequence in Social Science 101-102-103 may be taken in lieu of ECON 160, GOVT 180 and PSYC 128.

SOCIAL SCIENCE &
PUBLIC SERVICE TECHNOLOGY DIVISION

131

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIFTH QUARTER				
BCST 215	Technical Problems of Radio/TV II	2	3	3
BCST 216	Radio/TV Station Management & Operation	3	0	3
BCST 282	Advanced Radio/TV Production II	3	6	5
SOCI 186	Social Problems	3	0	3
	Elective	3	0	<u>3</u>
	Total			17
SIXTH QUARTER				
BCST 217	Radio/TV News	3	0	3
BCST 257	Social Problems in American Broadcasting	3	0	3
BCST 283	Advanced Radio/TV Production III	3	6	5
BCST 298	Seminar and Project (or BCST 290 or 299)	1	3	2
	Elective	3	0	<u>3</u>
	Health, Physical Education, or Recreation			
	Total			17-19
Total Minimum Credits for Radio and Television Production				
Technology Degree -----				101



PART V

DESCRIPTIONS OF COURSES

CONTINUING EDUCATION AND COMMUNITY SERVICES PROGRAMS

In order to provide the widest possible diversification of educational opportunity, Virginia Western Community College schedules credit and non-credit courses and programs to meet educational and training needs outside the realm of traditional college studies. These include classés, institutes, forums, workshops, lectures, and courses to provide: (1) individual cultural enrichment; (2) individual job skill improvement; (3) hobby and leisure time activity training; (4) service to commerce and industry in upgrading employee skills; (5) special services focused on societal and community development.

GENERAL COURSE INFORMATION

Course Numbers

Courses numbered 01-09 are courses for Developmental Studies. The credits earned in these courses are not applicable toward associate degree programs; however, upon approval of the Dean of Instruction, some developmental courses may provide credit applicable to basic occupational diploma or certificate programs. Students may re-register for these courses in subsequent quarters as necessary until the course objectives are completed.

Courses numbered 10-99 are basic occupational courses for diploma and certificate programs. The credits earned in these courses are applicable toward diploma and certificate programs but are not applicable toward an associate degree.

Courses numbered 100-199 are freshman courses applicable toward an associate degree, and/or certificate and diploma programs.

Courses numbered 200-299 are sophomore courses applicable toward an associate degree, and/or certificate and diploma programs.

Course Credits

The credit for each course is indicated 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 class each week (including laboratory, shop, supervised study, 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, as listed in the course description, each student also must spend some time on out-of-class assignments

under his own direction. Usually each credit hour per course requires an average of three hours of in-class and out-of-class study each week.

Course Prerequisites

If any prerequisites are required before enrolling in a course, these prerequisites will be identified in the course description. Courses in special sequences (usually identified by the numerals I-II-III) require that prior courses or their equivalent be completed before enrolling in the advanced courses in the sequence. When corequisites are required for a course, usually the 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 Dean of Instruction and instructional department.

ACCOUNTING

ACCT 14-15 BOOKKEEPING I-II (3 cr.) (3 cr.)—A study of the complete cycle of double-entry bookkeeping. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

ACCT 111-112-113 ACCOUNTING I-II-III (4 cr.) (4 cr.) (4 cr.)—Fundamentals of accounting. The accounting cycle, journals, ledgers, working papers, and the preparation of financial statements under the various forms of business ownership. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

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 forms and practical accounting procedures. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

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 inventory valuation, internal control systems, manufacturing processes, budgeting, and analysis of financial statements. Lecture 3 hours per week.

ACCT 221-222-223 INTERMEDIATE ACCOUNTING I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite ACCT 111-112-113. Extensive analysis of the principle elements of accounting systems and statements. Lecture 4 hours per week.

ACCT 229 AUDITING (3 cr.)—Prerequisite ACCT 111-112-113. Purposes of audit, relationships of auditor and client, kinds of audits, working papers, internal controls and examination of accounting systems, audit reports. Lecture 3 hours per week.

ACCT 234-235 COST ACCOUNTING I-II (3 cr.) (3 cr.)—Prerequisite ACCT 111-112-113. Studies in accounting systems, methods and statements involved in process and job cost accounting; use of standards and cost controls. Lecture 3 hours per week.

ACCT 244 TAXES I (3 cr.)—Principles of federal taxation relating to individual income taxes with emphasis on minimization of personal tax burden and preparation of personal tax returns; single preparation form and tax problems. Lecture 3 hours per week.

ACCT 298, 299—See *General Usage Courses* pages 155-156.

AIR CONDITIONING AND REFRIGERATION

AIRC 11 AIR CONDITIONING I (3 cr.)—Designed to introduce and explain basic principles of refrigeration and systems. Deals with the composition and state of matter, liquid vapor, equilibrium, pressure, density, pressure-volume-temperature relationship. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

AIRC 12 AIR CONDITIONING II (3 cr.)—The law of gases, temperature scales, heat work, power, energy, heat transfer and elementary refrigeration systems. Included is a thorough study of types of systems used in refrigeration. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

AIRC 13 AIR CONDITIONING III (3 cr.)—The theory and application of compressors, condensers, evaporators, expansion valves and capillary tubes used in refrigeration systems. Freezing process of foods and refrigeration load calculators are included. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

AIRC 14 AIR CONDITIONING IV (3 cr.)—Study of properties of air temperature, relative humidity, specific heat, condensation, evaporation, psychometrics, basic parts of systems, functions, problems, principles of operation, air-cooling, water cooling, and load calculation, and estimating procedures. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

AIRC 15-16 AIR CONDITIONING V-VI (3 cr.) (3 cr.)—Psychometric properties of air, heat, load and gain calculation, heated and chilled water systems, duct design, pipe sizing, air distribution, and air comfort requirements. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

APPLIANCE SERVICING

APPL 11-12-13 APPLIANCE REPAIR I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite ELEC 13 or equivalent. The maintenance and repair of home appliances including small appliances, laundry appliances, kitchen and refrigeration appliances. Emphasis is placed on practical repair techniques. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

APPL 26 TEST EQUIPMENT (2 cr.)—Prerequisite ELEC 13 or equivalent. Introductory course to familiarize student with basic testing equipment and the techniques of utilizing such equipment to troubleshoot major and minor appliances. Lecture 2 hours per week.

ARCHITECTURAL TECHNOLOGY

ARCH 100 INTRODUCTION TO ARCHITECTURE (3 cr.)—An intensive course outlining the history and impact of architecture. Emphasis on the dynamics and social aspects of architecture and society. Lecture 3 hours per week.

ARCH 111 ARCHITECTURAL DRAFTING I (3 cr.)—Designed to provide the fundamental knowledge of the principles of drafting. Skills and techniques of

drafting including use of drafting equipment, lettering, freehand orthographic and pictorial sketching, geometric construction, and orthographic drawing. Lecture 1 hour, Laboratory 6 hours, Total 7 hours per week.

ARCH 112 ARCHITECTURAL DRAFTING II (3 cr.)—Prerequisite ARCH 111 or equivalent. An introduction to complex one and two-point perspectives, basic techniques of shade and shadow construction in orthographic drawings, development of construction details using appropriate materials, indications and symbols, study of model construction, and drafting techniques with pen and ink. Lecture 1 hour, Laboratory 6 hours, Total 7 hours per week.

ARCH 113 ARCHITECTURAL DRAFTING III (3 cr.)—Prerequisite ARCH 112. An approach in depth to the study of architectural drafting. Development of techniques in architectural lettering, dimensioning, freehand sketching and instrument drawing. Drawings of construction details, using appropriate material symbols and conventions. Working drawings including plans, elevations, sections, scale details and full size details prepared from preliminary sketches. Lecture 1 hour, Laboratory 6 hours, Total 7 hours per week.

ARCH 141 MATERIALS AND METHODS OF CONSTRUCTION I (3 cr.)—Designed to introduce the materials used in erection of structures, the physical properties and the architecture and characteristics of steel, concrete, timber, glass, related materials and the methods used in testing materials. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

ARCH 142 MATERIALS AND METHODS OF CONSTRUCTION II (3 cr.)—Prerequisite ARCH 141. 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. Lecture 3 hours per week.

ARCH 211 ARCHITECTURAL DRAFTING IV (3 cr.)—Prerequisite ARCH 113. Preparation of structural plans, elevations, wall sections, and details for building construction with emphasis on structural components. Appropriate details and drawings necessary for construction. Reference materials provide skills and knowledge in locating data and in using handbooks. Lecture 1 hour, Laboratory 6 hours, Total 7 hours per week.

ARCH 212 ARCHITECTURAL DRAFTING V (3 cr.)—Prerequisite ARCH 211. Preparation of plans and details for building construction with emphasis on mechanical equipment such as air conditioning, plumbing and electrical systems using appropriate symbols and conventions. Coordination of mechanical and electrical features with structural and architectural components. Lecture 1 hour, Laboratory 6 hours, Total 7 hours per week.

ARCH 213 ARCHITECTURAL DRAFTING VI (3 cr.)—Prerequisite ARCH 212. Preparation of a complete set of working drawings for the architectural structure including structural components, mechanical equipment, and millwork drawings. Lecture 1 hour, Laboratory 6 hours, Total 7 hours per week.

ARCH 236 BUILDING ELECTRIC EQUIPMENT (3 cr.)—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 structures with architectural and structural design. Lecture 3 hours per week.

ARCH 237 BUILDING MECHANICAL EQUIPMENT (3 cr.)—Study of heating, air conditioning, plumbing and electrical equipment, materials and symbols. Building code interpretation of working drawings by mechanical engineers; coordination of mechanical and electrical features with structural and architectural design. Lecture 3 hours per week.

ARCH 276 CONSTRUCTION ESTIMATING (3 cr.)—Interpretation of working drawings for a project; preparation of material and labor quantity surveys for plans and specifications; approximate and detailed estimates of cost, and bid and contract procedures. Detailed inspection of the construction by comparing the finished work to the specifications. Lecture 3 hours per week.

ARCH 278 BUILDING CODES, CONTRACT DOCUMENTS AND PROFESSIONAL OFFICE PRACTICES (3 cr.)—The professional role of the architectural technician with regard to clients and employer. Building codes and their effect in relation to specifications and drawings. The purpose and writing of specifications with their legal and practical application to working drawings. Contract documents analyzed for client-architect-contractor responsibilities, duties and mutual protection. Lecture 3 hours per week.

ARCH 290, 298—See *General Usage Courses* on pages 155-156.

ARTS

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 beginning with prehistoric art and following the main stream of western civilization to the present. Lecture 3 hours per week.

ARTS 121-122-123 THEORY AND PRACTICE OF DRAWING I-II-III (3 cr.) (3 cr.) (3 cr.)—Representational and non-representational drawings in charcoal, wash, pencil, and varied combinations of media. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

ARTS 151-152 FUNDAMENTALS OF DESIGN I-II (3 cr.) (3 cr.)—Experimentation and practice on design problems relating to visual communications with emphasis on techniques and solution. Lecture 1 hour, Laboratory 4 hours, Total 5 hour per week.

ARTS 166-167 FUNDAMENTALS OF LETTERING I-II (3 cr.) (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. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

ARTS 180 INTRODUCTION TO PHOTOGRAPHY (2 cr.)—An introduction to the basic principles of photography with laboratory work related to the student's major field of interest. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

ARTS 187 COLOR PHOTOGRAPHY (2 cr.)—Prerequisite ARTS 180 or equivalent. Introduction to color photography which includes general color theory, developing color slide film and negatives. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

ARTS 221-222-223 ADVANCED DRAWING I-II-III (2 cr.) (2 cr.) (2 cr.)—The structure and forms of the environment (nature and human) memorized as a language to free the student's interpretation for creative graphic illustration. Laboratory 6 hours per week.

ARTS 231-232-233 THEORY AND PRACTICE OF PAINTING I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite ARTS 103 or 123. Abstract and representational painting in watercolor, oil, and tempera with emphasis on design, color composition and value. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

ARTS 241-242-243 THEORY AND PRACTICE OF SCULPTURE I-II-III (3 cr.) (3 cr.) (3 cr.)—The fundamental processes in the creation of form by work with various materials such as clay, plaster, wood, stone, and metal. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

ARTS 261-262-263 ADVERTISING DESIGN I-II-III (3 cr.) (3 cr.) (3 cr.)—A study of the principles of visual communications as applied to advertising design in newspaper, magazine, direct mail advertising, house organs, etc. Analysis of the influence on layout by contemporary art. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

ARTS 271-272-273 GRAPHIC TECHNIQUES I-II-III (3 cr.) (3 cr.) (3 cr.)—The use of drawing instruments and materials; introduction to engraving processes; and the mechanics of reproduction for printing. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

ARTS 274 INTRODUCTION TO ART PRINTMAKING (3 cr.)—A lecture workshop designed to introduce the student or print collector to printmaking from an historical and technical point of view from early wood block through the more contemporary modes of intaglio printing. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

ARTS 275-276 ART PRINTMAKING WORKSHOP I-II (3 cr.) (3 cr.)—The full range of art printmaking; beginning with wood block and progressing to serigraph, photo silk screen intaglio and lithography. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

ARTS 281-282-283 PHOTOGRAPHY WORKSHOP I-II-III (1 cr.) (1 cr.) (1 cr.)—Prerequisite ARTS 180. Advanced practical study in the photography laboratory. Black and white photography and color slides. Laboratory 3 hours per week.

ARTS 298—See *General Usage Courses* on pages 155-156.

AUTOMOTIVE TECHNOLOGY

AUTO 111-112-113 AUTOMOTIVE ENGINES I-II-III (4 cr.) (4 cr.) (4 cr.)—Analysis of power, cylinder condition, valves, and bearings in the automotive engine to establish the present condition, repairs or adjustments. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

AUTO 121-122-123 AUTOMOTIVE FUEL SYSTEMS I-II-III (4 cr.) (4 cr.) (4 cr.)—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. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

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. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

AUTO 154-155 POWER TRAIN I-II (4 cr.) (4 cr.)—Analysis of transmission, propeller shaft, joints, differential and rear axle identification of repairs and adjustments. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

AUTO 199—See *General Usage Courses* on pages 155-156.

AUTO 238 AUTOMOTIVE AIR CONDITIONING (3 cr.)—Principles of refrigeration, air conditioning controls, and the adjustment and general servicing of automotive air conditioning systems. Lecture 3 hours per week.

AUTO 241-242-243 AUTOMOTIVE ELECTRICITY I-II-III (4 cr.) (4 cr.) (4 cr.)—Electricity and magnetism, symbols and circuitry as applies to the automotive electrical system. Includes the storage battery, generators, alternators, regulators, starters, lighting systems, instruments and gauges. Troubleshooting through use of modern test equipment. Lecture 3 hours, Laboratory 3 hours. Total 6 hours per week.

AUTO 254-255 AUTOMATIC TRANSMISSIONS I-II (4 cr.) (4 cr.)—A study of the several types of automatic transmissions, fluid couplings, converters, and their principles of operation. Includes adjustment, servicing, and repair. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

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 of repair cost, front and rear suspension alignment, power and standard steering, and power, standard and disc brakes. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

AUTO 268 AUTOMOTIVE ALIGNMENT (2 cr.)—Use of alignment equipment in diagnosing, adjusting, and repairing suspension problems. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

AUTO 284-285 AUTOMOTIVE SERVICE PROCEDURES & TUNE-UP I-II (3 cr.) (3 cr.)—Diagnostic and service procedures for automatic electrical and mechanical systems; use of tools and test equipment, evaluation of test results, estimation of repair cost, and performance of required service. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

AUTO 287-288 SHOP MANAGEMENT AND CUSTOMER RELATIONS I-II (3 cr.) (3 cr.)—A study of shop layout, personnel management, cost analysis, record keeping and quality control. The shop manager, service salesman, and service writer's role in customer relations. Lecture 3 hours per week.

AUTO 290, 298—See *General Usage Courses* on pages 155-156.

BIOLOGY

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. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

BIOL 104-105 GENERAL BIOLOGY I-II (6 cr.) (6 cr.)—Two quarter sequence covering BIOL 101-102-103. Lecture 4-5 hours, Laboratory 6-3 hours, Total 10-8 hours per week.

- BIOL 114-115 GENERAL BOTANY I-II (4 cr.) (4 cr.)—Prerequisite BIOL 101 (not open to students who have completed BIOL 102 and 103). A study of the seedless plants, algae, fungi, mosses and liverworts, and ferns and their "allies" with emphasis on life cycles, morphology and taxonomy. A study of the seed plants, conifers and flowering plants with emphasis on anatomy, morphology, taxonomy, and evolution; principles of genetics, ecology, and physiology are considered. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.
- BIOL 124-125 GENERAL ZOOLOGY I-II (4 cr.) (4 cr.)—Prerequisite BIOL 101 (not open to students who have completed BIOL 102 and 103). Introduction to the invertebrates and vertebrates, presenting basic biological principles, and emphasizing evolutionary relationships, life histories, and economic importances. Cellular structure and physiology are considered. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.
- BIOL 154-155 HUMAN ANATOMY AND PHYSIOLOGY I-II (4 cr.) (4 cr.)—Structure and functioning of the normal human body. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.
- BIOL 176 MICROBIOLOGY (4 cr.)—The characteristics and activities of microorganisms, 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.
- BIOL 198, 199—See *General Usage Courses* on pages 155-156.
- BIOL 206 BIOLOGICAL PROBLEMS IN CONTEMPORARY SOCIETY (3 cr.)—Prerequisite BIOL 103 or divisional permission. Designed to develop soundly-based understanding of some of the major problems of today's living. Contemporary readings will include such topics as overpopulation, pollution, drug abuse, famine, ecology, conservation, and others. Lecture 3 hours per week.
- BIOL 214 INTRODUCTION TO NON-VASCULAR PLANTS (4 cr.)—Prerequisites BIOL 103 or equivalent (not open to students having had BIOL 114). 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. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.
- BIOL 215 INTRODUCTION TO VASCULAR PLANTS (4 cr.)—Prerequisites BIOL 103 or equivalent (not open to students having had BIOL 114). 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. Lecture 3 hours, Laboratory 3 hours. Total 6 hours per week.
- BIOL 220 INTRODUCTORY VERTEBRATE ZOOLOGY (4 cr.)—Prerequisite BIOL 103 or equivalent (not open to students having had BIOL 124). Fundamentals of vertebrate anatomy, physiology, embryology, classification and evolution. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.
- BIOL 226 INTRODUCTORY INVERTEBRATE ZOOLOGY (4 cr.)—Prerequisite BIOL 103 or the equivalent (not open to students having had BIOL 124). The biology of invertebrate animals with special reference to structure, embryology, function, ecology, classification, and evolution. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

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. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

BIOL 256 INTRODUCTORY GENETICS (5 cr.)—Prerequisite BIOL 103 or equivalent, or departmental permission. History and development of the science of genetics, with emphasis on Mendelian concepts, their modification, and application to human problems. Lecture 4 hours, Laboratory 3 hours, Total 7 hours per week.

BIOL 267 GENERAL ECOLOGY (5 cr.)—Prerequisite BIOL 103 or divisional permission. 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. Lecture 4 hours, Laboratory 3 hours, Total 7 hours per week.

BIOL 268 MICROBIOLOGY (6 cr.)—Prerequisites BIOL 103 and one year of college chemistry or divisional permission. Introduction to microbiology, morphology and activities of micro-organisms. Control of micro-organisms, infection, immunity and other antibody reactions; study of infections and infectious diseases. Lecture 3 hours, Laboratory 6 hours, Total 9 hours per week.

BIOL 276 REGIONAL FLORA (3 cr.)—Family characteristics of vascular plants including principal phylogeny and classification based principally on local flora. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

BIOL 298, 299—See *General Usage Courses* on pages 155-156.

BROADCASTING

BCST 110 INTRODUCTION TO RADIO/TV (3 cr.)—An historical overview of broadcasting; pioneer radio to television. The forces that have shaped broadcasting and its influence on society. Lecture 3 hours per week.

BCST 121-122-123 RADIO/TV PRODUCTION I-II-III (3 cr.) (3 cr.) (3 cr.)—Radio and television production and direction through sequentially arranged studio exercises. Laboratory 6 hours per week.

BCST 134-135 SPEECH FOR RADIO/TV I-II (3 cr.) (3 cr.)—Prerequisite SPDR 137. Broadcast announcing including technical problems, techniques and modes of articulatory expression in varied broadcast situations. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

BCST 138-139 TV STUDIO ART I-II (3 cr.) (3 cr.)—Designed for the prospective producer-director; the design and use of graphics, scenery and props, the use of color, special effects and animation. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

BCST 214-215 TECHNICAL PROBLEMS OF RADIO/TV I-II (3 cr.) (3 cr.)—Prerequisite BCST 123. A study of radio and television technical problems. Equipment operating characteristics including transmission, the audio board, camera, audio and video tape recording, editing and splicing; special purpose equipment such as reverb units and special effects; sound control, effect of color intensity, chroma and hue, FCC license requirements. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

BCST 216 RADIO/TV STATION MANAGEMENT AND OPERATION (3 cr.)—Broadcast management responsibility; simulated decision making; the roles of government, public interest and programming in radio and television management and operation. Lecture 3 hours per week.

BCST 217 RADIO/TV NEWS (3 cr.)—Prerequisite BCST 226. The principles and techniques of news organization; to provide experience in writing, editing and reporting news; and to develop an understanding of broadcast ethics and responsible news in a free society. Lecture 3 hours per week.

BCST 226 WRITING FOR RADIO/TV (3 cr.)—Prerequisite ENGL 102. The written communications process; writing and planning of continuity for radio and television; documentary writing. Lecture 3 hours per week.

BCST 257 SOCIAL PROBLEMS IN AMERICAN BROADCASTING (3 cr.)—The dominant issues in contemporary broadcasting including the role of pressure groups, violence and the mass media, the influence of advertising, censorship, and broadcasting's enormous potential. Lecture 3 hours per week.

BCST 281-282-283 ADVANCED RADIO/TV PRODUCTION I-II-III (5 cr.) (5 cr.) (5 cr.)—Prerequisite BCST 123. Advanced radio and television program production and direction; production environment and organization; producer-director responsibilities and techniques; practical exercises in student production and direction. Lecture 3 hours, Laboratory 6 hours, Total 9 hours per week.

BCST 290, 298, 299—See *General Usage Courses* on pages 155-156.

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. Lecture 3 hours per week.

BUAD 108 BUSINESS MACHINES (2 cr.)—A course to develop proficiency in the use of office machines such as calculator and adding machines. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

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. Lecture 3 hours per week.

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. Lecture 3 hours per week.

BUAD 157 PRINCIPLES OF BANK OPERATIONS (3 cr.)—The economic importance of banks, the receiving functions, processing of cash items, bookkeeping operations, posting systems, paying teller operations, collection services, legal relationship with depositors, characteristics of negotiable instruments, the savings and time deposit function, management of bank funds, loans and investments, general bank accounting, account analysis and service charges, internal controls, international financial services, trust services, safe deposit services, growth of the American banking system, the Federal Reserve System, government supervision, banking and public service. Lecture 3 hours per week.

BUAD 164 PRINCIPLES OF BUSINESS MANAGEMENT I (3 cr.)—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 required to be successful as a manager. Lecture 3 hours per week.

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. Lecture 3 hours per week.

BUAD 174-175 SMALL BUSINESS MANAGEMENT I-II (3 cr.) (3 cr.)—A study of management problems which 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 relationships, case studies involving actual business situations. Lecture 3 hours per week.

BUAD 176 ADMINISTRATIVE OFFICE MANAGEMENT (3 cr.)—Prerequisite BUAD 164. Principles of office management. The study of office organization and layout; work flow, office procedures, standards, personnel and supervision, equipment; centralized services; and current office management trends. Lecture 3 hours per week.

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 agency. Lecture 3 hours per week.

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. Lecture 3 hours per week.

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, and the Uniform Commercial Code. Lecture 3 hours per week.

BUAD 246 BUSINESS FINANCE (3 cr.)—Problems involved in the acquisition and use of funds necessary to the conduct of business. Sources and instruments of capital and finance, financial organizations, and financing of operations and adjustment. Lecture 3 hours per week.

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. Lecture 3 hours per week.

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. 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. Lecture 3 hours per week.

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 the position of labor in business today. Lecture 3 hours per week.

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 to employee, public customer, and stockholder relations; lecture, demonstrations, and problem cases for practical application. Lecture 3 hours per week.

BUAD 288 COMMUNICATIONS IN MANAGEMENT (3 cr.)—Functions of communication in management. Methods of communicating purposefully with emphasis on gathering, organizing and transmitting facts and ideas. Review of basic techniques of effective oral and written communications. Lecture 3 hours per week.

BUAD 289 PRACTICES AND PHILOSOPHIES OF MANAGEMENT (3 cr.)—Provides an opportunity to develop an understanding of appropriate attitudes related to human situations so that the individual may become a more useful and responsible member of an organization and prepare for positions of greater administrative responsibility. Analysis and discussion of cases to develop the ability to think and act responsibly. Consideration of principles, philosophies and ethical values to broaden the scope and growth of the administrator. Management development deals with men, motivation, and morale designed for managers, foremen, supervisors, and department heads. Lecture 3 hours per week.

BUAD 298, 299—See *General Usage Courses* on pages 155-156.

CHEMISTRY

CHEM 100 INTRODUCTION TO CHEMISTRY (4 cr.)—An introductory survey of chemistry for students not intending to specialize in chemistry. Lectures will emphasize basic principles of inorganic chemistry; laboratory will be illustrative of the principles considered. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

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.

CHEM 111-112-113 GENERAL INORGANIC CHEMISTRY I-II-III (4 cr.) (4 cr.) (4 cr.)—Fundamental principles and laws underlying chemical action with special emphasis on the non-metals, their compounds, theories and problems. Laboratory for the first two quarters deals with the non-metallic elements and their compounds. The last quarter deals with the theories of qualitative analysis. Lecture 3 hours, Laboratory 3 hours. Total 6 hours per week.

CHEM 114-115 GENERAL INORGANIC CHEMISTRY I-II (6 cr.) (6 cr.)—Two quarter sequence covering CHEM 111-112-113. Lecture 4-5 hours, Laboratory 6-3 hours, Total 10-8 hours per week.

CHEM 198, 199—See *General Usage Courses* on pages 155-156.

CHEM 241-242-243 ORGANIC CHEMISTRY I-II-III (4 cr.) (4 cr.) (4 cr.)—requisite 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. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

CHEM 298, 299—See *General Usage Courses* on pages 155-156.

CIVIL ENGINEERING TECHNOLOGY

CIVL 124 CIVIL ENGINEERING DRAFTING I (2 cr.)—Introduction to terminology and drafting procedures related to structural steel, reinforced concrete, and timber detailing. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

CIVL 125 CIVIL ENGINEERING DRAFTING II (2 cr.)—Drafting problems relating to highways and surveys. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

CIVL 140 CONSTRUCTION PLANNING (3 cr.)—Introduction to civil engineering construction and the principles and economics of construction planning. Lecture 3 hours per week.

CIVL 181-182 SURVEYING I-II (4 cr.) (4 cr.)—Prerequisites Algebra, Plane Geometry, Basic Trigonometry, or MATH 121. Introduction to surveying, chaining and pacing, direct and profile leveling, measurements of angles, transit-tape traversing, traverse analysis, calculation of areas, adjustment of instruments. Basic and complex circular curves, stadia surveying, topographic surveying analysis and preparation of topographic maps. Field work parallels classroom instruction. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

CIVL 217 STRUCTURAL STEEL DESIGN (4 cr.)—Prerequisite ENGR 152 or equivalent. Design, investigation, and detailing of basic structural steel members of steel frame structures. Lecture 4 hours per week.

CIVL 218 REINFORCED CONCRETE DESIGN (4 cr.)—Design, investigation and detailing of reinforced concrete structural members used in the construction of concrete framed structures. Lecture 4 hours per week.

CIVL 230 STRUCTURAL ANALYSIS (3 cr.)—Prerequisite ENGR 152 or equivalent. Analysis of statically determinate and indeterminate structures based on both the principles of statics and geometric conditions. Lecture 3 hours per week.

CIVL 246 SOIL MECHANICS (3 cr.)—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. Lecture 3 hours per week.

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. Laboratory 3 hours per week.

CIVL 254 CIVIL MATERIALS I (CONCRETE) (3 cr.)—Prerequisite or Corequisite CIVL 246 or equivalent. Properties of portland cement concrete, methods of mix design, use and placement of concrete. Lecture 3 hours per week.

CIVL 255 CIVIL MATERIALS II (ASPHALT) (3 cr.)—Prerequisite or Corequisite CIVIL 246 or equivalent. Properties of bituminous materials, particularly asphalt cement used in construction, methods of mix design, use and placement of asphalt. Lecture 3 hours per week.

CIVL 257 CONCRETE LABORATORY (1 cr.)—Corequisite CIVL 254. Mixing, curing, testing and quality control of concrete. Laboratory 3 hours per week.

CIVL 258 BITUMINOUS LABORATORY (1 cr.)—Corequisite CIVL 255. Testing and quality control of bituminous materials. Mixing, testing and quality controls of asphalt cements. Laboratory 3 hours per week.

CIVL 268 WATER AND SEWAGE SYSTEMS (3 cr.)—Sources, collection methods, treatment and distribution of water and collection, treatment and disposal of sewage. Field trips to local water and sewage treatment plants. Lecture 3 hours per week.

CIVL 276 TRAFFIC AND TRANSPORTATION TECHNOLOGY I (4 cr.)—Introduction to the techniques of traffic and transportation surveys. The application of survey data to the planning, design and operation of modern transportation systems. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

CIVL 284 ROUTE SURVEYING AND HIGHWAY DESIGN (4 cr.)—Prerequisite CIVL 181. Principles of route surveying; simple, compound and transition curves; grades and vertical curves; earthwork and haul quantities. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

CIVL 290, 298—See *General Usage Courses* on pages 155-156.

DATA PROCESSING

DAPR 36 KEY PUNCH/KEY TAPE OPERATIONS (3 cr.)—Prerequisite typing skills of 30 wpm or divisional permission. A comprehensive occupational course designed to prepare students to function as key punch/key tape operators in the current data processing employment market; an introduction to data processing principles. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 106 PRINCIPLES OF DATA PROCESSING (3 cr.)—Prerequisite one year of high school algebra. An introduction to methods, techniques, and systems of manual, mechanical, and electronic data processing. History and development of punch card data processing, and electronic or automatic data processing. Lecture 3 hours per week.

DAPR 130 INTRODUCTION TO COMPUTER OPERATIONS (3 cr.)—Prerequisite DAPR 106 or equivalent. Study of computer operation environment and hardware. Includes types of computer and peripheral equipment, operator use of data files, program libraries, utility routines, console use in controlling computer system manually, correcting errors, determining status of machine circuits and registers, and procedures for using input and output devices. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 136 COMPUTER OPERATIONS (3 cr.)—Prerequisite DAPR 130. An introduction to operating procedure using a computer. A study of the console used to control the machine manually, correct errors, determine the status of

machine circuits, registers, and determine the content of storage. The procedure for using input and output devices, punched paper tape, magnetic tape, random access devices, and printer. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 144 COMPUTER PROGRAMMING (COMPUTER CONCEPTS I) (3 cr.)—Prerequisite DAPR 106 or equivalent. Programming techniques and the various characteristics of computers. Practical experience in programming a series of problems in machine, assembler, or manufacturer's higher level language. Course objective is to provide a proper foundation for materials in subsequent courses rather than providing specific skills in any computer language. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 147 COMPUTER PROGRAMMING (COBOL) (3 cr.)—Prerequisite DAPR 144. Experience in using programming techniques with a high level language. Students will be required to program, debug, and test specified business oriented problems using Cobol. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 256 COMPUTER PROGRAMMING (ADVANCED COBOL) (4 cr.)—Prerequisite DAPR 147. 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. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

DAPR 266 COMPUTER PROGRAMMING (FORTRAN) (4 cr.)—Prerequisite DAPR 144 or equivalent. The business applications of Fortran including input/output, floating point arithmetic, loop control, and functions. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

DAPR 267 COMPUTER PROGRAMMING (RPG) (4 cr.)—Prerequisite DAPR 144 or equivalent. The study and development of programming capabilities in the business computer language Report Program Generator (RPG). Includes program logic, block diagramming, coding techniques, documentation, advantages and disadvantages of RPG as a high-level language in small and medium scale installations. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

DAPR 26B COMPUTER PROGRAMMING (P/L 1) (4 cr.)—Prerequisite DAPR 144. The study and development of programming capability in the IBM System 360 computer language P/L 1. 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. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

DAPR 269 COMPUTER PROGRAMMING (ASSEMBLER) (4 cr.)—Prerequisite DAPR 144 or equivalent. 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 debugging and core-dump reading will be given major emphasis. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

DAPR 281 SYSTEMS ANALYSIS I (3 cr.)—Prerequisite DAPR 106. A study of the overall computer based systems analysis and design process; information problems of business organization and the inter-relationships of functions; nature of business problem isolation and definition; initial phase of systems analysis and evaluation. Lecture 3 hours per week.

DAPR 282 SYSTEMS ANALYSIS II (3 cr.)—Prerequisite DAPR 281. The systems design and implementation phases relating to initial automation; up-grading

or revision of business data processing systems; system documentation including summaries for management schedules and cost analysis; equipment selection, acquisition and detailed review of pre- and post-installation considerations. Lecture 3 hours per week.

DAPR 286 COMPUTER PROGRAM APPLICATION (4 cr.)—Prerequisite DAPR 256. The characteristics and requirements of basic business applications. Design of a computer solution to an application as a case study. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

DAPR 298, 299—See *General Usage Courses* on pages 155-156.

DENTAL ASSISTANT

DENT 100 INTRODUCTION FOR DENTAL AUXILIARIES (3 cr.)—Introduction to dentistry and dental auxiliaries; history and development of dentistry and its related fields; the roles of the dental auxiliaries in practice and in relation to other members of the dental health team; dental ethics and jurisprudence; professional and educational opportunities. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

DENT 101-102-103 DENTAL SCIENCE I-II-III (4 cr.) (4 cr.) (4 cr.)—Bacteriology, anatomy and physiology, gross and oral dental anatomy, oral pathology, pharmacology, diet and nutrition, and first aid and dental emergencies, and dental-health education as related to dental science and the role of the dental assistant. Lecture 2 hours, Laboratory 4 hours, Total 6 hours per week.

DENT 110 INTRODUCTION TO DENTAL MATERIALS (4 cr.)—Introduction to the physical and chemical characteristics, uses, and manipulation of materials used in dental procedures, clinical and laboratory. Emphasis on the general principles of physical properties and the specifications program of the American Dental Association. Lecture 2 hours, Laboratory 4 hours, Total 6 hours per week.

DENT 111-112 CLINICAL PROCEDURES I-II (4 cr.) (4 cr.)—Prerequisites DENT 100, 110, 101-102 or corequisite. Principles and procedures related to radiology, dental instruments and equipment; role of the dental assistant in general and specialty practice. Lecture 2 hours, Laboratory 4 hours, Total 6 hours per week.

DENT 121-122 CHAIRSIDE ASSISTING I-II (4 cr.) (4 cr.)—Prerequisites DENT 100, 110, 101-102 or corequisite. The proper procedures of reception and preparation of the patient; care of dental equipment and instruments, charting of teeth, seating of patient, adjustment of dental chair, preparation of trays and instrument stands, layout and exchange of instruments and materials. Lecture 2 hours, Laboratory 6 hours, Total 8 hours per week.

DENT 190, 199—See *General Usage Courses* on pages 155-156.

DRAFTING

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. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

DRFT 112 TECHNICAL DRAFTING II (2 cr.)—Prerequisite DRFT 111 or equivalent. Sections and conventions, threads and fasteners, pictorial drawings, auxiliaries and revolutions. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

DRFT 113 TECHNICAL DRAFTING III (2 cr.)—Prerequisite DRFT 112 or equivalent. Assembly and detail drawings, working from the simple to the complex. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

DRFT 144-145 AUTOMOTIVE DRAWING INTERPRETATION I-II (2 cr.) (2 cr.)—The reading and interpretation of automotive shop drawings, including assembly and exploded drawings of automotive assemblies. Lecture 2 hours per week.

DRFT 158 ELECTRICAL-ELECTRONICS DRAFTING (2 cr.)—Applications of drafting procedures with emphasis on working and functional drawings and direct applications to electrical and electronic components and circuits. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

DRFT 171 BLUEPRINT READING I (2 cr.)—The purpose of blueprints, designing of the product and its production; review and application of basic principles, visualization, orthographic projection, detail of drafting shop process and terminology, assembly drawings and exploded views. Lecture 1 hour, Laboratory 3 hours, Total 4 hours.

DRFT 172 BLUEPRINT READING II (2 cr.)—Prerequisite DRFT 171. Dimensioning, review and application techniques, changes and corrections, classes of fits, tolerances and allowances, sections and convention in blueprint reading, auxiliary views, pictorial drawings, simplified drafting procedures. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

DRFT 173 BLUEPRINT READING III (2 cr.)—Prerequisite DRFT 172. Industrial plants, production drawings, operation sheets, tool drawings, assembly drawings, and detail prints. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

ECONOMICS

ECON 160 SURVEY OF AMERICAN ECONOMICS (3 cr.)—A survey of the history, principles, and policies of the American economic system. Some comparison with alternative economic systems. Lecture 3 hours per week.

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 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. Lecture 3 hours per week.

ECON 214-215 PRINCIPLES OF ECONOMICS I-II (5 cr.) (4 cr.)—Two quarter sequence covering ECON 211-212-213. Lecture 5 hours per week in ECON 214 and Lecture 4 hours per week in ECON 215.

ECON 241-242-243 MONEY AND BANKING I-II-III (3 cr.) (3 cr.) (3 cr.)—Monetary standards; the role of money in the performance of an economic system; operation and evolution of the commercial and central banking systems; developments in the theory of money and income; application of theory to analysis of policy questions including government finance and debt management. Lecture 3 hours per week.

ECON 298, 299—See *General Usage Courses* on pages 155-156.

ELECTRICITY AND ELECTRONICS

ELEC 11-12-13 ELECTRICITY I-II-III (4 cr.) (4 cr.) (4 cr.)—Principles of electricity covering resistance, current, and voltage in both AC and DC circuits. Lecture 4 hours per week.

ELEC 17 ELECTRONIC CONTROLS (4 cr.)—Applied air conditioning technology; fundamental devices and circuits, basic electronic instrumentation control devices and circuits; experiments to develop testing and trouble shooting techniques. Lecture 4 hours per week.

ELEC 21-22-23 ELECTRONICS I-II-III (4 cr.) (4 cr.) (4 cr.)—Introduction to vacuum tube, semiconductor principles and circuitry. Lecture 3 hours, Laboratory 4 hours per week.

ELEC 74 ELECTRICAL POWER (4 cr.)—Prerequisite ELEC 48 or equivalent. Circuit elements, direct current circuits and motors, single and three-phase circuits and motors, power distribution systems and protective devices. Lecture 4 hours per week.

ELEC 75 ELECTRICAL AND CONTROL SYSTEMS (4 cr.)—Prerequisite ELEC 74. Trouble shooting and servicing electrical controls, electric motors, motor controls, motor starters, relays, overloads, instruments and control circuits. Lecture 4 hours per week.

ELEC 111-112 INTRODUCTION TO ELECTRICAL CIRCUITS I-II (4 cr.) (6 cr.)—Corequisite MATH 121-122 respectively. The study of resistance, magnetism, inductance, capacitance, and the transient state. An introduction to circuit theorems as applied to direct current circuits. Electrical circuits employing complex algebra, equivalent circuit theorems and modern techniques for the solution of complex circuit problems. Lecture 3-5 hours, Laboratory 3 hours, Total 6-8 hours per week.

ELEC 118-119 INTRODUCTION TO ELECTRICAL SHOP I-II (1 cr.) (1 cr.)—Use of hand tools commonly found in the electrical and electronics industry. A variety of projects requiring fabrication of electrical-mechanical equipment are developed, tested and reports written. Laboratory 3 hours per week.

ELEC 125 INTRODUCTION TO ELECTRONICS (5 cr.)—Prerequisite ELEC 112. The theory, properties, and application of vacuum tube and solid state devices, including power supplies. Lecture 4 hours, Laboratory 3 hours, Total 7 hours per week.

ELEC 145 INTRODUCTION TO ELECTRICAL MACHINES (4 cr.)—Prerequisite ELEC 112 or equivalent. Construction, theory of operation, and application of direct and alternating current machinery and transformer. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 201-202-203 ELECTRICAL ENGINEERING TECHNOLOGY I-II-III (6 cr.) (7 cr.) (6 cr.)—Prerequisite ELEC 125 and MATH 123. The concepts of electron and solid-state physics, application of vacuum, gas, and semiconductor diodes and triodes to electronic circuits. Advanced semiconductor and tube theory; amplifier operating characteristics and design considerations; laboratory experiments demonstrate the application of vacuum tubes and transistors to various circuits. Application of principles to complex electronic systems; laboratory experiments demonstrate the operating characteristics of single-stage circuits. Lecture 5 hours, Laboratory 3-6-3 hours, Total 8-11-8 hours per week.

ELEC 211 ELECTRICAL MACHINES (4 cr.)—Prerequisite ELEC 112. Construction, theory of operating and application of direct current machinery and transformers both in single phase and polyphase. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 212 ELECTRICAL MACHINES AND INDUSTRIAL CONTROLS (4 cr.)—Prerequisite ELEC 211. Construction, theory of operation, characteristics, and application of alternator, synchronous motors, induction motors, and fractional horsepower motors. Introduction to the principles of industrial control, circuit diagram functions and symbols to "traditional" motor control, the principles of operation and application of the devices used for control and protection. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 213 ADVANCED INDUSTRIAL CONTROLS (4 cr.)—Prerequisite ELEC 212. A survey of principles and "building blocks" of industrial controls. Analyzing involved control circuits, principles of operation and application of special electro-magnetic and electronic devices, feedback circuits, and static control including devices, logic symbols, and Boolean algebra. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 214 ELECTRICITY (4 cr.)—Prerequisites MATH 122 and PHYS 112. A course for non-electrical students covering direct and alternating current theory with some introduction to electrical machines. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 241-242-243 COMMUNICATIONS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite ELEC 125 and MATH 123. The study of modulation and power in modulated waves, sinusoidal oscillations and oscillators, RF amplifiers and detectors, and AM receivers. The study of transmitters and receivers; FM receivers, RF power amplification, AM, SSB, and FM transmitters, and an introduction to transmission lines and antennas. The study of microwave systems; microwave devices, waveguides, antennas, measurements, microwave frequencies; introduction to radar and television systems. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 248 MICROWAVE TECHNIQUES (3 cr.)—Prerequisite ELEC 125. Microwave techniques to introduce the special requirements when using very high frequency equipment as klystrons, cavity resonators, slotted lines and waveguide type transmission devices. Lecture 3 hours per week.

ELEC 276 INSTRUMENTS AND MEASUREMENTS (4 cr.)—Prerequisite ELEC 125 or equivalent. A study of circuits used in electronic measurements and application of these circuits in test instruments such as oscilloscopes, vacuum tube voltmeters, and bridges; the accuracy of measurements, how instruments work, proper use of instruments, and calibration technique. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 298, 299—See *General Usage Courses* on pages 155-156.

ENGINEERING

ENGR 100 INTRODUCTION TO ENGINEERING TECHNOLOGY (2 cr.)—Professional fields of engineering technology: work of the engineering technologist, requirements of training and character, professional ethics, and division of industrial practice and competition, engineering problems with slide-rule applications. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

ENGR 101 INTRODUCTION TO ENGINEERING (2 cr.)—Professional fields of engineering; work of the engineer, requirements and character, professional problems from the various schools of engineering and slide-rule applications. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

ENGR 102 INTRODUCTION TO ENGINEERING METHODS (2 cr.)—Prerequisite ENGR 101. An introduction to electronic computation and programming of the digital computer; field trips to a nearby computer center. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

ENGR 103 CONCEPTUAL DESIGN AND ANALYSIS (2 cr.)—Prerequisite ENGR 102. Engineering fundamentals and concepts in designing for production, prototype and laboratory models, automation, tape programming and verification; design problems, class reports, and visits to nearby four-year colleges. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

ENGR 121 ENGINEERING GRAPHICS I (2 cr.)—Drawing and theories of projection. Multiview drawings, pictorial drawings and sketching, geometrical construction, sectioning, lettering, dimensioning, auxiliary views, revolutions, assembly drawings. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

ENGR 122 ENGINEERING GRAPHICS II (2 cr.)—Prerequisite ENGR 121. Graphical methods used in engineering design, layout and calculation, study of vector geometry, properties and types of graphs for engineering and scientific purposes. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

ENGR 123 ENGINEERING GRAPHICS III (2 cr.)—Prerequisite ENGR 122. A study of the analysis and graphic presentation of the space relationship of fundamental geometric elements: point, line, plane, curved surfaces, development and vectors. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

ENGR 151 MECHANICS I (STATICS) (4 cr.)—Corequisite MATH 122. 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. Lecture 4 hours per week.

ENGR 152 MECHANICS II (STRENGTH OF MATERIALS) (3 cr.)—Prerequisite ENGR 151. Strength of material concepts, stress and strain analysis, both elastic and plastic, with emphasis on elastic analysis of axially loaded members, connectors, beams, and columns. Lecture 3 hours per week.

ENGR 154 MECHANICS LABORATORY (1 cr.)—Prerequisite or corequisite ENGR 152. Tension, compression, torsion, bending, fatigue, and hardness of materials. Static and dynamic stresses and strains, stress concentration factors, and statistical evaluation of data. Experiments and/or demonstrations. Laboratory 3 hours per week.

ENGR 201 MECHANICS OF PARTICLES (5 cr.)—Corequisite MATH 241. Vector treatment of concepts of force, mass, space, time; gravitational systems of measurements; equilibrium of discrete force systems; centroids, dry friction, planar and three dimensional kinematics and kinetics of particles, relative motion, mass moments of inertia, Newton's laws, work and energy, impulse and momentum. Lecture 5 hours per week.

ENGR 202 MECHANICS OF DEFORMABLE SOLIDS (5 cr.)—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. Lecture 5 hours per week.

ENGR 203 DYNAMICS OF RIGID BODIES (3 cr.)—Prerequisite ENGR 201. Corequisite MATH 242. 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. Lecture 3 hours per week.

ENGR 206 ENGINEERING ECONOMY (3 cr.)—Economic decision process in the engineering design environment. Investment, financing, depreciation, manufacturing costs, economic selection replacement. Lecture 3 hours per week.

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 individual instruction. 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 hours.

ENGL 101-102-103 COMMUNICATION SKILLS I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite satisfactory score on appropriate English proficiency examination. Designed to teach the student to use the English language correctly and effectively and to develop skill in the preparation of reports, articles, essays, and correspondence related to technical fields. Attention to sentence structure and paragraph development to express thoughts in lucid, coherent, well-developed form. Reading selections provide material for discussion and supply topics for frequent writing assignments. Lecture 3 hours per week.

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. Lecture 3 hours per week.

ENGL 114-115 ENGLISH COMPOSITION I-II (5 cr.) (4 cr.)—Two quarter sequence covering ENGL 111-112-113. Lecture 5-4 hours per week.

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 skills; laboratory provides enrichment and application of techniques. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

ENGL 121-122-123 JOURNALISM I-II-III (3 cr.) (3 cr.) (3 cr.)—Instruction and classroom practice in gathering, evaluating, and writing news. Techniques of page layout, newspaper make-up, rewriting, and editing. Lecture 3 hours per week.

ENGL 137 TECHNICAL WRITING (3 cr.)—Prerequisite ENGL 102 or departmental approval. Designed to develop writing proficiency in technical fields. Emphasis on collecting, organizing, and presenting materials applicable to various specialized areas. Lecture 3 hours per week.

ENGL 180 FUNDAMENTALS OF BUSINESS ENGLISH (3 cr.)—Prerequisite ENGL 102. 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 a logical pattern. Lecture 3 hours per week.

ENGL 199—See *General Usage Courses* on pages 155-156.

ENGL 251-252-253 SURVEY OF AMERICAN LITERATURE I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite ENGL 113 or departmental approval. American Literature from Colonial times to the present. Emphasis on the ideas, themes, and characteristics of our national literature. Lecture 3 hours per week.

ENGL 261-262-263 SURVEY OF ENGLISH LITERATURE I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite ENGL 113 or departmental approval. A survey of major English writings from early times to the modern period. Emphasis on the ideas, themes, and characteristics of English literature. Lecture 3 hours per week.

ENGL 271-272-273 SURVEY OF WORLD LITERATURE I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite ENGL 113 or equivalent. 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. Lecture 3 hours per week.

ENGL 299—See *General Usage Courses* on pages 155-156.

FIRE SCIENCE

FIRE 106 FIRE PROTECTION ORGANIZATION (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. Lecture 3 hours per week.

FIRE 107 BLUEPRINT READING FOR FIREMEN (3 cr.)—Blueprint reading with emphasis on building construction, fire prevention and preplanning fire tactics and strategy. Lecture 3 hours per week.

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. Lecture 3 hours per week.

FIRE 111 HAZARDOUS MATERIALS I (3 cr.)—Identification and characteristics of materials contributing to fire hazards including chemicals, gases, flammable liquids, and radiological materials, and an examination of their storage, handling and transportation, and related fire science problems. Lecture 3 hours per week.

FIRE 137 FIRE FIGHTING TACTICS AND STRATEGY (3 cr.)—Prerequisite FIRE 106 and FIRE 108. Review of combustion and extinguishment. The problems during size-up; developing and implementing tactics and strategy during fires; and the leadership required on the fire ground. Lecture 3 hours per week.

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. Lecture 3 hours per week.

FIRE 216 FIRE HYDRAULICS AND EQUIPMENT (4 cr.)—Prerequisite FIRE 106. 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. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

FIRE 237 ARSON DETECTION AND INVESTIGATION (3 cr.)—Prerequisite FIRE 106. Introduction to arson laws and types of incendiary fires. Determining fire causes, recognizing and preserving evidence; interrogation of adults and juveniles; court procedures. Lecture 3 hours per week.

FRENCH

FREN 101-102-103 INTRODUCTORY FRENCH I-II-III (4 cr.) (4 cr.) (4 cr.)—The understanding, speaking, reading, and writing of French with emphasis on manipulation of the structure of the language. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

FREN 199—See *General Usage Courses* on pages 155-156.

FREN 201-202-203 INTERMEDIATE FRENCH I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite FREN 103 or successful completion of two years of high school French and departmental permission. Advanced study in the understanding, speaking, reading, and writing of French. French used in the classroom. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

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. Lecture 3 hours per week.

FREN 299—See *General Usage Courses* on pages 155-156.

GENERAL

GENL 100 ORIENTATION (1 cr.)—This course, required of all beginning college students, is designed as an instrument of group counseling and deals with such problems as adjustment to college, purposes and functions of the college planning for the future, making the most of the college years, and what the college has to offer. Emphasis is placed on experiences designed to improve study habits and skills such as reading, listening, and library activities. Lecture 1 hour, Laboratory 1 hour, Total 2 hours per week.

GENERAL USAGE COURSES

(Insert Appropriate Prefix) 90, 190, 290 COORDINATED PRACTICE IN (Insert Appropriate Discipline) (1-5 cr.)—Supervised practice in selected health agencies coordinated by the College. Credit/Practice Ratio maximum 1:5 hours. May be repeated for credit. Variable hours.

(Insert Appropriate Prefix) 90, 190, 290 COORDINATED INTERNSHIP IN (Insert Appropriate Discipline) (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 hours. May be repeated for credit. Variable hours.

(Insert Appropriate Prefix) 98, 198, 298 SEMINAR AND PROJECT IN (Insert Appropriate Discipline) (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 hours.

(Insert Appropriate Prefix) 99, 199, 299 SUPERVISED STUDY IN (Insert Appropriate Discipline) (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

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. Lecture 3 hours per week.

GEOG 250 INTRODUCTION TO CULTURAL GEOGRAPHY (3 cr.)—A survey of landscape modification through human agencies and the relationships of culture and geography. Lecture 3 hours per week.

GEOG 260 INTRODUCTION TO ECONOMIC GEOGRAPHY (3 cr.)—A geographic survey of primary production, manufacturing, mining, and trade, covering agriculture, forestry, and fishing. Lecture 3 hours per week.

GEOG 298, 299—See *General Usage Courses* on pages 155-156.

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. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

GEOL 104-105 GENERAL GEOLOGY I-II (6 cr.) (6 cr.)—Two quarter sequence covering GEOL 101-102-103. Lecture 4-5 hours, Laboratory 6-3 hours, Total 10-8 hours per week.

GEOL 198, 199—See *General Usage Courses* on pages 155-156.

GERMAN

GERM 101-102-103 INTRODUCTORY GERMAN I-II-III (4 cr.) (4 cr.) (4 cr.)—The understanding, speaking, reading, and writing of German with emphasis on manipulation of the structure of the language. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

GERM 199—See *General Usage Courses* on pages 155-156.

GERM 201-202-203 INTERMEDIATE GERMAN I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite GERM 103 or successful completion of two years of high school

German and departmental permission. Advanced study in the understanding, speaking, reading and writing of German. German is used in the classroom. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

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. Lecture 3 hours per week.

GERM 299—See *General Usage Courses* on pages 155-156.

GOVERNMENT

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 level. Lecture 3 hours per week.

GOVT 256 INTRODUCTION TO INTERNATIONAL POLITICS (3 cr.)—A study of principles and factors affecting current international politics to promote an understanding of nations' behavior with one another. Lecture 3 hours per week.

GOVT 257 CONTEMPORARY INTERNATIONAL PROBLEMS (3 cr.)—Analysis of selected contemporary issues illustrating basic problems in international relations. Some representative topics are the Middle East, Southeast Asia, East-West conflict, the rise of nationalism, and the quest for peace. Lecture 3 hours per week.

GOVT 258 CONTEMPORARY NATIONAL PROBLEMS (3 cr.)—Prerequisites GOVT 281 or permission of instructor. Selected issues illustrating basic problems in public affairs in the United States in such areas as national, state, and local politics, governmental theory and civil rights. Lecture 3 hours per week. (Note: This would be a parallel to GOVT 257, in the area of domestic problems.)

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. Lecture 3 hours per week.

GOVT 284-285 UNITED STATES GOVERNMENT I-II (5 cr.) (4 cr.)—Two quarter sequence covering GOVT 281-282-283. Lecture 5-4 hours per week.

GOVT 298, 299—See *General Usage Courses* on pages 155-156.

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. Lecture 1 hour per week.

HLTH 104 FIRST AID I (2 cr.)—The principles and techniques of safety and first aid according to the accepted content of a standard first aid course. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

HLTH 110 CONCEPTS OF PERSONAL AND COMMUNITY HEALTH (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. Lecture 3 hours per week.

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. Lecture 3 hours per week.

HISTORY

HIST 101-102-103 HISTORY OF WESTERN CIVILIZATION I-II-III (3 cr.) (3 cr.) (3 cr.)—The development of western civilization from ancient times to the present. The last two quarters deal with a survey of the period since the close of the Reformation. Lecture 3 hours per week.

HIST 111-112-113 AMERICAN 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. Lecture 3 hours per week.

HIST 114-115 AMERICAN HISTORY I-II (5 cr.) (4 cr.)—Two quarter sequence covering HIST 111-112-113. Lecture 5-4 hours per week.

HISTORY 187-188-189 HISTORY OF THE AFRO-AMERICAN I-II-III (3 cr.) (3 cr.) (3 cr.)—A survey of the history of the Afro-American, his 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. Lecture 3 hours per week.

HIST 198, 199—See *General Usage Courses* on pages 155-156.

HIST 221-222-223 AMERICAN ECONOMIC HISTORY I-II-III (3 cr.) (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 1920's and 1930's. The third quarter covers the period since 1930. Lecture 3 hours per week.

HIST 251-252-253 HISTORY OF MODERN EUROPE I-II-III (3 cr.) (3 cr.) (3 cr.)—The political, social, and economic developments from 1500 to the present. Lecture 3 hours per week.

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. Lecture 3 hours per week.

INDUSTRIAL TECHNOLOGY

INDT 111-112 MATERIAL AND PROCESSES OF INDUSTRY I-II (3 cr.) (3 cr.)—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 in terms of design application, processing and fabrication methods. Cutting, cold forming, hot working, welding, foundry and chipless manufacturing processes employed in contemporary industry; the science of precision measurement as applied to inspection practices. Lecture 3 hours per week.

INDT 170 INDUSTRIAL MANAGEMENT (3 cr.)—A study of organizational structure; operational, financial, accounting and marketing activities, management responsibilities, planning, control, personnel, safety, labor relationships and factors essential to effective management in industry. Lecture 3 hours per week.

INDT 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 promotion. Lecture 2 hours per week.

INDT 276-277 TIME AND MOTION STUDY I-II (3 cr.) (3 cr.)—Principles and applications of motion analysis, process study, operations study, micromotion study, methods improvement, work simplification, standardization, rating, allowance, analysis of time data. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

INDT 286 QUALITY CONTROL (3 cr.)—Principles of inspection and quality control with emphasis on setting up, maintaining, and interpreting control charts. Includes dimensional control, basic sizes, applications of tolerances, allowances, limits, precision measurements, comparison measurements, industrial applications, optical, electrical and air limit gauges, comparator, inspection techniques, control charts, and statistics as quality instruments. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

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. Lecture 3 hours per week.

LAW ENFORCEMENT

LWNF 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. Lecture 3 hours per week.

LWNF 110 PATROL ADMINISTRATION (3 cr.)—The theories, history, and development of police patrol. Methods and techniques of the various types of patrol and their importance to the overall police function. The responsibilities of patrol officers and supervisors in identifying police hazards, preventing crime, providing police services, establishing sound public relations; practical exercises. Lecture 3 hours per week.

LWNF 114-115 POLICE ORGANIZATION AND ADMINISTRATION I-II (3 cr.) (3 cr.)—Prerequisite LWNF 100. Police functioning at the administrative level. The organization and management of line operations, staff and auxiliary services, including investigative, juvenile, and vice units. The organization and management of personnel, internal control, planning and research, and housing and material functions. Lecture 3 hours per week.

LWNF 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 disturbed persons. Lecture 3 hours per week.

LWNF 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 as related to the juvenile problems. Lecture 3 hours per week.

LWNF 127 CRIMINAL OFFENSES (3 cr.)—The study of particular types of crime with emphasis on the pathology of criminals. Lecture 3 hours per week.

LWNF 128 CRIMINAL BEHAVIOR (3 cr.)—Analysis of relationship of society socialization, and deviancy. Social responses to deviancy and criminal offenders. Lecture 3 hours per week.

LWNF 134-135 CRIMINAL LAW I-II (3 cr.) (3 cr.)—Major crimes; their classification, elements of proof, intent, conspiracy, responsibility, parties, and defenses. Emphasis on the common law and Virginia adaptation. Lecture 3 hours per week.

LWNF 136 LEGAL EVIDENCE (3 cr.)—Kinds, degrees, and admissibility of evidence; methods and techniques of its acquisition, use in criminal proceedings, moot court activities. Lecture 3 hours per week.

LWNF 150 INTRODUCTORY POLICE PHOTOGRAPHY (2 cr.)—Fundamental photographic skills; uses of photography in law enforcement and in courtroom presentation; practical exercises. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

LWNF 166 POLICE COMMUNICATIONS AND RECORDS (3 cr.)—Principles of organization and administration as applied to records and communications, custody, central services, and police logistics; police applications of electronic data processing and the collection of performance data. Lecture 3 hours per week.

LWNF 176 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. Lecture 3 hours per week.

LWNF 187 TRAFFIC ADMINISTRATION AND CONTROL (3 cr.)—Modern methods of traffic facilitation and control; Virginia traffic offenses, techniques of selective enforcement and of accident investigation, police responsibilities in special situations; practical exercises. Lecture 3 hours per week.

LWNF 188 TRAFFIC ACCIDENT INVESTIGATION (3 cr.)—Prerequisite LWNF 187 or equivalent. 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. Lecture 3 hours per week.

LWNF 198, 199—See *General Usage Courses* on pages 155-156.

LWNF 216 MUNICIPAL POLICE ADMINISTRATION (3 cr.)—Police organization and management techniques with emphasis on the urban department; the application of sound management guidelines and techniques to police administration including the growing use of data processing. Lecture 3 hours per week.

LWNF 228 LAW ENFORCEMENT AND THE COMMUNITY (3 cr.)—The current efforts undertaken by the police to achieve an effective working relationship with the community; police image, crisis areas, public and police attitudes, and community relations activities. Lecture 3 hours per week.

LWNF 231-232-233 CRIMINAL LAW, EVIDENCE, AND PROCEDURES I-II-III (3 cr.) (3 cr.) (3 cr.)—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. Lecture 3 hours per week.

LWNF 236 CRIMINAL PROCEDURES (3 cr.)—Organization and jurisdiction of Virginia law enforcement agencies; selective review of the criminal code of Virginia, with emphasis on the most frequently occurring misdemeanors not covered in "Criminal Law." Limited to students who have completed all first-year Police Science courses or who have received departmental permission. Lecture 3 hours per week.

LWNF 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. Limited to students who have successfully completed five quarters of the Associate in Applied Science Degree program in Police Science, or who have secured departmental permission. Lecture 3 hours per week.

LWNF 240 CONSTITUTIONAL LAW FOR POLICE (3 cr.)—A survey of the background and application of Constitutional provisions, both State and Federal, pertinent to the functions of law enforcement officers. Includes such topical areas as speech; press and assembly, arrest and detention, search and seizure; interrogations and confessions; self-incrimination and assistance of counsel; double jeopardy; speedy and fair trial; humane punishment; and civil rights. Lecture 3 hours per week.

LWNF 246 PRINCIPLES OF CRIMINAL INVESTIGATION (3 cr.)—Conduct at the crime scene; collection and handling of evidence; interviewing and interrogation; obtaining statements, admissions, and confessions; testifying in court, practical exercises. Lecture 3 hours per week.

LWNF 247 ADVANCED CRIMINAL INVESTIGATION (3 cr.)—Prerequisite LWNF 246. Continued study of the investigative process; introduction to scientific aids and examination; application of investigative techniques to specific offenses; practical exercises. Lecture 3 hours per week.

LWNF 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. Lecture 3 hours per week.

LWNF 254-255 CRIMINAL INVESTIGATION TECHNIQUES I-II (4 cr.) (4 cr.)—Crime scene searches, collection and preservation of evidence, interrogations, and interviews, obtaining statements, admissions and confessions, testifying in court. Advanced laboratory study relating to investigations, introduction and use of scientific aids and examinations, applications of investigative techniques to specific offenses. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

LWNF 266 POLICE COMMUNICATIONS SYSTEMS (2 cr.)—Modern communications systems as they apply to daily operational requirements of a police organization. Includes basic methods and principles of communications with emphasis on procedures in an effective police communications system; practical exercises. Lecture 2 hours per week.

LWNF 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. Lecture 3 hours per week.

LWNF 298, 299—See *General Usage Courses* on pages 155-156.

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. Lecture 3 hours per week.

MKTG 109 PRINCIPLES OF SALESMANSHIP (3 cr.)—The development of selling standards, methods and buying motives. The organization and training processes necessary for a well coordinated sales plan through united efforts of the sales force. The training of sales personnel for maximum efficiency in selling. Lecture 3 hours per week.

MKTG 131-132-133 TRAFFIC AND TRANSPORTATION I-II-III (3 cr.) (3 cr.) (3 cr.)—The requirements for traffic managers and others concerned with such fields as railroading, trucking, and air travel. The course outlines the development of transportation, transportation regulations, tariffs and rates, and the regulations and applications of traffic management. Lecture 3 hours per week.

MKTG 134-135 ECONOMICS OF TRANSPORTATION I-II (3 cr.) (3 cr.)—Economic analysis and understanding of transportation systems. Rail, motor, water, air and pipeline carriers are examined for importance, cost, utility and inherent and comparative advantages. The economic basis for government regulation and for transportation pricing with emphasis on competition and coordination. Transport policy as reflected in current studies and legislation. Lecture 3 hours per week.

MKTG 136 RETAIL ORGANIZATION & MANAGEMENT (3 cr.)—The organization of business 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. Lecture 3 hours per week.

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. Lecture 3 hours per week.

MKTG 157 PRINCIPLES OF CASUALTY INSURANCE AND SURETY BONDING (3 cr.)—Prerequisite MKTG 150 or equivalent. Automobile liability insurance and policy terms, workmen's compensation and employer's liability, comprehensive liability, professional and personal liability, fidelity and surety bonds, theft coverages, miscellaneous casualty coverages, multiple-line trends and coverages, health insurance. Lecture 3 hours per week.

MKTG 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. Lecture 3 hours per week.

MKTG 165 PRINCIPLES OF REAL ESTATE II (3 cr.)—Prerequisite MKTG 164. Continued examination of marketing fundamentals. Emphasis on the 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. Lecture 3 hours per week.

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. Lecture 3 hours per week.

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. Lecture 3 hours.

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 and inventory systems, merchandise selection policy and pricing for profits. Lecture 3 hours per week.

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. Lecture 3 hours per week.

MKTG 231-232-233 INTERSTATE COMMERCE LAW I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite MKTG 133 or equivalent. A study of transportation law including the Interstate Commerce Act. First quarter devoted to constitutional issues, nature of interstate commerce, franchises, and combinations of carriers. Second quarter devoted to finance, rates, and services. Third quarter concerned with procedure, loss and damage, and related statutes. Lecture 3 hours per week.

MKTG 236 PHYSICAL DISTRIBUTION (3 cr.)—Business firm's functions and activities in the evaluation, purchase, and direction of transportation services provided by various transportation media; selection of transportation media, private transportation and management of equipment, order processing, supply scheduling, inventory control and customer service in developing a total system approach to marketing logistics. Lecture 3 hours per week.

MKTG 238 TRAFFIC MANAGEMENT (3 cr.)—The purpose, function, and operation of traffic management; the differences in various areas of traffic; and the relationship to other business operations. Lecture 3 hours per week.

MKTG 239 PROBLEMS IN TRANSPORTATION (3 cr.)—Prerequisite MKTG 231. Preparation and presentation of cases as Interstate Commerce Commission practitioner and witness; drafting of pleadings, briefs, and petitions, submission of testimony and exhibits in written and oral form with experience on the witness stand. Lecture 3 hours per week.

MKTG 266 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. Relations of broker and salesman, salesman and client and community responsibilities. Writing contracts, closing and settlement, and follow-up relations. Lecture 3 hours per week.

MKTG 268 PROPERTY MANAGEMENT (3 cr.)—Prerequisite MKTG 165. The field of property management; professional aspects of real estate brokerage, properties, neighborhood analysis, tenants and qualifications, aspects of maintenance and repair. Lecture 3 hours per week.

MKTG 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. Lecture 3 hours per week.

MKTG 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. Lecture 3 hours per week.

MKTG 298, 299—See *General Usage Courses* on pages 155-156.

MATHEMATICS

MATH 01 DEVELOPMENTAL MATHEMATICS (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. Lecture 5 hours per week.

MATH 99—See *General Usage Courses* on pages 155-156.

MATH 111-112-113 TECHNICAL MATHEMATICS I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite satisfactory score on appropriate mathematics proficiency examinations and one unit of high school algebra and one unit of high school geometry or equivalent. Designed for the technical student. Slide rule, review of geometry, dimensional analysis, analytical geometry of the straight-line, basic sketching, numerical trigonometry, introduction to analytical trigonometry, and an introduction to calculus to emphasize those techniques useful to the engineering student. Lecture 3 hours per week.

MATH 121-122-123 ENGINEERING TECHNICAL MATHEMATICS I-II-III (5 cr.) (5 cr.) (5 cr.)—Prerequisite three units of high school mathematics other than general mathematics, and satisfactory score on appropriate mathematics proficiency examinations. Algebra, trigonometry, introduction to calculus, and some emphasis on graphical methods. The course sequence includes solutions of linear and quadratic equations, trigonometric functions, trigonometric curve sketching, logarithms, ratio, proportion and variation, vectors, complex numbers and the binomial theorem. Credit cannot be obtained for both this course and MATH 161-162-163 (College Mathematics). Lecture 5 hours per week.

MATH 141-142-143 INTRODUCTORY MATHEMATICAL ANALYSIS I-II-III (5 cr.) (5 cr.) (5 cr.)—Prerequisites are a satisfactory score on appropriate mathematics proficiency examination and four units of high school mathematics including two units of algebra, one of geometry, and one-half of trigonometry or equivalent. A modern unified course in analytic geometry and calculus including functions, limits, derivatives, differentials, indefinite integrals, definite integrals, and applications. Lecture 5 hours per week.

MATH 151-152-153 INTRODUCTION TO BUSINESS MATHEMATICS I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite a strong background in basic arithmetic operations. Instruction, review and drill in percentage, cash and trade discounts, markup, payroll, sales, property and other taxes, simple and compound interest, bank discounts, interest, investments and annuities. Lecture 3 hours per week.

MATH 161-162-163 COLLEGE MATHEMATICS I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite a satisfactory score on appropriate mathematics proficiency examinations and three units of high school mathematics including two units of algebra and one unit of geometry or equivalent. A modern unified course in algebra, trigonometry, analytic geometry, and calculus for students other than those in physics or engineering. Lecture 3 hours per week.

MATH 164-165 COLLEGE MATHEMATICS I-II (5 cr.) (4 cr.)—Two quarter sequence covering MATH 161-162-163. Lecture 5-4 hours per week.

MATH 181-182-183 GENERAL COLLEGE MATHEMATICS I-II-III (3 cr.) (3 cr.) (3 cr.)—Intended for students with majors other than mathematics, science, business administration, or engineering. Prerequisite Algebra I and either Algebra II or Geometry and a satisfactory score on appropriate mathematics proficiency examinations. The first two quarters will include sets, the logic of algebra, the real number system, algebraic and transcendental functions, relations and graphs. The third quarter will include permutations, combinations, probability and elementary statistics. Lecture 3 hours per week.

MATH 184-185 GENERAL COLLEGE MATHEMATICS I-II (5 cr.) (4 cr.)—Two quarter sequence covering MATH 181-182-183. Lecture 5-4 hours per week.

MATH 198, 199—See *General Usage Courses* page(s) _____.

MATH 221-222 ADVANCED ENGINEERING TECHNICAL MATHEMATICS I-II (4 cr.) (4 cr.)—Prerequisite MATH 123. Differential and integral calculus with emphasis on applied problems in the appropriate technological fields. Lecture 4 hours per week.

MATH 241-242-243 ADVANCED MATHEMATICAL ANALYSIS I-II-III (4 cr.) (4 cr.) (4 cr.)—(for students in Engineering and Science Curricula.) Prerequisite MATH 143. A modern course including vectors, matrices, partial differentiation, multiple integrals, infinite series, and differential equations. Lecture 4 hours per week.

MATH 271-272-273 CALCULUS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite MATH 163 or equivalent. Topics include functions, limits, continuity, differentiation and integration of algebraic, trigonometric, and hyperbolic functions with applications, vectors in three dimensions, definite integrals, indeterminate forms, and partial differentiation. Lecture 4 hours per week.

MATH 298, 299—See *General Usage Courses* on pages 155-156.

MECHANICAL

MECH 20 MACHINE SHOP PRACTICE (2 cr.)—An introduction to machine shop operations with practice on various basic machines. Laboratory 6 hours per week.

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. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

MECH 132 MACHINE LABORATORY II (2 cr.)—Continued study of practical and industrial applications and set up, inspection tools, gauges, tapers, gear cutting, square threads and fits. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

MECH 156 MECHANISMS (2 cr.)—(Prerequisites PHYS 111 and MATH 121). The purpose and actions of cams, gear trains, levers, and other mechanical devices used to transmit control. A study of motions of linkages, velocities and acceleration of points within a link mechanism and layout method for designing cams and gear train. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

MECH 237-238 MACHINE DESIGN I-II (4 cr.) (4 cr.)—Prerequisites ENGR 152 and MATH 123. The analytical design of bearings, clutches, couplings, brakes, springs, gearing systems, and power shafting. Emphasis on methods of constructing machine parts and specifications of materials and manufacturing processes. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 246 METALLURGY I (4 cr.)—Fundamentals of metallurgy, grain size, effect on carbon content, and hardness testing devices. Different alloys will be tested to determine the effect of heat treatment. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 264 THERMODYNAMICS I (4 cr.)—Prerequisite MATH 123. Characteristics of gases; applied study of steam cycles and combustion processes. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 265 THERMODYNAMICS II (4 cr.)—Prerequisite MECH 264. Advanced thermodynamics with emphasis on applications relating to internal combustion engines and gas turbines. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 267 FLUID MECHANICS (4 cr.)—Prerequisites PHYS 111 or ENGR 151. Properties of fluids and fluid flow, Bernoulli's Theorem, measuring devices, viscosity and dimensional analysis. Emphasis on pumps, piping, and fluid motors. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 298—See *General Usage Courses* on pages 155-156.

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. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

MENT 190—See *General Usage Courses* on pages 155-156.

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 psychotherapy, 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 emphasis is placed on therapeutic use of everyday experiences in development of therapeutic relationships. Lecture 3 hours per week.

MENT 290, 298—See *General Usage Courses* on pages 155-156.

MUSIC

*Those courses marked with an asterisk may be taken as electives by students in any program that permits this; all other Music courses are for students enrolled in the Music program.

Theory and Composition

*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. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

*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. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

History and Literature

*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. Lecture 3 hours per week.

MUSC 221-222-223 HISTORY OF MUSIC I-II-III (3 cr.) (3 cr.) (3 cr.)—Primarily for music majors. A chronological study of musical 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. Lecture 3 hours per week.

Applied Music

Private lessons are available for either one or two hours of credit per quarter. The length of the lessons will be ½ hour for 1 hour credit and 1 hour for 2 hours credit. All courses in Applied Music may be repeated for credit for a total of 12 hours for the major and 6 hours for the minor. Laboratory 1-2 hours per week.

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-two half-hour lessons per week. 4-8 hours practice (laboratory) required.

MUSC 237 ADVANCED APPLIED MUSIC—VOICE (1-2 cr.)—
A continuation of MUSC 137.

MUSC 147 APPLIED MUSIC—KEYBOARD (1-2 cr.)—Instruction in piano or organ. Standard repertoire will be studied. Departmental permission required. One-two half-hour lessons per week. 4-8 hours practice (laboratory) required.

MUSC 247 ADVANCED APPLIED MUSIC—KEYBOARD (1-2 cr.)—
A continuation of MUSC 147.

MUSC 157 APPLIED MUSIC—WOODWINDS (1-2¹ cr.)—Instruction in fundamentals of the woodwind instruments. Standard repertoire will be studied. Departmental permission required. One-two half-hour lessons per week. 4-8 hours practice (laboratory) required.

MUSC 257 ADVANCED APPLIED MUSIC—WOODWINDS (1-2 cr.)—
A continuation of MUSC 157.

MUSC 167 APPLIED MUSIC—STRINGS (1-2 cr.)—Instruction in fundamentals of the string instruments. Standard repertoire will be studied. Departmental permission required. One-two half-hour lessons per week. 4-8 hours practice (laboratory) required.

MUSC 267 ADVANCED APPLIED MUSIC—STRINGS (1-2 cr.)—
A continuation of MUSC 167.

MUSC 177 APPLIED MUSIC—BRASS (1-2 cr.)—Instruction in fundamentals of the brass instruments. Standard repertoire will be studied. Departmental permission required. One-two half-hour lessons per week. 4-8 hours practice (laboratory) required.

MUSC 277 ADVANCED APPLIED MUSIC—BRASS (1-2 cr.)—
A continuation of MUSC 177.

MUSC 187 APPLIED MUSIC—PERCUSSION (1-2 cr.)—Instruction in fundamentals of percussion instruments. Standard repertoire will be studied. Departmental permission required. One-two half-hour lessons per week. 4-8 hours practice (laboratory) required.

MUSC 287 ADVANCED APPLIED MUSIC—PERCUSSION (1-2 cr.)—
A continuation of MUSC 187.

Ensemble

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. Laboratory 3 hours per week.

*MUSC 138 CHORUS (1 cr.)

*MUSC 238 CHORUS (1 cr.)—
A continuation of MUSC 138.

MUSC 139 SMALL VOCAL ENSEMBLE (1 cr.)

MUSC 239 SMALL VOCAL ENSEMBLE (1 cr.)—
A continuation of MUSC 139.

MUSC 148 ORCHESTRA (1 cr.)

MUSC 248 ORCHESTRA (1 cr.)—
A continuation of MUSC 148.

*MUSC 149 BAND (1 cr.)

*MUSC 249 BAND (1 cr.)—
A continuation of MUSC 149.

MUSC 159 WOODWIND ENSEMBLE (1 cr.)

MUSC 259 WOODWIND ENSEMBLE (1 cr.)—
A continuation of MUSC 159.

- MUSC 169 STRING ENSEMBLE (1 cr.)
- MUSC 269 STRING ENSEMBLE (1 cr.)—
A continuation of MUSC 169.
- MUSC 179 BRASS ENSEMBLE (1 cr.)
- MUSC 279 BRASS ENSEMBLE (1 cr.)—
A continuation of MUSC 179.
- MUSC 189 PERCUSSION ENSEMBLE (1 cr.)
- MUSC 289 PERCUSSION ENSEMBLE (1 cr.)—
A continuation of MUSC 189.

NATURAL SCIENCE

- NASC 100 SURVEY OF SCIENCE (4 cr.)—A general survey course designed to familiarize the student with the principles of the biological and physical sciences. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.
- NASC 125 CONSERVATION OF NATURAL RESOURCES (3 cr.)—A course for the non-science major. The management of natural resources, balance of nature and man's importance in his environment. Lecture 3 hours per week.
- 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. 154—Lecture 3 hours per week; 155—Lecture 2 hours per week, Laboratory 2 hours; Total 4 hours per week.

NURSING

- NURS 111 FUNDAMENTALS OF NURSING I (5 cr.)—The development of nursing skills for the physical, psychological, and social needs of patients. Selected clinical laboratory experience in cooperating health and welfare agencies. Lecture 3 hours, Laboratory 6 hours, Total 9 hours per week.
- NURS 112 FUNDAMENTALS OF NURSING II (6 cr.)—Continuation of NURS 111. Lecture 3 hours, Laboratory 9 hours, Total 12 hours per week.
- NURS 113 FUNDAMENTALS OF NURSING III (8 cr.)—Continuation of NURS 112. Lecture 4 hours, Laboratory 12 hours, Total 16 hours per week.
- NURS 199—See *General Usage Courses* on pages 155-156.
- NURS 221-222-223-224 NURSING IN MAJOR HEALTH PROBLEMS I-II-III-IV (8 cr.) (8 cr.) (8 cr.) (8 cr.)—Prerequisites NURS 111-112-113, BIOL 154-155-176. Representative problems in the nursing care of patients of all age groups with illness requiring medical, surgical and psychiatric care. Related clinical experiences to further develop the knowledge and skills required to provide nursing care for each patient's needs. The scope, prevention, diagnosis, treatment and control of major areas of illness in the United States. Lecture 4 hours, Laboratory 12 hours, Total 16 hours per week.
- NURS 298, 299—See *General Usage Courses* on pages 155-156.

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. Lecture 3 hours per week.

PHIL 221 LITERATURE OF THE BIBLE I (3 cr.)—A study of the literature of the Old Testament. Lecture 3 hours per week.

PHIL 222 LITERATURE OF THE BIBLE II (3 cr.)—A study of the literature of the New Testament. Lecture 3 hours per week.

PHIL 226 COMPARATIVE RELIGION (3 cr.)—A survey of the literature of comparative religions of the world. Lecture 3 hours per week.

PHYSICAL EDUCATION AND RECREATION

PHED 101-102-103 PHYSICAL EDUCATION I-II-III (1 cr.) (1 cr.) (1 cr.)—The study of recreational activities which will have value for more effective use of leisure time. The development of skills and methods in archery, badminton, bowling, golf, tennis, volleyball and other sports and activities appropriate to the local season, and facilities available. Lecture 1 hour, Laboratory 1 hour, Total 2 hours per week.

PHYSICS

PHYS 14 APPLIED PHYSICS I (2 cr.)—The fundamentals of physics, with application. Deals with the properties of matter and mechanics. Lecture 2 hours per week.

PHYS 16 APPLIED PHYSICS III (3 cr.)—The fundamentals of electricity and magnetism; electrostatic sources, effects of electric current, basic direct current circuits, electromagnetism, alternating current, and generators and motors. Lecture 3 hours per week.

PHYS 111-112-113 TECHNICAL PHYSICS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite three units of high school mathematics; corequisite MATH 121. Precision measurement, properties of matter, hydrostatics and hydraulics; force and motion, Newtonian mechanics, vectors and graphic solutions, 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. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

PHYS 121-122-123 PRINCIPLES OF PHYSICS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite three units of high school mathematics including two units of algebra and one unit geometry. An introductory course in Physics satisfying the science distribution requirement for majors other than Physics or Engineering. The fundamental principles of mechanics, heat, electricity and magnetism, wave, motion, atomic and nuclear physics. Attention is given to the historical development and philosophical significance of physical concepts and theories. Application to elementary problems and the role of physics in the modern world. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

PHYS 198, 199—See *General Usage Courses* on pages 155-156.

PHYS 221-222-223 GENERAL UNIVERSITY PHYSICS I-II-III (4 cr.) (4 cr.) (4 cr.)—Corequisite MATH 241 or equivalent. General University Physics designed

for students in engineering, physics or mathematics. Includes mechanics, relativity, electromagnetism, ray and wave optics, statistical and quantum mechanics, solid state and nuclear physics. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

PHYS 298, 299—See *General Usage Courses* on pages 155-156.

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. Lecture 3 hours per week.

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. Lecture 3 hours per week.

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. Lecture 3 hours per week.

PSYC 130 CHILD GROWTH AND DEVELOPMENT (3 cr.)—The development of the child concentrating on the physical, intellectual, social and emotional factors in his personality. Recent studies in child development. Provides a background for students who intend to become nurses, teachers, or enter other occupations involving continuous work with children. Lecture 3 hours per week.

PSYC 198, 199—See *General Usage Courses* on pages 155-156.

PSYC 201-202-203 GENERAL PSYCHOLOGY I-II-III (3 cr.) (3 cr.) (3 cr.)—The study of human behavior relating experimental data to practical problems: the measurement of ability, sensory and perceptive processes, organic basis of behavior, heredity, maturation, learning and thinking, motivation, emotion, personality and social factors in behavior. Lecture 3 hours per week.

PSYC 204-205 GENERAL PSYCHOLOGY I-II (5 cr.) (4 cr.)—The principles of behavior relating experimental data to practical problems: the measurement of ability, sensory and perceptive processes, organic basis of behavior, heredity, maturation, learning and thinking, motivation, emotion, personality and social factors in behavior. Lecture 5-4 hours per week.

PSYC 246 EDUCATIONAL PSYCHOLOGY (5 cr.)—Prerequisite PSYC 202, 130 or equivalent. Human behavior and learning treated in the context of educational processes. The nature of various mental characteristics such as intelligence, interest, knowledge; their measurement and appraisal and their significance for educational goals. Lecture 5 hours per week.

PSYC 257 LAW ENFORCEMENT PSYCHOLOGY (3 cr.)—Prerequisite PSYC 117 or PSYC 110 and 116. Intergroup relations and police work. Some facts about racial, religious and national differences. Prejudice, suggestion, emotion, frustration and aggression in interpersonal and intergroup situations. Types of abnormal behavior likely to be encountered in police work. Lecture 3 hours per week.

PSYC 298, 299—See *General Usage Courses* on pages 155-156.

RADIOLOGY

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 radiation protection. Lecture 2 hours per week.

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 developmental process necessary to produce artifact free radiographs. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

RADL 115 PRINCIPLES OF EXPOSURE II (4 cr.)—Prerequisite RADL 114. The controlled use of radiation producing sources both natural and man-made. Studies in the employment of exposure factors relative to pediatric radiology are presented to the student. In addition, the course will include topics dealing with equipment maintenance and minor repairs of X-ray equipment. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

RADL 124 POSITIONING I (4 cr.)—Positioning the patients' anatomical structures on the radiograph with emphasis on positioning of the extremities, chest, skull, and gross examination of the abdomen. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

RADL 125 POSITIONING II (4 cr.)—Prerequisite RADL 124. Emphasis on radiographic procedures such as inner ear studies, pediatric radiology, intra oral examination and other more complex examinations. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

RADL 136 PATIENT CARE PROCEDURES (2 cr.)—The care and handling of the sick and injured patient in the radiology department. The use of contrast media necessary in the investigation of the internal organs. Lecture 2 hours per week.

RADL 190, 199—See *General Usage Courses* on pages 155-156.

RADL 210 PROTECTION AND PATIENT SAFETY (2 cr.)—Prerequisite RADL 100. An advanced study in the use of protective devices to insure maximum protection for the patient and fellow employees from excessive amounts of radiation and electrical hazards. Lecture 2 hours per week.

RADL 216 APPLIED RADIATION PHYSICS (4 cr.)—Prerequisite RADL 114. The circuiting and electronics of x-ray machines. The structure of radioactive generators and the resultant isotopes. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

RADL 240 INTRODUCTION TO RADIONUCLIDES (2 cr.)—Prerequisite RADL 100. The emphasis of this course is to introduce the student to the safe employment of radionuclides for diagnostic and therapeutic examinations. Lecture 2 hours per week.

RADL 246 THERAPY (2 cr.)—The use of supervoltage and other radioactive sources for the cure and palliative treatment of diseases. A survey of major diseases treated with radiation therapy will be presented in conjunction with radiation treatment plans. Lecture 2 hours per week.

RADL 256 SPECIAL PROCEDURES (3 cr.)—Prerequisites RADL 124 and BIOL 155. The use of special radiographic and surgical equipment employed in the more complicated investigation of internal conditions of the human body. Lecture 3 hours per week.

RADL 276 RADIOLOGY DEPARTMENTAL ADMINISTRATION (2 cr.)—Purpose of this course is to acquaint the radiology student with the planning and operations of the Radiology Departments. Particular emphasis will be placed on work flow, call scheduling, inter and intra departmental communications, and budgetary cost centers. Lecture 2 hours per week.

RADL 290, 298, 299—See *General Usage Courses* on pages 155-156.

SECRETARIAL SCIENCE

SECR 39 RECORDKEEPING (3 cr.)—The keeping of financial, personnel, inventory and other records in the office. Lecture 3 hours per week.

SECR 111 TYPEWRITING I (3 cr.)—Introduction to keyboard with emphasis on good technique and machine mastery; letter format and styles, tabulation and centering, manuscript typing. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

SECR 112 TYPEWRITING II (3 cr.)—Prerequisite SECR 111 or departmental permission. Continuation of skill building with emphasis on standards required to meet job requirements in production typing. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

SECR 113 TYPEWRITING III (3 cr.)—Prerequisite SECR 112 or departmental permission. Skill development with high standard required to meet job requirements in production typing. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

SECR 121 SHORTHAND I (4 cr.)—Corequisite or prerequisite ENGL 101. Shorthand principles in Gregg Diamond Jubilee Series with emphasis on reading and writing skills, associated vocabulary and grammar. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

SECR 122 SHORTHAND II (4 cr.)—Prerequisite SECR 121 or departmental permission. Reinforcement of shorthand principles, further development of general business vocabularies and English usage, general business dictation. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

SECR 123 SHORTHAND III (4 cr.)—Prerequisite SECR 122 or departmental permission. Increased speed in general business dictation, introduction of specialized business dictation with emphasis on vocabularies. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

SECR 124 SHORTHAND IV (4 cr.)—Prerequisite SECR 123. Speed building in typical business dictation with accuracy in transcription from shorthand notes. Use of Gregg dictation tapes for building speeds. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

SECR 136 FILING AND RECORDS MANAGEMENT (3 cr.)—Indexing principles, filing procedures and techniques as applied to filing systems, establishment of filing system, selection of equipment and supplies, survey of system using electronics and microfilm, solution of records management problems. Lecture 3 hours per week.

SECR 138 OFFICE RECORDKEEPING (3 cr.)—Concentration on the types of recordkeeping duties performed by secretaries including financial, tax, payroll, personnel and inventory. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 139 CLERICAL PROCEDURES (3 cr.)—Designed to fuse skills acquired in typewriting, recordkeeping, business mathematics, and communication classes in performing clerical activities in the office. Special emphasis is placed on development of skills in the operation of stencil and spirit duplicating machines, selection of duplication process, and a study of type styles, paper, typewriter ribbons. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 157 MACHINE TRANSCRIPTION (3 cr.)—An introduction to machine transcription incorporating good listening techniques, grammar, punctuation, and correct business English. Practice in transcribing machine dictation. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 216 EXECUTIVE TYPEWRITING (3 cr.)—Prerequisite SECR 113 or departmental permission. Further development of speed and accuracy on production typing with emphasis on employment standards. Instruction in use of the executive style typewriters, reports, tabulations, statistical materials and justified copy. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 217 TYPEWRITING SKILL BUILDING (3 cr.)—Prerequisite SECR 113 or departmental permission. Further development of speed and accuracy on production typing with emphasis on employment standards. Preparation for employer's secretarial placement examinations. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

SECR 219 MAGNETIC TAPE SELECTRIC TYPEWRITER (3 cr.)—Prerequisite departmental permission. Operation of automatic typewriter, procedures for recording and playing back from tapes, revision and updating of tapes, merging information from two tapes. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

SECR 221 TRANSCRIPTION I (3 cr.)—Prerequisites SECR 113 and SECR 123 or 133. Review of principles of shorthand, development of vocabulary and phrases, speed building on general business dictation and transcription. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 222 TRANSCRIPTION II (3 cr.)—Prerequisite SECR 221 or departmental permission. 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. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 223 (GENERAL) TRANSCRIPTION (3 cr.)—Prerequisite SECR 222 or departmental permission. Speed building in typical business dictation with speed and accuracy in transcription from shorthand notes. Preparation for employers' secretarial placement examinations. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 224-225 (LEGAL) TRANSCRIPTION I-II (3 cr.) (3 cr.)—Prerequisite SECR 221 or departmental permission. Legal secretary preparation. Skill in taking dictation and transcribing material involving legal shorthand forms and phrases. Proficiency in use of legal vocabulary, forms, and procedures. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 227 (MEDICAL) TRANSCRIPTION (3 cr.)—Prerequisite SECR 222 or departmental permission. Medical secretary preparation. Development of skill in taking dictation and transcribing material involving medical shorthand forms and phrases. Proficiency in use of medical vocabulary forms, and procedures. Lecture 2 hours; Laboratory 2 hours, Total 4 hours per week.

SECR 241 SECRETARIAL PROCEDURES I (3 cr.)—Prerequisite SECR 113. Development of skills in operation of stencil and spirit duplicating machines. Preparation of copy for reproduction of offset, stencil, and spirit process. Criteria for selecting a duplicating process. Study of type styles, paper, typewriter ribbons, and carbon paper. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 242 SECRETARIAL PROCEDURES II (3 cr.)—Prerequisite SECR 241. Emphasis on the secretary's routine office responsibilities including mail handling, communication services, telephone techniques, and the use of reference materials. Emphasis on application of skills gained in typewriting and shorthand. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 243 SECRETARIAL PROCEDURES III (3 cr.)—Prerequisite 242. Continued emphasis on the secretary's office responsibilities including handling of banking transactions, maintaining records on securities transactions, travel arrangements, planning of office layouts, and personnel policies. Practical experience in solving office problems. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 256 ADVANCED MACHINE TRANSCRIPTION (3 cr.)—Prerequisite SECR 216 or departmental permission. Introduction to modern transcription incorporating good listening techniques, grammar, punctuation, and correct business English. Emphasis on mailability of copy with good production rates. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 264-265 LEGAL SECRETARIAL PROCEDURES I-II (3 cr.) (3 cr.)—Prerequisite SECR 241. Instruction in law office procedures, law office filing and record keeping, extension of legal vocabulary, court rules, reference materials, preparation of forms and pleadings. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 274-275 MEDICAL SECRETARIAL PROCEDURES I-II (3 cr.) (3 cr.)—Prerequisite SECR 241. Instruction in medical office procedures, medical office filing and record keeping, extension of medical vocabulary, preparation of medical reports, and special correspondence requirements. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 298, 299—See *General Usage Courses* on pages 155-156.

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 economics, and man's role in society. Lecture 3 hours per week.

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 of 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. Lecture 3 hours per week.

SOCIOLOGY

SOCI 101-102-103 INTRODUCTORY SOCIOLOGY I-II-III (3 cr.) (3 cr.) (3 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. Lecture 3 hours per week.

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. Lecture 5-4 hours per week.

SOCI 186-187 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 delinquency and crime, mental illness, drug addiction, alcoholism, and sexual behavior; population crisis, race relations, family and community disorganization, poverty, automation, wars and disarmament. Lecture 3 hours per week.

SOCI 198, 199—See *General Usage Courses* on pages 155-156.

SOCI 236 MARRIAGE AND THE FAMILY (3 cr.)—Prerequisite SOCI 101, 104, or 185. A study of comparative family systems and problems related to marriage and the family. Lecture 3 hours per week.

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. Lecture 3 hours per week.

SOCI 246 CULTURAL ANTHROPOLOGY (3 cr.)—Prerequisite SOCI 101, 240, or 244. 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 childrearing will be analyzed cross-culturally. Lecture 3 hours per week.

SPANISH

SPAN 101-102-103 INTRODUCTORY SPANISH I-II-III (4 cr.) (4 cr.) (4 cr.)—The understanding, speaking, reading, and writing of Spanish with emphasis on manipulation of the structure of the language. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

SPAN 199—See *General Usage Courses* on pages 155-156.

SPAN 201-202-203 INTERMEDIATE SPANISH I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite SPAN 103 or successful completion of two years of high school Spanish and departmental permission. Advanced study in the understanding, speaking, reading, and writing of Spanish. Spanish is used in the classroom. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

SPAN 231-232-233 SURVEY OF SPANISH LITERATURE AND CIVILIZATION I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite SPAN 203 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. Lecture 3 hours per week.

SPAN 299—See *General Usage Courses* on pages 155-156.

SPEECH AND DRAMA

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. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

SPDR 111-112-113 ACTING I-II-III (3 cr.) (3 cr.) (3 cr.)—A study of styles of acting. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SPDR 119 THEATRE WORKSHOP (1-5 cr.)—Organization and work in the various activities of play production. Practice in set design, stage carpentry, theatre development, sound, costumes, lights, stage managing, props, promotion, and stage crew. May be repeated for credit. Variable hours.

SPDR 137 PUBLIC SPEAKING (3 cr.)—Development of skill in speechmaking. Lecture 3 hours per week.

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. Lecture 3 hours per week.

SPDR 157 DEBATE (3 cr.)—Prerequisite either SPDR 137, or divisional permission. The presentation of oral argument and debate. Emphasis upon effectiveness in the analysis of issues, evidence, the reasoning process and skill in oral presentation. Lecture 3 hours per week.

SPDR 198—See *General Usage Courses* on pages 155-156.

SPDR 218 DIRECTING (3 cr.)—Fundamentals of stage direction. Lecture 3 hours per week.

SPDR 230 ADVANCED PUBLIC SPEAKING (5 cr.)—Prerequisite either SPDR 137, or divisional permission. Preparation and delivery of the various advanced forms and methods of public address. Lecture 5 hours per week.

SPDR 248 PERSUASION (3 cr.)—Prerequisite either SPDR 137 or divisional permission. Principles and practices of persuasion with emphasis on practical application. Lecture 3 hours per week.

SPDR 276 ORAL INTERPRETATION (3 cr.)—Prerequisite divisional permission or speech communication course. Introduction to the study of techniques and styles of oral reading. Lecture 3 hours per week.

SPDR 298, 299—See *General Usage Courses* on pages 155-156.

WELDING

WELD 27 ARC WELDING (2 cr.)—Fundamentals of arc welding; safety, set-up, welding procedures, vertical pipe welding. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

WELD 57 OXYACETYLENE WELDING & CUTTING (2 cr.)—Fundamentals of oxyacetylene welding and cutting; safety, setup, welding and cutting procedures, plate and pipe welding. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

WELD 115 ARC AND GAS WELDING (4 cr.)—Arc and gas welding practices. Safety, general welding practices, and effects of welding on metal. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.



PART VI

STATE AND LOCAL ORGANIZATION

GOVERNING BOARD COMMONWEALTH OF VIRGINIA

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ADMINISTRATION

- HOPPER, HAROLD H. *President of the College*
 B.S.—Washington University, 1951
 M.S.—Washington University, 1954
 Ed.D.—University of Florida, 1965
- McCABE, JAMES N. *Administrative Assistant to the President*
 A.B.—West Virginia University, 1940
- COOPER, JOHN J. *Dean of Instruction*
 B.M.E.—University of Kansas, 1957
 M.M.E.—University of Kansas, 1958
 Ed.D.—University of Colorado, 1965
- CUMMINS, DANIEL G. *Dean of Financial and Administrative Services*
 B.S.—University of Maryland, 1957
 M.B.A.—George Washington U., 1960
- RACE, HARRY C. *Dean of Student Services*
 B.S.E.E.—Northeastern University, 1942
 M.S.—Radford College, 1965
- GENTRY, CARROLL L. *Chairman, Division of Business Science*
 B.S.—East Tennessee State University, 1965
 M.B.A.—East Tennessee State University, 1967
- PHELPS, HUGH B. *Chairman, Engineering/Industrial & Health Technologies*
 B.M.E.—Clarkson College of Technology, 1950
 M.M.E.—Clarkson College of Technology, 1956
- PULLEN, PAUL T. *Chairman, Division of Humanities*
 A.B.—Asbury College, 1949
 M.Th.—Pittsburgh Theological Sem., 1957
 Ph.D.—University of Pittsburgh, 1961
- SHIRLEY, WILLIAM T. *Chairman, Division of Social Science & Public Service Technology*
 B.A.—Furman University, 1948
 M.A.—University of North Carolina, 1950
- STRAUSBAUGH, MAURICE *Director, Continuing Education*
 B.A.—Juniata College, 1950
 M.D.—Bethany Theological Seminary, 1953
 M.Ed.—Johns Hopkins University, 1966
- SYKES, CYRIL H. *Director, Learning Resources*
 B.A.—Norwich University, 1944
 M.S.—Syracuse University, 1950
- GRIGGS, MIGNONNE *Coordinator of Learning Laboratory*
 B.S.—Longwood College, 1941
 M.Ed.—Virginia Polytechnic Institute, 1961
- HOUSTON, CHARLES A. *Coordinator of Institutional Research*
 B.S.—University of Tennessee, 1964
 M.M.—University of Tennessee, 1969
- LEE, PIER M. *Coordinator of Library Sciences*
 B.A.—National Taiwan University, 1959
 M.A.L.S.—George Peabody Teachers College, 1962

- McCLUSKEY, JOHN W. *Coordinator of Counseling*
 B.S.—Alabama College-Montevallo University, 1965
 M.Ed.—University of Florida, 1968
 Ed.D.—University of Florida, 1972
- MUSIC, WILLIAM O., JR. *Coordinator of Admissions and Records*
 B.S.—Lynchburg College, 1963
 M.S.—University of Tennessee, 1964
- BLALOCK, DWIGHT E. *Administrative Data Processing Manager*
 B.S.—University of Alabama, 1966
 M.S.—Virginia Commonwealth University, 1970
- RYG, CHRIS J. *Radio Station Manager*
 B.A.—University of Iowa, 1970
- MOORE, DELORES K. *Grants Officer*
 Diploma—Lehrerinnen Seminar, 1945
 Interpreter's Diploma—Rackow Schule, 1947

FACULTY

- ADAMS, RICHARD P. *Assistant Professor*
 Accounting
 B.S.—Virginia Polytechnic Institute, 1949
 C.P.A.—State of Virginia, 1958
- ANDERSON, DONALD *Instructor*
 Counseling
 B.S.—Louisiana State University, 1970
 M.S.—V.P.I. & S.U., 1973
- ARCHER, J. ANDREW *Associate Professor*
 Mathematics
 A.A.—Reinhardt Junior College, 1959
 A.B.—Mercer University, 1961
 M.A.—George Peabody College, 1965
 Ph.D.—George Peabody College, 1972
- ARMINIO, ROBERT L. *Instructor*
 Architecture
 B. Arch.—University of Virginia, 1968
- BAKER, JAMES W., JR. *Instructor*
 Electrical/Electronics Engr.
 B.S.—VPI & SU, 1971
- BANKS, ROBERT G. *Assistant Professor*
 Music
 B.S.—Indiana (Pa.) State University, 1948
 M.Ed.—Pennsylvania State University, 1952
- BASS, J. LOUIS *Assistant Professor*
 Biology
 B.S.—University of Tennessee, 1960
 M.A.—Vanderbilt University, 1971
- BEITZELL, NEIL D. *Assistant Professor*
 Art
 B.S.—Illinois Institute of Technology, 1962
 M.F.A.—Rhode Island School of Design, 1964
- BENSON, G. DON *Associate Professor*
 Physics
 B.S.—Texas Western College, 1964
 Ph.D.—Vanderbilt University, 1971
- BIRMINGHAM, MICHAEL G. *Assistant Professor*
 Business Management
 B.A.—St. Bonaventure University, 1967
 M.P.A.—University of Missouri, 1969

- BLALOCK, DWIGHT E. *Assistant Professor*
 B.S.—University of Alabama, 1966 *Administrative Data Processing Manager*
 M.S.—Virginia Commonwealth, 1970
- BLEASE, ALFRED D. *Associate Professor*
 B.S.—Brown University, 1961 *Physics*
 M.S.—University of Maine, 1965
- BLOMBERG, ALBERT A. *Associate Professor*
 A.S.—Boston University, 1960 *Automotive Technology*
 B.S.—Northeastern University, 1968
 Certificate—New England Aircraft School, 1950
- BONDS, ETHEL *Instructor*
 B.A.—Bennett College, 1971 *English*
 M.A.—V.P.I. & S.U., 1973
- BOWMAN, BETTY R. *Assistant Professor*
 B.S.—Madison College, 1960 *Accounting*
 M.Ed.—Virginia Polytechnic Institute, 1969
- BRODY, MYRON R. *Assistant Professor*
 B.F.A.—Philadelphia College of Arch., 1965 *Art*
 M.F.A.—University of Pennsylvania, 1968
- BROKER, THOMAS O. *Associate Professor*
 B.A.—Wesleyan University, 1936 *Law and Government*
 J.D.—Cornell Law School, 1939
 M.A.—Tufts University, 1969
- BROWN, MARTHA L. *Assistant Professor*
 B.S.S.A.—Greensboro, N. C. Woman's College, 1957 *Secretarial Science*
 M.A.—East Carolina College, 1961
- BROWNSTEIN, HAROLD *Assistant Professor*
 D.D.S.—Chicago College of Dental Surgery, 1931 *Dental Technology*
- BRUSATI, JOHN F. *Assistant Professor*
 B.A.—Southwestern College, 1962 *Sociology*
 M.Div.—Duke University, 1965
 M.S.—Radford, 1970
 M.A.—University of Virginia, 1971
- BURLESON, THOMAS W. *Assistant Professor*
 B.S.—Appalachian State University, 1964 *Assistant Director of Continuing*
 M.Ed.—University of Virginia, 1968 *Education*
- CALLIS, TRACY G. *Assistant Professor*
 B.S.—VPI & SU, 1963 *Data Processing*
- CARR, GUY R. *Assistant Professor*
 B.S.—Virginia Polytechnic Institute, 1942 *Mechanical Engineering*
 M.S.—Virginia Polytechnic Institute & State University, 1973 *Technology*
- CARTER, DOUGLAS *Instructor*
 B.A.—University of Arizona, 1966 *Speech*
 M.A.—University of Arizona, 1968

- CARTER, LYNN R. *Instructor*
 B.A.—Emory & Henry College, 1963 *Reference Librarian*
 M.L.S.—University of North Carolina, 1969
- CHENG, FA-HWA *Associate Professor*
 B.S.—National Taiwan University, 1961 *Civil Engr. Technology*
 M.S.—VPI & SU, 1966
 Ph.D.—VPI & SU, 1970
- CLOWSER, MARGARET P. *Instructor*
 B.A.—V.P.I. & S.U., 1970 *English*
 M.A.—V.P.I. & S.U., 1971
- COHRON, JOSEPH W. *Associate Professor*
 B.A.—College of William and Mary, 1933 *Speech and Drama*
 M.A.—Ohio University, 1941
- COMFORT, BARBARA *Instructor*
 B.S.—Virginia Commonwealth University, 1970 *Data Processing*
- COOPER, JOHN J. *Professor*
 B.M.E.—University of Kansas, 1957 *Dean of Instruction*
 M.M.E.—University of Kansas, 1958
 Ed.D.—University of Colorado, 1965
- COUNCILL, GEORGE D. *Instructor*
 B.S.—Lebanon Valley College, 1954 *Music*
 M.A.—Scarritt College, 1959
 M.S.M.—Methodist University, 1964
- CRAIG, BETTY C. *Assistant Professor*
 B.A.—Hollins College, 1946 *English*
 M.A.L.S.—Hollins College, 1971
- CRAWFORD, PATRICIA M. *Assistant Professor*
 B.A.—University of Oregon, 1930 *English*
 M.A.—State University of Washington, 1933
- CRITES, RICHARD W. *Assistant Professor*
 B.S.—Eastern Illinois University, 1967 *Biology*
 M.S.—Eastern Illinois University, 1968
- CROCKETT, S. R., JR. *Assistant Professor*
 B.A.—University of Virginia, 1958 *English*
 M.S.—Radford College, 1967
- CROTTY, A. EUGENE *Professor*
 B.S.—University of Virginia, 1955 *Business Administration*
 M.B.A.—University of Virginia, 1957
 C.P.A.—Virginia, 1959
- CUMMINS, DANIEL G. *Associate Professor*
 B.S.—University of Maryland, 1957 *Dean of Financial and*
 M.B.A.—George Washington U., 1960 *Administrative Services*
- DAVID, RITA H. *Assistant Instructor*
Radiologic Technology
 Certificate in Radiologic Technology, Stevens Clinic Hospital, 1950

- DAVIS, EARLE S. *Instructor*
Mathematics
B.S.—U.S. Naval Academy, 1926
- DEARBORN, CHARLES E., JR. *Assistant Professor*
Automotive Technology
B.S.—Boston University, 1965
Certificate—Wentworth Institute, 1958
- DEVINS, GEORGE V. *Assistant Professor*
Health/Physical Education
B.A.—San Jose State College, 1939
M.S.—Radford College, 1970
Certified—Medical Rehabilitation Coordinator, 1956
- DICKERSON, VERA M. *Assistant Professor*
Art
B.A.—Radford College, 1968
M.F.A.—American University, 1970
- DURHAM, LINDA E. *Instructor*
Music
B.A.—Elon College, 1968
M.M.—Univ. of North Carolina, 1971
- DURLING, MARJORIE S. *Assistant Professor*
Reading
B.S.—West Virginia University, 1946
M.A.—West Virginia University, 1950
- EADS, SALLY A. *Assistant Professor*
History
B.A.—Agnes Scott College, 1965
M.A.—University of Virginia, 1967
- FIGHTMASTER, JAMES W. *Instructor*
Mathematics
B.S.—Georgetown College, 1957
M.Ed.—University of Virginia, 1965
- GALE, HUGH M. *Instructor*
Art
B.A.—University of North Carolina, 1953
B.P.A.—Art Institute of Design, Los Angeles, 1959
- GENTRY, CARROLL L. *Associate Professor*
Chairman, Division of
Business Science
B.S.—East Tennessee State University, 1965
M.B.A.—East Tennessee State University, 1967
- GILL, DAWN M. *Assistant Professor*
Biology
B.S.—Mary Washington College, 1949
M.S.—Radford College, 1969
Registered Physical Therapist—Walter Reed Hospital, U. S. Army, 1950
- GLANVILLE, JAMES O. *Associate Professor*
Chemistry
A.R.C.S.—The Royal College of Science, London, 1962
B.S.—University of London, 1962
Ph.D.—University of Maryland, 1967
- GRIGGS, MIGNONNE *Assistant Professor*
Coordinator of Learning Laboratory
B.S.—Longwood College, 1941
M.Ed.—Virginia Polytechnic Institute, 1961
- GROW, VIRGIL B. *Assistant Professor*
Civil Engineering Technology
B.S.C.E.—Virginia Military Institute, 1930

- HAMILTON, RUTH V. *Assistant Professor*
 B.A.—Ohio State University, 1927 *Art*
 M.A.—Ohio State University, 1928
- HAMLAR, CONSTANCE J. *Assistant Professor*
 A.B.—Virginia State College, 1942 *English*
 M.A.—Northwestern University, 1945
- HAMPTON, NORMAN A. *Instructor*
 B.A.—W.Va. University, 1952 *Data Processing*
- HEADLAND, CHARLES J. *Associate Professor*
 B.S.—State Teachers College, Slippery Rock, Pa., 1941 *Physics*
 M.Ed.—University of Pittsburgh, 1951
- HILL, JAMES P., JR. *Associate Professor*
 B.S.—Roanoke College, 1957 *Chemistry*
 M.Ed.—University of Virginia, 1963
- HILLMAN, DAVID L. *Instructor*
 B.A.—College of William & Mary, 1969 *Catalog, Librarian*
 M.L.S.—University of Maryland, 1972
- HINCHCLIFFE, ALICE B. *Associate Professor*
 A.B.—Syracuse University, 1962 *Program Head, Dental Technology*
 R.D.H.—Eastman School of Dental Hygiene, 1939
 M.Ed.—University of Virginia, 1970
- HOFFMAN, WILLIAM E., JR. *Instructor*
 A.A.S.—Roanoke Technical Institute, 1964 *Electrical Engineering*
 B.S.—Roanoke College, 1971 *Technology*
- HOOVEN, JAMES A. *Assistant Professor*
 B.A.—New Mexico Highlands University, 1965 *History and Government*
 M.A.—New Mexico Highlands University, 1967
- HOOVEN, JUDITH L. *Instructor*
 B.A.—New Mexico Highlands University, 1963 *English*
 M.A.—New Mexico Highlands University, 1966
- HOPPER, HAROLD H. *President of the College*
 B.S.—Washington University, 1951
 M.S.—Washington University, 1954
 Ed.D.—University of Florida, 1965
- HOUCHINS, WILLIAM A. *Assistant Professor*
 B.S.—Concord College, 1949 *Health and Physical Education*
 M.P.H.—University of North Carolina, 1961
- HOUSTON, CHARLES A. *Assistant Professor*
 B.S.—University of Tennessee, 1964 *Coordinator, Institutional Research*
 M.M.—University of Tennessee, 1969
- HUFFMAN, ALICE L. *Assistant Instructor*
Radiologic Technology
 Certificate in Radiologic Technology, Jefferson Hospital, 1965
 Certificate in Nuclear Medicine, Community Hospital, 1968

- JAMES, DAVID P., JR.
 B.S.—Virginia Polytechnic Institute, 1960
 M.S.—Radford College, 1969
Instructor
 Financial
 Aid Officer
- JOHNS, DOLORES J.
 B.S.—Virginia State, 1955
 M.S.—Virginia Commonwealth, 1969
Assistant Professor
 Counseling
- JONES, CLYDE
 B.A.—Furman University, 1956
 M.A.—George Peabody College for Teachers, 1957
Associate Professor
 English
- *KABLER, PAUL D.
 Diploma—Danville Technical Institute, 1960
Instructor
 Air Conditioning &
 Refrigeration
- KAZANJIAN, GARY M.
 B.A.—University of Iowa, 1970
 M.S.—Brooklyn College, 1972
Assistant Professor
 Radio & Television
- KILLIAN, JOHN M.
 B.S.—Louisiana State University, 1965
 Ph.D.—Louisiana State University, 1971
Associate Professor
 Biology
- KNISELY, ELLEN F
 B.S.—California (Pa.) State College, 1966
 M.A.—West Virginia University, 1967
Assistant Professor
 Counseling
- KOUR, EDNA LYNNE
 A.B.—Rutgers University, 1962
 M.S.—University of Rhode Island, 1968
Associate Professor
 Biology
- KRASNOW, RITA
 B.A.—Old Dominion University, 1969
 M.A.—University of Virginia, 1971
Assistant Professor
 Sociology
- KUNZE, DONALD C.
 B.S.—Baldwin Wallace College, 1945
 M.A.—Kent State University, 1952
Associate Professor
 Biology
- LAMANCA, JOHN
 Certificate in Radiologic Technology
 Roanoke Memorial Hospitals, 1962
Instructor
 Program Head
 Radiologic Technology
- *LAWRENCE, VIRGINIA P.
 B.S.—Radford College, 1920
 M.A.—Columbia University, 1925
Instructor
 Reading
- LEE, PIER M.
 B.A.—National Taiwan University, 1959
 M.A.L.S.—George Peabody Teachers College, 1962
Instructor
 Coordinator, Library Services

- LEE, WILLIAM WEI-LIM *Professor*
 Mechanical Engineering Technology
 B.S.—National Taiwan University, Taipei, Taiwan, China, 1959
 M.S.—Virginia Polytechnic Institute, 1964
 Ph.D.—Virginia Polytechnic Institute and State University, 1971
 Registered Professional Engineer
- LEVINE, MARTIN *Professor*
 Electrical Engineering
 Technology
 B.E.E.—College of the City of New York, 1949
 M.Litt.—University of Pittsburgh, 1956
 M.Ed.—University of Pittsburgh, 1960
 Ph.D.—University of Michigan, 1969
- LEWIS, ANDREW E. *Instructor*
 Mental Health
 B.S.S.W.—Tennessee State, 1971
 M.S.S.W.—University of Tennessee, 1973
- MACDONALD, ROBERTA C. *Professor*
 Secretarial Science
 B.A.—Regis College, 1935
 M.C.S.—Boston University, 1941
 Ed.D.—University of Florida, 1966
- MAGGARD, ROBERT E. *Assistant Professor*
 Health/Physical Education
 B.A.—University of Kentucky, 1958
 M.A.—Eastern Kentucky University, 1971
 Ed. Specialist—Eastern Kentucky University, 1972
- MAGRUDER, EDWARD G. *Assistant Professor*
 Business Management
 B.S.—Roanoke College, 1951
 Diploma—Commercial Banking—Rutgers University and
 Stonier Graduate School of Banking, 1960
 M.S.—Radford College, 1970
- MATHENY, GALLAIS E. *Associate Professor*
 Biology
 B.S.—University of Illinois, 1929
 M.S.—Virginia Polytechnic Institute, 1939
- MAYO, LINDA L. *Assistant Professor*
 Health and Physical Education
 B.A.—Glennville State College, 1961
 M.S.—Indiana University, 1968
- MAYS, CLARENCE C., JR. *Associate Professor*
 Spanish
 B.S.—University of Virginia, 1961
 M.Ed.—University of Virginia, 1965
- McCABE, JAMES N. *Assistant Professor*
 Administrative Assistant to the
 President
 A.B.—West Virginia University, 1940
- McCLUSKEY, JOHN W. *Associate Professor*
 Coordinator of
 Counseling
 B.S.—Alabama College-Montevallo University, 1965
 M.Ed.—University of Florida, 1968
 Ed.D.—University of Florida, 1972
- MC FARLAND, ROSALIND L. *Instructor*
 Mathematics
 B.A.—Radcliffe College, 1939

- MELLINGER, THOMAS J. *Instructor*
 B.A.—Arizona State University, 1968 Police Science
- MICHIE, WAYNE R. *Instructor*
 A.A.S.—Roanoke Technical Institute, 1964 Electrical Engineering
 B.S.—Roanoke College, 1969 Technology
- MILES, ROY G. *Associate Professor*
 B.S.—Missouri School of Mines, 1951 Geology
 M.S.—Northwestern University, 1957
- MITCHELL, FRANCES T. *Assistant Professor*
 B.S.—Radford College, 1942 Secretarial Science
 M.S.—Radford College, 1968
- MOORE, DOLORES K. *Instructor of German*
 Diploma—Lehrerinnen Seminar, 1945 & Grants Officer
 Interpreter's Diploma—Rackow Schule, 1947
 M.A.—Columbia University, 1949
 Ph.D.—Columbia University, 1972
- MOORE, BETTY L. *Associate Professor*
 A.B.—Kansas State Teachers College, 1943 English
 B.S.—Kansas State Teachers College, 1943
- MUSGROVE, CHARLES P. *Assistant Professor*
 B.S.—East Tennessee State University, 1967 Mathematics
 M.S.—Virginia Polytechnic Institute, 1969
- MUSIC, WILLIAM O., JR. *Assistant Professor*
 B.S.—Lynchburg College, 1963 Coordinator of Admissions and Records
 M.S.—University of Tennessee, 1964
- NELSON, JAMES E. *Assistant Professor*
 B.S.—U.S. Merchant Marine Academy, 1944 Mechanical Engineering
 B.S.—Roanoke College, 1949 Technology
 M.S.—Appalachian State University, 1966
- NICKENS, HARRY C. *Assistant Professor*
 B.S.—Tennessee Tech. University, 1966 Counseling
 M.A.—Tennessee Tech. University
 Ed.D.—University of Tennessee, 1972
- NICKERSON, GWENDOLYN J. *Associate Professor*
 B.S.—Roanoke College, 1951 Chemistry
 M.Ed.—University of Virginia, 1965
- NININGER, EDWARD C. *Associate Professor*
 B.A.—Richmond College, 1931 History
 M.A.—Richmond College, 1932
- PACK, JOEL C. *Assistant Professor*
 B.A.—Roanoke College, 1963 Mathematics
 M.A.—University of Virginia, 1967
- PAYNE, CHRISTINE K. *Assistant Professor*
 B.S.—Winston State College, 1946 Reading
 M.Ed.—Penn State Univ., 1956

- PAYNE, ELIZABETH W. *Assistant Professor*
 B.S.—University of North Carolina, 1950 *Secretarial Science*
 M.Ed.—University of North Carolina, 1969
- PHELPS, EMMA SUE *Assistant Professor*
 B.A.—Concord State Teachers College, 1939 *Speech and Drama*
 M.A.—State University of Iowa, 1946
- PHELPS, HUGH B. *Professor*
 B.M.E.—Clarkson College of Technology, 1950 *Chairman, Engineering/*
 M.M.E.—Clarkson College of Technology, 1956 *Industrial & Health*
Technologies
- POINDEXTER, J. CARL *Professor*
 B.S.—University of Virginia, 1933 *Economics*
 M.A.—University of Virginia, 1941
 Ph.D.—University of Virginia, 1944
- POOLE, MEREDITH J. *Instructor*
 B.A.—Oberlin College, 1968 *English*
 M.A.—University of Virginia, 1971
- PULLEN, PAUL T. *Associate Professor*
 A.B.—Asbury College, 1949 *Chairman, Division of Humanities*
 M.Th.—Pittsburgh Theological Seminary, 1957
 Ph.D.—University of Pittsburgh, 1961
- RACE, HARRY C. *Associate Professor*
 B.S.E.E.—Northeastern University, 1942 *Dean of Student Services*
 M.S.—Radford College, 1965
- RAKES, JEFFERY L. *Assistant Instructor*
 Certificate in Radiologic Technology *Radiologic Technology*
 Roanoke Memorial Hospital, 1969
- RYG, CHRIS J. *Instructor*
 B.A.—University of Iowa, 1970 *in Radio and Television &*
Radio Station Manager
- SALMON, JANE A. *Instructor*
 B.S.N.—Duke University, 1957 *A.D. Nursing Program*
- SANBORN, CARLETON H. *Assistant Professor*
 B.A.—Maryknoll College, 1958 *Counselor*
 M.Ed.—Plymouth State College, 1967
 Ed.D.—University of Virginia, 1973
- SAUNDERS, JEAN M. *Assistant Professor*
 B.S.—Radford College, 1954 *Business Management*
 M.Ed.—Virginia Polytechnic Institute, 1967
- SCHNEIDER, JUDITH P. *Instructor*
 B.S.N.—Old Dominion University, 1970 *A.D. Nursing Program*
- SCHULTZ, L. DAVID *Assistant Professor*
 B.A.—University of California, Santa Barbara, 1967 *Mathematics*
 M.A.—University of Arizona, 1969

- SELANDER, EDWIN V. *Assistant Professor*
 B.S.—Virginia Polytechnic Institute, 1955 *Mathematics*
 M.S.—Virginia Polytechnic Institute, 1967
- SELANDER, MARY V. *Instructor*
 B.S.—Virginia Polytechnic Institute, 1955 *Mathematics*
 M.A.—Pennsylvania State University, 1959
- SHEPARD, DAVID E. *Assistant Professor*
 B.S.—Virginia Commonwealth U., 1958 *Business Management*
 M.B.A.—University of Virginia, 1962
- SHEPPARD, VERNON M., JR. *Associate Professor*
 B.S.—Virginia Polytechnic Institute, 1954 *Economics*
 M.S.—Virginia Polytechnic Institute, 1960
- SHIRLEY, WILLIAM T. *Associate Professor*
 B.A.—Furman University, 1948 *Chairman, Division of Social Science*
 M.A.—University of North Carolina, 1950 *& Public Service Technology*
- SINGER, MADELYN H. *Associate Professor*
 A.B.—Brooklyn College, 1942 *Mathematics*
 M.A.—Columbia University, 1946
- SMITH, HUGH P. *Associate Professor*
 B.A.—University of California, 1948 *Geology and Geography*
 M.A.—University of California, 1950
 Ph.D.—University of Utah, 1969
- SMITH, MILTON S. *Professor*
 B.A.—Wesleyan University, 1933 *English*
 M.A.—Harvard University, 1934
 Ph.D.—Fordham University, 1955
- SOWER, RONALD D. *Instructor*
 B.A.—Emory & Henry College, 1969 *Biology*
 M.A.—Radford College, 1972
- STARNES, JOHN N. *Assistant Professor*
 B.S.—East Tennessee State University, 1960 *Mathematics*
 M.S.—East Tennessee State University, 1968
- STATON, RUTH J. *Associate Professor*
 B.A.—College of William and Mary, 1934 *English*
 M.Ed.—University of Virginia, 1954
 M.A.—University of Michigan, 1968
- STEWART, ALBERT W. *Assistant Professor*
 B.S.E.E.—Virginia Polytechnic Institute, 1957 *Electrical Engineering*
Technology
- STRAUSBAUGH, MAURICE *Associate Professor*
 B.A.—Juniata College, 1950 *Director of Continuing Education*
 M.D.—Bethany Theological Seminary, 1953
 M.Ed.—Johns Hopkins University, 1966

- SUTPHIN, IONA W.
B.S.—University of Virginia, 1966
M.S.—Emory University, 1969
Assistant Professor
Mental Health Technology
- SYKES, CYRIL H.
B.A.—Norwich University, 1944
M.S.—Syracuse University, 1950
Assistant Professor
Director, Learning Resources
- TRAHIN, LAVERNE L.
B.A.—Radford College, 1960
M.S.—Radford College, 1965
Instructor
Psychology
- TRAYNOR, MARGARET H.
B.S.Ed.—Longwood College, 1933
M.Ed.—University of Virginia, 1968
Instructor
Counselor
- TUCKER, RAY B.
B.S.—Southern Illinois University, 1956
M.A.T.—Southeastern State College, 1966
M.A.—University of Illinois, 1969
Associate Professor
Mathematics
- VAN LIERE, RUTH B.
B.A.—Roanoke College, 1967
M.S.—Radford College, 1968
Instructor
Psychology
- VAUGHT, MARTHA LOU
B.S.N.—University of Virginia, 1973
Instructor
AD Nursing Program
- WALL, E. HOYET
B.S.—Winthrop College, 1965
Assistant Professor
Secretarial Science
- WASHBURN, WILLIAM B.
B.A.—Lynchburg College, 1953
M.B.A.—University of New Haven, 1971
Assistant Professor
Business Management
- WEBB, JANICE E.
B.S.N.—University of Virginia, 1972
Instructor
A.D. Nursing Program
- WEINMAN, DANIEL J.
B.S.—Loyola University, 1967
M.A.—Northern Illinois University, 1969
Instructor
Government
- WELCH, JOHN D.
B.A.—St. Vincent College, 1964
M.L.S.—University of Pittsburgh, 1972
Instructor
Librarian
- WHITE, ROY R.
B.S.—Florida Southern College, 1954
M.A.—University of Florida, 1957
Ph.D.—University of Florida, 1960
Associate Professor
History
- WILSON, JAMES H.
A.A.S.—Roanoke Technical Institute, 1965
B.S.—Virginia Polytechnic Institute and State University, 1971
M.S.—Virginia Polytechnic Institute and State University, 1973
Assistant Professor
Mechanical Engineering
Technology
- WU, FRANK
B.S.—Rocky Mount College, 1958
M.A.—Montclair State College, 1965
Instructor
Counseling
- ZIRKLE, BENJAMIN F., III
B.S.—Roanoke College, 1965
M.S.—Florida State University, 1968
Assistant Professor
Mathematics

STAFF PERSONNEL

ADAMS, WILLIE I.	<i>Personnel Supervisor</i>
ANDERSON, GARY	<i>Radio Production Manager</i>
ARA, NANCY K.	<i>Secretary to the Chairman, Humanities Division</i>
ARRINGTON, MARVIN L.	<i>Police Chief</i>
BANKS, HELEN K.	<i>Instructional Aide, Learning Laboratory</i>
BOLLING, ESTHER A.	<i>Secretary to the Chairman, Business Science Division</i>
BRANDSTETTER, DOROTHY I.	<i>Procurement Clerk</i>
BRATTON, MARION B.	<i>Bookstore Manager</i>
BROOKS, THOMAS R., JR.	<i>Campus Policeman</i>
CARROLL, TYREE G.	<i>Campus Policeman</i>
CORRELL, ALICE L.	<i>Secretary to Data Processing Manager</i>
COSENZA, LYNN A.	<i>Secretary to the Chairman, Science Division</i>
DeFELICE, VIRGINIA B.	<i>Secretary to the Chairman, Engineering/ Industrial & Health Technologies</i>
EMORY, PAMELA P.	<i>Library Clerk</i>
EPPERLY, WANDA J.	<i>Requisition Control</i>
EQUI, JEAN D.	<i>Technician in Charge of Duplication</i>
EVANS, JANET E.	<i>Radio Traffic Director</i>
GARST, DORIS D.	<i>Secretary to President & Administrative Assistant</i>
GAULDIN, CLAUDE S.	<i>Campus Policeman</i>
GAUT, BESS S.	<i>Clerk Typist, Admissions & Records</i>
GRAY, MARIE L.	<i>Clerk-Steno, Admissions & Records</i>
GREGORY, JANE F.	<i>Circulation Librarian</i>
GRIMM, JOAN C.	<i>Financial Aid Clerk & Sec. to Coord. Counseling</i>
HOUSEMAN, W. ROBERT	<i>Instructional Assistant, Automotive Technology</i>
HURD, BARBARA E.	<i>Faculty Secretary</i>
JANNEY, BÉTTY	<i>Secretary-Projects, Continuing Education</i>
LINKOUS, CONNIE M.	<i>Secretary to Building & Grounds Supervisor</i>
McGEE, ROSE A.	<i>Secretary to Deans of Instr. & Student Services</i>
MARTIN, ANN T.	<i>Secretary to Director of Learning Resources</i>
MAUK, JOHN W.	<i>Campus Policeman</i>
MEADOR, FRANCES M.	<i>Bookstore Assistant</i>
MITCHELL, MILDRED C.	<i>PBX Operator & Receptionist</i>

MOCK, DOROTHY C.	<i>Secretary to Director, Continuing Education</i>
MORRIS, JUANITA C.	<i>Secretary to Coord. Learning Lab & Nursing</i>
MUNDY, MARION D.	<i>Secretary to Deans of Instruction & Student Services</i>
MUSSELMAN, RHONDA T.	<i>Illustrator, Audio-Visual</i>
NEAL, BETTIE T.	<i>Transcript and Government Clerk</i>
NELMS, CATHIE D.	<i>Sec. to Dean of Financial & Administrative Services</i>
NEWELL, CHARLES P., JR.	<i>Accountant Local Funds</i>
PETERS, BARBARA A.	<i>Key Punch Operator</i>
PREVO, PATRICIA L.	<i>Instructional Aide, Chemistry</i>
RAMEY, MONA J.	<i>Manager, Mailroom and Supply</i>
ROWLETT, JUNE V.	<i>Bookkeeper, Business Office</i>
ROUTT, PAUL L., JR.	<i>Campus Policeman</i>
SARGENT, JUDITH B.	<i>Computer Operator, Data Processing</i>
SAYLES, ARLETHA M.	<i>Secretary, Counseling Services</i>
SHUMAKER, DREWRY P.	<i>Secretary to the Chairman, Division Social Science & Public Service Technology</i>
SLAUGHTER, MICHAEL L.	<i>Instructional Aide, Biology</i>
SOWER, SANDRA B.	<i>Secretary to the Coordinator, Admissions & Records</i>
STRONG, ALICE M.	<i>Senior Citizens' Programs</i>
TALIAFERRO, ULITA S.	<i>Cashier, Business Office</i>
THOMAS, ROGER D.	<i>Accountant State Funds</i>
WEBB, ANNE Q.	<i>Confidential Secretary to the President</i>
WERTZ, DEBORAH W.	<i>Inventory Control</i>
WHEELER, WILLIAM H.	<i>Laboratory Mechanical Technician</i>
WILLIAMS, SHIRLEY R.	<i>Secretary, Dental Assistant Program</i>
WOOD, IRENE S.	<i>Faculty Secretary</i>
WOOD, JOYCELYN J.	<i>Clerk-Typist, Admissions & Records</i>
YOPP, BILL ROGER	<i>Instructional Aide, Learning Laboratory</i>
YOUNG, JOHN R., JR.	<i>Buildings and Grounds Supervisor</i>

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JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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