NORTHERN VIRGINIA COMMUNITY COLLEGE

VIRGINIA COMMUNITY COLLEGE SYSTEM
VIRGINIA
VCC
DIVISION

CATALOG 1968-1969

1968

JULY

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1969

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JULY

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AUGUST

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DECEMBER

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21	22	23	24	25	26	27
28	29	30	31			

NORTHERN VIRGINIA COMMUNITY COLLEGE

CATALOG

1968-1969

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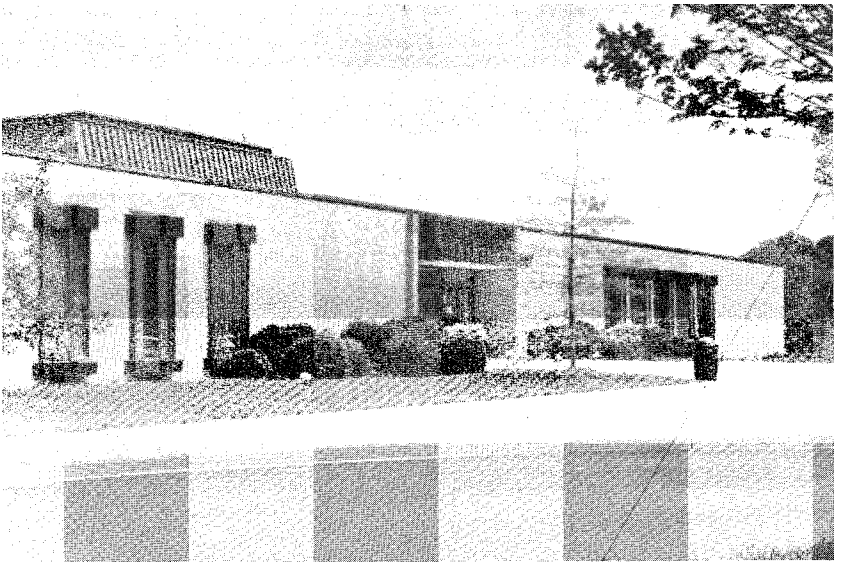
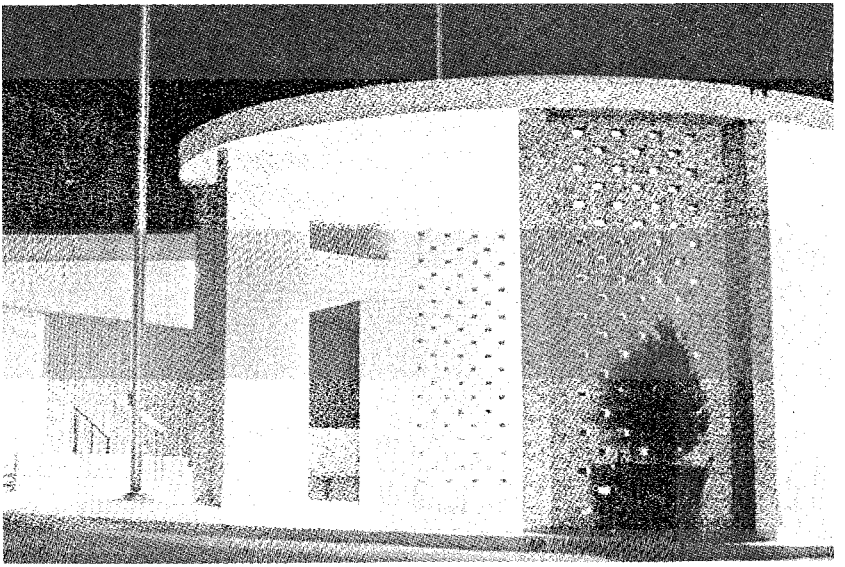
Annandale, Virginia 22003
Area Code 703 • 280-5500

EASTERN CAMPUS
3443 South Carlyn Spring Road
Bailey's Crossroads, Virginia 22041
Area Code 703 • 481-9100



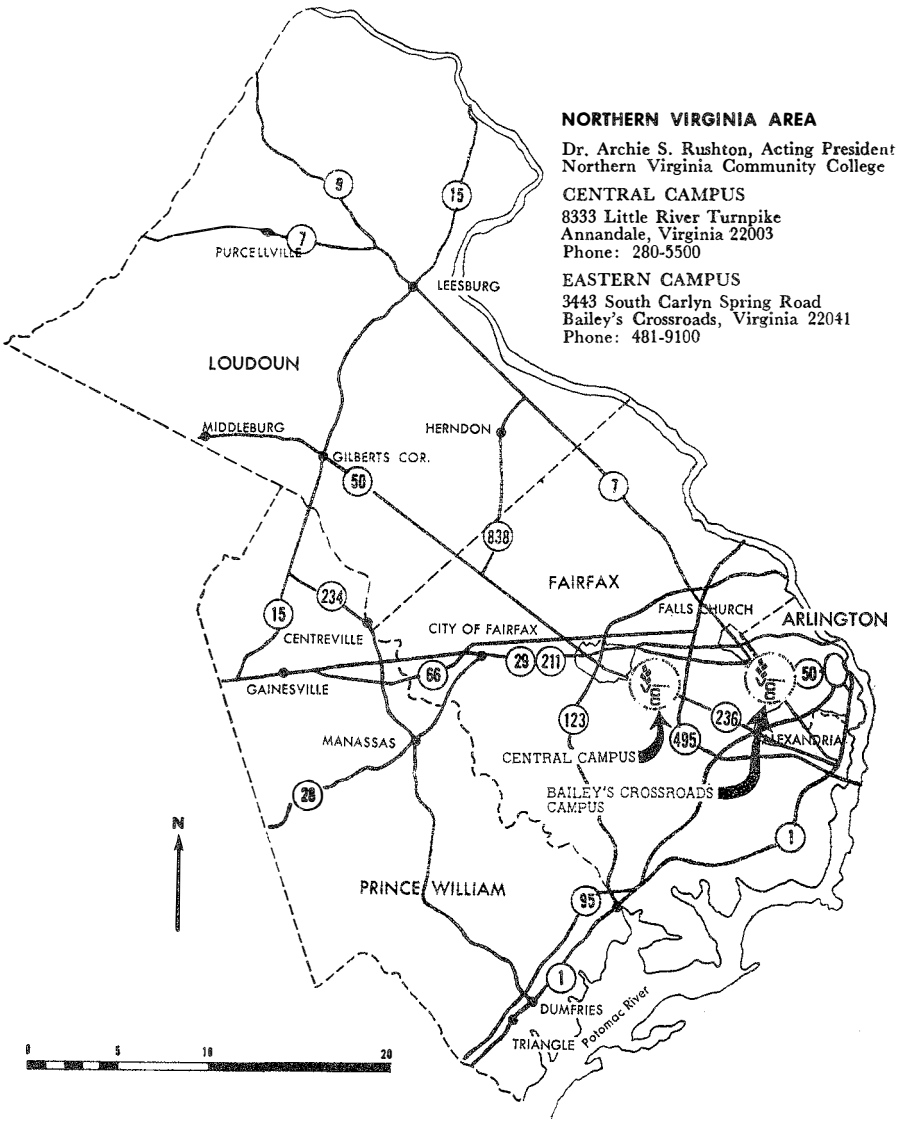
CENTRAL CAMPUS

Annandale



EASTERN CAMPUS

Bailey's Crossroads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PURCELLVILLE
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FAIRFAX
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GAINESVILLE
MANASSAS
CENTRAL CAMPUS
BAILEY'S CROSSROADS CAMPUS
ALEXANDRIA
PRINCE WILLIAM
DUMFRIES
TRIANGLE
Potomac River
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20

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GENERAL INFORMATION

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B.S.—North Georgia College

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M.A.—George Peabody College

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M.Ed.—University of Illinois
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M.A.—George Washington University

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M.Ed.—University of Virginia

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M.Ed.—University of Virginia

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M.A.—Rutgers University

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M.Ed.—University of Virginia

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M.Ed.—University of Maryland

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M.A.—Columbia University

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M.S.L.S.—Catholic University of America

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M.S.L.S.—Catherine Spaulding College

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M.A.—George Washington University

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M.A.—American University

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M.S.—University of Maryland

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M.A.—Texas College of Arts and Industries

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LL.B.—Baylor University

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M.S.N.—Catholic University of America

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M.A.—Fairleigh Dickenson University

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M.A.—Columbia University
Ph.D.—Rutgers University

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M.A.—University of Michigan

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B.S.—State University of Georgia

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B.S.—The Agricultural and Technical College of North Carolina

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M.A.—North Texas State University

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B.S.E.E.—USAF Institute of Technology
American Year Institute, Pennsylvania State University
M.Engr.—Pennsylvania State University

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M.A.—Boston University

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M.A.—University of Mississippi

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M.S.—Long Island University

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M.S.—University of Pennsylvania

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M.Ed.—University of Buffalo
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M.S.—Massachusetts Institute of Technology

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M.Ed.—State College at Boston

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M.Ed.—Virginia Polytechnic Institute

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B.S.E.—Auburn University

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M.S.N.—Catholic University of America

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M.S.—University of Tennessee

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M.S.—Southern Methodist University

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B. Arch.—Catholic University

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M.S.—Radford College

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M.A.—West Virginia University

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M.P.A.—City University of New York

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M.B.A.—Harvard University

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Ph.D.—University of Maryland

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M.Engr.—Pennsylvania State University

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M.S.—Syracuse University

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M.A.—Harvard University

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M.A.—American University

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M.S.E.E.—Massachusetts Institute of Technology

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M.B.A.—Columbia University
Member, N.A.S.D.

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M.A.—American University

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M.A.—University of Virginia

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M.A.—University of Pennsylvania

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M.A.—University of Chicago
Ph.D.—University of Illinois

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M.Ed.—University of Virginia

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M.F.A.—George Washington University

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M.A.—Georgia State College

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Ph.D. Studies—New York University

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Doctoral Studies—Ohio State University

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B.S.—Davis and Elkins College
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M.A.—American University

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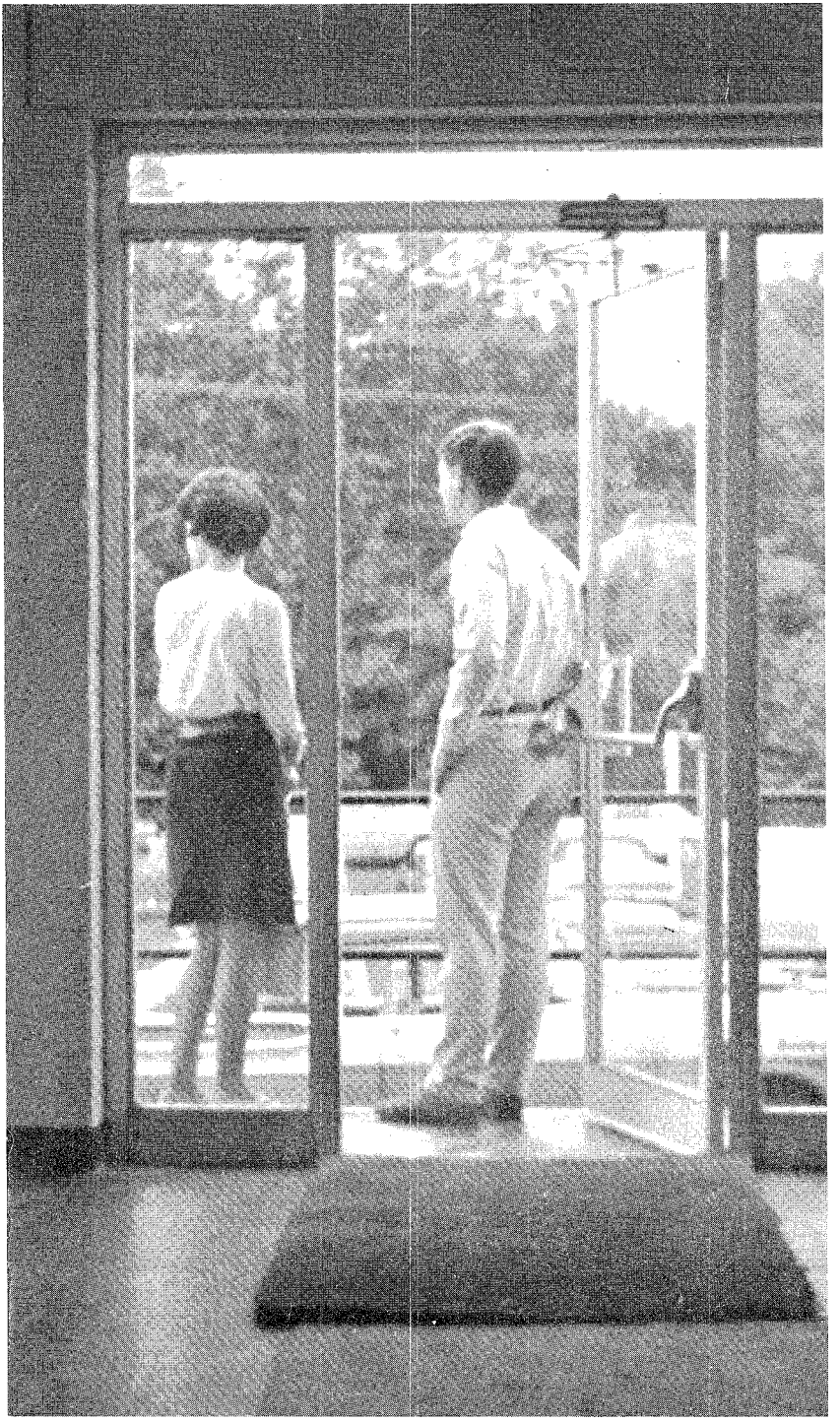


COLLEGE CALENDAR

Fall Quarter—1968

Orientation	September 23-25
Registration	September 26-27
Classes begin	September 30
Last day to add or change classes	October 4
Last day for withdrawal without penalty	October 18
Mid-Term grade reports	November 5
Thanksgiving recess	November 28-30
Classes end	December 11
Final Exam days	December 12-14

Winter Quarter—1969

Orientation day for students	January 2
Registration	January 2-3-4
Classes begin	January 6
Last day to add or change classes	January 10
Last day for withdrawal without penalty	January 24
Mid-Term grade reports	February 11
Applications due for June graduation	February 21
Washington's Birthday	February 22
Classes end	March 17
Final Exam days	March 18-20

Spring Quarter—1969

Orientation day for students	March 26
Registration	March 27-28
Classes begin	March 31
Last day to add or change classes	April 4
Last day for withdrawal without penalty	April 18
Mid-Term grade reports	May 6
Memorial Day	May 30

Classes end	June 9
Final Exam days	June 10-12
Graduation	June 14

Summer Quarter—1969

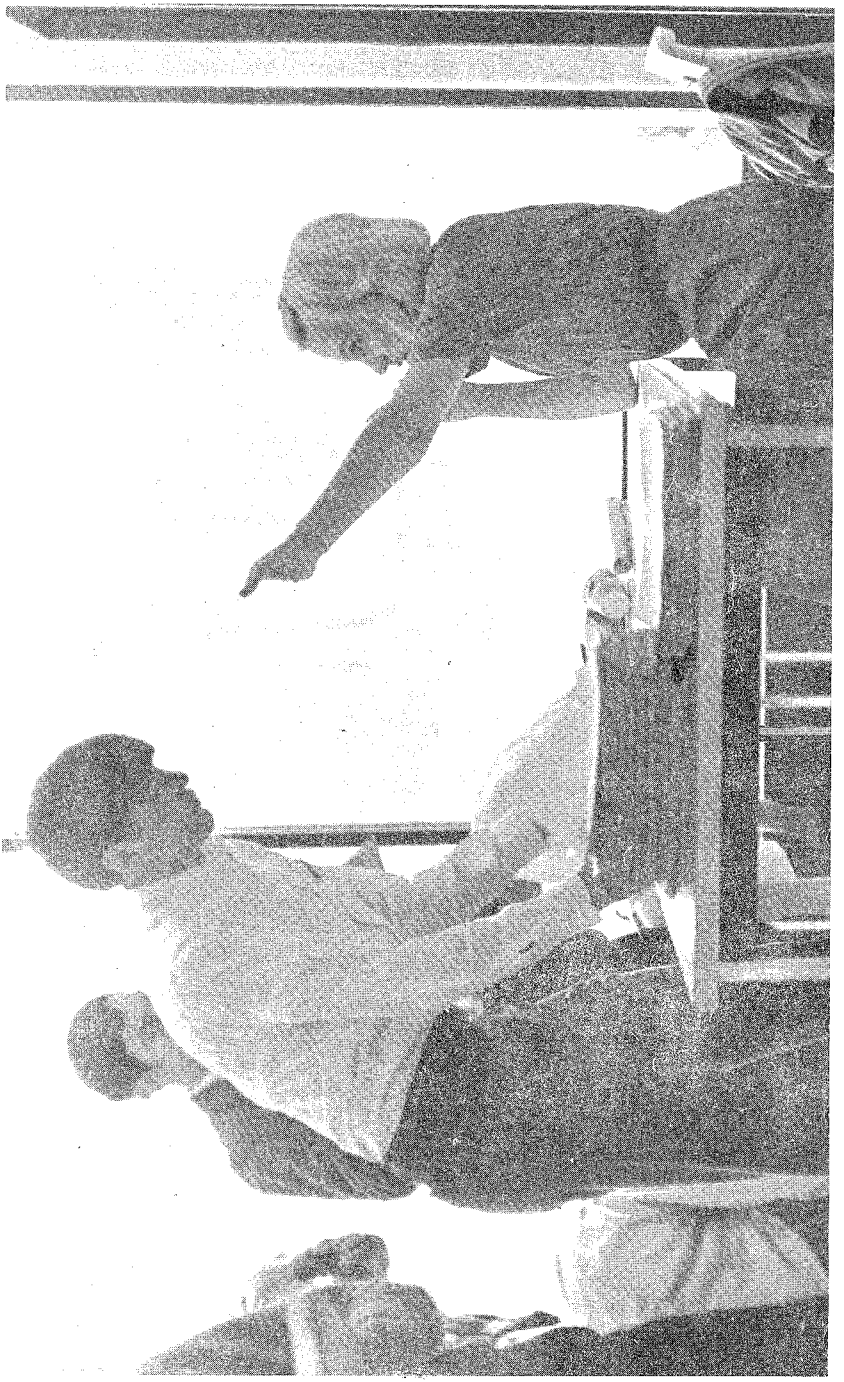
(Full Ten-Week Session)

(Subject to Change)

Orientation day for students	June 16
Registration	June 16
Classes begin	June 17
Last day to add or change classes	June 23
Independence Day	July 4
Last day for withdrawal without penalty	July 8
Mid-Term grade reports	July 23
Classes end	August 26
Final Exam days	August 27-29

Fall Quarter—1969

Orientation day for students	September 24
Registration	September 25-26
Classes begin	September 29
Last day to add or change classes	October 3
Last day for withdrawal without penalty	October 17
Mid-Term grade reports	November 4
Thanksgiving recess	November 27-28
Classes end	December 10
Final Exam days	December 11-13



GENERAL INFORMATION

THE COLLEGE

The College is a two-year institution of higher education established under a state-wide system of Community Colleges in Virginia and serving the counties of Arlington, Fairfax, Loudoun, Prince William, and the cities of Alexandria, Falls Church and Fairfax. These communities have a population of approximately 800,000 with a projected growth of 2,500,000 in the next 25 years.

The College operates on policies established by the State Board for Community Colleges and with the support and advice of a local Community College Advisory Board; and is financed primarily by State funds, supplemented by contributions from the seven local jurisdictions.

LOCATION AND FACILITIES

The College is presently operating two campuses. The Eastern Campus, located at Bailey's Crossroads, adjacent to the Melpar Building at the junction of South Carlyn Spring Road and Leesburg Pike (Route 7), has 60,000 square feet of space containing classrooms, laboratories, administrative and faculty offices, a counseling suite, business office, bookstore, library, snack bar and student lounge.

The library, consists of more than 15,000 new volumes and 300 periodicals. The Developmental Laboratory, operated in conjunction with the library, provides individual instruction for students who require the preparatory or foundations program in Mathematics or English

The new Central Campus, designed as a complete college unit, at 8333 Little River Turnpike (Route 236) two miles west of Annandale, Virginia, has one general classroom building in operation and three additional buildings scheduled to open in September, 1968.

Land has been purchased for three satellite campuses on which buildings will be constructed sometime after 1970.

HISTORY OF THE COLLEGE

Although covering a brief period of time, the history of the College is one of rapid growth and development. The College was established under the name of Northern Virginia Technical College, as a result of legislation by the 1964 State General Assembly. It became the first of an expanding system of technical colleges.

In early 1965 the College was approved by the State Board of Technical Education, the present Local Board of Trustees was formally established, and the President of the College was appointed. Less than four months later, the College opened its door at Bailey's Crossroads with an initial enrollment of 761 students and a staff and faculty of 46. The College was officially dedicated by Governor Albertis S. Harrison on November 16, 1965.

Approximately 1,600 persons were registered as full-time or part-time students during the first three quarters of the 1965-1966 term. Approximately 2,300 students were registered during the 1966-1967 term. 3,360 students were enrolled during the 1967-68 term.

The 1966 Session of the General Assembly enacted legislation which included what was then the Northern Virginia Technical College in a new, State-wide system of comprehensive community colleges. In accordance with this enlarged role and under its new name, the College has added a two-year University Parallel-College Transfer program to its curriculum of occupational and technical education.

PURPOSE

Northern Virginia 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 in awareness of his role and responsibility in society. The College is devoted to serving the educational needs of its community and assumes a responsibility for helping meet the requirements for trained manpower in its region through a cooperative effort with local industry, business, professions, and government.

Educational opportunities are provided for post-high school age youth and adults. These include high quality instructional programs at the associate degree level and at the preparatory (or foundations) level. A strong guidance and counseling program, along with a number of other student services, is also provided to help each student made sound decisions regarding his occupation, educational, and personal-social plans.

The College, dedicated to serving its community, is responsive to the requirements of industry and business. It seeks to fulfill these needs by offering various educational programs at the college level. The College assumes responsibility for providing Northern Virginia with trained manpower, to meet the challenge of an increasing technological society, the College provides a continuing education program for retraining and readjustment in employment, for increased productivity, and for training in new jobs for a changing society.

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

1. *Occupational-Technical Education.* The occupational and technical education programs are designed to meet the increasing demand for technicians, semi-professional workers, and skilled craftsmen for employment in industry, business, the professions, and government. The curriculums 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 worker, a consumer and a citizen.
4. *Continuing Adult Education.* These programs are offered to enable the adults in the region to continue their learning. This work includes both degree credit and non-degree credit work offered during the day and evening hours.
5. *Special Training Programs.* Special training may be provided where specific job opportunities are available for new and expanding industries. This special training shall be coordinated with Virginia's economic expansion efforts and with the needs of employers.
6. *Preparatory (Foundation) Programs.* Foundations and 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 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.

RECOGNITION

The College, a division of the Virginia Community College System, 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 is a Candidate for membership with the Southern Association of Colleges and Schools, has declared its intentior to work closely with the Association in pursuit of full accreditation and membership at the earliest possible date.

The College has institutional membership in the American Association of 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

General Admission to the College

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

For all regular students, the following items are required:

1. A completed "Application for Admission as a Regular Student." (NOTE: Social Security Number is required.)
2. A $5 application fee (non-refundable unless the requested program or course is not offered.)
3. Official transcripts from all high schools, colleges, and universities attended.

For all special students, part-time non-degree students, and those entering a continuing adult education program, only a completed "Application for Admission" and payment of appropriate fees is required. Those persons wishing to change their status to degree candidacy must then meet the requirements outlined above for general admission to the college.

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

Applicants will be accepted on a first-come, first-served basis subject to the quotas established for each curriculum. It is important that applications be made early if entrance to the desired program is to be achieved.

After a person has been admitted to the College as a regular student, he will be required to meet with one of the College counselors (a) to discuss the applicant's educational interests, (b) to determine what additional tests he may need, and (c) to plan his application for admission to a specific curriculum or program at the College. He will also be required to submit a health certificate (form to be furnished by the College).

Admission to Specific Curriculums

In addition to the general admission requirements listed above, specific requirements are usually prescribed for each curriculum of the College. Among the items generally considered in determining the eligibility of a student for admission to a curriculum in the College are his educational and occupational experiences and other reasonable standards to insure that the student possesses the potential to meet program requirements.

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 preparatory course work.

All regular students entering the College will be required to take the ACT test battery of the American College Testing Program at no additional cost to the student prior to registration.

Persons applying to enter one of the associate degree programs (Associate in Science, Associate in Arts, or Associate in Applied Science) shall be high school graduates or the equivalent or have completed an approved preparatory program.

In addition, all students who plan to transfer to a four-year college or university after completing their program at the Community College will be required to submit their scores on the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board.

Special Admission Requirements for Foreign Students

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

Residence Requirements

Applicants will be required to submit a residence affidavit to determine state residency eligibility for tuition purposes.

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 subdivisions supporting the College as listed under General Information, 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 re-entrance at the last college shall also be eligible for admission to the Community College.

It is the role of the Community College to help each student succeed in a program from which he can benefit. 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 preparatory program at the College. The Admissions Committee of the College shall decide on each case, and usually shall impose special conditions for the admittance of such students, including placement on probation.

Each student transferring from another college should consult the Counseling Department 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 subjects with a grade 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, or work experience may entitle them to an adjustment in the course work required in a particular curriculum should contact the Admissions Office at the College to determine procedures before registering for classes. Proficiency examinations will be used to determine course credit granted. Veterans may be given credit for Physical Education upon submission of discharge certificate.

Auditing

A student may audit a course to learn about the subject without having to take the course examination. No credit is given for auditing a course. If a person wishes to change his status in a course from audit to credit, he must do this within the first week of the class. In all cases, permission of the instructor and the Dean of Instruction is required to audit a class.

CLASSIFICATION OF STUDENTS

All students are classified according to the following categories:

Regular Student: A student is designated as a regular student when his file in the Admissions Office contains all of the information required for general admission to the College as a regular student and when he has been admitted to one of the curriculums of the College. A regular student is one of the following:

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

Special Student: A special student is one who is permitted to register under special conditions including the following:

1. A part-time student taking a course(s) for no credit;
2. A high school senior who with the permission of his high school principal is concurently enrolled in a college course(s);
3. A full-time or 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 regular student);
4. A person 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.

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

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

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

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

EXPENSES

Application Fee

An application fee of $5 must accompany the application for admission to the College for each regular 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	$ 45.00 per quarter
Out-of-State Resident	150.00 per quarter

Part-time Student (less than 12 hours):

Virginia Resident	$ 4.00 per credit (or equivalent)
Out-of-State Resident	12.50 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 lease one year prior to the commencement of the term or quarter for which he is enrolling.

All foreign students holding student visas are considered out-of-state residents.

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 school property (such as laboratory or shop equipment, supplies, libary books and materials) that they damage or lose.

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 approximately $35-$50 per quarter for the average full-time student.

Refunds

Authorized refunds will be as follows for students withdrawing from the College: (a) within the first 15 class days of a quarter, refund will be ⅔ of tuition; (b) within first 16-35 class days of a quarter, refund will be ⅓ of tuition; (c) after 35 class days of a quarter have

elapsed, no refund will be made. If a course is cancelled, there will be 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 pro-rated 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 Admission and Records and 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 work ***weekly*** by each student as follows:

a. One hour of lecture plus an average of two hours of out-of-class study, or
b. Two hours of laboratory or shop work plus an average of one hour of out-of-class study, or
c. Three hours of laboratory or shop work with no regular out-of-class assignments.

GRADING SYSTEM

A = Excellent = Four grade points per credit

B = Good = Three grade points per credit

C = Average = Two grade points per credit

D = Poor = One grade point per credit

F = Failure = 0 grade points

S = Satisfactory = No grade point credit (Applies only to specialized courses and seminars)

U = Unsatisfactory = No grade point credit (Applies only to specialized courses and seminars)

W = Withdrawal = No credit (A grade of withdrawal implies that the student was making satisfactory progress in the course 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 student absence from a limited number of class sessions near the end of a term or grading period and when the absence was 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 made up during the next term

following its issuance unless special permission for an extension of time is given by the Admissions Committee.)

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.

DEGREES, DIPLOMAS, AND CERTIFICATES

Northern Virginia Community College offers the following degrees, or certificates for students who successfully complete approved programs at the College.

1. *Associate in Arts degree* (*A.A.*) is awarded to students majoring in the liberal arts and who may plan to transfer to four-year colleges or universities after completing their community college programs.
2. *Associate in Science degree* (*A.S.*) is awarded to students majoring in specialized curriculums such as business administration, teacher education, pre-engineering, and other pre-professional programs and who may plan to transfer to four-year colleges or universities after completing their community college programs.
3. *Associate in Applied Science degree* (*A.A.S.*) is awarded to students majoring in one of the occupational-technical curriculums and who may plan to obtain a full-time job immediately upon graduation from the College.
4. *Certificate* is awarded to students who complete one of the approved curriculums that are usually less than two years in length.

GRADUATION REQUIREMENTS

Associate Degree Requirements

To be eligible for graduation with an Associate Degree from the College a student must:

1. Have fulfilled all of the course requirements of his particular curriculum as outlined in the College catalog;

2. Have been recommended for graduation by the major department in his curriculum;

3. Have completed at least 97 credits applicable to an associate degree, of which 45 credits must be acquired at the College;

4. Have completed the general education requirements (course work in Economics, English, Psychology, Government, and Orientation) for an associate degree;

5. Have earned a grade point average of at least 2.0 on all work attempted and which is applicable toward graduation in his particular 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 materials including library books.

Certificate Requirements

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

1. Have fulfilled all of the course requirements of his particular Certificate curriculum as outlined in the College *Catalog* (this includes achieving at least a passing grade in each course in the curriculum);
2. Have been recommended for graduation by the major department in the student's curriculum;
3. Have completed the prescribed total quarter hours of credit for the Certificate, at least one-half of which must have been taken at the College;
4. Have filed an application for graduation in the office of the Coordinator of Admissions and Records;
5. Have resolved all financial obligations to the College and returned all materials including library books.

Certificate of Completion

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 fails to meet the degree or diploma requirements, he may, upon recommendation of the appropriate instructional department and the Dean of Instruction, be issued a certificate in the occupational specialty in which he is considered proficient.

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 and the Dean of Instruction.

The classroom and laboratory courses of the College require regular attendance to achieve the learning goals of those programs. Any instruction missed and not made up will necessarily, and regardless of the reason for the absence, affect the grade of the student. It is College policy

to penalize by reduction of one letter grade for each class period missed which exceeds one week of instruction as normally scheduled for that subject. In this connection, a "Class period" is determined by the following formula:

$$\text{Class Period} = \frac{\text{Course Clock Hrs. Per Wk.}}{\text{Credit Hours of Course}}$$

Ex: (a) Class Period ENGL = 3/3 = 1

(b) Class Period DAPR 115 = 3 lecture plus 2 lab divided by 3 = 1 2/3 or 2

Change of Registration

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

1. *Withdrawal from a class—*

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 work has been passing 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 work has been satisfactory or will receive a failing grade of "F" if his 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 must 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.

4. *Transfer of Students Between Curriculums—*

A student who wishes to transfer from one curriculum to another should initially consult a counselor for assistance in effecting the transfer.

Academic Warning

Any student who fails to make a grade point average of 2.0 or higher for any one quarter, or who fails any course, will receive an Academic Warning.

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.

A student on academic probation shall be required to consult with his counselor and may be required to take less than the normal academic load in his next quarter following this action.

Academic Suspension

The student on academic probation who fails to make a grade point average of 1.5 for the next quarter that 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 Admissions 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 of the instructor of the class.

Normal Academic Load

The normal academic load for students 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 3.0 average or higher and must have the approval of the Dean of Instruction and usually the student's faculty advisor or counselor.

STUDENT SERVICES

COUNSELING

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

The counseling department functions to assist students in making intelligent decisions regarding their vocational, educational, and personal-social plans. As 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 supplementation to the instructional program of the College.

TESTING

A well-planned testing program for all students is coordinated by the Counseling Department. The ACT test battery of the American College Testing Program is required for all new students planning to enter one of the associate degree, diploma, or certificate programs. This ATC test battery is administered at the College prior to registration. In addition, all students who plan to transfer to a four-year college or university will be required to submit their scores on the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board.

Tests for students interested in one of the occupational-technical programs are available to provide special information for helping students determine their future occupational and educational plans. In addition, other special tests and interest inventories are available at the Counseling Center. Instructors in each curriculum of the College also have tests established for their courses and programs.

ORIENTATION

A three-stage 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 is asked to meet with a counselor at the College for an interview to discuss the student's educational interests, to determine what additional tests he may need, and to plan the student's application for admission to a specific curriculum at the College. The student will also meet with a faculty advisor in his major curriculum and/or a counselor to plan his program and course of studies.

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

In addition, an orientation class is provided for the first quarter to aid all students in their personal and academic adjustment.

FINANCIAL AIDS

It is the desire of the College that no qualified student be denied the privilege of attendance because of financial need. The Student Financial Aids Committee—composed of representatives of the administration, counseling and instructional staffs—is appointed by the President of the College for the purpose of providing information concerning aid programs, administering funds granted by donars, determining need, assessing applications, and granting awards.

Students wishing to apply for financial aid may secure application blanks from the Financial Aids Office in the Counseling Department.

SCHOLARSHIPS

The generosity of private citizens, business agencies, and associations has made the following scholarships available to students of this College:

The Routh Robbins Real Estate Corporation Scholarship

The amount of this annual fund is $1,000. Scholarships from this fund are granted annually and may be renewed.

Zonta Club Scholarship

Donated by the Zonta Club of Alexandria, this fund provides one scholarship of $250.

D. C. Chapter, The National Secretaries Association (International)

Two one-year scholarships not to exceed $250 each. The award is to be given to students in the secretarial program who are residents of Northern Virginia and maintain a "B" average or better. The recipient will be selected by the staff of the College from qualified applicants according to procedures established by the College.

Capitol Chapter, The National Secretaries Association

One two-year scholarship not to exceed $250 each year. The award is given to a Secretarial Science student from Northern Virginia. The recipient is selected by the Capitol Chapter of the National Secretaries Association.

Annandale Women's Club

Three scholarships, $150 each, for the academic year. These scholarships are open to any Fairfax County student in a degree or certificate program. The scholarships are to be awarded on the basis of financial need and potential as an individual and citizen.

Pan-Hellenic Association of Northern Virginia

One scholarship in the amount of $250. This award is to be made on the basis of scholarship and need to a female liberal arts student residing in Northern Virginia.

Professional Engineers of Northern Virginia Chapter of Virginia Society of Professional Engineers

This fund provides one scholarship of $180 for the College year. The scholarship is open to any pre-engineering or engineering technology student attending the College and is to be awarded on the basis of financial need, scholastic aptitude and achievement.

Value Engineering Scholarships

This fund is contributed by the Value Engineering Company of Alexandria and provides two annual scholarships to students enrolled in the College as described below:

1. $135 (annual tuition) to a student enrolled in the drafting curriculum. The award will be made on the basis of drafting ability and the probability of completing the one-year program as determined after one quarter of attendance in the College.
2. $135 to a student enrolled in the engineering technology curriculum. Award will be made on the basis of drafting and design ability as determined after three quarters of attendance in the College.

Security National Bank

One scholarship in the amount of $200 to be awarded on the basis of need and potential as a student.

The Junior Women's Club of Fairfax County

One scholarship in the amount of $135. This award is made on the basis of need and potential as a student.

Mount Vernon National Bank and Trust Company

One scholarship in the amount of $250 to be awarded on the basis of need and potential as a student.

Arlington Junior Chamber of Commerce

Two one-year scholarships of $250 each, to residents of Northern Virginia. The recipients will be selected by a Committee from the Arlington Junior Chamber of Commerce.

PART-TIME EMPLOYMENT

The placement office operates throughout the year to assist students in securing part-time employment. An effort is made to place students in fields which relate to their college programs. Students who work more than 20 hours per week are advised to adjust their course loads accordingly.

Work-Study Programs

Numerous jobs on campus are available each year under the Work-Study Program. Full-time students who are in financial need may qualify for participation in this program. Application forms are available in the office of the Counseling Department.

Student Loans

Students who need loans should contact the Counseling Department for information.

Students who are residents of Virginia are eligible to apply for loans under the State Education Assistance Authority Plan. Loans are made through commercial banks at favorable interest rates and are repayable in monthly installments beginning six months after the student graduates or after he leaves college. For details about the program or a list of participating banks, contact the College or write to State Education Assistance Authority, 1010 State-Planters Building, Richmond, Virginia 23219.

Other financial aid plans may be added throughout the year. Interested students may inquire through the Counseling Department.

Women's Club of Fairfax Revolving Loan Fund

The Women's Club of Fairfax has established a Revolving Loan Fund of $200 for Virginia residents. Anyone wishing to apply should contact the Financial Aids Officer for details.

Community Woman's Club of Annandale

The Community Women's Club of Annandale has established a Revolving Loan Fund of $250. Students in need of temporary loans may apply through the Financial Aids Officer.

Fairfax County Council of P.T.A.'s

The Fairfax County Council of P. T. A.'s has established a Revolving Loan Fund of $200. Students in need of temporary loans may apply through the Financial Aids Officer.

National Defense Student Loan Program and Nursing Student Loan Program

The College has made application to participate in the National Defense Student Loan Program and the Nursing Student Loan Program. It is anticipated that these funds will be available during the 1968-69 academic year.

Other scholarship funds or financial aid plans may be added throughout the year. Interested students may inquire through the Counseling Department's Financial Aids Officer.

Vocational Rehabilitation

The College cooperates with the State Department of Vocational Rehabilitation in providing education and training for persons with handicaps.

Veterans

Programs and courses of instruction at the College are approved by the Veterans Administration.

Health Services

An out-patient Student Health Service is provided to assist students and staff to maintain optimum health. Individual health counseling and informal teaching, as well as emergency care, is offered by the nurse on duty.

PLACEMENT SERVICE

The College maintains a placement service in the Counseling Department for students who wish to secure part-time or full time employment while attending college, during vacations, or after graduation. Occupational information on job requirements and opportunities is provided in the Counseling Department. The College maintains continuous contact with the state employment service, business, industry, the professions, and government for the latest information about jobs.

Students who seek part-time work are encouraged to do so with a view to their future career plans. The experience gained will assist them in finding permanent and satisfying positions.

SNACK BAR

Hot and cold food and beverages may be obtained from the snack bar throughout the day. The dispenser service is commercially operated, and a portion of the profits goes into the student activities fund.

PARKING

A large parking lot has been reserved behind the College at each campus for the convenience of students. Students are not permitted to park in the faculty and visitor reserved parking areas.

STUDENT ACTIVITIES

The student activities program is designed to supplement the instructional program by providing a variety of meaningful, educational, cultural, and social experiences.

The following organizations, activities and clubs are open to participation by all students:

Organizations:

- The Student Government Association
- Drama Club
- Veteran's Club
- Alpha Phi Omega
- Epsilon Kappa Psi
- Circle K Club
- Chess Club
- Bridge Club
- Distributive Education Club
- International Fellowship Organization
- Car Club

Activities:

- Cheerleaders
- Art Exhibits
- Dances and Proms
- "Hootenannies"
- Film Series
- Distinguished Speaker Lectures
- Intramural Sports

Student publications are:

The Burgess Record, the College newspaper

The Commonwealth, the College yearbook

Blunderbuss, the student literary magazine

The College anticipates a more comprehensive program of student activities for the coming year including an honor society and professional associations.

STUDENT HANDBOOK

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

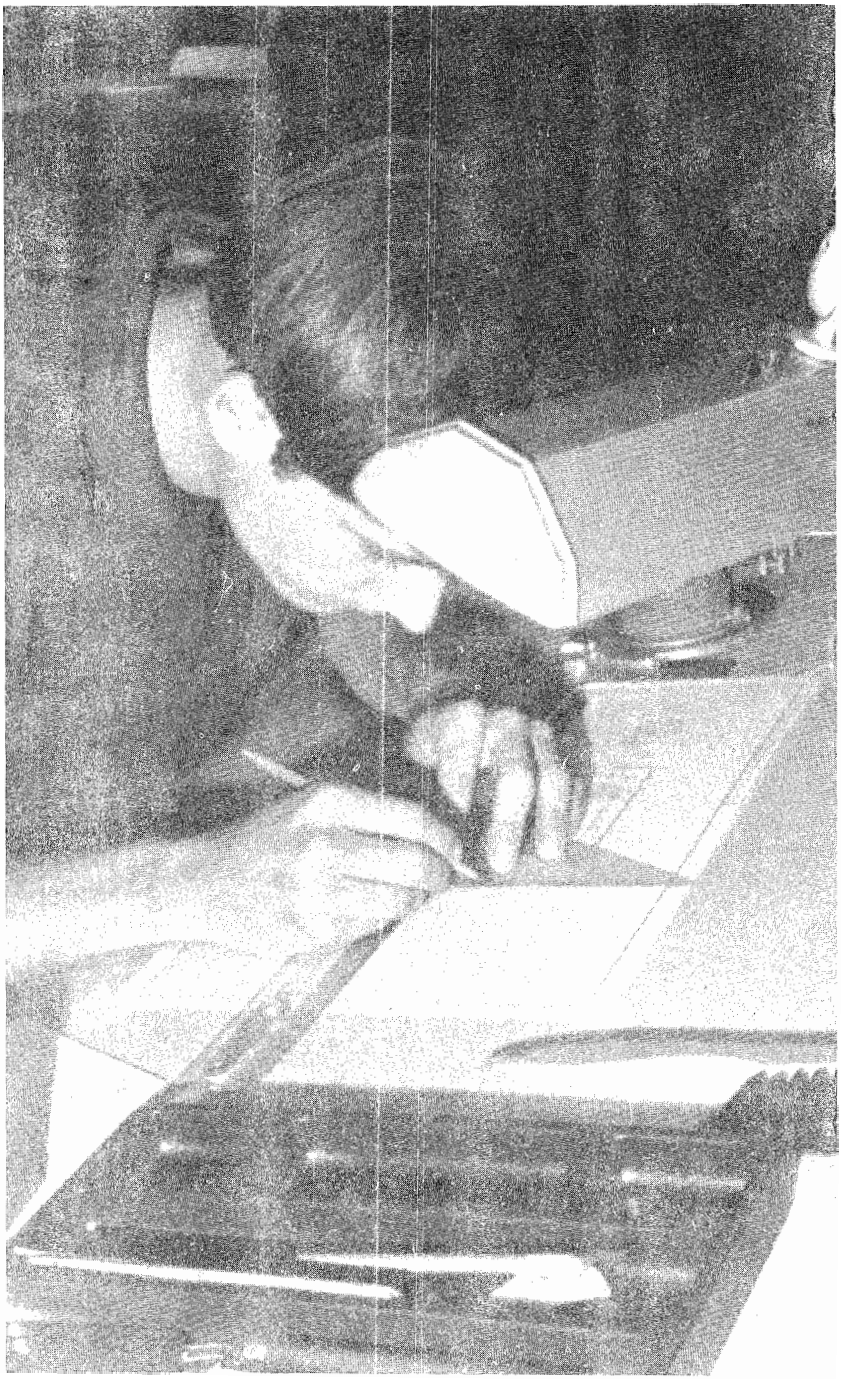
STUDENT CONDUCT

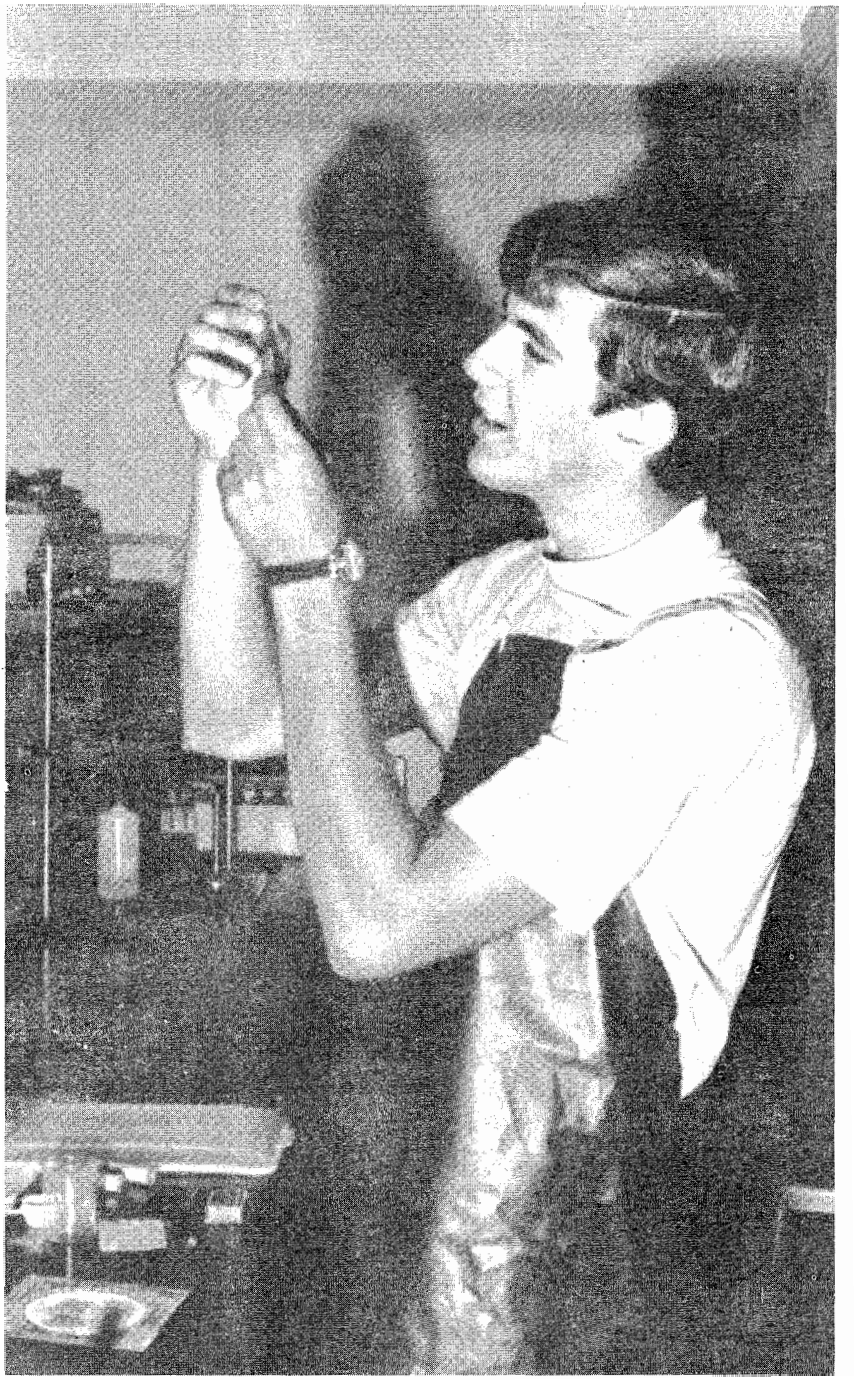
Each individual is considered a responsible adult, and it is assumed that men and women of college age will maintain standards of conduct appropriate to membership in the college community. Emphasis is placed on standards of student conduct rather than on limits or restrictions of students. Guidelines and regulations governing student conduct usually 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 the interest of all students when it is clearly necessary. The regulations shall become official by administrative statement.

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 require a completed official "Application for Admission," and to appear before a special committee before admission 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. This guarantee applies equally to all students. The exercise of one student's rights must not violate the rights of other students to peacefully pursue their education. Special care is taken to assure due process of institutional procedures and to spell out clearly defined routes of appeal when a student feels his rights have been violated.

The regulations pertaining to standards of student conduct are contained in the Student Handbook.





CURRICULUMS OF STUDY

- **Associate in Applied Science Degree Curriculums**
  - Accounting
  - Architectural Technology
  - Automotive Technology (Diagnostician)
  - Business Management
  - Civil Technology
  - Data Processing
  - Electronics Technology
  - Mechanical Technology
  - Merchandising and Distribution
  - Nursing
  - Police Science
  - Real Estate
  - Secretarial Science
- **University Parallel-College Transfer Curriculums**

  Associate in Arts Degree
  - Liberal Arts

  Associate in Science Degree
  - Business Administration
  - Pre-Engineering
  - Science
- **Certificate Curriculums**
  - Architectural Drafting
  - Automotive Diagnosis and Tune-up
  - Data Processing
    - **Key Punch**
    - Unit Record
  - Engineering Technology
  - Mechanical Drafting
  - Police Science
  - Radio-Television Repair
  - Structural Drafting
- **Special Training Programs**
- **Community Services**
- **Preparatory (Foundation) Program**
- **Pre-Technical Curriculum**

MINIMUM REQUIREMENTS FOR ASSOCIATE DEGREES

Associate in Arts (A.A.)

Associate in Science (A.S.)

Associate in Applied Science (A.A.S.)

	Number of Credits (Quarter Hours)		
Humanities	*A.A.*[a]	*A.S.*[a]	*A.A.S.*
English Composition	9	6-9	6
Literature (English, American, or World)	6-9 } 9	3-6 } 12	—
Speech	0-3 }	0-3 }	3
Art, Drama, Music, and/or Philosophy	3-6	0-3	—
Foreign Language	9-21[b]	—	—
Social Sciences			
History (American or Western Civilization)	9	3-9	—
Economics	0-9 }	0-9 }	3
Government	0-9 } 9[c]	0-9 } 9[c]	3
Psychology or Human Relations	0-9 }	0-9 }	3
Natural Sciences and Mathematics			
Natural Science (Laboratory) (Biology, Chemistry, Geology, Physics)	12-15	12-15	—
Mathematics	9	9	—
Health, Physical Education, or Recreation	3-6	3-6	3-6
Orientation	1	1	1
Electives and other Major Field Requirements	6-24[a]	57[a]	75[d]
Minimum Total Number of Credits for Degree	97	97	97

[a]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.

[b]Students who have successfully completed two years of a foreign language in high school may petition for advanced placement of the sophomore level course of this foreign language.

[c]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, and/or psychology.

[d]The Associate in Applied Science degree programs generally should be organized approximately as follows:

Specialized courses in major field	50%
Supporting technical and theory courses in related fields	25-30%
General education courses	20-25%

ASSOCIATE IN APPLIED SCIENCE CURRICULUMS

ACCOUNTING

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

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 program in Accounting is designed primarily for persons who seek full-time employment in the accounting field immediately upon completion of the community college program. Both persons who are seeking their first employment in an accounting position or those presently in accounting who are seeking a promotion may benefit from this program.

Occupational Objectives:

Bank Teller
Bookkeeper
Comptroller Aide
Junior Accountant

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 Associate in Applied Science degree program in Accounting requires proficiency in high school English and high school mathematics. Students who are not proficient in English and mathematics will be required to correct their deficiencies in the Preparatory (Foundations) Program before entering the Accounting curriculum.

Program Requirements: The first three quarters (first year) of the Associate in Applied Science degree program in Accounting are similar to the program in Business Management. In the second year each student will pursue his special field in accounting and will be required to complete BUAD 214, 215, 216, 217, and 218. Approximately one-half of the curriculum will include courses in accounting 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 accounting. Each student is urged to consult with the Counseling Department and his faculty advisor in planning his program and selecting his electives. Upon satisfactory completion of the six-quarter program listed on the next page, the student will be awarded the Associate in Applied Science degree with a major in Accounting.

ACCOUNTING

Associate in Applied Science Degree Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
BUAD 111	Accounting I	4
BUAD 100	Introduction to Business	3
BUAD 156	Office Machines	2
ENGL 101	Communication Skills I	3
MATH 151	Business Mathematics I	3
GENL 100	Orientation	1
PHED 108	Foundations of Physical Activity	1
	Total	17
	SECOND QUARTER	
BUAD 170	Business Organization and Management	3
BUAD 112	Accounting II	4
ENGL 102	Communication Skills II	3
MATH 152	Business Mathematics II	3
ECON 160	American Economics	3
SECR 110	Personal Typing*	2
PHED	Phys. Ed. Elective	1
	Total	19
	THIRD QUARTER	
BUAD 113	Accounting III	4
BUAD 106	Office Procedures	2
ENGL 136	Speech Communications	3
NASC 100	Survey of Science (or elective)	4
PSYC 110	Principles of Applied Psychology	3
PHED	Phys. Ed. Elective	1
	Total	17
	FOURTH QUARTER	
BUAD 294	Introduction to Business Statistics	3
BUAD 214	Intermediate Accounting I	4
DAPR 100	Introduction to Data Processing	4
ENGL 280	Business English	3
BUAD 241	Business Law I	3
	Total	17
	FIFTH QUARTER	
BUAD 240	Business Finance	3
BUAD 242	Business Law II	3
BUAD 215	Intermediate Accounting II	4
BUAD 220	Cost Accounting	3
GOVT 180	American Constitutional Government	3
	Total	16

SIXTH QUARTER

BUAD	243	Business Law III (or Elective)	3
BUAD	246	Money and Banking	3
BUAD	216	Intermediate Accounting III	4
BUAD	248	Business Taxes	3
BUAD	299	Business Administration Seminar and Project	2
		Total	15
		Total Minimum Credits for an Accounting Major	101

*Waiver may be granted for the student who has satisfactorily completed one year of typing in high school or who demonstrates equivalent competence.

ARCHITECTURAL TECHNOLOGY

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

Purpose: With the rapid growth of the building and construction industries in Virginia, and the steady demand for qualified people in the local area, there is a need for trained personnel to meet these requirements. The Associate in Applied Science degree curriculum in Architectural Technology is designed to train persons for full-time employment immediately upon completion of the community college curriculum offering.

Occupational Objectives:

Architectural Aide
Architectural Draftsman
Architectural Office Assistant
Field Assistant

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 Associate in applied Science curriculum in Architectural Technology 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 Preparatory (Foundation) program before entering the curriculum.

Curriculum Requirements: The curriculum in Drafting is a two-year curriculum combining instruction in the many subject 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 subjects, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in Architectural Technology. Each student is advised to consult with his faculty advisor and the Counseling Department in planning his program and

selecting his electives. Upon satisfactory completion of the six-quarter program listed on the next page, the student will be awarded the Associate in Applied Science degree with a major in Architectural Technology.

ARCHITECTURAL TECHNOLOGY

Associate in Applied Science Degree Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
ARCH 100	Introduction to Architecture	3
ARCH 111	Architectural Drafting I	3
ARCH 141	Materials and Methods of Construction I	3
GENL 100	Orientation	1
MATH 111	Technical Mathematics I	3
ENGL 101	Communications Skills I	3
PHED	Physical Education Elective	1
	Total	17
	SECOND QUARTER	
ARCH 112	Architectural Drafting II	3
ARCH 142	Materials and Methods of Construction II	3
MATH 112	Technical Mathematics II	3
ENGL 102	Communication Skills II	3
PHYS 101	Introductory Physics I	4
PHED 108	Foundations of Physical Activity	1
	Total	17
	THIRD QUARTER	
ARCH 113	Architectural Drafting III	3
MATH 113	Technical Mathematics III	3
ENGL 136	Speech Communications	3
PHYS 102	Introductory Physics II	4
PHED	Physical Education Elective	1
ENGR 151	Mechanics I (Statics)	3
	Total	17
	FOURTH QUARTER	
ARCH 211	Architectural Drafting IV	3
ARCH 236	Building Electric Power Equipment	3
GOVT 180	American Constitutional Government	3
ECON 160	American Economics	3
ENGR 152	Mechanics II (Strength of Materials)	4
	Total	16

FIFTH QUARTER

ARCH 212	Architectural Drafting V	3
ARCH 237	Building Mechanical Equipment	3
ARCH 277	Building Codes and Contract Documents	3
ARCH 276	Construction Estimating	3
ARCH 256	Architectural Office Practice	2
ARCH 226	Art and Architecture	3
	Total	17

SIXTH QUARTER

ARCH 213	Architectural Drafting VI	3
CIVL 180	Elements of Surveying	4
CIVL 249	Contracts, Specifications and Codes	3
ENGL 227	Technical Report Writing	3
PSYC 110	Principles of Applied Psychology	3
ARCH 299	Seminar & Project in Architectural Technology	2
	Total	18
	Min. Credits for Arch. Tech. Major	100

AUTOMOTIVE TECHNOLOGY (DIAGNOSTICIAN)

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

Purpose: Complexity in automotive vehicles increases each year because of scientific discovery and new engineering. 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 diagnostician status, to develop his interest in an automotive industry career, and to develop his awareness in the advantages of such a 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, minor 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 efficiently analyze automobile defects, repair and adjustment needs, along with the estimation of customer cost for the repairs and adjustments.

Occupational Objectives:

Automotive Diagnostician
Automotive Technician
Auto Parts Sales and Service
Customer Service Representative
Quality Control Technician
Repair Service Estimator
Repair Service Salesman
Repair Service Writer
Repair Technician
Service Manager
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 minimum of a one-year comprehensive automotive shop program in high school or its equivalent and a good understanding of mathematics are usually required for entry into the program. For one to advance successfully in this program of study, a thorough understanding of the repair techniques and skills is required before entering the program. Students who do not meet these requirements will be required to correct their deficiencies to the Preparatory Foundations Program before entering the Automotive Technology Program.

Program Requirements: Approximately one-half of the curriculum will include courses in automotive technology with the remaining courses in related subjects, general and practical applications needed for future success in Automotive Technology. Each student is advised to consult with his faculty advisor and the Counseling Department of the college in planning his program and selecting his electives. Students satisfactorily completing the six-quarter planned program listed on the next page will be awarded the Associate in Applied Science degree with a major in Automotive technology.

AUTOMOTIVE TECHNOLOGY (DIAGNOSTICIAN)

Associate in Applied Science Degree Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
AUTO 101	Automotive Systems Technology I	3
AUTO 181	Automotive Diagnostic Technology I	2
ENGL 101	Communication Skills I	3
GENL 100	Orientation	1
MATH 111	Technical Mathematics I	3
GOVT 180	American Constitutional Government	3
PHED	Physical Education Elective	1
	Total	16

SECOND QUARTER

AUTO	102	Automotive Systems Technology II	3
AUTO	182	Automotive Diagnostic Technology II	2
ENGL	102	Communication Skills II	3
MATH	112	Technical Mathematics II	3
PHED	108	Foundations of Physical Activity	1
PSYC	110	Principles of Applied Psychology	3
		Total	15

THIRD QUARTER

AUTO	103	Automotive Systems Technology III	3
AUTO	183	Automotive Diagnostic Technology III	2
ENGL	136	Speech Communications	3
MATH	113	Technical Mathematics III	3
PHED		Phys. Ed. Elective	1
ECON	160	American Economics	3
		Total	15

FOURTH QUARTER

AUTO	201	Automotive Systems Technology IV	4
AUTO	281	Automotive Diagnostic Technology IV	4
		Electives	4
PHYS	101	Introductory Physics I	4
		Total	16

FIFTH QUARTER

AUTO	202	Automotive Systems Technology V	4
AUTO	271	Automotive Shop Management & Customer Relations	3
AUTO	282	Automotive Diagnostic Technology V	4
AUTO	282	Electives	3
PHYS	102	Introductory Physics II	4
		Total	18

SIXTH QUARTER

AUTO	203	Automotive Systems Technology VI	4
AUTO	283	Automotive Diagnostic Technology VI	4
AUTO	272	Automotive Shop Management & Customer Relations	3
AUTO	299	Seminar and Project in Automotive Technology	2
PHYS	103	Introductory Physics III	4
		Total	17
		Total Minimum Credits for an Automotive Technology Major	97

BUSINESS MANAGEMENT

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

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 program in Business Management is designed primarily for persons who seek full-time employment in business management immediately upon completion of the community college program. Both persons who are seeking their first employment in a managerial position or those presently in management who are seeking a promotion may benefit from this program.

Occupational Objectives:

Administrative Assistant
Junior Executive
Manager of Business Office
Manager of Small Business
Office Assistant
Supervisor

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 Associate in Applied Science degree program in Business Management requires proficiency in high school English and mathematics will be required to correct their deficiencies in the Preparatory (Foundation) Program before entering the Business Management curriculum.

Program Requirements: The first three quarters (first year) of the Associate in Applied Science degree program in Business Management are similar to the program in Accounting. However, in the second year each student will pursue his specialty in business management. Approximately one-half of the curriculum will include courses in business management 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 business management. Each student is urged to consult with the Counseling Department and his faculty advisor in planning his program listed on the next page, the student will be awarded the Associate in Applied Science degree with a major in Business Management.

BUSINESS MANAGEMENT

Associate in Applied Science Degree Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
BUAD 111	Accounting I	4
BUAD 100	Introduction to Business	3
BUAD 156	Office Machines	2
ENGL 101	Communication Skills I	3
MATH 151	Business Mathematics I	3
GENL 100	Orientation	1
PHED	Phys. Ed. Elective	1
	Total	17
	SECOND QUARTER	
BUAD 170	Business Organization & Management	3
BUAD 112	Accounting II	4
ENGL 102	Communication Skills II	3
MATH 152	Business Mathematics II	3
ECON 160	American Economics	3
SECR 110	Personal Typing*	2
PHED 108	Foundations of Physical Activity	1
	Total	19
	THIRD QUARTER	
BUAD 113	Accounting III	4
BUAD 106	Office Procedures	2
ENGL 136	Speech Communications	3
NASC 100	Survey of Science (or Elective)	4
PSYC 110	Principles of Applied Psychology	3
PHED	Phys. Ed. Elective	1
	Total	17
	FOURTH QUARTER	
BUAD 294	Introduction to Business Statistics	3
BUAD 277	Purchasing & Materials Management	3
DAPR 100	Introduction to Data Processing	4
ENGL 280	Business English	3
BUAD 241	Business Law I	3
	Total	16
	FIFTH QUARTER	
BUAD 240	Business Finance	3
BUAD 242	Business Law II	3
BUAD 130	Marketing Principles and Practices	3
GOVT 180	American Constitutional Government	3
BUAD 180	Human Relations and Leadership	3
	Total	15

SIXTH QUARTER

BUAD	243	Business Law III (or Elective)	3
BUAD	246	Money and Banking	3
BUAD	286	Personnel Management	3
BUAD	299	Business Administration Seminar & Project	2
BUAD	248	Business Taxes	3
		Total	14
		Total Minimum Credits for a Business Management Major	98

*Waiver may be granted for the student who has satisfactorily completed one year of typing in high school or who demonstrates equivalent competence.

CIVIL TECHNOLOGY

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

Purpose: The Civil Technology program is designed to prepare students to work as "Engineering Aides" in any one of a number of civil engineering areas. The civil technician serves as an important link between the engineering profession and the skilled workman in the design, construction, and operation of civil engineering projects.

Occupational Objectives: Job opportunities for civil technicians are diverse and numerous. Civil technicians are employed by industry, private consulting firms, and all levels of government. A few of the specific areas in which civil technicians work are structural design offices, highway departments, field and laboratory assignments, and city engineering offices in planning surveys and traffic operations.

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 Associate in Applied Science degree curriculum in Civil Technology requires the satisfactory completion of the following high school units or equivalent as a minimum:

4 units of English

2 units of mathematics (C grade or better) (1 unit of algebra and 1 unit of geometry, or equivalent)

1 unit of a laboratory science (preferably a physical science)

1 unit of social studies

Students who do not meet these requirements may be permitted to correct their deficiencies in the Preparatory Foundations Program before entering the Civil Technology curriculum.

Program Requirements: Approximately one-half of the curriculum will include courses in Civil Technology 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 Civil Technology. Each student is advised to consult with his faculty advisor and the Counseling Department in planning his program and selecting his electives. Upon satisfactory completion of the six-quarter program listed on the next page, the student will be awarded the Associate in Applied Science degree with a major in Civil Technology.

CIVIL TECHNOLOGY

Associate in Applied Science Degree Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
GENL 100	Orientation	1
PHED	Phys. Education Elective	1
ENGL 101	Comm. Skills I	3
MATH 111	Tech Math I	3
PHYS 101	Introductory Physics I	4
DRFT 126	Intro. to Graph Representation	3
	Total	15
	SECOND QUARTER	
PHED 108	Foundations of Physical Activity	1
ENGL 102	Comm. Skills II	3
MATH 112	Tech. Math II	3
PHYS 102	Introductory Physics II	4
CIVL 140	Construction Planning	3
CIVL 124	Civil Engineering Drft. I	2
	Total	16
	THIRD QUARTER	
PHED	Phys. Education Elective	1
ENGL 136	Speech Comm.	3
MATH 113	Tech. Math III	3
PHYS 103	Introductory Physics III	4
ENGR 151	Statics	3
CIVL 125	Civil Engineering Drft. II	2
	Total	16
	FOURTH QUARTER	
PSYC 110	Applied Psychology	3
ENGR 152	Strength of Materials	4
CIVL 219	Building Design	4
CIVL 180	Elements of Surveying	4
CIVL 227	Structural Drft.	4
	Total	19

FIFTH QUARTER

GOVT	180	American Government	3
CIVL	204	Civil Engineering Tech I	4
CIVL	256	Soil Mechanics	3
		Elective	2
		Elective	4
		Total	16

SIXTH QUARTER

ECON	160	American Economics	3
CIVL	205	Civil Engineering Tech II	4
CIVL	299	Project in Civil Tech.	2
CIVL	270	Traffic & Transportation Technology	4
		Elective	4
		Total	17
		Total Minimum Credits for a Civil Technology Major	99

DATA PROCESSING TECHNOLOGY (COMPUTER PROGRAMMING)

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

Purpose: The Data Processing Technology Curriculum with specialization in computer programming is designed to provide the kinds of education and training that both industry and the computer manufacturers agree are needed. Each student will be at the same time educated and trained—educated to know what must be done without having to be told, and trained always to maintain the highest standards of performance. Education of the student will not be limited to the use of data processing devices and equipment, but it will include that formal instruction which will give him an understanding of the environment in which he will be working. The Associate in Applied Science degree curriculum in Data Processing Technology in Computer Programming is designed to prepare persons for full-time employment immediately upon completion of the community college curriculum offering.

Occupational Objectives:

Computer Operator
Computer Programmer
Data Processing Supervisor
Junior Systems Analyst

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 Associate in Applied

Science degree program in Data Processing Technology requires a minimum of one unit of high school algebra or the equivalent and proficiency in high school English. Students who are not proficient in these subject areas will be required to correct their deficiencies in the Preparatory (Foundation) Program before entering the Data Processing Curriculum.

Program Requirements: Approximately one-half of the curriculum will include courses in data processing technology 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 Data Processing Technology. Each student is urged to consult with the Counseling Department and his faculty advisor in planning his program and selecting his electives. Upon satisfactory completion of the six-quarter curriculum, the student will be awarded the Associate in Applied Science degree with a major in Data Processing Technology and specialization in (Computer Programming.)

DATA PROCESSING TECHNOLOGY (COMPUTER PROGRAMMING)

Associate in Applied Science Degree Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
DAPR 106	Principles of Data Processing	3
DAPR 111	Unit Record I	3
BUAD 100	Introduction to Business	3
BUAD 156	Office Machines	2
ENGL 101	Communication Skills I	3
GENL 100	Orientation	1
PHED	Phys. Ed. Elective	1
	Total	16
	SECOND QUARTER	
DAPR 112	Unit Record II	3
DAPR 121	Computer Programming I	3
BUAD 111	Principles of Accounting I	4
ENGL 102	Communication Skills II	3
MATH 151	Business Mathematics I	3
PHED 108	Foundations of Physical Activity	1
	Total	17
	THIRD QUARTER	
DAPR 122	Computer Programming II	3
DAPR 116	Unit Record Applications	3
BUAD 112	Principles of Accounting II	4
ENGL 136	Speech Communications	3
MATH 152	Business Mathematics II	3
PHED	Phys. Ed. Elective	1
	Total	17

FOURTH QUARTER

DAPR	221	Computer Programming III	3
DAPR	226	Computer Program Applications	3
DAPR	241	Systems Analysis I	3
BUAD	294	Introduction to Business Statistics I	3
ECON	160	American Economics	3
		Total	15

FIFTH QUARTER

DAPR	222	Computer Programming IV	3
DAPR	242	Systems Analysis II	3
BUAD	170	Business Organization & Management	3
PSYC	110	Principles of Applied Psychology	3
BUAD	295	Business Statistics II	3
		Total	15

SIXTH QUARTER

DAPR	223	Computer Programming V	3
DAPR	243	Systems Analysis III	3
DAPR	298	Individual Field Problem	6
DAPR	299	Seminar and Project in Data Processing	2
GOVT	180	American Constitutional Government	3
		Total	17

Total Minimum Credits for a Data Processing Technology (Computer Programming Major) 97

ELECTRONICS TECHNOLOGY

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

Purpose: With the rapid growth of the electronics and manufacturing industries in Virginia, and the steady demand for qualified electronic technicians in the local area, there is a need for trained personnel to meet these requirements. The Associate in Applied Science degree curriculum in Electronics Technology is designed to prepare persons for full-time employment immediately upon completion of the community college curriculum offering.

Occupational Objectives:

Communications Technician
Electronics Technician
Industrial Electronics Technician
Instrument Technician
Laboratory Technician
Radio and Television Technician

Admission Requirements: In addition to the admission requirements established for the college (as listed in the section on admissions requirements in Part II of this catalog), entry into the Associate in Applied Science curriculum in Electronic Technology requires proficiency in high school English, mathematics and science including one unit of algebra and one unit of geometry or equivalent. It is also recommended that two units of algebra and one unit of high school physics be completed. Students who are not proficient in these subject areas will be required to correct their deficiencies in a Preparatory (Foundation) program before entering the curriculum.

Curriculum Requirements: The curriculum in Electronics is a two-year curriculum combining instruction in the many subject areas required for competence as a Technician in industry. The first year of the Electronics Technology curriculum is designed to establish a general base in mathematics and electronic circuits and networks. The second year develops this base in a number of important areas of electronics, such as computers, control circuits, measurements, and communications. The graduate should have sufficient background, both in depth and diversity, to allow him employment in any area of the electronics field as a technician. Approximately one-half of the curriculum will include courses in electronics technology 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 Electronics Technology. Students are permitted a choice of electives in the second year. These electives should be carefully chosen to develop further skill and competence in either communication networks or specialized Industrial Controls. Each student is advised to consult with his faculty advisor and the Counseling Department in planning his program and selecting his electives. Upon satisfactory completion of the six-quarter curriculum listed on the next page, the student will be awarded the Associate in Applied Science degree with a major in Electronics Technology.

ELECTRONICS TECHNOLOGY

Associate in Applied Science Degree Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
ELEC 114	Fundamentals of Direct Current	4
ELEC 120	Introduction to Tubes and Transistors	4
ENGL 101	Communication Skills I	3
MATH 121	Engineering Technical Mathematics I	5
GENL 100	Orientation	1
PHED	Phys. Ed. Elective	1
	Total	18

SECOND QUARTER

ELEC	115	Fundamentals of Alternating Current	4
ELEC	124	Electronics I	5
ENGL	102	Communication Skills II	3
MATH	122	Engineering Technical Mathematics II	5
PHED	108	Foundations of Physical Activity	1
		Total	18

THIRD QUARTER

ELEC	116	Circuit Analysis	4
ELEC	126	Amplifiers	4
MATH	123	Engineering Technical Mathematics III	5
PHYS	101	Introductory Physics I	4
PHED		Phys. Ed. Elective	1
		Total	18

FOURTH QUARTER

ELEC	227	Pulse and Switching Circuits	3
ELEC	241	Communications I	4
ELEC	276	Instruments and Measurements	4
PHYS	102	Introductory Physics II	4
GOVT	180	American Constitutional Government	3
		Total	18

FIFTH QUARTER

ELEC	242	Communications II	4
ELEC	250	Introduction to Computers	4
DRFT	256	Electronics Drafting	2
ECON	160	American Economics	3
		Elective	2-4
		Total	15-17

SIXTH QUARTER

ELEC	299	Seminar and Project in Electronics Technology	2
ELEC	287	Advanced Circuits and New Devices	2
ELEC	249	Principles of Television Electronics	3
ENGL	136	Speech Communications	3
PSYC	110	Principles of Applied Psychology	3
		Elective	3-4
		Total	16-17
		Total Minimum Credits for an Electronics Major	103

MECHANICAL TECHNOLOGY

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

Purpose: In this age of increasing automation, almost every device consists of many mechanical parts. Mechanical Technology encompasses the design, production, installation and operation of machines, tools,

and all types of metal products and devices. The Associate in Applied Science degree program in Mechanical Technology is designed to prepare people for full-time employment in mechanical fields immediately upon completion of the community college program.

Occupational Objectives:

Engineering Aide
Estimator
Jig and Fixture Designer
Machine Designer
Machine Shop Foreman
Tool and Methods Engineer
Tool Designer

Admission Requirements: In addition to the admission requirements for the college (as listed in the section on admission requirements in Part II of the catalog), entry into the Mechanical Technology curriculum requires proficiency in high school mathematics, English, and science including one unit of algebra and one unit of geometry or equivalent. Students with identified deficiencies may be required to take special Preparatory Foundations courses to correct these deficiencies before enrollment in the Mechanical Technology curriculum.

Curriculum Requirements: The curriculum in Mechanical Technology is a two-year curriculum combining instruction in the many subject areas required for competence in industry in the areas of mechanical design, thermodynamics, and mechanical technology. Approximately one-half of the curriculum will include courses in mechanical technology 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 Mechanical Technology. Each student is advised to consult with his faculty advisor and the Counseling Department in planning his program and selecting his electives. Upon satisfactory completion of the six-quarter curriculum, the student will be awarded the Associate in Applied Science degree with a major in Mechanical Technology.

MECHANICAL TECHNOLOGY

Associate in Applied Science Degree Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
INDT 111	Materials and Process of Industry I	3
DRFT 111	Drafting I	2
ENGL 101	Communication Skills I	3
GENL 100	Orientation	1
MATH 111	Technical Mathematics I	3
INDT 176	Plant Safety	2
PHED	Phys. Ed. Elective	1
	Total	15

SECOND QUARTER

INDT	141	Methods of Manufacturing I	3
DRFT	112	Drafting II	2
ENGL	102	Communications Skills II	3
MATH	112	Technical Mathematics II	3
MECH	131	Machine Laboratory I	2
ECON	160	Basic American Economics	3
PHED	108	Foundations of Physical Activity	1
		Total	17

THIRD QUARTER

INDT	142	Methods of Manufacturing II	3
DRFT	113	Drafting III	2
ENGL	136	Speech Communications	3
MATH	113	Technical Mathematics III	3
MECH	132	Machine Laboratory II	2
PSYC	110	Principles of Applied Psychology	3
PHED		Phys. Ed. Elective	1
		Total	17

FOURTH QUARTER

MECH	214	Mechanical Design I	4
MECH	246	Metallurgy	4
ENGR	151	Mechanics I (Statics)	3
PHYS	101	Introductory Physics I	4
		Total	15

FIFTH QUARTER

MECH	215	Mechanical Design II	4
MECH	264	Thermodynamics (or MECH elective)	4
ENGR	152	Mechanics II (Strength of Materials)	4
PHYS	102	Introductory Physics II	4
		Total	16

SIXTH QUARTER

MECH	218	Jig and Fixture Design (or elective)	3
MECH	299	Seminar and Project in Mechanical Technology	2
INDT	286	Quality Control	3
ENGR	153	Mechanics III	3
GOVT	180	American Constitutional Government	3
PHYS	103	Introductory Physics III	4
		Total	18

Total Minimum Credits for a Mechanical Technology Major 98

MERCHANDISING AND DISTRIBUTION

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

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 program in Merchandising and Distribution is designed primarily for persons who seek full-time employment in merchandising and distribution of goods, including retailing and wholesaling, immediately upon completion of the community college program.

Occupational Objectives:

Distributor
Merchandiser
Retailer
Salesmen
Wholesaler

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 Associate in Applied Science degree program in Merchandising and Distribution requires proficiency in high school English and high school mathematics. Students who are not proficient in English and Mathematics will be required to correct their deficiencies in the Preparatory Foundations Program before entering the Merchandising and Distribution curriculum.

Program Requirements: Although some courses in this curriculum are similar to the programs in Business Management, the primary emphasis in this curriculum is on Merchandising and Distribution. Approximately one-half of the curriculum will include courses in merchandising and distribution or support subjects, 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 merchandising and distribution. A unique feature within this specialized program is the requirement that all students participate in a coordinated occupational experience program or equivalent thus combining classroom study with directed and closely correlated occupational training in selected businesses. Work stations are established through contractual agreement between employers, the college, and the student. Each student is urged to consult with the Counseling Department and his faculty advisor in planning his program and selecting his electives. Upon completion of the six-quarter program listed on the next page, the student will be awarded the Associate in Applied Science degree with a major in Merchandising and Distribution.

MERCHANDISING AND DISTRIBUTION

Associate in Applied Science Degree Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
BUAD 111	Accounting I	4
BUAD 100	Introduction to Business	3
BUAD 130	Marketing Principles and Practices	3
BUAD 190	Coordinated Occupational Experiences	1
ENGL 101	Communication Skills I	3
MATH 151	Business Mathematics I	3
GENL 100	Orientation	1
PHED 108	Foundations of Physical Activity	1
	Total	19
	SECOND QUARTER	
BUAD 176	Retail Organization & Management	3
BUAD 190	Coordinated Occupational Experience	1
ENGL 102	Communication Skills II	3
MATH 152	Business Mathematics II	3
ECON 160	American Economics	3
BUAD 180	Human Relations & Leadership Training	3
PHED	Phys. Ed. Elective	1
	Total	17
	THIRD QUARTER	
BUAD	Elective	3
BUAD 137	Salesmanship: Concepts & Management	3
BUAD 190	Coordinated Occupational Experience	1
ENGL 136	Speech Communications	3
PSYC 110	Principles of Applied Psychology	3
PHED	Phys. Ed. Elective	1
	Elective	2-3
	Total	16-17
	FOURTH QUARTER	
BUAD 241	Business Law I	3
BUAD 236	Merchandise Buying and Control	3
BUAD 294	Introduction to Business Statistics	3
BUAD 290	Coordinated Occupational Experience	1
ENGL 280	Business English	3
BUAD 230	Color, Line & Design in Retailing	3
	Total	16
	FIFTH QUARTER	
BUAD 242	Business Law II	3
BUAD 237	Advertising and Display	3
BUAD 286	Personnel Management	3
BUAD 290	Coordinated Occupational Experience	1
GOVT 180	American Constitutional Government	3
BUAD 239	Fashion Merchandising	3
	Total	16

SIXTH QUARTER

BUAD	243	Business Law III (or Elective)	3
BUAD	238	Sales Promotion and Customer Relations	3
BUAD	248	Business Taxes	3
BUAD	290	Coordinated Occupational Experience	1
BUAD	299	Business Administration Seminar & Project	2
PSYC	226	Psychological Aspects of Management	3
		Total	15
		Total Minimum Credits for a Merchandising and Distribution Major	99

NURSING

Degree: Associate in Applied Science

Length: Seven-quarter (two-year) program

Purpose: The two-year Associate Degree Nursing Program 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 the Virginia State Board of Nursing examinations leading to licensure as a registered nurse (R.N.)

To provide a base of general education from which the individual student will grow and develop—as a person, a worker, and a citizen of the community. Students who successfully complete the program are awarded the degree Associate in Applied Science.

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:

1. High School Courses
   a. Science—2 units
      (1) Biology (Laboratory course)
      (2) Chemistry (Laboratory course)
   b. Mathematics—2 units
      (1) Algebra
      (2) Second unit of algebra is preferred, but geometry may be substituted if necessary

Students who do not meet these requirements may be permitted to correct their deficiencies in the Preparatory Foundations Program before entering the Nursing curriculum.

2. High school record of achievement must reflect a "C" average in academic subjects excluding foreign language.
3. Evidence of good physical and mental health. Applicants must be free from any physical or mental condition which might adversely affect acceptance or performance as a nurse practitioner.
4. The program is open to both male and female applicants between the ages of 17-45 at the time of entering the program. Older students will be considered upon special request in writing if they meet the academic and health standards for admission. Marital status is not a factor.
5. Two personal interviews are required. The first interview will be with the Counseling Department Chairman, and the second interview for qualified applicants will be with the Chairman of the Department of Nursing or her delegate.
6. Satisfactory performance on the appropriate portions of the General Aptitude Test Battery.
7. 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 students suitability for nursing. If, in the opinion of the nursing faculty, the student does not exhibit the appropriate demeanor, she will be required to withdraw from the nursing program.

Students who receive a final grade lower than "C" in any of the courses in the nursing sequence must obtain permission from the Chairman of the Department 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.

Students are totally responsible for transportation to and from the College and the health agencies utilized for clinical experiences.

Upon satisfactory completion of the program listed on the next page, the student will be awarded the Associate in Applied Science degree with a major in nursing.

Special Accreditation Status: The program is fully approved by the State Council of Higher Education of the Commonwealth of Virginia, holds initial approval of the Virginia State Board of Nurse Examiners, and holds reasonable assurance of accreditation for new programs by the National League for Nursing.

NURSING

Associate in Applied Science Degree Program

Course Number	Course Title	Course Credits
	FIRST YEAR	
	FIRST QUARTER	
BIOL 151	Anatomy and Physiology I	5
HLTH 100	Concepts of Health and Illness	2
NURS 121	Fundamentals of Nursing I	4
ENGL 101	Communication Skills I	3
	(OR)	
ENGL 111	English Composition I	3
PSYC 110	Principles of Applied Psychology	3
GENL 100	Orientation	1
	Total	18
	SECOND QUARTER	
BIOL 152	Anatomy and Physiology II	5
NURS 122	Fundamentals of Nursing II	6
*ENGL 102	Communication Skills II	3
	(OR)	
ENGL 112	English Composition II	3
PSYC 116	Psychology of Personal Adjustment	3
	Total	17
	THIRD QUARTER	
BIOL 166	Microbiology	3
NURS 123	Fundamentals of Nursing III	8
*ENGL 136	Speech Communications	3
	(OR)	
ENGL 113	English Composition III	3
PSYC 130	Child Growth and Development	3
	Total	17
	SUMMER QUARTER	
NURS 211	Nursing in Major Health Problems I	8
	SECOND YEAR	
	FOURTH QUARTER	
NURS 212	Nursing in Major Health Problems II	8
ECON 160	American Economics	3
SOCI 101	Introductory Sociology I	3
	Elective	3
	Total	17

FIFTH QUARTER

NURS	213	Nursing in Major Health Problems III	8
GOVT	180	American Constitutional Government	3
SOCI	102	Introductory Sociology II	3
		Elective	3
		Total	17

SIXTH QUARTER

NURS	214	Nursing in Major Health Problems IV	8
NURS	299	Seminar in Nursing	1
SOCI	103	Introductory Sociology III	3
DAPR	100	Principles of Data Processing	4
GOVT	296	Seminar in Public Affairs	2
		Total	18
		Total Minimum Credits for a Nursing Major	112

*Placement in English sequence dependent upon A.C.T. scores and high school records.

POLICE SCIENCE

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

Purpose: The curriculum in Police Science has been developed and is maintained in cooperation with state and local police officials. The curriculum is not designed to train for any speciality, but rather to provide a broad foundation which will prepare the student to enter any of the many fields of law enforcement. Although the curriculum is primarily designed for persons seeking full-time employment in law enforcement, adjustments will be made to enable a qualified student to prepare for transfer to a baccalaureate degree in Police Science.

Occupational Objectives:

Commercial and Industrial Security Officer
Local, State, and Federal Enforcement Officer
Police Officer
Private, or Government Investigator
Advancement within the Profession

Admission Requirements: In addition to the general requirements for admission to the college (as listed in the section on admissions requirements in Part II of this catalog), entry into the Associate in Applied Science degree program in Police Science requires the following:

1. A written statement from the law enforcement agency having jurisdiction in the applicant's area of residence as to the applicant's record of conduct.

2. A personal interview with a representative of the Police Science Department.
3. Satisfactory results on any additional tests that may be required by the counseling department.

Special Requirements:

A. Students who wish to enroll in the Police Science Program with the objective of obtaining employment with law enforcement agencies in Northern Virginia are advised that the following qualifications are generally prerequisite to such employment:

1. Excellent physical condition, free from any physical or mental condition which might adversely affect acceptance or performance as a law enforcement officer.
2. Possess normal hearing and normal color vision. Eye functions must be normal. Visual acuity must not be less than 20/40 in either eye without correction.
3. Weight should be in proportion to height. Very few law enforcement agencies will accept male applicants who are less than 5'8" in height.
4. Must be of excellent moral character. Must not have been convicted of any felony or any crime involving moral turpitude. Must not have received an excessive number of traffic citations. Background investigation will be conducted by the employing agency to confirm the foregoing.

B. Qualified students who expect to continue on to a senior institution to complete their requirements for a four-year degree in Law Enforcement may have their programs adjusted to do so under the following conditions:

1. Obtain written permission from the Chairman of the Police Science Department.
2. Maintain a minimum grade point average of 2.6 or better in their Police Science subjects.

Program Requirements: Approximately one-half of the curriculum will include courses in Police Science 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 Police Science. Each student is urged to consult with his faculty advisor and the Counseling Department of the Community College in planning his program and selecting his electives. Students who qualify and who plan to transfer to a senior college or university to complete a baccalaureate degree program in Police Science (Law Enforcement) will be advised to substitute several other courses than those listed on the next page, to conform with the curriculum of the four-year institution to which transfer is contemplated. Upon completion of the six-quarter program listed on the next page, the student will be awarded the Associate in Applied Science degree with major in Police Science.

Students who possess an adequate background in law enforcement may sustitute alternate police science courses offered by this institution in lieu of courses prescribed in the curriculum for the degree requirement upon obtaining permission of the Department Chairman.

SPECIAL NOTE TO LAW ENFORCEMENT OFFICERS

Law Enforcement Officers are reminded that courses in Police Science offered at this College qualify under the Virginia State Education Law, Chapter 177, Acts of the Assembly, 1966, which states in part:

> "Any law enforcement officer of the state, or of any county, city or town, thereof, who attends any college which offers a degree or associate degree in Law Enforcement, may, upon application and acceptance in such college in an accredited course toward such degree, apply to the Department of Education for Virginia for reimbursement of the tuition paid for such course."

POLICE SCIENCE

Associate in Applied Science Degree Program

Course Number		Course Title	Course Credits
		FIRST QUARTER	
PLCE	100	Introduction to Law Enforcement	3
PLCE	110	Patrol Administration	3
ENGL	101	Communication Skills I	3
SOCI	101	Introductory Sociology I	3
NASC	100	Survey of Science	4
GENL	100	Orientation	1
PHED	108	Foundations of Physical Activity	1
		Total	18
		SECOND QUARTER	
PLCE	120	Special Enforcement Problems	3
PLCE	187	Traffic Administration and Control	3
ENGL	102	Communication Skills II	3
SOCI	102	Introductory Sociology II	3
PSYC	110	Principles of Applied Psychology	3
PHED		Physical Education Elective	1
		Total	16
		THIRD QUARTER	
PLCE	126	Prevention and Control of Juvenile Delinquency	3
PLCE	150	Introductory Police Photography	2
ENGL	136	Speech Communications	3
GOVT	187	American National Government	5
PSYC	116	Psychology of Personal Adjustment	3
PHED		Physical Education Elective	1
		Total	17

FOURTH QUARTER

PLCE	244	Principles of Criminal Investigation	3
PLCE	270	Industrial and Commercial Security	3
PLCE	130	Criminal Law	3
PLCE	111	Police Organization & Administration I	3
		Elective	3
		Total	15

FIFTH QUARTER

PLCE	245	Advanced Criminal Investigation	3
PLCE	136	Legal Evidence	3
PLCE	112	Police Organization & Administration II	3
PLCE	276	Criminology	3
		Elective	3
		Total	15

SIXTH QUARTER

PLCE	237	Administration of Justice	3
PLCE	160	Police Communication and Records	3
PLCE	299	Seminar and Project in Law Enforcement	2
GOVT	296	Seminar in Public Affairs	2
ECON	160	American Economics	3
		Elective	3
		Total	16
		Total Minimum Credits for a Police Science Major	97

REAL ESTATE

(Proposed for 1968-1969)

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

Purpose: The Real Estate curriculum offering is arranged to provide the local community with the needed young talent to serve this field in a professional manner. It is also designed to acquaint, inform, and train the young post high school student in the special field of Real Estate. Based on recent surveys, the graduates of this program would very likely fill a part of the indicated needs of the profession. Persons already employed in the Real Estate field should also find certain course offerings in this program of value in expanding their individual capacities, to further their personal objectives.

Occupational Objectives:

Real Estate Salesman
Real Estate Broker
Apartment House Manager
Real Estate Office Manager
County Urban Planning
Land Utilization Activity
Real Estate Loan Officer
Real Estate Sales Manager

Admission Requirements: In addition to the admission requirements established for the College (as listed in the section on admission requirements in the Administrative Information section), entry into the Associate in Applied Science degree program in Real Estate requires proficiency in high school English and high school mathematics, as well as satisfactory results on any additional tests that may be required by the Counseling Department. Students not proficient in English and mathematics will be required to correct their deficiencies in the Preparatory (Foundations) Program before entering the Real Estate curriculum.

Program Requirements: The student will be required to complete the courses listed elsewhere in this catalogue under the Real Estate course listings and fulfill the basic Graduation Requirements of the college. In addition, he shall have been recommended for graduation by the head of the Real Estate Department.

The first year of the program follows the basic Business Management program very closely and is designed to allow for appropriate flexibility.

Approximately one-third of the curriculum will include courses in Real Estate with the remaining courses in related business subjects, general education and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in the Real Estate field.

Upon completion of the six-quarter program listed on the adjacent page, the student will be awarded the Associate in Applied Science degree with a major in Real Estate.

REAL ESTATE

Associate in Applied Science Degree Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
BUAD 111	Accounting I	4
BUAD 100	Introduction to Business	3
BUAD 156	Office Machines	2
ENGL 101	Communication Skills I	3
MATH 151	Business Math I	3
GENL 100	Orientation	1
PHED 108	Foundations of Physical Activity	1
	Total	17
	SECOND QUARTER	
BUAD 112	Accounting II	4
ENGL 102	Communication Skills II	3
MATH 152	Business Math II	3
ECON 160	American Economics	3
BUAD 170	Business Org. and Mgt.	3
SECR 110	Personal Typing*	2
PHED	Physical Education Elective	1
	Total	19

THIRD QUARTER

BUAD	113	Accounting III	4
BUAD	106	Office Procedures	2
ENGL	136	Speech Communications	3
PSYC	110	Prin. of Applied Psych.	3
BUAD	161	Principles of Real Estate I	3
PHED		Physical Education Elective	1
		Total	16

FOURTH QUARTER

ENGL	280	Business English	3
BUAD	241	Business Law I	3
BUAD	180	Human Relations & Leadership at a Supervisor's Level	3
BUAD	267	Real Estate Appraisal	3
BUAD	162	Principles of Real Estate II	3
		Total	15

FIFTH QUARTER

BUAD	242	Business Law II	3
GOVT	180	American Constitutional Govt.	3
BUAD	265	Real Estate Finance	3
BUAD	264	Property Management	3
BUAD	268	Real Estate Sales	3
		Total	15

SIXTH QUARTER

BUAD	269	Legal Aspects of Real Estate	3
BUAD	263	Real Estate Economics	3
BUAD	260	Land Planning and Use	3
BUAD	248	Business Taxes	3
BUAD	160	Survey of Insurance	3
BUAD	299	Seminar & Project in Business Administration	2
		Total	17
		Total Minimum Credits for a Real Estate Major	99

*Waiver may be granted for the student who has completed one year of typing in high school or who demonstrates equivalent competence.

SECRETARIAL SCIENCE

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

Purpose: There is a steady demand for qualified secretaries, stenographers, typists, and office machine operators in Virginia. 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 curriculum offerings:

Occupational Objectives:

Executive Secretary

General Secretary

Legal Secretary

Legal Office Manager

Legal Stenographer

Medical Secretary

Office Machine Operator

Stenographer

Technical Secretary in Industry

Technical Secretary in Research

Technical Stenographer

Admission Requirements: In addition to the admission requirements established for the college (as listed in the section on admissions requirements in Part II of this catalog), entry into the Associate in Applied Science curriculum in Secretarial Science requires one year of typing and proficiency in high school English and mathematics. Students who are not proficient in these subject areas will be required to correct their deficiencies in a Preparatory (Foundation) program before entering the curriculum. In addition, students who have had some training in shorthand may be granted advanced placement upon acceptance into the department. The student's achievement record in the prior courses will be the major basis upon which advanced standing may be granted.

Curriculum Requirements: The curriculum in Secretarial Science is a two-year curriculum combining instruction in the many subject areas required for competence as a secretary in business, government, industry, law offices, and other organizations. Approximately one-half of the curriculum will include courses in secretarial science with the remaining courses in related subjects, general education and electives. Students who receive a grade lower than "C" in any shorthand or typewriting class will be required to repeat the course and to earn a grade of "C" or higher before registering for the next course in the sequence.

The first year (three quarters) of the Secretarial Science curriculum is similar for all students. In the second year (starting with the fourth quarter), students may elect to pursue a specialty in either the General Secretary, or Legal Secretary curriculum. Each student is advised to consult with her faculty advisor and the Counseling Department in planning her program and selecting her electives. Upon satisfactory completion of the six-quarter curriculum the student will be awarded the Associate in Applied Science degree with a major in Secretarial Science and specialization as a general secretary, or legal secretary.

SECRETARIAL SCIENCE (GENERAL SECRETARY)

Associate in Applied Science Degree Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
SECR 112	Typewriting II*	3
SECR 121	Shorthand I*	4
BUAD 100	Introduction to Business	3
ENGL 101	Communication Skills I	3
MATH 151	Business Mathematics I	3
GENL 100	Orientation	1
PHED 108	Foundations of Physical Activity	1
	Total	18
	SECOND QUARTER	
SECR 113	Typewriting III	3
SECR 122	Shorthand II*	4
BUAD 170	Business Organization & Management	3
ENGL 102	Communication Skills II	3
MATH 152	Business Mathematics II	3
PHED	Phys. Ed. Elective	1
	Total	17
	THIRD QUARTER	
BUAD 121	Record Keeping I	3
SECR 123	Shorthand III	4
SECR 136	Filing & Records Management	2
SECR 156	Personal Development	3
BUAD 156	Office Machines	2
ENGL 136	Speech Communications	3
PHED	Phys. Ed. Elective	1
	Total	18
	FOURTH QUARTER	
SECR 216	Executive Typing	2
SECR 241	Secretarial Procedures I	3
SECR 221	Shorthand Transcription I	3
GOVT 180	American Constitutional Government	3
PSYC 110	Principles of Applied Psychology	3
	Total	14
	FIFTH QUARTER	
SECR 266	Machine Transcription	3
SECR 222	Shorthand Transcription II	3
SECR 242	Secretarial Procedures II	3
BUAD 241	Business Law I	3
ECON 160	American Economics	3
	Total	15

SIXTH QUARTER

SECR	217	Typewriting Skill Building	2
SECR	223	Shorthand Transcription (General)	3
SECR	243	Secretarial Procedures III	3
SECR	299	Seminar and Project in Secretarial Science	2
BUAD	242	Business Law II	3
		Elective	2
		Total	15

Total Minimum Credits for a Secretarial Science Major (General Secretary option) 97

*Students who have completed work in shorthand or advanced typewriting may petition for advanced placement in the program.

SECRETARIAL SCIENCE (LEGAL SECRETARY)

Associate in Applied Science Degree Program

Course Number		Course Title	Course Credits

FIRST QUARTER

SECR	112	Typewriting II*	3
SECR	121	Shorthand I*	4
BUAD	100	Introduction to Business	3
ENGL	101	Communication Skills I	3
MATH	151	Business Mathematics I	3
GENL	100	Orientation	1
PHED	108	Foundations of Physical Activity	1
		Total	18

SECOND QUARTER

SECR	113	Typewriting III	3
SECR	122	Shorthand II*	4
BUAD	170	Business Organization & Management	3
ENGL	102	Communication Skills II	3
MATH	152	Business Mathematics II	3
PHED		Phys. Ed. Elective	1
		Total	17

THIRD QUARTER

BUAD	121	Record Keeping I	3
SECR	123	Shorthand III	4
SECR	136	Filing & Records Management	2
SECR	156	Personal Development	3
BUAD	156	Office Machines	2
ENGL	136	Speech Communications	3
PHED		Phys. Ed. Elective	1
		Total	18

FOURTH QUARTER

SECR	216	Executive Typing	2
SECR	221	Shorthand Transcription I	3
SECR	241	Secretarial Procedures I	3
GOVT	180	American Constitutional Government	3
PSYC	110	Principles of Applied Psychology	3
		Total	14

FIFTH QUARTER

SECR	266	Machine Transcription	3
SECR	222	Shorthand Transcription II	3
SECR	271	Legal Secretarial Procedures I	3
BUAD	241	Business Law I	3
ECON	160	American Economics	3
		Total	15

SIXTH QUARTER

SECR	217	Typewriting Skill Building	2
		Elective	2
SECR	227	Shorthand Transcription (Legal)	3
SECR	272	Legal Secretarial Procedures II	3
SECR	299	Seminar and Project in Secretarial Science	2
BUAD	242	Business Law II	3
		Total	15
		Total Minimum Credits for a Secretarial Science Major (Legal Secretary option)	97

*Students who have completed work in shorthand or advanced typewriting may petition for advanced placement in the program.

UNIVERSITY PARALLEL-COLLEGE TRANSFER CURRICULUMS

General: The student in this program pursues one of four curriculums:

1. That which leads to the Associate in Arts (A.A.) degree via a broad, general preparation for those contemplating a major field of study in the liberal arts or social sciences, or those whose major field of study has not yet been determined; or
2. One of three curriculums which lead to the Associate in Science degree:
   a. Business Administration
   b. That designated "Science," for those contemplating a major field of study in the natural or physical sciences or mathematics (e.g., pre-medical, pre-dental, biology, chemistry, mathematics, physics); or

c. That designated "Pre-Engineering," for those intending to transfer to a four-year engineering school.

The student is urged to consult with the Counseling Department of the College in selecting the curriculum which he is to follow; and is advised that substitution of courses within a curriculum, or change from one curriculum to another, may be accomplished only with the approval of the Counseling Department. Students are also urged to acquaint themselves with the requirements of the department of their intended major field in the school to which transfer is contemplated; and to be guided thereby in choosing electives.

LIBERAL ARTS

Degree: Associate in Arts

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
Education
English
Foreign Language
Government (Political Science)
History
Humanities
Journalism
Library Science
Literature
Philosophy
Pre-Law
Psychology
Sociology
Teacher 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 this catalog), 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 mathematics (algebra and geometry)
1 unit of laboratory science
1 unit of history

The remaining units are elective subjects, but at least two units of a foreign language are recommended. Students who do not meet these requirements may be permitted to correct their deficiencies in the Preparatory Foundations Program before entering the Liberal Arts curriculum.

*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: 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. A minimum of 97 credits is required for the Liberal Arts major in the Associate in Arts degree program. *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 also to consult with the Counseling Department of the Community College in planning his program and selecting his electives.* In order to help prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college that is comparable in length and courses to the first two years of the program at the four-year college or university. Upon satisfactory completion of the six-quarter program listed on the next page, the student will be awarded the Associate in Arts degree with a major in Liberal Arts.

LIBERAL ARTS

Associate in Arts Degree Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
ENGL 111	English Composition I	3
BIOL 101 or CHEM 111	Biology I or Chemistry I	4
MATH 181	General College Mathematics I	3
HIST 101	History of Western Civilization	3
	Foreign Language I*	4
GENL 100	Orientation	1
PHED	Phys. Ed. Elective	1
	Total	19
	SECOND QUARTER	
ENGL 112	English Composition II	3
BIOL 102 or CHEM 112	Biology II or Chemistry II	4
MATH 182	General College Mathematics II	3
HIST 102	History of Western Civilization	3
	Foreign Language II*	4
PHED	Phys. Ed. Elective	1
	Total	18

THIRD QUARTER

ENGL	113	English Composition III	3
BIOL	103		
or			
CHEM	113	Biology III or Chemistry III	4-5
MATH	183	General College Mathematics III	3
HIST	103	History of Western Civilization	3
		Foreign Language III*	4
PHED	108	Foundations of Physical Activity	1
		Total	18-19

FOURTH QUARTER

ENGL		English or American Literature I	3
		Foreign Language IV*	3
		Social Science Elective I**	3-5
PHED	103	Phys. Ed.	1
		Humanities Elective	3
		Other Elective	3
		Total	16-18

FIFTH QUARTER

ENGL		English or American Literature II	3
		Foreign Language V*	3
		Social Science Elective II**	3-5
		Humanities or Social Science Elective	3
		Other Elective	3
		Total	15-17

SIXTH QUARTER

ENGL		English or American Literature III	3
		Foreign Language VI*	3
		Social Science Elective III**	3
		Humanities or Social Science or Speech Elective	3-5
		Other Elective	3
		Total	15-17
		Total Minimum Credits for a Liberal Arts Major	101

*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.

**Students are required to take 9 credits of Social Science which may be selected from the following:

ECON 211-212-213

GOVT 281-282-283 or GOVT 187-188

PSYCH 201-202-203

The Social Science course selected should be one required by the four-year college or university to which students plan to transfer.

BUSINESS ADMINISTRATION

Degree: Associate in Science

Length: Six-quarter (two-year) program

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

The Associate in Science degree program 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 (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Science degree program in Business Administration 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

1 unit of social studies

Students who do not meet these requirements may be permitted to correct their deficiencies in the Preparatory Foundations Program before entering the Business Administration curriculum. *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 course to be taken in the Community College.

Program Requirements: The modern business world demands that its staff be knowledgeable in fields over and beyond the 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 principles of accounting usually required in the first two years of a baccalaureate business administration curriculum. *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 also to consult with the Counseling Department of the Community College in planning his program and selecting his electives.* In order to help prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college that is comparable in length and courses to the first two years of the program at the four-year college or university. Upon completion of the six-quarter program listed on the next page, the student will be awarded the Associate in Science degree with a major in Business Administration.

BUSINESS ADMINISTRATION

Associate in Science Degree Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
ENGL 111	English Composition I	3
BIOL 101	General Biology I	4
MATH 181	General College Mathematics I	3
HIST 101	History of Western Civilization	3
GENL 100	Orientation	1
	Elective	2-4
PHED	Elective	1
	Total	17-19
	SECOND QUARTER	
ENGL 112	English Composition II	3
BIOL 102	General Biology II	4
MATH 182	General College Mathematics II	3
HIST 102	History of Western Civilization	3
PHED	Phys. Ed. Elective	1
	Elective	2-4
	Total	16-18
	THIRD QUARTER	
ENGL 113	English Composition III	3
BIOL 103	General Biology III	4
MATH 183	General College Mathematics III	3
HIST 103	History of Western Civilization	3
PHED 108	Foundations of Physical Activity	1
	Elective	2-3
	Total	16-18
	FOURTH QUARTER	
ENGL	English or American Literature I	3
ECON 211	Principles of Economics I	3
BUAD 211	Principles of Accounting I	4
	Elective*	3-5
	Elective	3
	Total	16-18
	FIFTH QUARTER	
ENGL	English or American Literature II	3
ECON 212	Principles of Economics II	3
BUAD 212	Principles of Accounting II	4
	Elective*	3-5
	Elective	3
	Total	16-18

SIXTH QUARTER

ENGL		English or American Literature III	3
ECON	213	Principles of Economics III	3
BUAD	213	Principles of Accounting III	4
		Humanities Elective	3
		Other Elective	3
		Total	16
		Total Minimum Credits for a Business Administration Major	97

*In addition to the general education requirements of the Community College, students may be advised to take a full year of a sophomore level social science course if required by the four-year college or university to which they plan to transfer.

PRE-ENGINEERING

Degree: Associate in Science

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, engineer, 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 Pre-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 engineering fields:

Areospace Engineering
Agricultural Engineering
Architectural Engineering
Ceramic Engineering
Chemical Engineering
Civil Engineering
Electrical Engineering
Engineering Mechanics
Industrial Engineering
Mechanical Engineering
Metallurgical Engineering
Mining Engineering
Nuclear Engineering

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 Associate in Science degree curriculum in Pre-Engineering requires the 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
1 unit of social studies

Students who do not have an adequate foundation in English grammar and composition to enroll in ENGL 112 (the beginning English course for pre-engineering), as indicated by high school grades and test scores, may first have to complete ENGL 111. Students who do not meet the requirements listed above may be permitted to correct their deficiencies in the Preparatory Foundations Program before entering the Pre-Engineering curriculum.

Program Requirements: This program includes the English and Humanities, mathematics, science, social science, and introductory engineering courses usually required in the first two years of a baccalaureate engineering curriculum. *Each student is urged to acquaint himself with the requirements of the major department in the college or university to which he expects to transfer and also to consult with the Counseling Department of the community college in planning his program and selecting his electives.* In order to help prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college that is comparable in length and course to the first two years of the program at the four-year college or university. Upon satisfactory completion of the six-quarter curriculum listed on the next page, the student will be awarded the Associate in Science degree with a major in Pre-Engineering.

PRE-ENGINEERING

Associate in Science Degree Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
CHEM 111	General Inorganic Chemistry I	4
MATH 141	Mathematical Analysis I	5
ENGR 121	Engineering Graphics I	2
ENGL 112	English Composition II*	3
PHED	Phys. Ed. Elective	1
GENL 100	Orientation	1
ENGR 100	Introduction to Engineering	1
	Total	17
	SECOND QUARTER	
CHEM 112	General Inorganic Chemistry II	4
MATH 142	Mathematical Analysis II	5
ENGR 122	Engineering Graphics II	2
HIST	History of West. Civ. or History Elective	3
ENGL 113	English Composition III	3
PHED	Phys. Ed. Elective	1
	Total	18

THIRD QUARTER

CHEM	113	General Inorganic Chemistry III	5
MATH	143	Mathematical Analysis III	5
ENGR	123	Descriptive Geometry	3
ECON		Economics**	3
HIST		History of West. Civ. III (Opt.)	3
PHED	108	Foundations of Physical Activity	1
		Total	20

FOURTH QUARTER

PHYS	221	College Physics I	4
MATH	241	Advanced Mathematical Analysis I	4
ENGR	251	Engineering Mechanics I (Statics)	4
		Social Science Elective I**	3-5
ENGL		English or American Literature I	3
		Total	18-20

FIFTH QUARTER

PHYS	222	College Physics II	4
MATH	242	Advanced Mathematical Analysis II	4
ENGR	252	Engineering Mechanics II (Dynamics)	5
		Social Science Elective II**	3-5
		Total	16-18

SIXTH QUARTER

PHYS	223	College Physics III	4
MATH	243	Advanced Mathematical Analysis III	4
ENGR	253	Engineering Mechanics III (Mechanics of Solids)	4
		Social Science Elective III**	3-5
		Literature (Opt.)	0-3
		Total	15-20

Total Minimum Credits of Pre-Engineering Major 104

*Entering freshmen without adequate foundation in English grammar and composition to enroll in ENGL 112 as indicated by high school grades and test scores may first have to take ENGL 111.

**Students are required to take 9 credits of Social Science which may be selected from the following:

ECON 211-212-213

GOVT 281-282-283 or GOVT 187-188

PSYCH 201-202-203

The Social Science course selected should be the one required by the four-year college or university to which students plan to transfer.

SCIENCE

Degree: Associate in Science

Length: Six-quarter (two-year) program

Purpose: With the tremendous emphasis on scientific discoveries and technological developments in today's society, there is a great demand for scientists and scientifically-oriented persons in business, government, industry, and the professions.

The Associate in Science degree program with a major 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	Forestry	Nursing
Biology	Home Economics	Pharmacy
Chemistry	Mathematics	Physics
Dentistry	Medicine	

Admission Reqirements: 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 Associate in Science degree program with a major in science requires the satisfactory completion of the following high school units or equivalent as a minimum:

4 units of English
2 units of algebra
1 unit of geometry
1 unit of laboratory science
1 unit of social studies

Students who do not meet these requirements may be permitted to correct their deficiencies in the Preparatory Foundations Program before entering this science curriculum.

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 the humanities and social sciences. Numerous 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. 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 also to consult with the Counseling Department of the Community College in planning his program and selecting his electives. In order to help prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college that is comparable in length and courses to the first two years of the program at the four-year college or university. Upon satisfactory completion of the six-quarter program listed on the next page, the student will be awarded the Associate in Science degree with a major in science.

SCIENCE

Associate in Science Degree Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
ENGL 111	English Composition I	3
CHEM 111	General Inorganic Chemistry I	4
MATH 161	College Mathematics I	5
GENL 100	Orientation	1
PHED	Phys. Ed. Elective	1
	Electives	3-6
	Total	15-18
	SECOND QUARTER	
ENGL 112	English Composition II	3
CHEM 112	General Inorganic Chemistry II	4
MATH 162	College Mathematics II	5
HIST	History Elective	3
PHED	Phys. Ed. Elective	1
	Other Elective	3-4
	Total	17-18
	THIRD QUARTER	
ENGL 113	English Composition III	3
CHEM 113	General Inorganic Chemistry III	5
MATH 163	College Mathematics III	5
PHED 108	Foundations of Physical Activity	1
	Electives	6-7
	Total	18-19
	FOURTH QUARTER	
ENGL	English or American Literature	3
CHEM 241		
or		
CHEM 221	Organic Chemistry I or Quantitative Analysis I	4
MATH 271	Calculus I	4
	Social Science Elective I*	3-5
PHED 103	Phys. Ed.	1
	Elective	0-3
	Total	15-20
	FIFTH QUARTER	
ENGL	English or American Literature II	3
CHEM 242		
or		
CHEM 222	Organic Chemistry II or Quantitative Analysis II	4
MATH 272	Calculus II	4
	Humanities Elective	3
	Social Science Elective II*	3-5
	Total	17-19

SIXTH QUARTER

ENGL	English or American Literature III	3
CHEM 243 or CHEM 223	Organic Chemistry II or Quantitative Analysis III	4
MATH 273	Calculus III	4
	Social Science Elective III*	3
	Other Electives	2-4
	Total	16-18
	Total Minimum Credits for a Science Major	97

*Students are required to take 9 credits of Social Science which may be selected from the following:

ECON 211-212-213
GOVT 281-282-283 or GOVT 187-188
PSYC 201-202-203

The Social Science course selected should be the one required by the four-year college or university to which students plan to transfer.

CERTIFICATE CURRICULUMS

ARCHITECTURAL DRAFTING

Certificate: Certificate in Architectural Drafting

Length: Three-quarter (one-year) program

Purpose: Consistent with the population and building construction growth the need for competent draftsmen in the construction industry has in the past, as well, in the foreseeable future, exceeded the supply. The Architectural Draftsman curriculum prepares graduates to assume responsible positions in the architectural profession and building construction industry. Under the supervision of licensed architects, and engineers they participate in the analysis of development of architectural and engineering plans essential to the completion of: Architectural drafting, landscape drafting, land development drafting, material fabrication drafting, building construction drafting, county and state construction program drafting, and federal housing and construction drafting.

Occupational Objectives: Draftsmen

Admission Requirements: Admission to the program, in addition to the requirements for general admission to the College, requires that the student show satisfactory aptitude for drawing as measured by appropriate tests administered by the College Counseling Department.

Program Requirements: The Architectural Drafting program is designed to prepare students to work as architectural draftsmen and to provide them to assume responsible positions in the architectural pro-

fession and building construction industry. The curriculum includes basic courses in the humanities (English, government, and psychology) to assist the student in social and business communications and to prepare the student to meet the obligations of our society.

Students successfully completing the three-quarter sequence for Architectural Draftsman receive a Certificate of Completion.

ARCHITECTURAL DRAFTING

Course Number	Course Title	Course Credits
	FIRST QUARTER	
ARCH 106	Architectural Terminology	1
ARCH 111	Architectural Drafting I	3
ARCH 141	Materials and Methods of Construction I	3
GENL 100	Orientation	1
MATH 011	Elements of Mathematics I	3
ENGL 101	Communication Skills	3
GOVT 180	American Constitutional Government	3
	Total	17
	SECOND QUARTER	
ARCH 112	Architectural Drafting II	3
ARCH 113	Architectural Drafting III	3
ARCH 277	Building Codes & Contract Documents	3
ARCH 142	Materials and Methods of Construction II	3
MATH 012	Elements of Mathematics II	3
ECON 160	American Economics	3
	Total	18
	THIRD QUARTER	
ARCH 211	Architectural Drafting IV	3
ARCH 212	Architectural Drafting V	3
CIVL 249	Construction Contract Specifications & Codes	3
ARCH 238	Structural & Mechanical Coordination	3
ARCH 256	Architectural Office Practice	2
PSYC 110	Applied Psychology	3
	Total	17
	Total Minimum Credits for Certificate in Architectural Drafting	52

AUTOMOTIVE DIAGNOSIS AND TUNE-UP

Certificate: Automotive Diagnosis and Tune-Up

Length: Three-quarter (one year) program

Purpose: To satisfy a part of the great demand for qualified automotive, diagnostic, and tune-up specialists in the local area. Rapid growth in the numbers of automobiles in the area and ever increasing complex

development in automotive vehicles account for a continued critical shortage of service and repair technicians.

The Automotive Diagnosis and Tune-Up Certificate Program is designed to provide a thorough knowledge of the mechanics of the internal combustion engine and supporting systems used in modern automobiles, to develop an individual's mechanical skills to a point where he has attained tune-up technician status 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 tune-up and trouble shooting field immediately upon completion of the one year program. The course will develop the students skills in the use of the most modern trouble shooting, diagnosing and tune-up test instruments and repair tools. For one to advance successfully in this program of study a thorough understanding of the automobile, its basic operating principles, minor repair techniques and repair skills is required.

Admission Requirements: In addition to the admission requirements established for the college (as established in the college catalog), a minimum of a one-year automotive shop program in high school or the equivalent and a good understanding of general mathematics are usually required for entry into the program.

Program Requirements: The Automotive Diagnostic and Tune-Up Certificate Program will concentrate on practical applications needed to succeed in immediate employment as automobile engine trouble shooters and tune-up technicians. In addition to the highly technical oriented courses, the curriculum includes basic courses in social studies which will prepare the student to meet the obligations of the citizen in our Democratic Society.

AUTOMOTIVE DIAGNOSIS AND TUNE-UP

Certificate Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
AUTO 021	Automotive Trouble Shooting and Engine Tune-Up I	5
ECON 160	American Economics	3
ENGL 011	Verbal Expression I	3
MATH 011	Elements of Mathematics I	3
GENL 100	Orientation	1
DRFT 126	Introduction to Graphic Representation (or elective)	3
	Total	18
	SECOND QUARTER	
AUTO 022	Automotive Trouble Shooting and Engine Tune-Up II	5
ENGL 012	Verbal Expression II	3
MATH 012	Elements of Mathematics II (or elective)	3
PSYC 110	Principles of Applied Psychology	3
AUTO 024	Automotive Fuel Systems I	4
	Total	18

THIRD QUARTER

AUTO	023	Automotive Trouble Shooting and Engine Tune-Up III	5
ENGL	013	Verbal Expression III	3
MATH	013	Elements of Mathematics III (or elective)	3
AUTO	299	Seminar & Project in Automotive Technology	2
AUTO	025	Automotive Fuel Systems II	4
		Total	17
		Total Credit Hours	53

Total Minimum Credits for a Certificate in Automotive Diagnosis and Tune-Up is 53 Credit Hours.

DATA PROCESSING

Certificate: Certificate in Key Punch

Length: One-Quarter Program

DAPR 037 Key Punch Operation 15 Credit Hours

This is a comprehensive occupational course designed to train the student as a key punch operator in 12 weeks. In addition to the development of keyboard competency, this course includes an introduction to data processing principles. This class will meet six hours per day on Monday, Wednesday and Friday for a period of 12 weeks in a combination of lecture and laboratory experience.

Prerequisite: Typing skill of 30 wpm or permission of Department Head

Certificate: Certificate in Unit Record

Length: Three-quarter (one-year) program

Applicants planning to enter the one-year Unit Record Program must meet the admission requirements set forth by the College in the front section of the catalog. A student satisfactorily completing the program will be granted a Certificate of Competence.

DATA PROCESSING

Course Number		Course Title	Course Credits
		FIRST QUARTER	
DAPR	100	Introduction to Data Processing	4
DAPR	184	U/R Processing Equipment I	4
BUAD	100	Introduction to Business	3
ENGL II	101	Communication Skills I	3
GENL II	100	Orientation	1
		Total	15

SECOND QUARTER

DAPR	185	U/R Processing Equipment II	6
BUAD	111	Accounting I	4
BUAD	170	Business Organization & Management	3
ENGL II	102	Communication Skills II	3
		Total	16

THIRD QUARTER

DAPR	186	Unit Record Applications	6
BUAD	112	Accounting II	4
ECON	160	American Economics	3
PSYC II	110	Principles of Applied Psychology	3
		Total	16
		Total Credit Hours	47

ENGINEERING TECHNOLOGY

Certificate: Certificate in Specific Area of Engineering Technology

Architectural Drafting
Civil Surveys
Mechanical Laboratory

Length: Three-quarter (one-year) program

Purpose: With the ever increasing demand for people trained in the areas of engineering technology in the region of Northern Virginia, the need developed for programs for specific activities within the vast spectrum of engineering technologies. In order to meet this need and also to provide the opportunity for advanced education for all citizens of the community, especially designed certificate programs are offered in engineering technology.

Occupational Objectives: To provide technical aides trained in specific areas of technology. The nature of the individual programs offered is highly dependent on the current requirements of the local region.

Admission Requirements: Students who have been admitted to one of the associate degree programs in Engineering Technology and who at the end of the first quarter of study are found to be better suited for a more "artisan" oriented program in technology will be advised to enter the Engineering Technology Certificate Program.

Program Requirements: The Engineering Technology Certificate Programs are designed to prepare students to work as technical assistants of varying nature and depth of knowledge, in addition to highly technical oriented courses. The curriculum includes basic courses in humanities (English, government, and psychology) to assist the student in social and

business communications and to prepare him to meet the obligations of our society.

ENGINEERING TECHNOLOGY

Certificate Program

Course Number	Course Title	Course Credits
	FIRST QUARTER	
ENGR 100	Introduction to Engineering	1
DRFT 126	Introduction to Graphic Representation	3
PHYS 101	Introductory Physics I	4
MATH 011	Elements of Mathematics I	3
ENGL 101	Communication Skills I	3
GENL 100	Orientation	1
	Total	15
	SECOND QUARTER	
ENGL 102	Communication Skills II	3
GOVT 080	Basic American Government	3
	Technical Electives Selected on an individual basis)	10
	Total	16
	THIRD QUARTER	
PSYC 110	Principles of Applied Psychology	3
	Non-technical Elective	3
	Technical Electives (Selected on an individual basis)	10
	Total	16
	Total Minimum Credits for Certificate in Engineering Technology	47

MECHANICAL DRAFTING

Certificate: Certificate in Mechanical Drafting
Length: Three-quarter (one-year) program

Purpose: With the rapid growth of industry in Virginia and the steady demand for qualified draftsmen in the local area, there is a need for trained personnel to meet these requirements. The curriculum in Mechanical Drafting is designed to train persons for full-time employment upon completion of the community college curriculum.

Occupational Objectives: Draftsman

Admission Requirements: Admission to the program, in addition to the requirements for general admission to the College, requires that the student show satisfactory aptitude for drawing as measured by appropriate tests administered by the College Counseling Department.

Program Requirements: The Mechanical Drafting program is designed to prepare students to work as mechanical draftsmen and to provide them

with an introduction to the basic problems associated with design and manufacturing of mechanical devices. The curriculum includes basic courses in the humanities (English, government, and psychology) to assist the student in social and business communications and to prepare the student to meet the obligations of our society.

Students successfully completing the three-quarter sequence in Mechanical Drafting receive a Certificate of Completion. Job opportunities for mechanical draftsmen exist in many areas, primarily in the manufacturing industries.

MECHANICAL DRAFTING

Course Number	Course Title	Course Credits
	FIRST QUARTER	
DRFT 131	Mechanical Drafting I	5
ECON 160	American Economics	3
ENGL 011	Verbal Expression I	3
MATH II 011	Elements of Mathematics I	3
NASC 126	Science in Industry	3
GENL 100	Orientation	1
		18
	SECOND QUARTER	
DRFT 132	Mechanical Drafting II	5
ENGL 012	Verbal Expression II	3
MATH II 012	Elements of Mathematics II	3
INDT 111	Materials and Processes of Industry I	3
PSYC 110	Principles of Applied Psychology	3
		17
	THIRD QUARTER	
DRFT 133	Mechanical Drafting III	5
ENGL 013	Verbal Expression III	3
MATH II 013	Elements of Mathematics III	3
INDT 112	Materials and Processes of Industry II	3
	Elective	3
		17
	Total Minimum Credits for Certificate in Mechanical Drafting	52

POLICE SCIENCE

Certificate: Certificate In Police Science

Length: Three-quarter (one year) program

Purpose: The Certificate Program is designed for practitioners in law enforcement and associated fields who desire to take only those courses

which relate directly to their employment needs. However, students who fail to demonstrate an ability to meet academic standards may be advised to enroll in appropriate support classes which are designed to provide the background necessary for academic proficiency.

Admission Requirements: In addition to requirements for general admission to the college, a personal interview with a member of the faculty of the Police Science Department is required.

Program Requirements: The Police Science Certificate Program is designed to improve the job related skills of the person engaged in law enforcement. Students will be advised as to which courses are most applicable to their field of interest and will upon successful completion of 50 credits in the Police Science curriculum, be awarded a certificate in Police Science.

Moreover, upon completion of the certificate program, students may continue on toward the Associate in Applied Science Degree in Police Science and will be awarded this degree upon successful completion of the prescribed support courses.

POLICE SCIENCE

Certificate in Police Science

Course Number	Course Title	Course Credits
PLCE 100	Introduction to Law Enforcement	3
PLCE 110	Patrol Administration	3
PLCE 120	Special Enforcement Problems	3
PLCE 187	Traffic Administration and Control	3
PLCE 126	Prevention and Control of Juvenile Delinquency	3
ENGL 101	Communication Skills I	3
PLCE 244	Principles of Criminal Investigation	3
PLCE 270	Industrial and Commercial Security	3
PLCE 130	Criminal Law	3
PLCE 111	Police Organization and Administration	3
GOVT	Government Elective	5
PLCE 136	Legal Evidence	3
PSYC 110	Principles of Applied Psychology	3
PLCE 237	Administration of Justice	3
PLCE 160	Police Communication and Records	3
PLCE 228	Law Enforcement and The Community	3
	Total	50
	Total Minimum Credits for a Certificate in Police Science	50

RADIO-TELEVISION REPAIR

Certificate: Certificate in Radio-Television Repair

Length: Four-quarter (one-year) program

Purpose: With the rapid growth of the radio-TV repair industry in Virginia and the steady demand for qualified repairmen in the local area, there is a need for trained personnel to meet these requirements. The certificate curriculum in Radio-TV Repair is designed to train persons for full-time employment upon completion of the community college curriculum offering.

Occupational Objectives: Radio-TV Repairman

Home Entertainment Repairman

Admission Requirements: Admission to the program, in addition to the requirements for general admission to the College, requires that the student show satisfactory aptitude in electronics as measured by appropriate test administered by the College Counseling Department and the Electronics Department. Admission to the program may be limited to students who have successfully completed a high school vocational or industrial arts program in electronics. Students who have a demonstrated ability or previous employment in the field of electronics or radio-TV will also be enrolled. Students who are not proficient in certain subject areas may be required to correct their deficiencies in a Preparatory (Foundation) program before entering the curriculum.

Program Requirements: The Radio-Television Repair program is designed to prepare students to work as radio-television repairmen and to provide them with an introduction to the basic problems associated with the repair of radios and televisions and home entertainment equipment. The curriculum includes basic courses in the humanities (English, government, and psychology) to assist the student in social and business communications and to prepare the student to meet the obligations of our society.

Students successfully completing the four-quarter sequence in Radio-Television Repair receive a Certificate of Completion. Job opportunities for radio-television repair exist in many areas.

RADIO-TELEVISION REPAIR

Course Number	Course Title	Course Credits
	FIRST QUARTER	
ENGL 011	Verbal Expression I	3
RDTV 040	Basic Electricity for Radio	6
GENL 091	Seminar in American Society I	1
GENL 100	Orientation	1
PSYC 110	Principles of Applied Psychology	3
	Total	14

SECOND QUARTER

ENGL	012	Verbal Expression II	3
RDTV	041	Radio Receiver Circuits	6
RDTV	042	Radio Trouble Shooting	3
GENL	092	Seminar in American Society II	1
ECON	160	American Economics	3
		Total	16

THIRD QUARTER

RDTV	043	T.V. Receiver Circuits	6
RDTV	044	T.V. Receiver Trouble Shooting	3
GOVT	180	American Government	3
		Elective	3
		Total	15

FOURTH QUARTER

RDTV	045	Color T.V. Circuits	6
RDTV	046	Color T.V. Trouble Shooting	3
		Electives	6
		Total	15
		Total Minimum Credits for Certificate in Radio-Television Repair	60

Suggested electives may be limited to repair of home entertainment devices and systems.

STRUCTURAL DRAFTING

Certificate: Certificate in Structural Drafting

Length: Three-quarter (one year) program

Purpose: The Structural Drafting Program is designed to prepare students to work as qualified draftsmen in the general area of building construction. The curriculum is designed to equip the student with the necessary general technical background and manual drafting skill for a full time employment immediately upon completion of the program.

Occupational Objectives: Structural Draftsmen are, generally, employed by: Structural Engineers, Construction Contractors, Steel and Concrete Sub-Contractors and Manufacturers, Structural Departments of Local, State and Federal Agencies, Structural Departments of Related Industries.

Admission Requirements: Same as for general admission to the college. Applicants may be required to show satisfactory aptitude for drawing as measured by an appropriate test.

Program Requirements: In order to graduate the student is required to complete a balanced curriculum with courses approximately distributed as follows: 30% in the general education field such as English and Social Sciences, 20% in the supporting field of Mathematics and Physical Sciences, and 50% in the professional field with particular stress on Structural Drafting as applied to building construction.

STRUCTURAL DRAFTING

Course Number	Course Title	Course Credits
	FIRST QUARTER	
GEN 100	Orientation	1
ENGR 100	Intro. to Engr. Tech.	1
ENGL 011	Verbal Expression I	3
MATH 011	Elements of Math I	3
NASC 100	Survey of Science	3
DRFT 126	Intro. to Graphic Representation	3
	Total	14
	SECOND QUARTER	
	Elective*	3
GOVT 180	American Government	3
MATH 012	Elements of Math II	3
CIVL 140	Construction Planning	3
CIVL 124	Civil Engineering Drafting I	2
CIVL 125	Civil Engineering Drafting II	2
	Total	16
	THIRD QUARTER	
	Elective*	3
DRFT 266	Structural Design I	4
CIVL 219	Building Design	4
CIVL 227	Structural Drafting	4
	Total	15
	Total Minimum Credits for Certificate in Structural Drafting	45

*Elective must be chosen among:

1. American Economics—ECON 160
2. Applied Psychology—PSYC 110

SPECIAL TRAINING PROGRAMS

Northern Virginia Community College works closely with the Special Training Division of the Virginia Department of Community Colleges in setting up training programs for industries and businesses that are expanding their facilities or are locating in Virginia for the first time.

Under these programs Virginians are trained in the basic skills required by a wide variety of job opportunities.

A few of the skills that have been taught by the Special Training Division include sewing operations, welding, electronics, motor winding, furniture construction, electronic assembly, shoe manufacturing, telephone assembly, paper manufacturing, candy making, printing, metal forming, tire manufacturing, supervisory development and machine operation.

Space, where needed, and qualified instructors are provided at State expense.

Further information may be obtained from the Coordinator of Continuing Adult Education and Community Service Programs or the Special Training Division, Virginia Department of Community Colleges, Richmond, Virginia 23219.

CONTINUING ADULT EDUCATION AND COMMUNITY SERVICE PROGRAMS

In order to fulfill the ever-increasing educational needs of the community, the Northern Virginia Community College offers a well-planned diversified program which includes the following: 1) An opportunity to pursue degree programs, certificate programs and college credit courses six days a week during the hours of 8:00 AM until 11:00 PM; 2) Classes, forums, lectures, exhibits, short courses, art festivals and music festivals to promote cultural affairs of the community; 3) Various community development programs and seminars which focus attention on social issues; 4) An offering of non-catalogued special courses or programs to the community's several industries, businesses, or professions, directed and taught at the college or at the client's site by the faculty and staff of the College; 5) Special services such as a speaker's/programs bureau, use of College facilities, tours and visits, and others as they are needed.

PREPARATORY FOUNDATION PROGRAM

Foundation and 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 College. These programs are designed to help develop the basic skills and understandings necessary to succeed in other programs of the College.

The foundation program provides an opportunity to obtain needed knowledges and skills for an individual who is not fully prepared for entry into an associate degree program because he has previously not had an opportunity to complete an appropriate educational course or program or because he has low achievement in his previous educational programs. A student is placed in the foundations program after a close analysis of his high school transcript, test scores, and other data available on his achievement level.

Through the use of specialized teaching methods and modern equipment with an extensive concentration upon laboratory experiences, the student may, through concentrated effort in the areas of his weakness, progress at his own rate. The student will be tested frequently for the purpose of finding the progress he is making.

The student may use either of two approaches to improve his knowledges and skills in the foundations program. In one approach, he may

enroll in the regular foundations courses scheduled each quarter at the College. In the other approach the student may utilize the materials and equipment in the Learning Laboratory for individual study of appropriate units or course materials in the areas of his deficiencies. Personnel in the Learning Laboratory or other faculty members of the College would be available to provide individualized assistance for the student. Progressing at his own rate, the student may complete the unit of study at any time that he demonstrates sufficient mastery of the subject to meet the minimum requirements for the unit or course.

A student in the foundations program may be taking all of his work at the foundation level or he may be taking some associate degree level courses for which he is qualified in addition to one or more foundations courses. Many of the foundations courses will provide credit applicable to the requirments of a diploma or certificate program. In addition, if the student takes any associate degree courses, the credit earned in these courses may be transferred to an associate degree curriculum when the student is admitted to the associate degree curriculum and if the courses are applicable to the curriculum.

The student is urged to consult with the Counseling Department of the College in planning his program and selecting his courses.

TYPICAL PREPARATORY FOUNDATION PROGRAM

Course Number	Course Title	Course Credits
	FIRST QUARTER	
ENGL 001	Verbal Studies Lab I	5
MATH 001	Developmental Mathematics I	5
GENL 110	Developmental Reading	3
GENL 100	Orientation	1
		14
	SECOND QUARTER	
ENGL 002	Verbal Studies Lab II	5
MATH 002	Developmental Mathematics II	5
PSYC 016	The Psychology of Successful Living	3
		13
	THIRD QUARTER	
ENGL 003	Verbal Studies Lab III	5
MATH 003	Developmental Mathematics III	5
NASC 100	Survey of Science	3
		13

PRE-TECHNICAL PROGRAM

For those students who are restricted from entering an Associate Degree program because of a deficiency of one or more courses in their high school experience, the Pre-Technical Program is an opportunity for gaining the experiences required for the selected specialization. The

course content in the Pre-Technical Program parallels the high school course in which the student is deficient.

The student enrolling in the Pre-Technical curriculum will select only those courses in which he is deficient. His remaining program will be selected from the non-technical courses in his Associate degree major.

Courses in the Pre-Technical Program:

MATH 031	Basic Algebra I	5
MATH 036	Basic Plane Geometry	5
MATH 032	Basic Algebra II	5
MATH 038	Basic Trigonometry	5
MATH 039	Review of Algebra and Trigonometry	5
MATH 050	Basic Business Mathematics	3
CHEM 006	Basic Chemistry	4
PHYS 006	Basic Physics	4
BIOL 006	Basic Biology	4

DESCRIPTION OF COURSES

Course Numbers

Courses numbered 000-099 are freshmen level courses for the preparatory foundations program and for the occupational 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 freshmen level courses applicable toward an associate degree. They may also be used in certificate and diploma courses.

Courses numbered 200-299 are sophomore level courses applicable toward an associate degree. They may also be used in certificate and diploma or 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 practice, and cooperative work experiences) are indicated for each course in the course description. The number of lecture and laboratory hours in class each week are also called "contact" hours because it is time spent under the direct supervision of a faculty member. In addition to the lecture and laboratory hours in class each week each student must spend some time on out-of-class assignments under his own direction. Usually each credit per course requires an average of three hours of in-class and out-of-class work each week.

Prerequisites

If any prerequisites are required before enrolling in a course, they 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 co-requisites 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 the instructor of the course.

ARCHITECTURAL TECHNOLOGY

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

ARCH 106 ARCHITECTURAL TERMINOLOGY (1 cr.)—Provide accelerated vocabulary in technical language, covering building design and construction. Lecture 1 hour per week.

ARCH 111 ARCHITECTURAL DRAFTING I (3 cr.)—Prerequisite, 2 years of high school algebra, plane and solid geometry or permission of the instructor. Co-enrollment in MATH 111 or 121 desirable, but not required. A course designed to provide the fundamental knowledge of principles of drafting. Basic skills and techniques of drafting included are: Use of drafting equipment, lettering, freehand orthographic and pictorial sketching, geometric construction, orthographic instrument drawing of principal views. Projection problems dealing with

principles of descriptive geometry involving points, lines, planes and connectors. The principles of isometric, oblique and perspective drawings are introduced. Lecture 1 hours, Laboratory 6 hours, Total 7 hours per week.

ARCH 112 ARCHITECTURAL DRAFTING II (3 cr.)—Prerequisite ARCH 111. Development of techniques in architectural lettering, symbols, and interpretation; dimensioning, freehand and instrument drafting. Drawing of construction details, using appropriate material symbols and connections. Sections, scale details and full-size details will be prepared from preliminary sketches. Applications of descriptive geometry are used in visualization and analytic solutions of drafting problems involving auxiliary views, intersections and developments. 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 will be prepared from preliminary sketches. Lecture 1 hour, Laboratory 6 hours, Total 7 hours per week.

ARCH 141-142 MATERIALS AND METHODS OF CONSTRUCTION I-II (3 cr.) (3 cr.)—Prerequisite ARCH 100. A subject designed to familiarize the student with the physical properties and the methods used in the erection of structures, with brief descriptions of their manufacture. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

ARCH 211 ARCHITECTURAL DRAFTING IV (3 cr.)—Prerequisite ARCH 113. Drawing of structural plans and details as prepared for building construction including steel, concrete and timber structural components. Appropriate details and drawing necessary for construction and fabrication of structural members. Reference materials will be used to provide the draftsman with skills and knowledge in locating data and in using handbooks. Laboratory 9 hours per week.

ARCH 212 ARCHITECTURAL DRAFTING V (3 cr.)—Prerequisite ARCH 211. Drawing of plans and details as prepared for mechanical equipment such as air conditioning, plumbing and electrical systems by using appropriate symbols and conventions. Consideration is given to coordination of mechanical and electrical features with structural and architectural components. Laboratory 9 hours per week.

ARCH 213 ARCHITECTURAL DRAFTING VI (3 cr.)—Prerequisite ARCH 212. Preparation of the complete set of working drawings for the architectural structure. Preparation of millwork drawings, cabinets and built-in equipment detail drawings, and door, window and room schedules. Site and landscaping plans will be studied and drawn. Final assembly of the complete document for construction purposes will be made. Laboratory 9 hours per week.

ARCH 226 ART AND ARCHITECTURE (3 cr.)—A course designed to emphasize architecture as an art form, emphasis will be placed on art values of components and details, structures are coordinated as art and architecture. Lectures 3 hours per week.

ARCH 236 BUILDING ELECTRIC POWER EQUIPMENT (3 cr.)—A general study of the types of heavy electric power equipment, loads, distribution forces, outdoor and indoor connections, overhead and underground transmission lines. Lectures 3 hours per week.

ARCH 237 BUILDING MECHANICAL EQUIPMENT (3 cr.)—General study of heating, air conditioning, plumbing and electrical equipment, materials and symbols. Building code requirements pertaining to residential and commercial structures; reading and interpretation of working drawings by mechanical engi-

neers; coordination of mechanical and electrical features with structural and architectural designs. Lectures 3 hours per week.

ARCH 256 ARCHITECTURAL OFFICE PRACTICES (2 cr.)—A study of the professional relationship of the architectural firm in relation to clients, contractors, suppliers, consultants and other architects. Ethics of the profession as applicable to the draftsman's role in the architectural firm will be stressed. Lectures 2 hours per week.

ARCH 276 CONSTRUCTION ESTIMATING (3 cr.)—Interpretation of working drawings for a project; preparation of material and labor quantity surveys from plans and specifications; approximate and detailed estimates of cost. The student will study materials take-off, subcontractors' estimates of cost, and bid and contract procedures. Detailed inspection of the construction by comparing the finished work to the specifications. Lectures 3 hours per week.

ARCH 277 BUILDING CODES AND CONTRACT DOCUMENTS (3 cr.)—A study of building codes and their effect in relation to specifications and drawings. The purpose and writing of specifications will be studied along with their legal and practical application to working drawings. Contract documents will be analyzed and studied for the purpose of client-architect-contractor responsibilities, duties and mutual protection. Lectures 3 hours per week.

ARCH 299 SEMINAR AND PROJECT IN ARCHITECTURAL TECHNOLOGY (2 cr.)—A selection and completion of an individual project related to the student's occupational objective and designed to combine theoretical concepts with practical applications by cooperative arrangements with architectuarl firms. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in architectural technology.

ARTS AND CRAFTS

ARTS 111-112-113 HISTORY AND APPRECIATION OF ART I-II-III (3 cr.) (3 cr.) (3 cr.)—The history and interpretation of architecture, sculpture and painting. The course begins with prehistoric art and follows the main stream of western civilization to the present. Lectures 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 drawing in charcoal, wash, pencil, and varied combinations of media. Lecture 1 hour, Laboratory 5 hours, Total 6 hours per week.

ARTS 126 FREE-HAND SKETCHING (2 cr.)—Basic principles and practice in free-hand sketching. Laboratory 6 hours per week.

ARTS 126 FREE-HAND SKETCHING (2 cr.)—Basic principles and practice in free-hand sketching. Laboratory 6 hours per week.

ARTS 196 ART WORKSHOP (2 cr.)—A workshop for individual special projects in arts and crafts. Laboratory 6 hours per week.

AUTOMOTIVE TECHNOLOGY

AUTO 007 INTRODUCTION TO AUTO MECHANICS (4 cr.)—Is a foundation course on auto mechanics designed to develop a basic understanding of the automobile, its basic systems, operating principles, problems and repair techniques. The student is introduced to shop layout, shop safety, tools and equipment application and diagnosis, disassembly, inspection, repair, reassembly and adjustments of automobile components. Lecture 2 hours, Laboratory 4 hours, Total 6 hours per week.

AUTO 021-022-023 AUTOMOTIVE DIAGNOSIS AND TUNE-UP I-II-III (5 cr.) (5 cr.) (5 cr.)—A study of the history of the development of the

automobile; the development, growth and potential of the automotive industry and related industries. A study of diagnostic and car care clinics and automotive maintence and repair facilities in the local area. Instruction on the mechanical operation of the internal combustion engine and its supporting electrical, fuel, lubricating and cooling systems. The basic theory and function of each system is demonstrated, possible defects along with the troubleshooting methods are explored and logical diagnosis and corrective procedures are demonstrated and practiced. Experience is provided the student with emphasis on troubleshooting and complete engine tune-up to the point that he is a craftsman with ability to compete with mechanics of proven ability. Lectures 2 hours, Laboratory 6 rours, Total 8 hours per week.

AUTO 024-025 AUTOMOTIVE FUEL SYSTEMS I-II (4 cr.) (4 cr.)—The 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. Estimation of repairs and adjustments to be made and the cost of these repairs and adjustments. Lectures 2 hours, Laboratory 4 hours, Total 6 hours per week.

AUTO 100 INTRODUCTION TO AUTOMOTIVE TECHNOLOGY (3 cr.) —A study of the history of the development of the automobile; the development, growth and potential of the automotive industry and related industries; introduction in opportunities and advantages of an automotive career. A study of diagnostic and car care clinics and automobile maintenance and repair facilities in the Northern Virginia area. Lecture 3 hours per week.

AUTO 101-102-103 AUTOMOTIVE SYSTEMS TECHNOLOGY I-II-III (3 cr.) (3 cr.) (3 cr.)—Instruction on the basic systems of an automobile, the engine, fuel, exhaust, electric, lubrication, cooling, transmission, steering, brake and suspension systems. The basic theory and function of each system is explained and the operation is demonstrated in the laboratory. Lectures 2 hours, Laboratory 3 hour, Total 5 hours per week.

AUTO 181-182-183 AUTOMOTIVE DIAGNOSTIC TECHNOLOGY I-II-III (2 cr.) (2 cr.) (2 cr.)—Introduction to the principles of automotive maintenance using modern diagnostic methods. Theory and laboratory experiments designed to explain and illustrate the scientific basis of modern electronic and mechanical diagnostic procedures. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

AUTO 201-202-203 AUTOMOTIVE SYSTEMS TECHNOLOGY IV-V-VI (4 cr.) (4 cr.) (4 cr.)—Prerequisite AUTO 103 and MATH 113 or equivalent. Advanced theory and detailed study of the basic systems of the automobile. Laboratory periods provide the student with actual field practice in troubleshooting. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

AUTO 271-272 SHOP MANAGEMENT AND CUSTOMER RELATIONS I-II (3 cr.) (3 cr.)—A study of basic shop layout, personnel management, cost analysis, record keeping, and quality control. The shop manager, service salesman and service writer's role in customer relations. Lectures 3 hours per week.

AUTO 281-282-283 AUTOMOTIVE DIAGNOSTIC TECHNOLOGY IV-V-VI (4 cr.) (4 cr.) (4 cr.)—Prerequisite AUTO 183 and MATH 113 or equivalent (AUTO 272 is a prerequisite for AUTO 283). Detailed training in the application of modern electronic and mechanical diagnostic procedures in the evaluation of the operational condition of automobiles. Safety and economy of operation are stressed. The student acquires actual diagnostic experience in the laboratory under the supervision of experienced instructors. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

AUTO 299 SEMINAR AND PROJECT IN AUTOMOTIVE TECHNOLOGY (2 cr.)—A selection and completion of an individual project related to the stu-

dent's occupational objective and designed to combine theoretical concepts with practical applications by cooperative arrangements with industry and automotive businesses. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in automobile technology.

BIOLOGY

BIOL 006 BASIC BIOLOGY (4 cr.)—A foundation course in general biology designed to develop a basic understanding of plant and animal life. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

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 plant and animal life; evolutionary processes; adaptation of organisms to their environments. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

BIOL 151-152 HUMAN ANATOMY AND PHYSIOLOGY I-II (5 cr.) (5 cr.)—Structure and function of the body; organization of tissues, organs and systems. Detailed study of structure and function of selected body systems. Lectures 4 hours, Laboratory 3 hours, Total 7 hours per week.

BIOL 166 MICROBIOLOGY (3 cr.)—The characteristics and activities of micro-organisms, showing their essential relation to diagnosis, treatment and prevention of disease. Fundamentals of bacteriology, mycology and parasitology, emphasizing relationship to individual and community health. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

BIOL 201-202-203 GENERAL BIOLOGY IV-V-VI (4 cr.) (4 cr.) (4 cr.)—Prerequisite BIOL 103 or equivalent. Physiological aspects of living systems with emphasis on relationship of form and function; principles of physiology and anatomy. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

BUSINESS ADMINISTRATION

BUAD 100 INTRODUCTION TO BUSINESS (3 cr.)—Prerequisite ENGL 101 must have been taken previously or must be taken concurrently. An orientation course designed to give the student a general acquaintance with all types of business, organization, structure, legal aspects and management operations. The various phases of business are studied from an operational point of view. Lectures 3 hours per week.

BUAD 106 OFFICE PROCEDURES (2 cr.)—This course is designed to enable the student to understand general office routines such as work flow, time scheduling, filing and communications. Lectures 2 hours per week.

BUAD 111-112-113 ACCOUNTING I-II-III (4 cr.) (4 cr.) (4 cr.)—A course designed to provide an understanding of the fundamentals of accounting. Content includes the accounting cycle, journals, ledgers, working papers, and the preparation of financial statements under the various forms of business ownership. Lectures 3 hours, Laboratory 2 hours, Total 5 hours per week.

BUAD 121-122 RECORD KEEPING I-II (3 cr.) (3 cr.)—A course designed to concentrate on the keeping of financial, personnel, inventory and other records in the office. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

BUAD 130 MARKETING PRINCIPLES AND PRACTICES (3 cr.)—A course in the principles, methods and problems involved in the distribution and marketing of goods and services. It includes a study of the various marketing agents: wholesaler, broker, agent, cooperative and trade association. Discussions of present day problems and policies connected with the distribution and sale of commodities, pricing, advertising and promotion, and buyer motivation. Lectures 3 hours per week.

BUAD 137 SALESMANSHIP; CONCEPTS AND MANAGEMENT (3 cr.)—This program carries beyond the basic study of the development of selling standards, methods and buying motives. It will develop the organization and training processes necessary for a well coordinated sales plan through united effort by the sales force. The objective is the training of sales personnel for maximum efficiency in selling. Lectures 3 hours per week.

BUAD 156 OFFICE MACHINES (2 cr.)—A course to develop proficiency in the use of office machines such as calculators and adding machines. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

BUAD 160 SURVEY 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. Lectures 3 hours per week.

BUAD 161 PRINCIPLES OF REAL ESTATE I (3 cr.)—Practical application of real estate management principles. Includes a study of contracts, deeds, mortgages, bonds, leases, search, real property leasing and appraisal. Lectures 3 hours per week.

BUAD 162 PRINCIPLES OF REAL ESTATE II (3 cr.)—Prerequisite BUAD 250. Continuation of Real Estate I with more detailed examination of the fundamentals already exposed in the first course. Particular attention is given to the techniques required for the proper selection, analysis and listing of real properties. How to determine needed data, how to analyze, forms and records for recording and presenting data. Lectures 3 hours per week.

BUAD 170 BUSINESS ORGANIZATION AND MANAGEMENT (3 cr.)—Prerequisite BUAD 100. This course deals with the basis of management and the management functions: planning, organizing, staffing. directing and controlling. Management is examined as a science and an art with emphasis on both the formal body of knowledge and the personal abilities required of the successful manager. Lectures 3 hours per week.

BUAD 174-175 SMALL BUSINESS MANAGEMENT I-II (3 cr.) (3 cr.)—A study of management problems that relate to the small-scale entrepeneur. Includes problems in initiating the business, financial and administrative control, marketing programs and policies, management of business operations, legal and governmental relationships. Also includes case studies involving actual business situations. Lectures 3 hours per week.

BUAD 176 RETAIL ORGANIZATION & MANAGEMENT (3 cr.)—Prerequisite BUAD 130. The student learns how businesses are organized to carry out their goals in the most effective and efficient manner possible. Beginning with location, the course covers layout, internal management, policy development, methods of operation, merchandise control and protection, property maintenance and analysis of results. Lecture 3 hours per week.

BUAD 180 HUMAN RELATIONS AND LEADERSHIP AT A SUPERVISOR'S LEVEL (3 cr.)—The task of management involves getting things done through people. It follows that understanding of human motivation and behavior is a major key to effective leadership. Examines functions in terms of behavior patterns, performance, understanding why people act like people and analyzes manpower growth in an organization. Lectures 3 hours per week.

BUAD 190 COORDINATED OCCUPATIONAL EXPERIENCE (1 cr.)—This course may be repeated for credit. A minimum of 500 hours per year of occupational training is required of all students majoring in Distribution. The directed training is conducted in select retail, wholesale or service businesses through a contractual arrangement between the College, the student and the business management, whereby a varied program of on-the-job training is outlined and

completed. The student will be evaluated frequently both by management and the College coordinator. Students will receive full prevailing wages for their work. The 500 hour requirements may be completed during the school year outside of school hours, or during summer and vacation periods. Laboratory 3 hours per week.

BUAD 211-212-213 PRINCIPLES OF ACCOUNTING I-II-III (4 cr.) (4 cr.) (4 cr.)—The fundamental principles and elements of accounting. Lectures 3 hours, Laboratory 2 hours, Total 5 hours per week.

BUAD 214-215-216 INTERMEDIATE ACCOUNTING I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite BUAD 111-112-113. Extensive analysis of the principal elements of accounting systems and statements. Lectures 4 hours per week.

BUAD 219 MANAGERIAL ACCOUNTING (3 cr.)—Prerequisite BUAD 215. Preparation, analysis and interpretation of accounting and financial data for managerial purposes. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

BUAD 220 COST ACCOUNTING (3 cr.)—Prerequisite BUAD 111-112-113. Studies in accounting systems, methods and statements involved in process and job cost accounting, with attention to the use of standards and cost controls. Lectures 3 hours per week.

BUAD 227 AUDITING (3 cr.)—Prerequisite BUAD 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.

BUAD 230 COLOR, LINE AND DESIGN IN RETAILING (3 cr.)—The vital role played by Color and Design in almost every aspect of the marketing of consumer goods in today's economy. The emphasis on styling, packaging, advertising and professional layouts. Basic sketching for art forms, balance and color harmony will be emphasized along with recognition of basic period architecture as applied to consumer goods today. Lectures 3 hours per week.

BUAD 236 MERCHANDISE BUYING AND CONTROL (3 cr.)—A study of the place of buying and inventory control in the merchandising cycle, plus the techniques used in developing merchandise plans, model stock, unit control and inventory systems. Merchandise selection policy and pricing for profits are also covered. Lecture 3 hours per week.

BUAD 237 ADVERTISING AND DISPLAY (3 cr.)—A survey of the forms of advertising and the principles of display as they apply to retail and other distributive businesses. Emphasis will be placed on the principles of layout and copy, media selection, analysis of costs and results and the coordination of advertising and display activities within the store. Lecture 3 hours per week.

BUAD 238 SALES PROMOTION AND CUSTOMER RELATIONS (3 cr.)—The scope and total activities of a sales promotion program designed to coordinate advertising, display and publicity. The effective use of the sales force and store policies to develop favorable customer relationships. Institutional practices which develop good will for the store. Lecture 3 hours per week.

BUAD 239 FASHION MERCHANDISING (3 cr.)—A knowledge of Fashions, including a study of development, trends and changes makes the task of the buyer, the manager and the salesman much easier. Customer attitudes and behaviorism toward style and fashion details are emphasized. Lectures 3 hours per week.

BUAD 240 BUSINESS FINANCE (3 cr.)—An introduction to the problems involved in the acquisition and use of funds necessary to the conduct of business. The course covers sources and instruments of capital and finance, financial organization and financing of operations and adjustments. Lecture 3 hours per week.

BUAD 241-242-243 BUSINESS LAW I-II-III (3 cr.) (3 cr.) (3 cr.)—The application of rules of law to the operation of a business. It covers the legal aspects of the principal instruments of business activity, rights and liabilities of business principals and agents, formation and dissolution of ownership forms and the legal aspects of negotiable instruments and securities. Lecture 3 hours per week.

BUAD 246 MONEY AND BANKING (3 cr.)—A review of the history of American banking institutions; banking theories, principles and practices; emphasis is placed on relationship of finances to business structure, operation and organization; present day financial structures, agents, problems and institutions are examined in depth. Lectures 3 hours per week.

BUAD 248 BUSINESS TAXES (3 cr.)—A study of applicable federal, state and local taxes and their implications in terms of business ownership, policy and operations. Lectures 3 hours per week.

BUAD 260 LAND PLANNING AND USE (3 cr.)—A basic course in developing understanding of all aspects of land value and usage, planning, zoning regulations, building and site requirements, sanitary and utilities among other details, highest and best use concept, population analysis, influence of market forces and public policies. Lectures 3 hours per week.

BUAD 263 REAL ESTATE ECONOMICS (3 cr.)—The nature and classification of land economics, the development of property, construction and subdivision, economic values and real estate evaluation, real estate cycles and business fluctuations, residential market trends, rural property and special purpose property trends. Lectures 3 hours per week.

BUAD 264 PROPERTY MANAGEMENT (3 cr.)—An overview in understanding the field of property management, the professional aspects of real estate brokerage, leases, leaving procedures and requirements, managing residential and commercial properties, neighborhood analysis, tenants and qualifications, aspects of maintenance and repair. Lectures 3 hours per week.

BUAD 265 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, and other types covered in previous courses, includes loan application, relations between correspondent and investor, construction loans. Lectures 3 hours per week.

BUAD 266 REAL ESTATE (3 cr.)—Practical application of real estate management principles. Includes a study of contracts, deeds, mortgages, bonds, leases, search, real property leasing and appraisal. Lectures 3 hours per week.

BUAD 267 REAL ESTATE APPRAISAL (3 cr.)—Fundamentals of real estate valuation and methods used in determining value, application of procedure and techniques is made meaningful by utilizing actual appraisals. The course will include the opportunities available in the appraisal field and the background required for successful participation in this field of real estate activity. Lectures 3 hours per week.

BUAD 268 REAL ESTATE SALES (3 cr.)—This course covers the fundamentals of sales principles as they apply to real estate. Attention is directed to the prospect, his motives, his needs, and his abilities to buy real estate. The course will examine relations of broker and salesmen, salesmen and client and community responsibilities. Writing contracts, closing and settlement, and follow-up relations will be covered. Lectures 3 hours per week.

BUAD 269 LEGAL ASPECTS OF REAL ESTATE (3 cr.)—A study of Virginia real estate law, including rights incident to property ownership and management, agency, contracts and application to real estate transfer, conveyancing, probate proceedings, trust transactions. Lectures 3 hours per week.

BUAD 277 PURCHASING AND MATERIALS MANAGEMENT (3 cr.)—A study of the principles of purchasing and management of industrial inventories, including determination of requirements, pricing, source selection and inventory policy and control. Lectures 3 hours per week.

BUAD 278 PRODUCTION PLANNING (3 cr.)—A study of the fundamentals of production planning and control. It covers plant layout, manpower, equipment and inventory planning, production forecasting, scheduling and control and statistical quality control. Lectures 3 hours per week.

BUAD 286 PERSONNEL MANAGEMENT (3 cr.)—A course in the problems and issues involved 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. Lectures 3 hours per week.

BUAD 290 COORDINATED OCCUPATIONAL EXPERIENCE (1 cr.)—A minimum of 500 hours per year of occupational training is required of all students majoring in Distribution. This directed training is conducted in select retail, wholesale or service businesses through a contractual arrangement between the College, the student and the business management, whereby a varied program of on-the-job training is outlined and completed. The student will be evaluated frequently both by management and the College coordinator. Students will receive full prevailing wages for their work. The 500 hour requirement may be completed during the school year outside of school hours, or during summer and vacation periods. This course may be repeated for credit. Laboratory 3 hours per week.

BUAD 294 INTRODUCTION TO BUSINESS STATISTICS I (3 cr.)—This course covers the collection, tabulation and graphic presentation of data concerning business activity, economic trends and cycles and similar fields, and the application of these techniques in solving practical business problems. Lectures 3 hours per week.

BUAD 295 BUSINESS STATISTICS II (3 cr.)—Prerequisite BUAD 294. A study of statistical and probability techniques and their use. Specific topics include the principal statistical concepts and techniques and their applications, including analysis, and the use of graphic presentation and solutions. Lectures 3 hours per week.

BUAD 299 SEMINAR AND PROJECT IN BUSINESS ADMINISTRATION (2 cr.)—A selection and completion of an individual project related to the student's occupational objective and designed to combine theoretical concepts with practical applications by cooperative arrangements with business and industry. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in business administration.

CHEMISTRY

CHEM 006 BASIC CHEMISTRY (4 cr.)—A foundations course in general chemistry designed to develop a basic understanding of inorganic and organic chemistry. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

CHEM 100 INTRODUCTION TO CHEMISTRY (4 cr.)—An introductory survey of chemistry for students not intending to pursue this science further. Lectures will emphasize basic principles of inorganic chemistry; laboratory will be illustrative of the principles considered. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

CHEM 101-102-103 GENERAL CHEMISTRY I-II-III (4 cr.) (4 cr.) (4 cr.) —Course designed to introduce the student to fundamental laws and theories of chemistry; the most important elements and their compounds; the basic facts,

the properties and uses of the more important metallic and non-metallic elements and their general importance. The laboratory work in the third quarter includes qualitative analysis. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

CHEM 111-112-113 GENERAL INORGANIC CHEMISTRY I-II-III (4 cr.) (4 cr.) (5 cr.)—Fundamental principles and laws underlying chemical action with special emphasis on the non-metals and their compounds and theories and problems concerning them. The laboratory work for the first two quarters of the course deals chiefly with the non-metallic elements and their compounds. The last quarter deals with the theories of qualitative analysis. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week. (Laboratory for CHEM 113 is 6 hours.)

CHEM 151-152 HEALTH SCIENCE CHEMISTRY I-II (4 cr.) (4 cr.)—This is primarily an introductory course in chemistry for students in the health sciences. It deals with the basic principles of inorganic, organic and biological chemistry. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

CHEM 221-222-223 QUANTITATIVE ANALYSIS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite CHEM 103 or CHEM 113 or equivalent. The theory and practice in standard methods of gravimetric, volumetric, colorimetric and electrometric analysis. Special emphasis is placed on equilibrium in acid-base and oxidation-reduction equations, as well as the stoichiometry of chemical reactions. The third quarter is devoted to instrument analysis. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

CHEM 241-242-243 ORGANIC CHEMISTRY I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite CHEM 103 or CHEM 113 or equivalent. A year course in the fundamentals of organic chemistry. The structure, physical properties, synthesis and typical reactions of the various series of aliphatic, alicyclic and aromatic compounds are studied with attention to reaction mechanisms. In the laboratory representative carbon compounds are synthesized with emphasis on basic laboratory techniques. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

CHEM 267 INSTRUMENT ANALYSIS FOR CHEMISTRY (3 cr.)—The use of various instruments in chemical analysis including calibration; representative titrimetric, gravimetric, and colorimetric determinations; the pH Meter; the filter photometer, the spectrophotometer, flame photometer, refractometer, polarimeter, emission spectrograph; potentiometric titrator, electroanalyzer, polarograph; gas and other chromotographic apparatus, and geiger counter. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

CIVIL TECHNOLOGY

CIVL 124-125 CIVIL ENGINEERING DRAFTING I-II (2 cr.) (2 cr.) (2 cr.)—Prerequisite ENGR 100 and DRFT 126. A two-course sequence in drawing designed to acquaint the student with the basic terminology and drafting procedures related to structural (steel, reinforced concrete and timber) detailing and highway drafting. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

CIVL 140 CONSTRUCTION PLANNING (3 cr.)—A basic course introducing the fundamental materials and equipment used in civil engineering construction. An introduction to the basic principles of construction planning is included. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

CIVL 180 ELEMENTS OF SURVEYING (4 cr.)—Introduction to the basic elements of surveying. Lecture and laboratory on the use and care of the modern survey equipment and the application of surveying in engineering construction. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

CIVL 204-205 CIVIL ENGINEERING TECHNOLOGY I-II (4 cr.) (4 cr.)—Application of the principles of mechanics to the analysis and design of civil

engineering structures, particularly in the areas of building and highway construction. Timber, steel and concrete structures are considered. Laboratory periods are distributed between design problem and materials testing. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

CIVL 219 BUILDING DESIGN (4 cr.)—Commercial-industrial building design, with emphasis on estimating, preparation, and reading of specifications and working drawings. Materials and methods of architectural construction. Lectures 4 hours per week.

CIVL 227 STRUCTURAL DRAFTING (4 cr.)—Designed to teach the fundamentals of structural drafting which includes the basic design and fabrication of frame connections, column detailing, welding connections, shop details, and general drafting room procedure. Laboratory work includes making drawings of timber, steel, and reinforced concrete structures. Lectures 2 hours. Laboratory 6 hours. Total 8 hours per week.

CIVL 249 CONSTRUCTION CONTRACTS, SPECIFICATIONS, CODES (3 cr.)—Prerequisite or corequisite CIVL 248 (for architecture program only—ARCH 112 and 142). Explores purpose and preparation of contracts and specifications with examination of sources of necessary information. Discusses preliminary specifications, construction supervision, local and national code requirements, relationships to government and commercial agencies, schedule and performance. Lectures 3 hours per week.

CIVL 256 SOIL MECHANICS (3 cr.)—A study of soil in its relationship to engineering construction. The topics covered include soil density, sampling soil water, origin and nature of soil, flow nets and seepage forces, classification frost action, stabilization, stress, consolidation, settlement, shearing strength, stability, embankments, dams, retaining walls, piles and underground conduits. The laboratory work covers ASTM and AASHO specifications used in classifying and predicting the behavior of soils. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

CIVL 257 SOILS TECHNOLOGY (4 cr.)—Prerequisite or corequsite CIVL 256. Detailed study of the properties of soils and the identification, classification and testing of soils to determine their suitability for use in engineering projects. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

CIVL 258 CONCRETE TECHNOLOGY (4 cr.)—Prerequisite or corequisite CIVL 256. Introduction to the basic properties of portland cement concrete. Various methods of designing concrete mixtures and the mixing, testing and quality control during construction are considered. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

CIVL 259 BITUMINOUS TECHNOLOGY (4 cr.)—Prerequisite or corequisite CIVL 256. Introduction to the basic properties of bituminous materials (primarily asphalt cement as used in highway construction). The testing of asphalt materials and the quality control of asphalt concrete mixtures are considered. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

CIVL 264 WATER RESOURCES TECHNOLOGY I (4 cr.)—Introduction to the basic elements of hydrology and hydraulic systems as related to engineering projects. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

CIVL 265 WATER RESOURCES TECHNOLOGY II (3 cr.)—Prerequisite CIVL 264. Continuation of CIVL 264 with emphasis on the application of hydraulic principles to the problems of water quality control. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

CIVL 270 TRAFFIC AND TRANSPORTATION TECHNOLOGY (4 cr.)—Introduction to the techniques of carrying out traffic and transportation surveys. The application of survey data to the planning, design and operation of modern

transportation systems is covered. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

CIVL 280 ADVANCED SURVEYING (4 cr.)—Prerequisite CIVL 180. Closure and area computations, United States system of land surveys, stadia, contours, building layouts, lines and grades. Field topographic surveys and city surveys. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

CIVL 286 ADVANCED SURVEYING (3 cr.)—Prerequisite CIVL 180 and MATH 113. Introduction to the basic principles of aerial photogrammetry and photo interpretation. The application of these modern techniques in the fields of engineering and planning is discussed. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

CIVL 299 SEMINAR AND PROJECT IN CIVIL TECHNOLOGY (2 cr.)—A selection and completion of an individual project related to the student's occupational objective and designed to combine theoretical concepts with practical applications by cooperative arrangements with industry. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in civil technology.

DATA PROCESSING TECHNOLOGY

DAPR 037 KEY PUNCH OPERATION (15 cr.)—Prerequisite typing skill of 30 wpm or permission of Department Chairman. A comprehensive occupational course designed to train the student to an employable level as a key punch operator in twelve weeks. In addition to the development of keyboard competency, this course includes an introduction to data processing principles. Lectures 5 hours, Laboratory 20 hours, Total 25 hours per week.

DAPR 100 INTRODUCTION TO DATA PROCESSING (4 cr.)—Prerequisite one year of high school algebra. An introduction to basic methods, techniques and systems of manual, mechanical and electronic data processing. Covers the history and development of punch card data processing and electronic or automatic data processing. Monitors and controls digital computers to process predefined business or other data according to operating instructions. Lectures 3 hours, Laboratory 2 hours, Total 5 hours per week.

DAPR 106 PRINCIPLES OF DATA PROCESSING (3 cr.)—Prerequisite one year high school algebra. An introduction to basic methods, techniques and systems of manual, mechanical and electronic data processing. Covers the history and development of punch card data processing and electronic or automatic data processing. Monitors and controls digital computers to process predefined business or other data according to operating instructions. Lectures 3 hours per week.

DAPR 111 UNIT RECORD I (3 cr.)—Prerequisite DAPR 100 or DAPR 106 or equivalent. Basic operating, wiring and control of data processing machines other than electronic digital computers. The machines include the card punch, verifier, interpreter, sorter and document originating machine. Experience is provided with the equipment in the data processing center using business problems for "hands-on" machine concept. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 112 UNIT RECORD II (3 cr.)—Prerequisite DAPR 111. Comprehensive exercises are executed, involving the planning and wiring of a range of unit record equipment. Particular emphasis is placed on the accounting machine. Actual experience is provided with the equipment in the data processing center. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 116 UNIT RECORD APPLICATIONS (3 cr.)—Prerequisite DAPR 112. Designed to introduce the student to the basic concepts, objectives and

general approaches to typical data processing applications, including accounts receivable, accounts payable, payroll and inventory control. Practical laboratory experience is provided on the punched card equipment of the data processing center. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 121 COMPUTER PROGRAMMING I (3 cr.)—Prerequisite DAPR 112. A basic course in programming electronic digital computer for those who plan to be programmers, computer operators or those whose work may be closely related to computer applications in business and industry. Course covers problems of data processing or coding with emphasis on symbolic programming techniques. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 122 COMPUTER PROGRAMMING II (3 cr.)—Prerequisite DAPR 121. A continuation of the basic computer programming course. The major emphasis is placed on the development of programming techniques. Symbolic programming will be continued. Students should become proficient in programming of card system problems. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 184 UNIT RECORD PROCESSING EQUIPMENT I (4 cr.)—Prerequisite DAPR 100. Basic operation and control of data processing machines, with major emphasis toward the tabulating equipment. The machines include card punch, verifier, sorter, interpreter, document originating machine, collator and accounting machine. This course specifically designed for Unit Record Operator certificate. Lecture 3 hours, Laboratory 4 hours, Total 7 hours per week.

DAPR 185 UNIT RECORD PROCESSING EQUIPMENT II (6 cr.)—Prerequisite DAPR 184. A continuation of the Unit Record Operation I with particular emphasis placed on the accounting machine. Comprehensive exercises are given, involving the planning and wiring a range of unit record equipment. This course specifically designed for Unit Record Operator certificate. Lecture 3 hours, Laboratory 6 hours, Total 9 hours per week.

DAPR 186 UNIT RECORD APPLICATIONS (6 cr.)—Prerequisite DAPR 185. Designed to introduce the Unit Record student to the basic concepts, objectives and approaches to typical Data Processing Application. The students will develop a solution to a problem through implementation developed by the instructional staff in accounts receivable, accounts payable, payroll and inventory control. This course specifically designed for Unit Record Operator certificate. Lecture 3 hours, Laboratory 6 hours, Total 9 hours per week.

DAPR 221 COMPUTER PROGRAMMING III (3 cr.)—Prerequisite DAPR 122. An introduction to the concepts of magnetic tape utilization and to the programming techniques required for effective use of magnetic tape storage. In addition, principles of random access storage devices and drum programming will be introduced. The student will reinforce and augment theoretical material and extend the programming techniques available to him by additional "hands-on" practical work in the data processing center. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 222 COMPUTER PROGRAMMING IV (3 cr.)—Prerequisite DAPR 221. The study and development of programming capability in the business computer language COBOL. Upon completion of the course, a student can expect to be able to program in this language. The course will cover the relative advantages and disadvantages of the use of this higher level language in installations using medium-scale and large-scale computer systems. In addition, the student will continue the study of magnetic tape and random access programming. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 223 COMPUTER PROGRAMMING V (3 cr.)—Prerequisite DAPR 222. Advanced programming systems and other higher level languages will be

covered. The student will gain some proficiency in the use of these systems, and he will understand the advantages and disadvantages of their use in medium-scale and large-scale computer systems. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 226 COMPUTER PROGRAM APPLICATIONS (3 cr.)—Prerequisite DAPR 122. Designed to introduce the student to computer solutions of data processing applications. Practice problems will include combined applications in a simulated business. Installation management principles will be taught. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 241 SYSTEMS ANALYSIS I (3 cr.)—Prerequisite DAPR 122. A study of computer types and relationship of hardware configuration to applications. A study of the techniques and principles of file structuring for internal and external memory devices. Discussion of standard design techniques: systems flow vs. detailed program flow charting. Lectures 3 hours per week.

DAPR 242 SYSTEMS ANALYSIS II (3 cr.)—Prerequisite DAPR 241. Designed to familiarize the student with the various types of programming systems. The study will cover assembly and compiler systems, macro generators, report generators, utility systems: 1/0, sort/merge, print. Lectures 3 hours per week.

DAPR 243 SYSTEMS ANALYSIS III (3 cr.)—Prerequisite DAPR 242. An introduction to the problems of system evaluation. Discussions will include timing factors, testing techniques, error control, a survey of the various types of reports involved in systems implementation, an understanding of the role of management. Lectures 3 hours per week.

DAPR 298 INDIVIDUAL FIELD PROBLEM (6 cr.)—Prerequisite DAPR 226. A field project in which the student will be directed through a real data processing problem in business or industry, or a special problem developed by the instructional staff. The student will develop the solution from problem definition through implementation. One hour control class. Laboratory 18 hours per week.

DAPR 299 SEMINAR AND PROJECT IN DATA PROCESSING (2 cr.)—A selection and completion of an individual project related to the student's occupational objective and designed to combine theoretical concepts with practical applications by cooperative arranegments with industry and business. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in data processing.

DRAFTING AND DESIGN

DRFT 071 BASIC BLUEPRINT READING I (2 cr.)—Reading and interpreting various kinds of blueprints and working drawings. Making simple sketches, two and three dimensional. Lectures 1 hours, Laboratory 3 hours, Total 4 hours per week.

DRFT 111 DRAFTING I (2 cr.)—Prerequisite 2 years of high school algebra, plane and solid geometry. Co-enrollment in Math III highly recommended. (High school mechanical drawing courses desirable, but not required.) Introduction to the techniques and instruments required for success as a draftsman in industry. Content will include use of instruments, lettering, simple descriptive and analytic geometry principles as applied to drafting; basic principles of orthographic projection are used in the preparation of simple drawings. Emphasis will be placed upon the making of a careful analysis of each problem before attempting to graphically solve the problem. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

DRFT 112 DRAFTING II (2 cr.)—Prerequisite DRFT 111. New materials introduced will include sections and conventions, fasteners, freehand sketching

as required; introduces principles of isometrics; additional drawing skill is developed through more complicated drawings. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

DRFT 113 DRAFTING III (2 cr.)—Prerequisite DRFT 112. Special emphasis on assembly drawings, working from the simple to the complex. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

DRFT 126 INTRODUCTION TO GRAPHIC REPRESENTATION (3 cr.)—Basic course in drawing, introduction to the use of instruments, lettering, sketching, and elementary drawing conventions. The importance of neat, legible drawings and the value of visual presentations in technology are discussed. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

DRFT 131 MECHANICAL DRAFTING I (5 cr.)—An introduction to Mechanical Engineering Drawing with heavy emphasis on industrial drafting practices. Course content includes: geometric construction, principles of orthographic projection, sections, theory and application of dimensioning and tolerancing. Lettering practice and technical sketching are also covered. Lectures 2 hours, Laboratory 12 hours, Total 14 hours per week.

DRFT 132 MECHANICAL DRAFTING II (5 cr.)—Prerequisite DRFT 131. Class activities include fasteners, preparation of assembly drawings and working drawings, shop practices and inspection procedures as they relate to the working drawing. Continued emphasis is placed on lettering skill and freehand sketching. Lecture 2 hours, Laboratory 12 hours, Total 14 hours per week.

DRFT 133 MECHANICAL DRAFTING III (5 cr.)—Prerequisite DRFT 132. This course is designed to focus the knowledge and skills acquired on practical industrial drawing problems. True position dimensioning, electrical drawings, piping and reproduction methods are discussed. Flat pattern layout, gearing and design layout drawings are presented with emphasis on communication through graphic language. Lectures 2 hours, Laboratory 12 hours. Total 14 hours per week.

DRFT 256 ELECTRONICS DRAFTING (2 cr.)—Fundamental principles, practices and methods of presenting electromechanical information through the graphic language. Principles of projection, fastening, materials and finishes, chassis design and fabrication, electronic symbology, diagrammatic drawings, printed circuit drawings and checking of electronic drawings. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

DRFT 266 STRUCTURAL DESIGN I (4 cr.)—A study of the design of the major structural elements used in framing commercial buildings with steel and timber. Design procedures for beams and girders and columns are presented, and methods of fastening are shown. Laboratory work consists of computations that follow and expand the principles explained in the classroom. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

DRFT 267 STRUCTURAL DESIGN II (4 cr.)—Prerequisite DRFT 266. This study covers approximately the same topics as DRFT 266 except the material studied is concrete, both plain and reinforced. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ECONOMICS

ECON 160 AMERICAN ECONOMICS (3 cr.)—A survey of the history, principles, and policies of the American economic system. Some comparison with alternative economic systems. Lectures 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 organization of business, labor and government institutions and economic stability and growth. Measurements of economic activity. Private enterprise, economic growth and stabilization policies, monetary and fiscal policy. International economic relationships, alternative economic systems. Lectures 3 hours per week.

ELECTRONIC TECHNOLOGY

ELEC 114 FUNDAMENTALS OF DIRECT CURRENT (4 cr.)—MATH 111 or MATH 121 must have been taken previously or must be taken concurrently. A study of current flow and direct current circuits. The course presents work with magnetic circuits. This course utilizes mathematical tools as they are developed in the mathematics course. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 115 FUNDAMENTALS OF ALTERNATING CURRENT (4 cr.)—Prerequisite ELEC 114, MATH 112 or MATH 122 must have been taken previously or must be taken concurrently. The study of time varying currents. The student will use complex numbers and vector concepts in dealing with A.C. impedances. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 116 CIRCUIT ANALYSIS (4 cr.)—Prerequisite ELEC 115, MATH 113 or MATH 123. A course emphasizing A.C. circuit theory and both A.C. and D.C. network theorems. Course provides a continuation of study of background information needed to analyze networks with both active and passive elements present. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 119 ELECTRICAL SHOP (1 cr.)—A course designed to familiarize the student with the use of hand tools commonly found in the electrical and electronics industry. A variety of projects requiring fabrication of electrical-mechanical equipment are performed. Laboratory 3 hours per week.

ELEC 120 INTRODUCTION TO TUBES AND TRANSISTORS (4 cr.)—Prerequisites ELEC 114 and MATH 111 or MATH 121 must have been taken previously or must be taken concurrently. A course concerned with how electronic devices work and the characteristics of these devices. Both tube and solid state device characteristics are covered. This course utilizes the mathematical tools as they become available and the ideas of electronic flow and circuit analysis as they are developed in the fundamentals of electricity course. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 124 ELECTRONICS I (5 cr.)—Prerequisites ELEC 114 and ELEC 120. A course dealing with special electronic devices and power supplies. Lectures 4 hours, Laboratory 3 hours, Total 7 hours per week.

ELEC 126 AMPLIFIERS (4 cr.)—Prerequisites ELEC 115 and ELEC 124. A continuation of electronic devices, in that many of the devices previously studied are used in forming amplifier circuits. Amplifiers, both transistor and tube types, are covered with emphasis on methods of analysis and design procedures. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 227 PULSE AND SWITCHING CIRCUITS (3 cr.)—Prerequisites ELEC 116, ELEC 126, and MATH 112 or MATH 122. A course dealing with both linear and nonlinear wave shaping. This course supplies a base for further study in the areas of computers and automatic controls. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

ELEC 241 COMMUNICATIONS I (4 cr.)—Prerequisites ELEC 116, ELEC 126. An introduction to modulation and power in modulated waves. Topics included are sinusoidal oscillations and oscillators, RF amplifiers and detectors and AM receivers. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 242 COMMUNICATIONS II (4 cr.)—Prerequisite ELEC 241. A study of transmitters and receivers. Topics included are FM receivers, RF power ampli-

fication, AM SSB and FM transmitters, and an introduction to transmission lines and antennas. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 243 COMMUNICATIONS SYSTEMS (4 cr.)—Prerequisite ELEC 242. A study of microwave systems. Topics included are microwave tubes, waveguides, antennas and measurements at microwave frequencies. Also, an introduction to radar and television systems is presented. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 249 PRINCIPLES OF TELEVISION ELECTRONICS (3 cr.)—A lecture-demonstration course dealing with the special devices and techniques associated with monochrome and color, broadcast and industrial television transmission and reception. Specifically included are the standards of American television electronics as set down by the National Association of Broadcasters (NAB). Cameras and television receivers are given special emphasis. Lectures 3 hours per week.

ELEC 250 INTRODUCTION TO COMPUTERS (4 cr.)—Prerequisite ELEC 227. A general introduction to concepts and basic features of electronic computers. Topics include: fundamentals of internal operations, number systems, digital circuits, Boolean algebra, basic logical design techniques, analysis of input-output devices, control and arithmetic units, memory units and limited programming. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 260 CONTROL CIRCUITS (4 cr.)—Prerequisite ELEC 227. The principles and applications of electrical controllers are covered in this course, which serves as an introduction to automation. Devices for differentiation, integration and proportioning are studied in detail. Hardware and circuitry for AC and DC industrial control devices, including contactors, starters, speed controllers, time delays, limit switches and pilot devices. Application in the control of industrial equipment-motors, servo units and motor-driven actuators. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 276 INSTRUMENTS AND MEASUREMENTS (4 cr.)—Prerequisite ELEC 116 and ELEC 126. A study of basic circuits used in electronic measurements and application of these circuits in test instruments such as oscilloscopes, vacuum tube voltmeters and bridges. Further study concerned with the accuracy of measurements, how instruments work, proper use of instruments and calibration technique. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 287 ADVANCED CIRCUITS AND NEW DEVICES (2 cr.)—This is a unique course, since it depends so heavily on the judgment of the teaching staff. It is composed of lectures and demonstrations concerned with the latest developments in electronics. Lectures 2 hours per week.

ELEC 299 SEMINAR AND PROJECT IN ELECTRICAL ENGINEERING TECHNOLOGY (2 cr.)—A selection and completion of an individual project related to the student's occupational objective and designed to combine theoretical concepts with practical applications by cooperative arrangements with industry. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in electrical and electronics technology.

ENGINEERING TECHNOLOGY

ENGR 100 INTRODUCTION TO ENGINEERING (1 cr.)—Professional fields of engineering; the work of the engineer, requirements of training and character, professional ethics, the division of industrial practice and competition. Pure and simple problems from the various schools of engineering are used with slide-rule applications. Laboratory 3 hours per week.

ENGR 121 ENGINEERING GRAPHICS I (2 cr.)—A basic course in drawing and theories of projection. Multiview drawings, pictorial drawings and sketching, geometrical construction, sectioning, lettering, dimensioning, auxiliary views, revo-

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

ENGR 122 ENGINEERING GRAPHICS II (2 cr.)—Prerequisite ENGR 121, MATH 141. Graphical methods used in engineering design, layout and calculation. Properties and types of graphs for engineering and scientific purposes. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

ENGR 123 DESCRIPTIVE GEOMETRY (3 cr.)—Prerequisite ENGR 122. A study of the analysis and graphic presentation of the space relationship of fundamental geometric figures: point, line, plane, curved surfaces, development and vectors. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

ENGR 151 MECHANICS I (STATICS) (3 cr.)—Prerequisite MATH 122 or MATH 112. Subject matter includes principles and applications of free body diagrams for force systems, shear and moment diagrams, deflection of beams by numerical integration and determination of section properties. Lectures 3 hours per week.

ENGR 152 MECHANICS II (STRENGTH OF MATERIALS) (4 cr.)—Prerequisite ENGR 151, MATH 123 or MATH 113. A discussion of strength of material concepts with laboratory demonstrations and experiments. Subject matter includes stress and strain analysis, both elastic and plastic, with emphasis on elastic analysis of: axially loaded members; connectors; beams, and columns. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ENGR 153 MECHANICS III (3 cr.)—Prerequisite ENGR 152 and MATH 123 or equivalent. Additional topics in the study of rigid body mechanics, including kinetics, kinematics and advanced strength of materials. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

ENGR 251 ENGINEERING MECHANICS I (STATICS) (4 cr.)—Prerequsites ENGR 123, MATH 143. Corequisites MATH 241 and PHYS 221. Vector treatment of concepts of force, mass, space and time, gravitational systems of measurements, forces, moments and vector quantities; the analysis of discrete and distributed force systems and their application to bodies in external equilibrium including cranes, trusses, etc.; principles of dry friction centroids and fluid statics. Lectures 4 hours per week.

ENGR 252 ENGINEERING MECHANICS II (DYNAMICS) (5 cr.)—Prerequisite ENGR 251. Corequisites MATH 242, PHYS 222. Vector treatment of coplanar and three-dimensional kinematics and kinetics of particles and rigid bodies, including relative motion, mass moments or inertia, Newton's laws, work and energy, impulse and momentum, vibration and balancing. Lectures 5 hours per week.

ENGR 253 ENGINEERING MECHANICS III (MECHANICS OF SOLIDS) (4 cr.)—Prerequisite ENGR 251. Corequisites MATH 243, PHYS 223. Introductory mechanics of continuous media; concepts of stress and deformation due to longitudianl loads, torsion and bending; plane stress. Lectures 4 hours per week.

ENGLISH

ENGL 001 VERBAL STUDIES LABORATORY I (5 cr.)—An intensive course in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skills. Emphasis on words, phrases, and effective sentences. Individual and group instruction. Lectures 5 hours, Laboratory 10 hours, Total 15 hours per week.

ENGL 002 VERBAL STUDIES LABORATORY II (5 cr.)—An intensive course in English grammar and composition with major emphasis on exercises in the basic structure of the English language and in the writing of paragraphs and themes. Individual and group instruction. Lectures 5 hours, Laboratory 10 hours, Total 15 hours per week.

ENGL 003 VERBAL STUDIES LABORATORY III (5 cr.)—A more advanced course in the study of types of expository writing with weekly exercises based on student's needs. Lectures 5 hours, Laboratory 10 hours, Total 15 hours per week.

ENGL 011 VERBAL EXPRESSION I (3 cr.)—A course designed as one of a series to improve the student's written and spoken communication. Review of effective writing practices. Emphasis on practical application; the writing of instructions, explanations, business letters, job applications, summary paragraphs. Lectures 3 hours per week.

ENGL 012 VERBAL EXPRESSION II (3 cr.)—Prerequisite ENGL 011 or equivalent. Continued practice in the methods of informative writing, outlining, reading for understanding, and vocabulary building. Practice in listening and speaking: giving and following instructions, explanations, interviewing for a job, short informative talks. Lectures 3 hours per week.

ENGL 013 VERBAL EXPRESSION III (3 cr.)—Prerequisite ENGL 012. A more advanced course with emphasis on unity, development and organization in writing. Intensified practice in varied speaking and writing problems and brief reports. Lectures 3 hours per week.

ENGL 040 READING IMPROVEMENT (3 cr.)—A course designed with the use of modern techniques, equipment, and materials to increase the student's comprehension, skill, and speed in reading. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

ENGL 101 COMMUNICATION SKILLS I (3 cr.)—Prerequisite satisfactory score on English Expression portion of American College Test or ENGL 003 or equivalent. An introductory course in using the English language appropriately and precisely. Designed to improve the student's ability to write effectively. Emphasis on vocabulary, spelling, and reading comprehension. Lectures 3 hours per week.

ENGL 102 COMMUNICATION SKILLS II (3 cr.)—Prerequisite ENGL 101. Designed to help students increase their competence in thinking critically, expressing their thoughts clearly, writing effectively, and appreciating the creative activity of others, by considering selected examples of communication in all mediums. Literature serves as both model and subject for students in achieving these goals. Includes basic research methods, outlining, and technical report writing. Lectures 3 hours per week.

ENGL 111-112-113 ENGLISH COMPOSITION I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite successful completion of 4 units of high school English and a satisfactory score on the English Expression portion of the American College Test or ENGL 013 or equivalent. Expository writing, ranging from single paragraphs to essays of some length and complexity. Study of the logical, rhetorical and linguistic structures of expository prose; the methods and conventions of preparing research papers; and the practical criticism of major literary types. Lectures 3 hours per week.

ENGL 121-122-123 JOURNALISM I-II-III (4 cr.) (4 cr.) (4 cr.)—Instruction and classroom practice in gathering, evaluating, and writing news. Techniques of page layout, newspaper make-up, rewriting, and editing. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

ENGL 136 SPEECH COMMUNICATIONS (3 cr.)—Proficiency in oral communication is devolped through the learning of the basic forms, uses, and techniques of speech. Emphasis on the practical aspects of speech writing, listening, and oral presentation. Includes advanced basic research techniques and technical report writing. Lectures 3 hours per week.

ENGL 221 JOURNALISM IV—NEWS WRITING (3 cr.)—Prerequisite ENGL 121 or instructor's permission. Intensive practice in reporting and news writing

for local newspapers or the college newspaper under supervision of professional journalists and the journalism faculty. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

ENGL 222 JOURNALISM V—FEATURE WRITING (3 cr.)—Prerequisite ENGL 121 or instructor's permission. Intensive practice in writing feature articles for newspapers and magazines under the supervision of professional journalists and the journalism faculty. Articles will be submitted for publication. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

ENGL 223 JOURNALISM VI—EDITING (3 cr.)—Prerequisite 9 hours of journalism and department's permission. Qualified students will receive practical experience working with professional journalists in the preparation and production of copy. Special attention will be given to the selective judgment required. Editing will be treated as a creative process. Managerial functions of the editor will be studied. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

ENGL 227 TECHNICAL REPORT WRITING (3 cr.)—A course in the basic concepts of good report writing in technical fields. Designed to give the student practice in collecting and presenting material in an orderly and correct manner. Lectures 3 hours per week.

ENGL 246 THE MODERN NOVEL (3 cr.)—Prerequisite ENGL 113, 136, or department approval. A study of the modern novel by such authors as Conrad, Camus, Tolstoy, Mann, Hemingway, Malamud, and Updike. Primarily for adult education and occupational-technical programs. Lectures 3 hours per week.

ENGL 247 THE MODERN DRAMA (3 cr.)—Prerequisite ENGL 113, 136, or department approval. A study of the works of Western Dramatists beginning with Ibsen and extending through O'Neill to Edward Albee. Principal types to include realism, naturalism, departures from naturalism. Course designed to help the student understand and enjoy dramatic literature. Primarily for adult education and occupational-technical programs. Lectures 3 hours per week.

ENGL 248 THE MODERN SHORT STORY (3 cr.)—Prerequisite ENGL 113, 136, or department approval. A study of the short story as a literary form with reading and analysis of stories by writers such as Joyce, Mansfield, Fitzgerald. Primarily for adult education and occupational-technical programs. Lectures 3 hours per week.

ENGL 249 ORAL LITERATURE (3 cr.)—Prerequisite ENGL 113, 136, or department approval. The study of historical and social aspects of oral communications media: analysis and discussion of folklore with emphasis on ballads and folk songs, epic and lyric poetry, oral traditions, television and radio plays, and their interrelation with literature. Primarily for adult education and occupational-technical programs. Lectures 3 hours per week.

ENGL 251-252-253 AMERICAN LITERATURE I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite ENGL 113 or equivalent. The cultural history of America as revealed through its major literary works and historical events. Emphasis on the ideas, themes and characteristics of an emerging national literature. 1: Colonial period to 1860; II: 1860 to 1914; III; 1914 to present. Lectures 3 hours per week.

ENGL 261-262-263 ENGLISH LITERATURE I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite ENGL 113 or equivalent. Historical survey of English literature, to include the novel, drama, and poetry. Emphasis upon development of critical judgment and taste in reading superior literature with appreciation, and in writing about it. Lectures 3 hours per week.

ENGL 280 BUSINESS ENGLISH (3 cr.)—Prerequisites ENGL 102 and 136. 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. Lectures 3 hours per week.

ENGL 286 ENGLISH AND THE LAW (3 cr.)—Prerequisite ENGL 136. A critical survey of literature based on law and order, justice and injustice, as clarified by great writers. Intensive consideration of famous trials, and other non-fictional and fictional literary works. Lectures 3 hours per week.

ENGL 287 INCIDENT INVESTIGATION REPORTING (3 cr.)—This course is designed for writing accurate and concise paragraphs and summaries of incidents, misdemeanors, and felonies. Emphasis on investigation, observation and reporting in detail. Special attention will be given to law enforcement forms for analysis and practice. Lectures 3 hours per week.

FRENCH

FREN 101-102-103 ELEMENTARY FRENCH I-II-III (4 cr.) (4 cr.) (4 cr.)—Introductory training in the speaking, understanding, reading, and writing of French. Lectures 3 hours, Laboratory and drill 2 hours, Total 5 hours per week.

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

FRENCH 231-232-233 INTRODUCTION TO FRENCH CIVILIZATION AND LITERATURE I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite FRENCH 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. Lectures 3 hours per week.

GENERAL

GENL 091-092 SEMINAR IN AMERICAN SOCIETY (1 cr.) (1 cr.)—A general survey course of the factors and forces at work in contemporary American Society. Content will be structured to develop a broad understanding of contemporary issues. Lectures 1 hour and a seminar 1 hour, Total of 2 hours per week.

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

GOVERNMENT

GOVT 080 BASIC AMERICAN GOVERNMENT (3 cr.)—A survey of the American governmental system designed primarily to familiarize the student with the general principles and basic policies of our constitutional system at the local, state and national levels. Lectures 3 hours per week.

GOVT 180 AMERICAN CONSTITUTIONAL GOVERNMENT (3 cr.)—An introductory course in American government, including fundamental concepts and principles of our constitutional system at the national, state and local levels. Lectures 3 hours per week.

GOVT 186 NATIONAL, STATE AND LOCAL GOVERNMENT (5 cr.)—A study of American government at the national, state and local levels. Credit cannot be obtained for this course and either GOVT 180 or GOVT 187. Lectures 5 hours per week.

GOVT 187 AMERICAN NATIONAL GOVERNMENT (5 cr.)—Covers, in depth, the organization, structure and functions of the national government in the United States. Credit cannot be obtained for this course and either GOVT 180 or GOVT 186. Lectures 5 hours per week.

GOVT 188 STATE AND LOCAL GOVERNMENT (5 cr.)—A study of the theory, structure and functioning of, and interrelationships among, state and local governments in the United States, with illustrations from Virginia jurisdictions. Lectures 5 hours per week.

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. Lectures 3 hours per week.

GOVT 296 SEMINAR IN PUBLIC AFFAIRS (2 cr.)—Prerequisites GOVT 180 or equivalent. Seminar in current public affairs concerning domestic and foreign policy of the United States. Purpose is to develop the ability to analyze and critically evaluate present problems as they relate to the functioning of the United States. Lectures and seminars 2 hours per week.

HEALTH SCIENCES

HLTH 100 CONCEPTS OF HEALTH AND ILLNESS (2 cr.)—Emphasizes the maintenance of health and prevention of illness at the personal and community level. It is designed to acquaint students with the causes of illness, the body's response to illness and some methods of diagnosis, treatment and prevention of illness. Some principles of care common to all patients will be introduced. Lectures 2 hours per week.

HISTORY

HIST 101-102-103 HISTORY OF WESTERN CIVILIZATION I-II-III (3 cr.) (3 cr.) (3 cr.)—The development of civilization from ancient times to the present. The 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-II (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 UNITED STATES HISTORY I (3 cr.)—The political, social and economic development of the United States from the settlement of the colonies to the Civil War. Emphasis will be given to the intellectual theories and forces of various periods and to their impact upon contemporary events and the American character. Lecture 3 hours per week.

HIST 115 UNITED STATES HISTORY II (3 cr.)—The political, social and economic development of the United States from the Civil War to the present. Emphasis will be given to the transition of the United States into a World power and to contemporary intellectual movements in the twentieth century. Lecture 3 hours per week.

HUMANITIES

HUMN 201-202-203 SURVEY OF WESTERN CULTURE I-II-III (3 cr.) (3 cr.) (3 cr.)—A survey of the Western world which correlates the art, music and literature of the following periods: Greek and Roman, Middle Ages, Renaissance, Elizabethan, Victorian, Neo-classical and Modern. Lectures 3 hours per week.

INDUSTRIAL TECHNOLOGY

INDT 111-112 MATERIALS AND PROCESSES OF INDUSTRY I-II (3 cr.) (3 cr.)—The objective of this course is to familiarize the student with the ma-

terials and processes of modern industry from the drafting and design point of view. The physical properties of industrial materials such as ferrous, non-ferrous metals, woods, plastics and clay products will be studied in terms of design application, processing and fabricating methods. Students will be introduced to cutting, cold forming, hot working, welding, foundry and chipless manufacturing processes which are widely employed in contemporary industry. In addition, the science of precision measurement as applied to inspection practices will be studied. Lectures 3 hours per week.

INDT 141 METHODS OF MANUFACTURE I (3 cr.)—An introduction to an understanding of the processes and equipment used in the manufacture of metal parts, plastic materials; information includes design cost and material and tool forms involved in selecting a method of manufacture. Lectures 3 hours per week.

INDT 142 METHODS OF MANUFACTURE II (3 cr.)—Prerequisite INDT 141. Emphasis on the understanding of production techniques, production tools; includes discussions of lathes, millers, shapers, jig borer; machine controls and inspection techniques. Lectures 3 hours per week.

INDT 176 PLANT 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 of same. Lectures 2 hours per week.

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

MATHEMATICS

MATH 001-002-003 DEVELOPMENTAL MATHEMATICS I-II-III (5 cr.) (5 cr.) (5 cr.)—This practical course bridges the gap between a weak mathematical foundation and the knowledge necessary for the study of advanced mathematical courses in technical and professional programs. It presupposes little or poor background of secondary school mathematics. Arithmetic, algebra, and geometry will be covered. Lectures 5 hours, Laboratory 10 hours, Total 15 hours per week.

MATH 011-012-013 ELEMENTS OF MATHEMATICS I-II-III (3 cr.) (3 cr.) (3 cr.)—Designed for the occupational student. This course involves practical applications of elementary mathematics, including algebra, geometry, and trigonometry, to the common everyday problems in the manufacturing and trade world. The instructional material meets the full requirements for elementary mathematics in the machinist, drafting, toolmaking, and auto mechanic trades. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

MATH 031-032 BASIC ALGEBRA I-II (5 cr.) (5 cr.)—Fundamentals of algebraic calculations for students who want a basic review of the principles of algebra. The first course (MATH 031) reviews introductory algebra and the second course (MATH 032) reviews the second year of high school algebra. The course will provide the necessary proficiency in algebra required for entry into an associate degree program. Lectures 5 hours per week.

MATH 036 BASIC PLANE GEOMETRY (5 cr.)—Fundamentals of plane geometry for students who want an introductory review of plane geometry. The course will provide the necessary proficiency in plane geometry required for entry in an associate degree program. Lectures 5 hours per week.

MATH 038 BASIC TRIGONOMETRY (5 cr.)—Fundamentals of trigonometry for students who want an introductory review of trigonometry. Lecture 5 hours per week.

MATH 039 REVIEW OF ALGEBRA AND TRIGONOMETRY (5 cr.)—Prerequisite MATH 001-002-003 or equivalent. Trigonometric functions, graphic representations, logarithms, laws of sine and cosines, trigonometric equations, inverse functions, and complex numbers. Lectures 5 hours per week.

MATH 050 BASIC BUSINESS MATHEMATICS (3 cr.)—This course provides a review of the fundamentals of mathematics related to business activities. Particular emphasis is placed on the use of percents. Discounts, interest, depreciation, insurance calculations and other practical business problems are studied. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

MATH 111 TECHNICAL MATHEMATICS I (3 cr.)—Prerequisite satisfactory mathematics score on the ACT test and one unit of high school algebra and one unit of geometry or MATH 003 or equivalent. Designed for the technical student. Slide rule and review of geometry, basic algebra and analytic geometry of the straight line, advanced algebra and logarithms. Lectures 3 hours per week.

MATH 112 TECHNICAL MATHEMATICS II (3 cr.)—Prerequisite MATH 111. Curve sketching, non-linear empirical equations, numerical trigonometry of the right triangle, and introduction to analytical trigonometry. Lectures 3 hours per week.

MATH 113 TECHNICAL MATHEMATICS III (3 cr.)—Prerequisite MATH 112. Oblique triangles and applications of numerical trigonometry, analytical trigonometry, introduction to calculus. The intention of the calculus at this point is to introduce those techniques of calculus which will be useful to the engineering student in the pursuit of his major subjects. Lectures 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 and a satisfactory mathematics score on the ACT test or MATH 036 and MATH 038 or equivalent. Algebra, trigonometry, and introduction to calculus. 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 binomial theorem. Lectures 5 hours per week.

MATH 141-142-143 INTRODUCTORY MATHEMATICAL ANALYSIS I-II-III (5 cr.) (5 cr.) (5 cr.)—Prerequisite satisfactory mathematics score on the ACT test and four units of high school mathematics including two units of algebra, one unit of geometry, and one-half unit of trigonometry, or MATH 036 and MATH 038 or equivalent. A modern unified course in algebra, trigonometry, analytic geometry, and calculus designed primarily for engineering and science students. Lectures 5 hours per week.

MATH 151-152 BUSINESS MATHEMATICS I-II (3 cr.) (3 cr.)—Prerequisite a strong background in the basic arithmetic operation or MATH 050 or equivalent. 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. Lectures 3 hours per week.

MATH 161-162-163 COLLEGE MATHEMATICS I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite a satisfactory mathematics score on the ACT test and three units of high school mathematics including two units of algebra and one unit of geometry or MATH 032 and MATH 036 or equivalent. A modern unified course in algebra, trigonometry, analytic geometry, and calculus for students other than those in engineering. Lectures 3 hours per week.

MATH 181-182-183 GENERAL COLLEGE MATHEMATICS I-II-III (3 cr.) (3 cr.) (3 cr.)—This course is intended for students with majors other than mathematics, science or engineering. Prerequisite algebra I and either algebra II or geometry and a satisfactory mathematics score on the ACT test. Topics including sets; the logic of algebra; the real number system; algebraic and trancendental functions, relations and graphs will be covered the first two quarters. The third quarter will include permutations, combination, probability and elementary statistics. Lectures 3 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. Lectures 4 hours per week.

MATH 271-272-273 CALCULUS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite MATH 133 or MATH 163 or equivalent. Functions; analytic geometry of the plane; rate of change; limits; continuity; differentiation of algebraic functions; differentials; definite and indefinite integrals. Lectures 4 hours per week.

MECHANICAL TECHNOLOGY

MECH 114 MECHANICAL ENGINEERING DRAFTING I (2 cr.)—Prerequisite DRFT 126. A continuation of topics introduced in DRFT 126, plus threads and fasteners, sectioning, conventional representation, working drawings and some specialized drafting areas. Provides additional understanding of drafting problems and skills and techniques that are essential to the work of draftsmen. The student is given work dealing with gears, cams, jigs, and fixtures in preparation for the second year courses. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

MECH 115 MECHANICAL ENGINEERING DRAFTING II (2 cr.)—Prerequisite MECH 114. The student is given more advanced problems (including the principles of descriptive geometry) and is encouraged to analyze the problems, collect data, and make mathematical calculations, complete drawings, and check out work. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

MECH 118 TOOL DESIGN (3 cr.)—A basic course in design and layout of cutting tools, stamping tools, punches, gages, dies, blanking and forming tools, notching tools, progressive dies, embossing dies, instruction in use and application of these tools. Lecture 1 hour, Laboratory 5 hours, Total 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; emphasis will be placed on cutting speeds, tool care, tool grinding; surface grinder, milling machine operations and tools will be included. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

MECH 132 MACHINE LABORATORY II (2 cr.)—A continuation of Machine Lab I with greater emphasis on practical and industrial applications and set-up will be included; inspection tools, gauges, tapers, gear cutting, square threads and fits will also be included. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

MECH 187 INTRODUCTION TO INSTRUMENTATION (4 cr.)—Broad introduction to use of industrial electro-mechanical equipment. Provides an understanding of the methods, techniques, and skills required for installation, services and operation of a variety of industrial control systems. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 214-215 MECHANICAL DESIGN I-II (4 cr.) (4 cr.)—Prerequisite MATH 113, ENGR 152. Application of the principles of mechanics to the analysis and design of tools and machine elements, including the factors that

influence the selection of materials used in mechanical design. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 218 JIGS AND FIXTURE DESIGN (3 cr.)—Designed to give the student a thorough knowledge of the principles, practices, tools, and commercial standards of jig and fixture design. Through lectures, visual aids, and individual project and design work, the student becomes well acquainted with the many types of jigs and fixtures and their design. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

MECH 246 METALLURGY (4 cr.)—Prerequisite INDT 142. Fundamentals of metallurgy, grain size, effect of 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 (4 cr.)—Prerequisite PHYS 103, MATH 113. Basic thermodynamics; characteristics of gases; applied study of steam cycles and combustion processes. Laboratory includes application of principles covered in lecture. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 266 FLUID POWER (4 cr.)—Prerequisite PHYS 101. Introduction to the analysis and design of pneumatic control systems. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 286 PRECISION MEASUREMENTS (3 cr.)—A study of the various precision measuring instruments and their uses in modern industry. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

MECH 299 SEMINAR AND PROJECT IN MECHANICAL TECHNOLOGY (2 cr.)—A selection and completion of an individual project related to the student's occupational objective and designed to combine theoretical concepts with practical applications by cooperative arrangements with industry. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in machine and mechanical technology.

MUSIC

MUSC 121-122-123 INTRODUCTION TO MUSICAL LITERATURE (3 cr.) (3 cr.) (3 cr.)—The study of representative musical composition from the Middle Ages to the present. The purpose of this study is to train students in intelligent listening and to provide them with an understanding of our musical heritage and will serve as a basis for lifelong interest in music. No previous knowledge of music is required. Lectures 3 hours per week.

MUSC 236 THE HISTORY OF JAZZ (3 cr.)—Prerequisite ENGL 102 or department approval. A study of the underlying elements of jazz, concentrating on its cultural sources and historical development from its earliest stages to the present. Illustrated by musical examples through recordings and other audio-visual devices. No previous knowledge of music required. Lecture 3 hours.

NATURAL SCIENCE SURVEYS

NASC 100 SURVEY OF SCIENCE (4 cr.)—A general survey course designed to familiarize the student with the basic principles of biological and physical sciences. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

NASC 126 SCIENCE IN INDUSTRY (3 cr.)—This course is designed to provide a background in the physical sciences for the draftsman and other industrial workers. A study of the laws and principles of physics, chemistry and other fields of science with consideration to their relationship to industrial processes, products and methods will be undertaken. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

NURSING

NURS 121 FUNDAMENTALS OF NURSING I (4 cr.)—Corequisites: BIOL 151, HLTH 100, PSYC 110. Emphasizes the development of beginning nursing skills essential to meeting basic physical, psychological, and social needs of patients through lecture, campus laboratory experiences, and selected clinical laboratory experiences in cooperating health and welfare agencies. Lecture 3 hours, Laboratory 4 hours, Total 7 hours per week.

NURS 122 FUNDAMENTALS OF NURSING II (6 cr.)—Prerequisites and corequisites: HLTH 100, NURS 121, BIOL 152, PSYC 116. Continuation of NURS 121 with emphasis on development of nursing skills essential to meeting common patient problems resulting from illness and injury. Lecture 4 hours, Laboratory 8 hours, Total 12 hours per week.

NURS 123 FUNDAMENTALS OF NURSING III (8 cr.)—Prerequisites and corequisites: BIOL 166, NURS 122, PSYC 130. Continuation of NURS 122. Designed to continue development of nursing skills essential to meeting basic needs and solving common problems of patients. Emphasizes a family-centered approach to the complete care of mother and baby during the maternity cycle and general nursing care of infants and children through adolescence including preventive aspects of health care and adaptations of nursing care based upon developmental needs and tasks. Lectures 4 hours, Laboratory 16 hours, Total 20 hours per week.

NURS 211-212-213-214 NURSING IN MAJOR HEALTH PROBLEMS I, II, III, IV (8 cr.) (8 cr.) (8 cr.) (8 cr.)—Prerequisites and corequisites: NURS 123, SOCI 101, 102, 103. A course designed to acquaint the student with representative problems in the nursing care of patients of all age ranges with illness requiring medical, surgical, and psychiatric care. The selection of content and related clinical experiences will enable the nursing student to further develop the knowledge and nursing skills which are necessary to provide nursing care designed to meet each patient's particular needs. The scope, prevention, diagnosis, treatment, and control of major areas of illness in the United States will be considered. Selected clinical experiences in co-operating health and welfare agencies. Lecture 4 hours, Laboratory 16 hours, Total 20 hours per week.

NURS 299 SEMINAR IN NURSING (1 cr.)—Corequisite: NURS 214. A course designed to prepare the student for her role as a graduate, registered nurse. Emphasis is on career opportunities, professional organizations, legal and ethical implications, and methods of planning and assigning patient care. Seminar method primarily used. 2 hours per week.

PHILOSOPHY AND RELIGION

PHIL 101 INTRODUCTION TO PHILOSOPHY I (3 cr.)—Reading and informal discussion of Plato's Republic and the writings of several recent thinkers who deal with the problems of economics, society, and government in their relation to human welfare in general. Lectures 3 hours per week.

PHIL 102 INTRODUCTION TO PHILOSOPHY II (3 cr.)—An introductory study of some basic philosophical problems concerning the perception and belief of man in society. Lectures 3 hours per week.

PHYSICAL EDUCATION

PHED 108 FOUNDATIONS OF PHYSICAL ACTIVITY (1 cr.)—A course designed to study the concepts concerning the role of physical activity in daily living. The course investigates: (a) the methods of personal evaluation of physical fitness, and performance, (b) the ways to make meaningful interpretations of the

findings of such evaluations, and (c) the ways to design activity programs and patterns that will meet one's needs, now and in the future. Lecture 1 hour, Laboratory 1 hour, Total 2 hours per week.

PHED 126 TENNIS (1 cr.)—Course designed for emphasis on theory, fundamental skills, practice, strategy, rules, recreational and leisure time approach, court courtesies, sportsmanship, and the "play for fun" elements. Group and individual instruction; objective to enable student to make tennis an adult recreative and leisure time sport. Laboratory 3 hours per week.

PHED 136 ARCHERY (1 cr.)—A course designed to teach the fundamental skills of both field and target archery. Laboratory 2 hours per week.

PHED 138 GOLF (1 cr.)—Course designed for emphasis on theory, fundamental skills, class practice and independent study, golf etiquette, rules and strategy. Individual and group instruction; objective to enable student to make golf an adult recreative and leisure time activity. Laboratory 3 hours per week.

PHED 139 BOWLING (1 cr.)—Course designed for emphasis on fundamental skills, practice, bowling etiquette, sportsmanship, and basic rules. Group and individual instruction; objective to enable student to make bowling an adult recreative and leisure time activity. Laboratory 3 hours per week.

PHED 169 RECREATIONAL DANCE (1 cr.)—A course designed to explore the many and varied forms of dance that have been and are an integral part of social behavior. The skills and related knowledges of square dance, folk dance, and social dance—the main forms of recreational dance through the years—are included. Laboratory 2 hours per week.

PHED 176 SWIMMING (1 cr.)—A course designed to teach the fundamental strokes and techniques for beginning swimmers—advanced acquatics skills for experienced swimmers. Laboratory 2 hours per week.

PHED 177 ANGLING AND CASTING (1 cr.)—A course designed to teach the fundamental skills of fresh water fishing—spinning, spin casting, bait casting, fly fishing and fly tying. It includes the selection and care of equipment, sportsmanship, conservation, and safety. Laboratory 2 hours per week.

PHYSICS

PHYS 006 BASIC PHYSICS (4 cr.)—A foundations course in general physics designed to develop a basic understanding of physics. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

PHYS 101-102-103 INTRODUCTORY PHYSICS I-II-III (4 cr.) (4 cr.) (4 cr.)—A survey of general physics, treating briefly the fundamentals of mechanics, properties of matter, heat, magnetism, electricity, sound, light, and radiation. Lecture 3 hours, Lab 3 hours, Total 6 hours per week.

PHYS 221-222-223 COLLEGE PHYSICS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite: MATH 143 and Corequisite MATH 241 or equivalent. General college physics for students of engineering and the mathematical sciences. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

POLICE SCIENCE

PLCE 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. Open to all students as exploratory course. Lectures 3 hours per week.

PLCE 110 PATROL ADMINISTRATION (3 cr.)—The theories, history and development of police patrol. Examines the methods and techniques of the vari-

ous types of patrol and their importance to the overall police function. Focuses on the responsibilities of patrol officers and supervisors in identifying police hazards, preventing crime, providing police services, and establishing sound public relations. Practical exercises are included. Lectures 3 hours per week.

PLCE 111 POLICE ORGANIZATION AND ADMINISTRATION I (3 cr.)—Prerequisite PLCE 100. Principles of organization and administration in law enforcement; functions and activities; planning and research; public relations, personnel and training; inspection and control; policy formulation. Lectures 3 hours per week.

PLCE 112 POLICE ORGANIZATION AND ADMINISTRATION II (3 cr.)—Prerequisite PLCE 111. Principles of organization and administration as applied to operational services. Patrol; criminal investigation; intelligence and vice units; juvenile units; traffic administration. Lectures 3 hours per week.

PLCE 120 SPECIAL ENFORCEMENT PROBLEMS (3 cr.)—Crowd control during civil demonstrations, picketing, rioting and other emergency situations; the police role in civil defense; police problems caused by narcotics addiction; the handling of mentally or emotionally abnormal persons. Lecture 3 hours per week.

PLCE 126 PREVENTION AND CONTROL OF JUVENILE DELINQUENCY (3 cr.)—Survey of youth crime, stressing the police role in community programs of prevention and control. Lectures 3 hours per week.

PLCE 130 CRIMINAL LAW (3 cr.)—Major crimes; their classification, elements of proof, intent, conspiracy, responsibility, parties and defense. Emphasis on the common law and Virginia adaptations. Lectures 3 hours per week.

PLCE 136 LEGAL EVIDENCE (3 cr.)—Kinds, degrees and admissibility of evidence, methods and techniques of its acquisition and use in criminal proceedings. Moot court activities are included. Lectures 3 hours per week.

PLCE 150 INTRODUCTORY POLICE PHOTOGRAPHY (2 cr.)—Fundamental photographic skills; uses of photography in law enforcement and in courtroom presentations. Practical exercises are included. Lecture 1 hour, Laboratory 2 hours per week.

PLCE 160 POLICE COMMUNICATION AND RECORDS (3 cr.)—Principles of organization and administration as applied to auxiliary services. Records and communications, custody, central services and police logistics. Special attention to police applications of electronic data processing and the collection of performance data. Lectures 3 hours per week.

PLCE 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 are included. Lectures 3 hours per week.

PLCE 228 LAW ENFORCEMENT AND THE COMMUNITY (3 cr.)—An examination of the current efforts undertaken by the police to achieve an effective working relationship with the community. Among the topics studied in depth are the police image, crisis areas, public and police attitudes, and community relations activities. Lectures 3 hours per week.

PLCE 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 to, 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 written permission of the instructor. Lectures 3 hours per week.

PLCE 244 PRINCIPLES OF CRIMINAL INVESTIGATION (3 cr.)—Conduct at the crime scene; collection and handling of evidence; interviewing and interrogations; obtaining statements, admissions and confessions; testifying in court. Practical exercises are included. Lectures 3 hours per week.

PLCE 245 ADVANCED CRIMINAL INVESTIGATION (3 cr.)—Prerequisite PLCE 244. Continued study of the investigative process; introduction to scientific aids and examinations; application of investigative techniques to specific offenses. Practical exercises are included. Lectures 3 hours per week.

PLCE 270 INDUSTRIAL AND COMMERCIAL SECURITY (3 cr.)—Organization, methods, techniques and equipment for physical protection of industrial and commercial facilities and prevention of theft of merchandise and valuables by persons within and without those facilities. Practical exercises are included. Lectures 3 hours per week.

PLCE 276 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.

PLCE 299 SEMINAR AND PROJECT IN LAW ENFORCEMENT (2 cr.)—An examination of selected, critical problems in law enforcement. Student selection, with the approval of the instructor, of a research topic for the preparation and discussion of a paper which is pertinent to a timely topic in law enforcement or to anticipated employment in a federal, state or local law enforcement agency. Limited to students who have successfully completed five quarters of the program in Police Science or who have secured written permission of the instructor.

PSYCHOLOGY

PSYC 016 THE PSYCHOLOGY OF SUCCESSFUL LIVING (3 cr.)—Studies of the attitudes and habits of successful people and of the psychological principles involved in their success. Emphasis on particular principles may vary with the interests of the individual class, but the principles of adjustment and of effective study usually will be included. Lectures 3 hours per week.

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. Credit cannot be received for both this course and PSYC 117. Lectures 3 hours per week.

PSYC 116 THE PSYCHOLOGY OF PERSONAL ADJUSTMENT (3 cr.)—Prerequisite PSYC 110. 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. Credit cannot be received for both this course and PSYC 117. Lectures 3 hours per week.

PSYC 117 BASIC PRINCIPLES OF PSYCHOLOGY APPLIED TO PERSONAL ADJUSTMENT (5 cr.)—The general principles of perceptions, learning and conscious and unconscious motivation which are operative in all practical applications of psychology. Application of these principles to the development of a mature personality and problems of everyday life. Effective methods of study and work. Credit cannot be received for both this course and PSYC 116. Lectures 5 hours per week.

PSYC 130 CHILD GROWTH AND DEVELOPMENT (3 cr.)—Prerequisite PSYC 110 or instructor's permission. The development of the child from one stage of growth to the next, concentrating on the physical, intellectual, social and emotional factors in his personality. Recent studies in child development will be presented. The course is designed to provide a background for those students

who intend to become nurses, teachers, or enter other occupations involving continuous work with children. Lectures 3 hours per week.

PSYC 201-202-203 GENERAL PSYCHOLOGY I-II-III (3 cr.) (3 cr.) (3 cr.) —The principles of behavior with a relating of experimental data to practical problems: the measurement of ability, sensory and perceptive processes, organic basis of behavior, hereditary, maturation, learning and thinking, motivation, emotion, personality and social factors in behavior. Lectures 3 hours per week.

PSYC 226 PSYCHOLOGICAL ASPECTS OF MANAGEMENT (3 cr.)—Prerequisite PSYC 110. Psychological principles applied to business. Supervision, communication, employee relations, group dynamics, employee selection. Lectures 3 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. Lectures 3 hours per week.

RADIO AND TELEVISION TECHNOLOGY

RDTV 040 BASIC ELECTRICITY FOR RADIO (6 cr.)—Basic concepts of electric and magnetic fields; identification of electrical components and their electrical symbols; reading schematic diagrams; wiring, circuit tracing, use of hand tools, measuring instruments, VTVM VOM, Oscilloscopes, Ohm's Law, series circuits, Parallel Circuits, Kirchoff Laws, voltage, current, and resistance. D. C. Theory, A. C. Theory, Thevenin's Theorem; Norton's Theorem, Lissajous Patterns. Lectures 4 hours, Laboratory 4 hours, Total 8 hours per week.

RDTV 041 RADIO RECEIVER CIRCUITS (6 cr.)—Inductance, capacitance, impedance, R.C. RLC Circuits. Theory and experiments with vacuum tubes and transistors; Rectifiers; Amplifiers and Power Transformers, Filters, Audio Units, Detectors, Oscillators, Special Receivers. Lectures 4 hours, Laboratory 4 hours, Total 8 hours per week.

RDTV 042 RADIO TROUBLE SHOOTING (3 cr.)—Theory and Laboratory experiences with I-F Amplifiers, Converters, AVC. Super-Heterodyne Receivers, alignment, Oscillators, Calibration, R-F, Adjustment; Measurement; Analysis of Audio, R-F, I-F, and Detectors. AC-DC receivers. Testing and servicing AC-DC receivers. Power supply and filament circuits. Laboratory 8 hours per week.

RDTV 043 TV RECEIVER CIRCUITS (6 cr.)—Theory and laboratory experiences with TV; repairs, controls, and adjustments. The Cathode Ray Tubes and circuits, vertical sweep oscillator and amplifier, horizontal sweep oscillator and amplifier. Damper circuits. High voltage circuits. Deflection circuits, Synch circuits. Video Amplifiers Pic I-F Amplifiers, detectors and video amplifiers, AGC. Sound. Low voltage power supply. Lectures 4 hours, Laboratory 4 hours, Total 8 hours per week.

RDTV 044 TV RECEIVER TROUBLE SHOOTING (3 cr.)—VHF and UHF Tuners. Test points. Practical service considerations; home servicing. Alignment, Antennas, home service and repair. Color CRT: circuit, adjustments, alignment procedures. Laboratory 8 hours per week.

RDTV 045 COLOR TV CIRCUITS (6 cr.)—Theory and Laboratory experiences, with color T.V.; Color dart-bar generators; convergence circuits; purity and fine tuner adjustments; tuners; test points; antennas. Lectures 4 hours, Laboratory 4 hours, Total 8 hours per week.

RDTV 046 COLOR TV TROUBLE SHOOTING (3 cr.)—Theory and practices with trouble shooting color TV circuits; alignment; replacement of parts. Laboratory 8 hours per week.

SECRETARIAL SCIENCE

SECR 110 PERSONAL TYPING (2 cr.)—A basic course in typing designed to teach the keyboard, simple techniques; emphasis is placed on accuracy, preparation of reports, themes, essays and letters. Lecture 1 hour, Laboratory 3 hours, Total 4 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. Electric typewriters are used for training. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

SECR 112 TYPEWRITING II (3 cr.)—Prerequisite SECR 111 or placement test. Continuation of skill building with increased emphasis on standards required to meet job requirement in production typing. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

SECR 113 TYPEWRITING III (3 cr.)—Prerequisite SECR 112 or placement test. An advanced course in skill development with high standards required to meet job requirements in production typing. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

SECR 114 TYPEWRITING IV (3 cr.)—Production typing of advanced problems involved in rough drafts, tabulations, reports, and specialized business forms. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

SECR 121 SHORTHAND I (4 cr.)—Corequisite or prerequisite ENGL 101. Presentation of shorthand principles in Gregg Diamond Jubilee Series with emphasis on basic reading and writing skills, emphasizing associated vocabulary and grammar. Lectures 3 hours, Laboratory 2 hours, Total 5 hours per week.

SECR 122 SHORTHAND II (4 cr.)—Prerequisite SECR 121 or placement test. Reinforcement of shorthand principles, further development of general business vocabularies and English usage. General business dictation. Lectures 3 hours, Laboratory 2 hours, Total 5 hours per week.

SECR 123 SHORTHAND III (4 cr.)—Prereqisite SECR 122 or placement test. Increased speed in general business dictation. Introduction of specialized business dictation with emphasis on vocabularies. Lectures 3 hours, Laboratory 2 hours, Total 5 hours per week.

SECR 136 FILING AND RECORDS MANAGEMENT (2 cr.)—A comprehensive course covering indexing principles, filing procedures and techniques as applied to basic systems of filing; establishment of filing systems; selection of equipment and supplies; survey of systems using electronics and microfilm; solution of records management problems. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

SECR 156 PERSONAL DEVELOPMENT (3 cr.)—A course designed to develop the personality, appearance, and values necessary to make a favorable impression on the job. Lectures 3 hours per week.

SECR 216 EXECUTIVE TYPING (2 cr.)—Prerequisite SECR 113. Further development of speed and accuracy on production typing with emphasis on employment standards. Preparation for employers' secretarial placement examinations. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

SECR 217 TYPEWRITING SKILL BUILDING (2 cr.)—Prerequisite SECR 113. Further development of speed and accuracy on production typing with em-

phasis on employment standards. Preparation for employers' secretarial placement examinations. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

SECR 218 TECHNICAL TYPING (1 cr.)—Prerequisite SECR 216 and SECR 281 (or concurrent enrollment in SECR 281) and MATH 206. Instruction in typing reports containing special symbols. Emphasis is placed on the Greek alphabet and correct methods of typing equations, formulas, charts, and statistical tables. Use of templates and changeable type bars. Laboratory 2 hours per week.

SECR 219 MAGNETIC TAPE SELECTRIC TYPEWRITER (2 cr.)—Prerequisite permission of the instructor. Operation of automatic typewriter. Includes instruction on procedures for recording and playing back from tapes, revision and updating of tapes, and for merging information from two tapes. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

SECR 221 SHORTHAND TRANSCRIPTION I (3 cr.)—Prerequisite SECR 113 and 123. Rapid review of fundamental principles of Gregg Shorthand, Diamond Jubilee Series, development of vocabulary and phrases. Speed building on general business dictation and transcription. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

SECR 222—SHORTHAND TRANSCRIPTION II (3 cr.)—Prerequisite SECR 221 or placement test. 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 1 hour, Laboratory 4 hours, Total 5 hours per week.

SECR 223 SHORTHAND TRANSCRIPTION III (GENERAL) (3 cr.)—Prerequisite SECR 222 or placement test. Speed building in typical business dictation with a high degree of speed with accuracy in transcription from shorthand notes. Preparation for employer's secretarial placement examinations. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

SECR 226 SHORTHAND TRANSCRIPTION (TECHNICAL) (3 cr.)—Prerequisite SECR 222 or placement test. Preparation for secretarial positions in highly technical fields. Development of skill in taking dictation and transcribing material using technical vocabularies, phrases, symbols, and forms associated with electronics, engineering, and allied fields. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

SECR 227 SHORTHAND TRANSCRIPTION (LEGAL) (3 cr.)—Prerequisite SECR 222 or placement test. 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 1 hour, Laboratory 4 hours, Total 5 hours per week.

SECR 241 SECRETARIAL PROCEDURES I (3 cr.)—Corequisite SECR 216. Development of skills in operation of stencil and spirit duplicating machines. Preparation of copy for reproduction by offset, stencil and spirit process. Criteria for selecting a duplicating process. In-depth study of type styles, paper, typewriter ribbons, and carbon paper. Lectures 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, communications services, telephone techniques, and the use of reference materials. Emphasis is placed on application of skills gained in typewriting and shorthand. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 243 SECRETARIAL PROCEDURES III (3 cr.)—Prerequisite SECR 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. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 266 MACHINE TRANSCRIPTION (3 cr.)—Prerequisite SECR 216. Introduction to machine transcription, incorporating good listening techniques, grammar, punctuation, and correct business English. Emphasis is placed on mailability of copy with good production rates. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 271-272 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. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 281-282 TECHNICAL SECRETARIAL PROCEDURES I-II (3 cr.) (3 cr.)—Prerequisite SECR 241 and permission of the instructor. Training is given in the procedures unique to scientific and research organizations, including security procedures, special correspondence requirements, preparation of technical reports, proposals, and visual aids. Emphasis is placed on vocabulary development. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 299 SEMINAR AND PROJECT IN SECRETARIAL SCIENCE (2 cr.)—A selection and completion of an individual project related to the student's occupational objective and designed to combine theoretical concepts with practical applications by cooperative arrangements with industry and business offices. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in secretarial science.

SOCIAL SCIENCES

SOSC 161-162-163 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. Course materials will be presented in an integrated pattern to develop an understanding of American history, American government, American economics, and man's role in society. Lectures 3 hours per week.

SOSC 180 PROBLEMS OF MAN IN THE MODERN WORLD (3 cr.)—Survey of contemporary social, political, and economic problems connected with industrialization, urbanization, the role of government, national and international tensions. Lectures 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. Lectures 3 hours per week.

SOCI 236 MARRIAGE AND THE FAMILY (3 cr.)—A study of comparative family systems and problems related to marriage and the family. Lectures 3 hours per week.

SPANISH

SPAN 101-102-103 ELEMENTARY SPANISH I-II-III (4 cr.) (4 cr.) (4 cr.)—Introductory training in the understanding, speaking, reading, and writing of Spanish with emphasis on manipulation of the structure of the language. Lectures 3 hours, Laboratory and drill 2 hours, Total 5 hours per week.

SPAN 201-202-203 INTERMEDIATE SPANISH I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite Spanish 103 or successful completion of two years of high school Spanish and permission of the instructor. Advanced training in the under-

standing, speaking, reading, and writing of Spanish. Spanish is used in the classroom. Lectures 3 hours, Laboratory and drill 2 hours, Total 5 hours per week.

SPEECH AND DRAMA

SPDR 106 INTRODUCTION TO THE THEATRE (3 cr.)—The basic principles of theatre. The background of modern drama, play analysis, types of theatrical production, and a comparison of the stage with motion pictures, radio and television as dramatic media. Lectures 3 hours per week.

SPDR 116 FUNDAMENALS OF PLAY PRODUCTION (3 cr.)—The materials and techniques of play production with particular reference to the stage, but including a consideration of the methods of dramatic production involved in motion pictures, radio, and television. Lectures 3 hours per week.

SPDR 230 PRINCIPLES OF PUBLIC SPEAKING (5 cr.)—Prerequisite ENGL 113 or equivalent. A study of the organization and techniques of speaking in public. Development of skill in vocabulary building and speechmaking with emphasis on the effective control of voice and action. Practice in the preparation and delivery of speeches by use of tape recorders and before various size groups of persons. Lectures 4 hours, Laboratory 2 hours, Total 6 hours per week.

SPDR 266 THE ART OF THE FILM (3 cr.)—Prerequisite ENGL 102 or departmental approval. An introduction to the art of the film: a survey of the history of the film; the viewing, discussion, and analysis of selected films, past and present; introduction to film techniques—composition, shot sequence, lighting, visual symbolism, sound effects, pace of editing. Lectures 3 hours per week.

ADVISORY COMMITTEES

Advisory Committee: Accounting

Jack Blumenthal, Manager
Bradshaw's Shoe Stores
Alexandria, Virginia

Reuben B. Hicks
Box 472
Manassas, Virginia

Norman O. Jenkins
Vice-President, Personnel
Clarendon Trust Company
Arlington, Virginia

John Koehler
Olivetti Underwood Corp.
Washington, D. C.

William S. Leach
Hardware Store
Middleburg, Virginia

Frank J. Parrish, President
Certified Food Buyers Service, Inc.
Manassas, Virginia

Walter S. Quinn, Owner
Walter S. Quinn, Inc.
Alexandria, Virginia

Ralph S. Richard
Johnston, Lemon & Co.
Washington, D. C.

M. Elton Thigpen
U. S. Department of Agriculture
Springfield, Virginia

William M. Zollman, City Manager
Fairfax, Virginia

Advisory Committee: Architectural Technology

T. E. Bobbitt
Falls Church, Virginia

James M. Cole
U. S. Department of Commerce
Washington, D. C.

Leigh Conrad, Architect
Eastern Drafting & Design Corp.
Arlington, Virginia

Herman L. Courson
Springfield Surveys
Springfield, Virginia

Allen V. Dickey, Architect
Arlington, Virginia

Stephen O. Edmunds, Engineer
Falls Church, Virginia

Col. Michael C. Grenata, Ret.
Leesburg, Virginia

Reuben B. Hicks
Manassas, Virginia

Dr. David Miller, General Mgr.
American Machine & Foundry Company
Alexandria, Virginia

James Patton, Civil Engineer
Fairfax, Virginia

John B. Toomey, President
Value Engineering Company
Alexandria, Virginia

William W. Wildhack
National Bureau of Standards
Arlington, Virginia

Advisory Committee: Automotive Technology

Willard R. Clark, Service Mgr.
Fairfax Chrysler-Plymouth Corp.
Fairfax, Virginia

E. A. Coleman, Instructor
Parkside High School
Manassas, Virginia

Roy N. Colter, Representative
Allen Electric Company
Fairfax, Virginia

Martin I. Cook, Manager
Esso Service Station
Arlington, Virginia

W. D. Graham, Representative
Marquette Corporation
Falls Church, Virginia

Louis M. Hicks, President
Auto Accessories Co., Inc.
Alexandria, Virginia

Harry M. Mathews, Service Manager
Herby's Ford, Inc.
Alexandria, Virginia

William H. Milburn (or)
Joseph I. Grehan (Co-owners)
M & G Motors, Inc.
Leesburg, Virginia

Morris E. Newcomb, Instructor
W. T. Woodson High School
Fairfax, Virginia

John P. Shott, Manager
Montgomery Ward & Company
Falls Church, Virginia

William L. Smith, Owner
Smith's Center Garage
Alexandria, Virginia

Henry E. Wamsley, Asst. Serv. Mgr.
American Motors Sales Corp.
McLean, Virginia

Advisory Committee: Business Management

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Bradshaw's Shoe Stores
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M. Elton Thigpen
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Howard Gammon
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Merton S. Parsons
Department of Agriculture
Washington, D. C.

John Powell
Honeywell, Inc.
Bowie, Maryland

Arthur M. Rector, Vice President
First & Citizens National Bank
Alexandria, Virginia

Charles A. Richardson
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Advisory Committee: Electronics Technology

William S. Alberts, Vice President
D.E.C.O. Electronics
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T. E. Bobbitt
Falls Church, Virginia

Victor C. Clark
U.S. Coast Guard
Alexandria, Virginia

George De Socio, Chief Engineer
Cooke Engineering Company
Falls Church, Virginia

William E. Garner
U.S.N. Research Lab
Silver Spring, Maryland

David E. Lewis
Melpar, Inc.
Falls Church, Virginia

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