virginia western 71-72

CURRICULUMS

*Pending approval

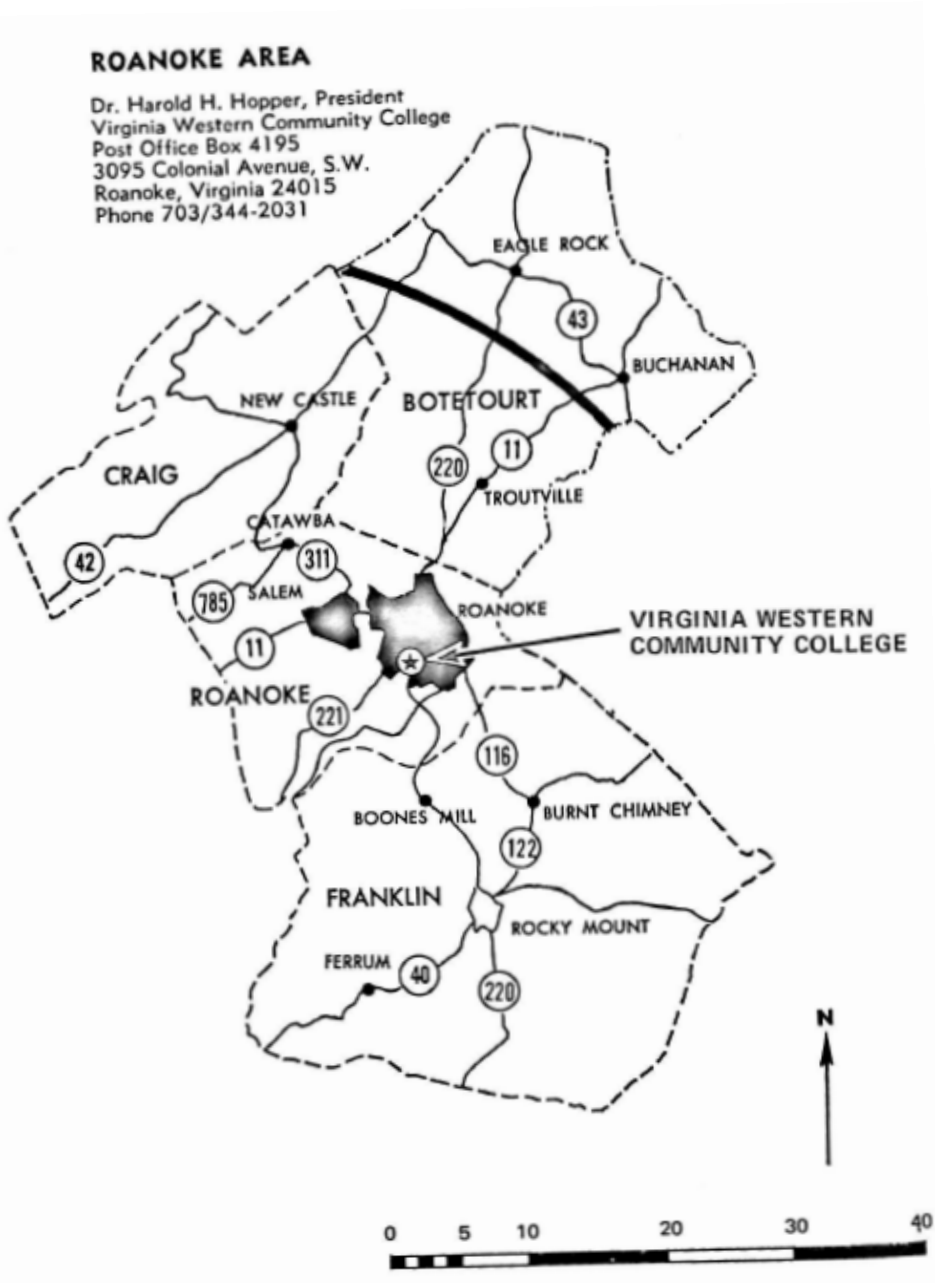
Cover Design
by
Miss Mary Collins
Student, Advertising Design

VIRGINIA WESTERN COMMUNITY COLLEGE

CATALOG

1971-72

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


ROANOKE AREA
Dr. Harold H. Hopper, President
Virginia Western Community College
Post Office Box 4195
3095 Colonial Avenue, S.W.
Roanoke, Virginia 24015
Phone 703/344-2031
EAGLE ROCK
43
BUCHANAN
NEW CASTLE
BOTETOURT
CRAIG
220
11
TROUTVILLE
CATAWBA
42
311
785
SALEM
ROANOKE
VIRGINIA WESTERN
COMMUNITY COLLEGE
11
ROANOKE
221
116
BOONES MILL
BURNT CHIMNEY
122
FRANKLIN
ROCKY MOUNT
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220
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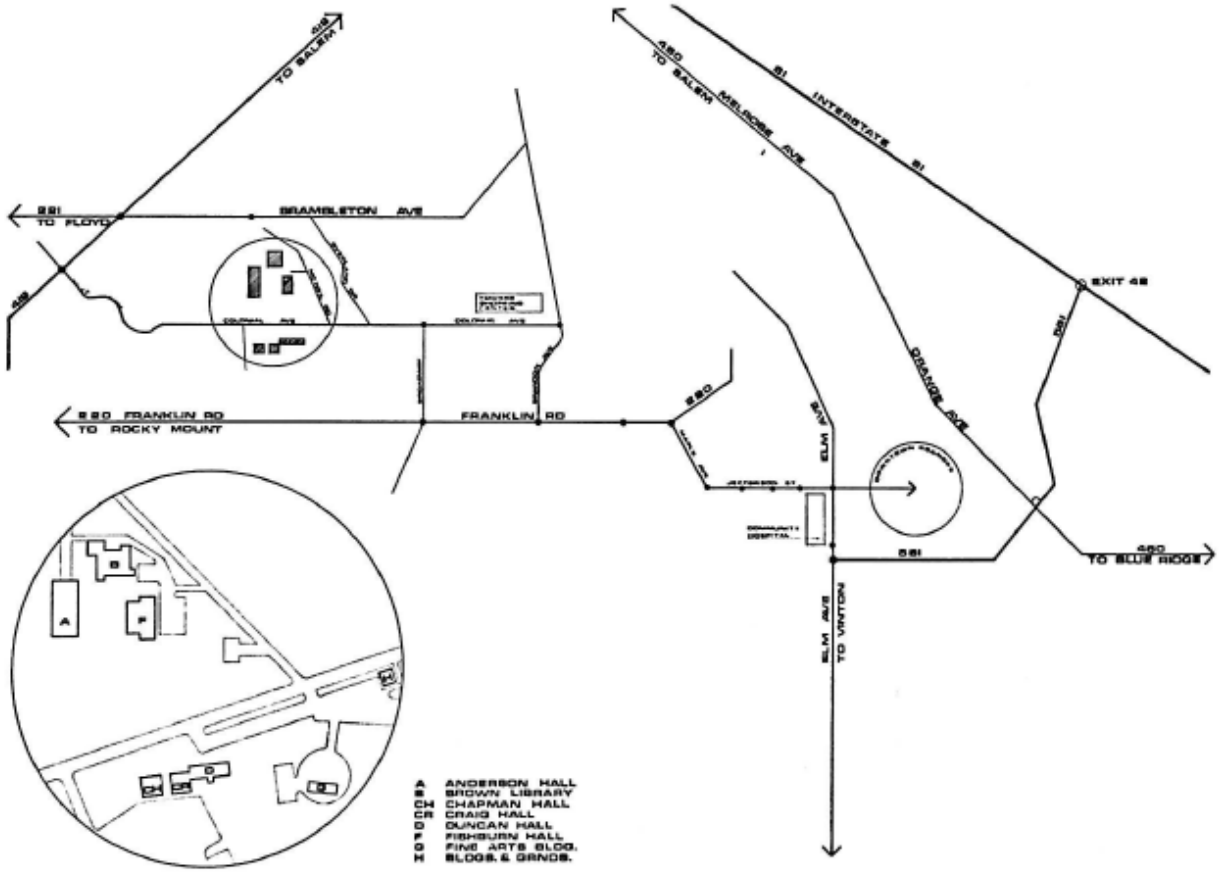

VIRGINIA WESTERN COMMUNITY COLLEGE

CONTENTS

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

CALENDAR

FALL QUARTER 1971

Faculty Report	Monday, September 13
Orientation Day for New Students	Monday-Wednesday, September 13-15
Registration	Wednesday-Friday, September 15-17
Classes Begin	Wednesday, September 22
Last Day to Add or Change Classes	Tuesday, September 28
Last Day for Withdrawal Without Penalty	Tuesday, October 12
Mid-term Grade Reports	Monday, November 1
Thanksgiving Recess	Thursday-Saturday, November 25-27
Classes End	Tuesday, December 7
Final Exams	Wednesday-Friday, December 8-10
Faculty Work Day	Monday, December 13

1971

SEPTEMBER

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OCTOBER

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NOVEMBER

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WINTER QUARTER 1972

All Faculty Report----------Monday, January 3

Orientation Day for New Students----------Monday, January 3

Registration----------Monday-Tuesday, January 3-4

Classes Begin----------Wednesday, January 5

Last Day to Add or Change Classes----------Tuesday, January 11

Last Day for Withdrawal Without Penalty----------Tuesday, January 25

Mid-term Grade Reports----------Friday, February 11

Classes End----------Tuesday, March 14

Final Exams----------Wednesday-Friday, March 15-17

Faculty Work Day----------Saturday, March 18

1971

DECEMBER

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1972

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SPRING QUARTER 1972

Faculty Report---------- Wednesday, March 22

Orientation Day for Students---------- Wednesday, March 22

Registration---------- Thursday-Friday, March 23-24

Classes Begin ---------- Monday, March 27

Last Day to Add or Change Classes---------- Friday, March 31

Last Day for Withdrawal Without Penalty---------- Friday, April 14

Mid-term Grade Reports---------- Monday, May 1

Classes End---------- Saturday, June 3

Final Exams---------- Monday-Thursday, June 5-8

Faculty Work Day---------- Friday, June 9

Graduation---------- Saturday, June 10

Last Faculty Work Day---------- Monday, June 12

1972

MARCH

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SUMMER QUARTER 1972

(Full ten-week session)

Faculty Report---------- Thursday, June 15

Registration---------- Thursday-Friday, June 15-16

Classes Begin---------- Monday, June 19

Last Day to Add or Change Classes---------- Monday, June 26

Independence Day Holiday---------- Monday, July 3

Last Day to Withdraw Without Penalty---------- Friday, July 7

Mid-term Grade Reports---------- Tuesday, July 25

Classes End ---------- Friday, August 25

Final Exams---------- Monday-Tuesday, August 28-29

Faculty Work Day---------- Wednesday, August 30

Graduation---------- Thursday, August 31

1972

JUNE

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SUMMER QUARTER 1972

(Two five-week terms with double class periods)

FIRST TERM

Faculty Work Day	Thursday, June 15
Registration	Thursday-Friday, June 15-16
Classes Begin	Monday, June 19
Last Day to Add or Change Classes	Thursday, June 22
Last Day for Withdrawal Without Penalty	Wednesday, June 28
Independence Day Holiday	Monday, July 3
Classes End	Monday, July 24
Final Exams	Tuesday, July 25
Faculty Work Day	Wednesday, July 26

SECOND TERM

Faculty Work Day	Monday, July 24
Registration	Tuesday, July 25
Classes Begin	Wednesday, July 26
Last Day to Add or Change Classes	Monday, July 31
Last Day for Withdrawal Without Penalty	Friday, August 4
Classes End	Monday, August 28
Final Exams	Tuesday, August 29
Faculty Work Day	Wednesday, August 30
Graduation	Thursday, August 31

PART I

GENERAL INFORMATION

THE COLLEGE

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

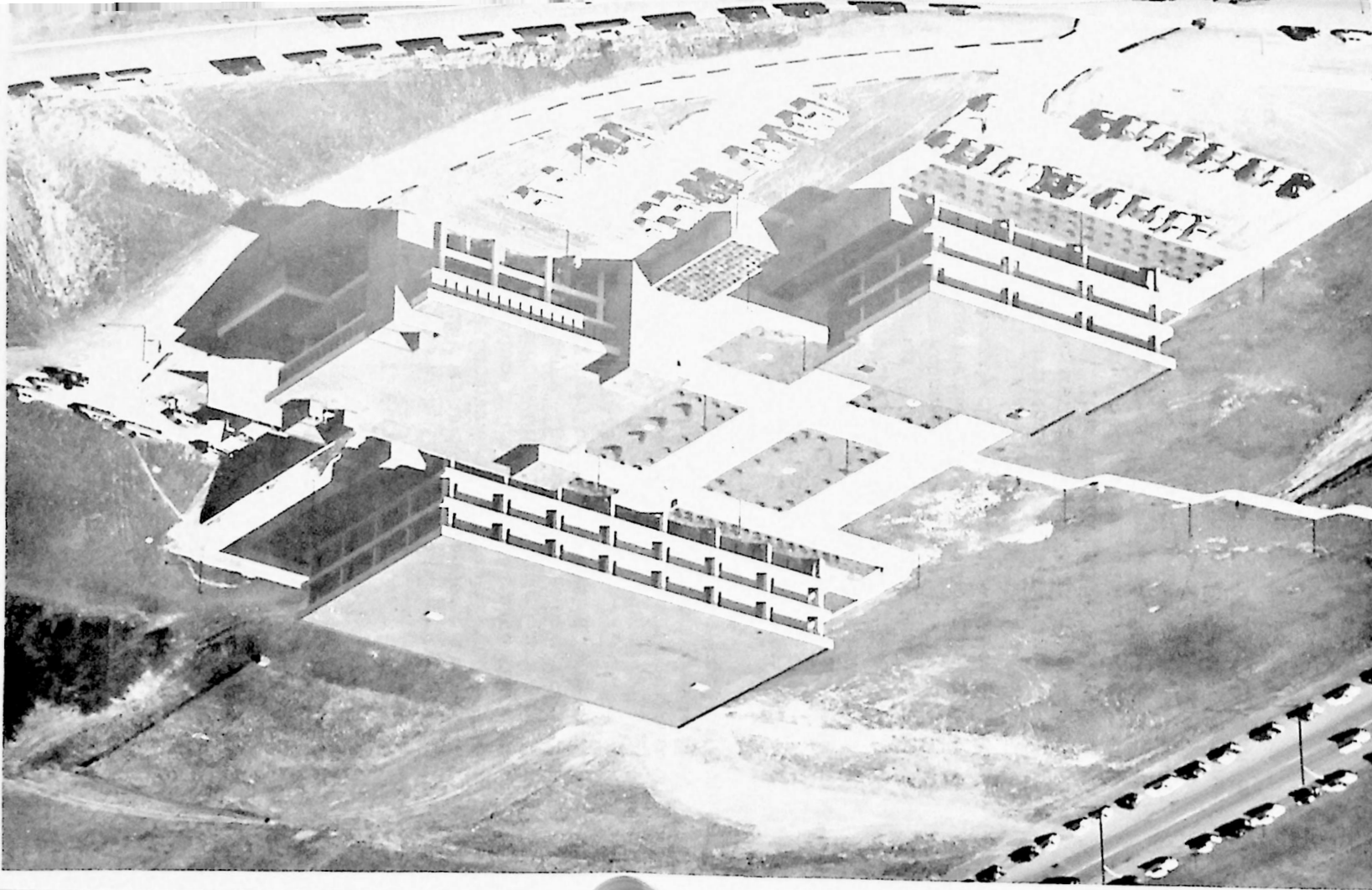
The College operates under the policies established by the State Board for Community Colleges and with the support and advice of a local Community College Board. It is financed primarily by State funds supplemented by contributions from the various local political subdivisions, individuals, and businesses.

LOCATION AND FACILITIES

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

The South Campus has four buildings which were inherited by Virginia Western from Roanoke Technical Institute in 1966. Two of these buildings house the Electrical and Mechanical Technologies Labs, one building is mostly classrooms, and one is for Music and Fine Arts.

The North Campus has three buildings surrounding a mall planted with flowers and shrubs selected to bloom alternately in each of the four seasons. The smaller of these buildings is the Administration Building that also contains Business Science classrooms. Opposite is the Science Building containing laboratories and equipment of the most modern design, Learning Laboratory, Reading Laboratory, Language Laboratory, classrooms, and faculty offices. In the center is the Library with its 23,000 volumes and the Counseling, Admissions, and Records Offices on the bottom floor.



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

HISTORY

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

PURPOSE

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

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

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

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

2. **University Parallel-College Transfer Education.** The university parallel-college transfer program includes college freshman and sophomore courses in arts and sciences and pre-professional programs meeting standards acceptable for transfer to baccalaureate degree programs in four-year colleges and universities.

3. **General Education.** The programs in general education encompass the common knowledge, skills, and attitudes needed by each individual to be effective as a person, a member of a family, a worker, a consumer, and a citizen.

4. **Continuing Adult Education.** Adult education programs are offered to enable the adults in the region to continue their learning experiences. This work includes both degree credit and non-degree credit work during the day and evening hours.

5. **Special Training Programs.** Special training may be provided where specific job opportunities are available for new or expanding industries. This special training shall be coordinated with Virginia's economic expansion efforts and with the needs of employers.

6. **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 the individual develop the basic skills and understandings necessary to succeed in other programs of the community college.

7. **Specialized Regional and Community Services.** The facilities and personnel of the College are available to provide specialized services to help meet the cultural and educational needs of the region served by the Community College. This service includes the non-classroom and non-credit programs, cultural events, workshops, meetings, lectures, conferences, seminars, and special community projects which are designed to provide needed cultural and educational opportunities for the citizens of the region.

RECOGNITION

The College is a division of the Virginia Community College System and is approved by the State Board for Community Colleges and by the State Department of Community Colleges in Virginia.

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

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.

PART II

ADMINISTRATIVE INFORMATION

ADMISSION REQUIREMENTS

General Admission to the College

Any person who hos a high school diploma or the equivalent, or who is 18 years of age, and in any case is able to benefit from a program at the College may be admitted to the College as a regular or special student when the following items hove been received by the Office of Admissions. The College reserves the right to evaluate special coses and to refuse admission to applicants when considered advisable in the best interest of the College.

For all regular students, the following items ore required:

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

For all special students, the following items ore required:

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

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

After a person hos 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 plon 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).

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

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 foundation (preparatory) study.

All regular students entering the College will be required to take the Comparative Guidance and Placement Test (CGP). The test battery is administered at the College normally prior to registration.

Persons applying for admission to an associate degree (Associate in Science, Associate in Arts, or Associate in Applied Science) program shall be a high school graduate or the equivalent or have completed an approved foundation (preparatory) program.

In addition, all students who plan to transfer to a four-year college or university which requires the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board will be requested to submit these test scores to the Community College.

Foreign Student—Admission Requirements

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

Written English proficiency will be demonstrated by submitting scores on "Test of English as a Foreign Language," administered by the College Entrance Examination Board, Princeton, N. J.

Oral English proficiency must be demonstrated by a personal interview at the College. If this is not possible, a letter from on official of the U. S. Government residing in the foreign country testifying to the student's ability will be accepted.

Financial responsibility must also be shown by stating how school and living expenses will be met.

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 subdivision supporting the College, provided such students apply for admission to the program a reasonable length of time prior to registration. The priority list is as follows: (1) residents of the political subdivisions supporting the College, (2) other Virginia residents, (3) out-of-state and foreign students.

Students Transferring from Other Colleges

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

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

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

Students Applying for Credit or Waiver of Requirements

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

Auditing A Course

Students desiring to attend a course without taking the examination or receiving credit for the course, may do so by registering to

audit that course. Degree candidates usually may not audit required courses prior to taking the course for credit. Students desiring to audit a course will register in the regular manner and pay the regular tuition. Audited courses carry no credit and do not count as a part of the student's course load. Students desiring to change status in a course from audit to credit or credit to audit must do so within the first week of the quarter. Permission of the institutional department and the Dean of Instruction is required to audit a course.

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 or part-time student working toward completion of an associate degree, diploma, certificate, or foundation program;

2. A full-time or 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 course(s) as audit for no credit;

2. A high school senior who, with the permission of his high school principal, is concurrently enrolled in a college course;

3. A part-time student not enrolled in an associate degree, diploma, or certificate program who may be taking a course(s) for credit (such students may later apply to the College for admission to a program as a regular student);

4. A student who has not yet fulfilled all of the requirements as a regular student but who is admitted under special consideration by the Admissions Committee of the College. It is expected that such students would fulfill all requirements prior to the midterm of the quarter or face dismissal from the College.

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

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

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

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

EXPENSES

Application Fee

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

Tuition

Full-time Student (12 or more credits)

Virginia Resident	$ 60.00
Out-of-State Resident	200.00

Part-time Student (less than 12 credits):

Virginia Resident	$ 5.00 per credit (or equivalent)
Out-of-State Resident	17.00 per credit (or equivalent)

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

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

Graduation Fee

A graduation fee of $10.00 shall be charged each graduating student to cover the cost of the rental of caps and gowns and the cost of the degrees, diploma, or certificates, payable at the beginning of the last quarter of instruction.

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 $35-$50 per quarter for the average full-time student. The College operates a bookstore which maintains a complete stock of books and supplies to meet the needs of students.

Refunds

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

1. Within first 15 class days of a quarter, refund will be ⅔ of the tuition;
2. Within first 16-35 class days of a quorter, refund will be ⅓ of tuition;
3. After 35 class days of a quarter hove elapsed, no refund will be made.

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

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

CREDITS

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

1. One hour of lecture plus on overage of two hours of out-of-closs study, or
2. Two hours of laboratory or shop study plus an overage of one hour of out-of-class study, or
3. Three hours of laboratory or shop study with no regular out-of-closs assignments.
4. Fixed credit and variable hours with behavioral objectives ore assigned to each Foundation Course (courses numbered 01-09).
5. Variable Credit (1-5 credits) is assigned to all Supervised Study, Seminar and Project, and Coordinated Internship courses.

GRADING SYSTEM

A	Excellent	4 grade points per credit
B	Good	3 grade points per credit
C	Average	2 grade points per credit
D	Poor	1 grade point per credit
F	Failure	0 grade points per credit
S	Satisfactory	No grade point credit (applies to specialized courses and seminars).
U	Unsatisfactory	No grade point credit (applies to specialized courses and seminars).
W	Withdrawal	No credit (A grade of withdrawal implies that the student was making satisfactory progress in the courses at the time of his withdrawal or that the withdrawal was officially made before the "deadline" date published in the college calendar).
I	Incomplete	No credit (A grade of incomplete is assigned only in cases of the student's absence from a limited number of class sessions near the end of a term or grading period and when the absence is for a verifiable unavoidable reason; i. e., sickness verified by medical statement, accident verified by police records, etc., or absence from final examination for a verifiable and unavoidable reason. An "Incomplete" must be academically removed during the ensuing quarter following the issuance of that grade unless special permission for an extension of time is given by the Dean of Instruction or his designate). (Approved March 20, 1969.)
R	Re-enroll	No credit (Credit will be given when the course objectives are completed. To be used only for courses numbered 01 through 09.)
X	Audit	No credit (Permission of the instructor and the Dean of Instruction is required to audit a class.)

The grade point average (GPA) is determined by dividing the total number of grade points earned in courses by the total number of credits attempted.

Grading-Foundation Courses

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

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

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

DEGREES, DIPLOMAS, AND CERTIFICATES

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

1. **Associate in Arts Degree (AA)** is awarded to students majoring in the liberal arts who may plan to transfer to four-year colleges or universities after completing their Community College program.
2. **Associate in Science Degree (AS)** is awarded to students majoring in specialized curriculums such as business administration, pre-engineering, pre-music, pre-teacher education, science, and other pre-professional programs who may plan to transfer to four-year colleges or universities after completing their Community College programs.
3. **Associate in Applied Science Degree (AAS)** is awarded to students majoring in one of the occupational-technical curriculums.
4. **Diploma** is awarded to students who complete one of the two-year non-degree occupational curriculums.
5. **Certificate** is awarded to students who complete one of the approved, non-degree curriculums which are usually less than two years in length.

GRADUATION REQUIREMENTS

Associate Degree Requirements

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

1. Have fulfilled all of the course requirements of his curriculum as outlined in the College catalog;
2. Have been recommended for graduation by the appropriate instructional authority in his curriculum;
3. Have completed at least 97 credits applicable to an associate degree of which 45 credits must be acquired at the College;

4. Have completed the general education requirements (study in Economics, English, Government, Orientation, and Psychology) for an associate degree;
5. Have earned a grade point average of at least 2.0 on all courses attempted which are applicable toward graduation in his curriculum;
6. Have filed an application for graduation in the Office of Admissions and Records;
7. Have resolved all financial obligations to the College and returned all library and other college materials;
8. Have attended graduation exercises.

Diploma Requirements

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

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

Certificate Requirements

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

ACADEMIC REGULATIONS

Attendance

Registration in a course presupposes that regularly scheduled classes and laboratory sessions will be attended. When absence

from a class becomes necessary it is the responsibility of the student to inform the instructor prior to the absence whenever possible. Frequent unexplained absences may result in dismissal from a course.

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

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

Change of Registration

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

1. Withdrawal from a 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 course work has been satisfactory up to that time, he will receive a grade of "W" for withdrawal. After that time the student may receive a grade of "W" if his course work has been satisfactory or will receive a failing grade of "F" if his course work has been unsatisfactory up to the time of official withdrawal. In all cases the word "Withdrawn" will be written on his permanent academic record.

2. Addition of a course:

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

3. Withdrawal from the College:

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

Academic Warning

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

Academic Probation

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

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

Academic Suspension

The student on academic probation who fails to attain a grade point average of 1.5 for the next quarter he is in attendance will be subject to academic suspension. Academic suspension normally will be for two quarters unless the student reapplies, and is accepted, for readmission to another curriculum of the College. The statement "Placed on Academic Suspension" will be placed on the student's permanent record. The student must apply for readmission under all circumstances of academic suspension.

Academic Dismissal

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

Examinations

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

Normal Academic Load

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

PART III

STUDENT SERVICES

COUNSELING

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

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

The counseling service provides individual attention and supplementation to the instructional program of the College.

TESTING

A well-planned testing program for all students is coordinated by Student Services. The Comparative Guidance and Placement Test (CGP) is required for all new students planning to enter one of the associate degree, diploma, or certificate programs. This test battery is administered at the College, normally prior to registration. In addition, all students who plan to transfer to a senior college or university which requires the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board will be requested to submit these test scores to the Community College. In addition, other special tests and inventories are available at the counseling office and may be used to help solve particular problems.

ORIENTATION

An orientation program has been established to acquaint new students with the purposes and programs of the College. The orientation program begins weeks before registration when the student may be 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 counselor and/or faculty advisor in his major curriculum to plan his program and course of studies.

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

In addition, an orientation class is provided for the first quarter for all students to aid them in their personal and academic adjustments. This orientation class is required for all newly entering full-time regular students.

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 may be composed of representatives of the administrative, counseling, and instructional staffs—appointed by the President of the College for the purpose of providing information on policies. Students wishing to apply for financial aid may secure application forms from the office of the Placement and Financial Aid Officer.

APPLICATION PROCEDURES

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

1. File application for admission to Virginia Western Community College. Application forms are available upon request from the Office of Admissions and Records, Virginia Western Community College, Box 4195, 3095 Colonial Avenue, S.W., Roanoke, Virginia 24015.
2. File application for financial assistance with the Financial Aid Officer of Virginia Western Community College. Applications ore available on request in the office of the Placement and Financial Aid Officer.
3. Have completed a "Parents' Confidential Statement" or a "Student's Confidential Statement" and submit to the College Scholarship Service, Box 176, Princeton, New Jersey, designating Virginia Western Community College (Code 5868) to receive the analysis. The statement forms are available through the office of the Placement and Financial Aid Officer.

Determination for awards will be processed when the application for financial aid and the analysis sheet from College Scholarship Service are received by the Financial Aid Officer.

Scholarships

The Community College participates with the State Teacher's Scholarship, College Service, and Notional Merit Programs. A separate pamphlet explaining all financial assistance programs is available from the office of the Placement and Financial Aid Officer.

Part-Time Employment

A placement office operates throughout the year to assist students in securing port-time employment. An effort is mode to place students in job fields which ore related to our College programs. Students who work more than 20 hours per week are advised to adjust their course loads accordingly.

(Also see section "Placement Service.")

Work-Study Program

Numerous jobs on campus ore available each year under the Work-Study Program. Application forms ore available in the office of the Placement and Financial Aid Officer.

Student Loans

Students who need student loons should contact the Financial Aid Officer for information.

Students who ore residents of Virginia ore eligible to apply for loons under the State Education Assistance Authority Plon. Loons are mode through commercial banks at favorable interest rotes and are repayable in monthly installments beginning six months ofter the student graduates or ofter 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 office of the Placement and Financial Aid Officer.

The College also participates in the Notional Defense Student Loon Program.

Vocational Rehabilitation

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

Veterans

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

Law Enforcement Education Program

A Law Enforcement Student Loan Program and Law Enforcement Student Grant Program has been established by the Law Enforcement Assistance Administration as authorized by the Omnibus Crime Control and Safe Streets Act of 1968 (PL 90-35). This grant and loan program is designed to encourage and assist persons pursuing, or interested in pursuing, law enforcement careers.

Under this program, an applicant has available low interest bearing loans, and grants applicable toward tuition, fees, and associated expenses.

These benefits are available to those students enrolled in programs leading to degrees in areas directly related to law enforcement and who can establish financial need.

Application and full information relative to this program are available from the Financial Aid Officer.

HEALTH SERVICES

The College does not provide facilities or staff for the treatment of students' health problems. Each student must make his own arrangements for caring for his health needs. Applications for student accident insurance are available in the Dean of Student Services office.

PLACEMENT SERVICE

The College maintains a placement service 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 office of the Placement and Financial Aid Officer. 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.

Many students feel they are in need of further information about various occupational fields and opportunities in order to aid them in selecting vocational goals which will be maximally satisfying to them. These students are invited to peruse the occupational information available in the Counseling Office and to consult with a counselor if additional assistance is desired.

LUNCH ROOM

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

PARKING

In order to make most effective use of our limited parking facilities, students must register their vehicles at the time of registration for classes. All students are expected to comply with the parking regulations in force. A copy of these regulations is made available at registration, and they are also printed in the Student Handbook.

STUDENT ACTIVITIES

The student activities program is designed to provide a variety of meaningful educational, cultural, and social experiences.

Additional information is provided in the Student Handbook.

STUDENT HANDBOOK

A student handbook will be available to provide additional information of interest to students. The handbook will describe student activities and organizations and will also list the college rules and regulations.

The Student Handbook may be obtained during the registration process through the office of the Dean of Student Services or at the Counseling Office.

STUDENT CONDUCT

Each College student is considered a responsible adult, and it is assumed that men and women of college age will maintain standards of conduct appropriate to membership in the college community. Emphasis is placed on standards of student conduct rather than on student limits or restrictions. Guidelines and regulations governing student conduct 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 its own best interest 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 be required to appear before a special committee before readmission can be granted.

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

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

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

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

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

PART IV

CURRICULUMS OF STUDY

Associate in Arts

Liberal Arts
Music

Associate in Science

Business Administration
Pre-Engineering
Pre-Teacher Education
Science

Associate in Applied Science Degree

Accounting
Architectural Technology
Business Management
Civil Engineering Technology
Commercial Art
Data Processing Technology
Electrical/Electronics Engineering Technology
Mechanical Engineering Technology
Police Science
Radio and Television Production Technology
Secretarial Science
Traffic and Transportation Management

Diploma Curriculum

Automotive Technology

Certificate Curriculums

Air Conditioning and Refrigeration
*Automotive Mechanics
Clerk-Typist
Dental Assistant
*Engineering/Technical Assistant
*Industrial Management
Stenographic

*Pending Approval.


WE HAVE A HEART

STATEWIDE ASSOCIATE DEGREE CURRICULUMS AVAILABLE TO ALL QUALIFIED STUDENTS

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

1. Agricultural Technology
   Paul D. Camp Community College
2. Animal Technology
   Blue Ridge Community College
3. Aviation Technology
   Northern Virginia Community College
4. Broadcast Engineering Technology
   Northern Virginia Community College
5. Chemical Technology
   John Tyler Community College
6. Construction Management Technology
   Germanna Community College
7. Dental Laboratory Technology
   Northern Virginia Community College
8. Environmental Technology
   Wytheville Community College
9. Forest Technology
   Dabney S. Lancaster Community College
10. Hotel, Restaurant and Institutional Management
    Northern Virginia Community College
11. Insurance
    Tidewater Community College
12. Marine Science
    Thomas Nelson Community College
13. Media Advertising Arts
    Tidewater Community College
14. Medical Laboratory Technology
    Central Virginia Community College
15. Medical Record Technology
    Central Virginia Community College
    Northern Virginia Community College
16. Mental Health Technology
    Blue Ridge Community College
17. Mining Technology
    Southwest Virginia Community College
18. Mortuary Science
    John Tyler Community College
19. Radio and Television Production Technology
    Virginia Western Community College

20. Radiologic Technology
    Central Virginia Community College
21. Real Estate Management
    Northern Virginia Community College
    Tidewater Community College
22. Recreation and Parks Leadership
    Northern Virginia Community College
23. Textile Management
    Danville Community College
24. Traffic and Transportation Management
    Virginia Western Community College

MINIMUM REQUIREMENTS FOR ASSOCIATE DEGREES

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

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

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

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

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

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

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

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

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

LIBERAL ARTS

Associate in Arts Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ENGL 111	English Composition I	3	0	3
GENL 100	Orientation	1	1	1
HIST	American History (or Hist. of West. Civ.)	3	0	3
MATH	Mathematics I (MATH 161 or 181)	3	0	3
	Foreign Language[1]	3	2	4
	Natural Science	3	3	4
	Total	16	6	18
	SECOND QUARTER			
ENGL 112	English Composition II	3	0	3
HIST	American History (or Hist. of West. Civ.)	3	0	3
MATH	Mathematics II (MATH 162 or 182)	3	0	3
	Foreign Language[1]	3	2	4
	Natural Science	3	3	4
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	15-18	5-8	18-20
	THIRD QUARTER			
ENGL 113	English Composition III	3	0	3
HIST	American History (or Hist. of West. Civ.)	3	0	3
MATH	Mathematics III (MATH 163 or 183)	3	0	3
	Foreign Language[1]	3	2	4
	Natural Science	3	3	4
	Total	15	5	17
	FOURTH QUARTER			
ENGL	English or American Literature	3	0	3
GOVT	Government[2]	3	0	3
	Foreign Language	3	2	4
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Humanities Elective	3	0	3
	Elective	3	0	3
	Total	15-18	2-5	17-19

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

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

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
ENGL	English or American Literature	3	0	3
PSYC	Psychology[2]	3	0	3
	Foreign Language	3	2	4
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Humanities or Social Science Elective	3	0	3
	Elective	3	0	3
	Total	15-18	2-5	17-19
	SIXTH QUARTER			
ECON	Economics[2]	3	0	3
ENGL	English or American Literature	3	0	3
	Foreign Language	3	2	4
	Humanities, Social Science or Speech	3	0	3
	Elective	3	0	3
	Total	15	2	16
Total Minimum Credits for the Liberal Arts Degree				97

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

MUSIC

Degree: Associate in Arts

Length: Six-quarter (two-year) program

Purpose: The Associate in Arts Degree curriculum in Music is designed primarily for students who wish to transfer to a four-year college or university to complete the baccalaureate degree in music or music education.

Admission Requirements: In addition to the admission requirements established for the college, entry into the Music program requires the satisfactory completion of the following high school units or equivalent as a minimum: 4 units of English; 2 units of mathematics (algebra and geometry); 1 unit of laboratory science; and 1 unit of social studies. Students with deficiencies will require Developmental Studies. An audition and interview by the music faculty is necessary prior to final acceptance in this program. Students are urged to check the mathematics requirements of the four-year institution to which they plan to transfer to determine the proper mathematics courses to be taken in the community college.

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

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

MUSIC

Associate in Arts Degree[1]

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ENGL 111	English Composition	3	0	3
GENL 100	Orientation	1	1	1
HIST	History	3	0	3
MATH	Mathematics	3	0	3
MUSC 111	Music Theory	3	2	4
MUSC	Applied Music (Major instrument)	-	-	2
MUSC	Applied Music (Minor instrument)	-	-	1
MUSC	Ensemble (Vocal or Instrument)	0	3	1
	Total	-	-	18
	SECOND QUARTER			
ENGL 112	English Composition II	3	0	3
HIST	History	3	0	3
MATH	Mathematics	3	0	3
MUSC 112	Music Theory II	3	2	4
MUSC	Applied Music (Major instrument)	-	-	2
MUSC	Applied Music (Minor instrument)	-	-	1
MUSC	Ensemble (Vocal or Instrumental)	0	3	1
	Health, Physical Education, or Recreation	0	3	1
	Total	-	-	18
	THIRD QUARTER			
ENGL 113	English Composition III	3	0	3
HIST	History	3	0	3
MATH	Mathematics	3	0	3
MUSC 113	Music Theory III	3	2	4
MUSC	Applied Music (Major instrument)	-	-	2
MUSC	Applied Music (Minor instrument)	-	-	1
MUSC	Ensemble (Vocal or Instrumental)	0	3	1
	Health, Physical Education, or Recreation	0	3	1
	Total	-	-	18

[1] Foreign language degree requirement optional.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FOURTH QUARTER			
ECON	[2]Economics	3	0	3
MUSC 211	Advanced Music Theory I	3	2	4
MUSC	Applied Music (Major instrument)	-	-	2
MUSC	Applied Music (Minor instrument)	-	-	1
MUSC	Ensemble (Vocal or Instrumental)	0	3	1
	Natural Science (Lab)	3	3	4
	Health, Physical Education, or Recreation	0	3	1
	Total	-	-	16
	FIFTH QUARTER			
GOVT	[2]Government	3	0	3
MUSC 212	Advanced Music Theory II	3	2	4
MUSC	Applied Music (Major instrument)	-	-	2
MUSC	Applied Music (Minor instrument)	-	-	1
MUSC	Ensemble (Vocal or Instrumental)	0	3	1
	Natural Science (Lab)	3	3	4
	Total	-	-	15
	SIXTH QUARTER			
MUSC 213	Advanced Music Theory III	3	2	4
MUSC	Applied Music (Major instrument)	-	-	2
MUSC	Applied Music (Minor instrument)	-	-	1
MUSC	Ensemble (Vocal or Instrumental)	0	3	1
PSYC	[2]Psychology	3	0	3
	Natural Science (Lab)	3	3	4
	Total	-	-	15

Total Minimum Credits for the Pre-Music Degree----------100

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

BUSINESS ADMINISTRATION

Degree: Associate in Science

Length: Six-quarter (two-year) curriculum

Purpose: With the rapid development in business and industry in Virginia, there is a great demand for qualified personnel in business administration to provide leadership for this economic growth. The Associate in Science Degree curriculum in Business Administration is designed for persons who plan to transfer to a four-year college or university to complete a baccalaureate degree program in business administration.

Admission Requirements: In addition to the admission requirements established for the college, entry into the Business Administration program requires the satisfactory completion of the following high school units or equivalent as a minimum: 4 units of English; 2 units of mathematics (algebra and geometry); 1 unit of laboratory science; and 1 unit of social studies. Students with deficiencies will require Developmental Studies. Students are urged to check the mathematics requirements of the four-year college or university to which they plan to transfer to determine the proper mathematics courses to be taken in the community college.

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

BUSINESS ADMINISTRATION

Associate in Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ENGL 111	English Composition I	3	0	3
GENL 100	Orientation	1	1	1
HIST	American History or Hist. of West. Civ.	3	0	3
MATH 161	Mathematics	3	0	3
	Natural Science (Lab.)	3	3	4
	Elective	3	0	3
	Total	16	4	17

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

Total Minimum Credits for the Business Administration Degree_____ 97

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

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, 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:

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

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

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

*PRE-ENGINEERING

Associate in Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
CHEM 111	General Inorganic Chemistry I	3	3	4
ENGL 111	English Composition	3	0	3
ENGR 101	Introduction to Engineering	1	2	2
ENGR 121	Engineering Graphics I	1	3	2
GENL 100	Orientation	1	1	1
MATH 141	Introductory Mathematical Analysis I	5	0	5
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	14-17	9-12	18-20
	SECOND QUARTER			
CHEM 112	General Inorganic Chemistry II	3	3	4
ENGL 112	English Composition	3	0	3
ENGR 102	Introduction to Engineering Methods	1	2	2
ENGR 122	Engineering Graphics II	1	3	2
MATH 142	Introductory Mathematical Analysis II	5	0	5
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	13-16	8-11	17-19
	THIRD QUARTER			
CHEM 113	General Inorganic Chemistry III	3	3	4
ENGL 113	English Composition	3	0	3
ENGR 103	Conceptual Design and Analysis	1	2	2
ENGR 123	Engineering Graphics III	1	3	2
MATH 143	Introductory Mathematical Analysis III	5	0	5
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	13-16	8-11	17-19
	FOURTH QUARTER			
ECON	**Economics	3	0	3
	History Elective	3	0	3
ENGR 201	Mechanics of Particles	5	0	5
MATH 241	Advanced Mathematical Analysis I	4	0	4
	Elective	3	0-3	3-4
	Total	18	0-3	18-19

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

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

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
ENGR 202	Mechanics of Deformable Solids	5	0	5
ENGR 206	Engineering Economy (or Elective)	3	0	3
MATH 242	Advanced Mathematical Analysis II	4	0	4
PHYS 222	General University Physics II	3	3	4
	Elective	0-3	0	0-3
	Total	15-18	3	16-19
	SIXTH QUARTER			
ENGR 203	Dynamics of Rigid Bodies	3	0	3
MATH 243	Advanced Mathematical Analysis III	4	0	4
PHYS 223	General University Physics III	3	3	4
PSYC	**Psychology	3	0	3
	Elective	3	0	3
	Total	16	3	17

Total Minimum Credits for Pre-Engineering Degree----------105

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

PRE-TEACHER EDUCATION

Degree: Associate in Science

Length: Six-quarter (two-year) program

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

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

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

PRE-TEACHER EDUCATION

Associate in Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ENGL 111	English Composition I	3	0	3
GENL 100	Orientation	1	0	1
HIST 111	American History I (or HIST 101)	3	0	3
MATH	Mathematics (MATH 161 or 181)	3	0	3
	Natural Science (Lab)	3	3	4
	Elective	3	0	3
	Total	16	4	17
	SECOND QUARTER			
ENGL 112	English Composition II	3	0	3
HIST 112	American History II (or HIST 102)	3	0	3
MATH	Mathematics (MATH 162 or 182)	3	0	3
	Natural Science (Lab)	3	3	4
	Elective	3	0	3
	Total	15	3	16
	THIRD QUARTER			
ENGL 113	English Composition III	3	0	3
HIST 113	American History III (or HIST 103)	3	0	3
MATH	Mathematics (MATH 163 or 183)	3	0	3
	Natural Science (Lab)	3	3	4
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Elective	3	0	3
	Total	15-18	3-6	17-19
	FOURTH QUARTER			
ENGL	Literature	3	0	3
GOVT	Government[1]	3	0	3
PSYC 201	General Psychology I (or PSYC 231)	3	0	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Humanities Elective	3	0	3
	Elective	3	0	3
	Total	15-18	0-3	16-18

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

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
ENGL	Literature	3	0	3
ECON	Economics[1]	3	0	3
PSYC 202	General Psychology II (or PSYC 232)	3	0	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Elective	3	0	3
	Total	12-15	0-3	13-15
	SIXTH QUARTER			
ENGL	Literature (or Elective)	3	0	3
PSYC 203	Gen. Psych. III (or PSYC 223)	3	0	3
SOCI	Sociology (or Elective)	3	0	3
SPDR 137	Public Speaking (or Elective)	3	0	3
	Elective	3	0	3
	Elective	3	0	3
	Total	18	0	18
Total Minimum Credits for a Pre-Teacher Education Degree				97

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

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 in Science is designed for persons who are interested in the pre-professional or scientific program and who plan to transfer to a four-year college or university to complete a baccalaureate degree program with a major in one of the following fields:

Agriculture	Geology	Pharmacy
Biology	Home Economics	Physical Therapy
Chemistry	Mathematics	Physics
Pre-Dentistry	Pre-Medicine	Science Education
Forestry	Nursing	

Admission Requirements: In addition to the admission requirements established for the college, entry into the Science program requires satisfactory completion of the following high school units or equivalent as a minimum: 4 units of English, 3 units of college preparatory mathematics, 1 unit of laboratory science, and 1 unit of social science. Students with deficiencies will require Developmental Studies.

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

SCIENCE

Associate in Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ENGL 111	English Composition I	3	0	3
GENL 100	Orientation	1	1	1
HIST 101	History of West. Civ. (or HIST 111)	3	0	3
MATH 161	College Mathematics (or MATH 141)	3-5	0	3-5
	Science with Laboratory	3	3	4
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	13-18	4-7	15-19
	SECOND QUARTER			
ENGL 112	English Composition II	3	0	3
HIST 102	History of West. Civ. (or HIST 112)	3	0	3
MATH 162	College Mathematics (or MATH 142)	3-5	0	3-5
	Science with Laboratory	3	3	4
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	12-17	3-6	16-20
	THIRD QUARTER			
ENGL 113	English Composition III	3	0	3
HIST 103	History of West. Civ. (or HIST 113)	3	0	3
	Science with Laboratory	3	3	4
MATH 163	College Mathematics (or MATH 143)	3-5	0	3-5
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Elective	2	0	2
	Total	14-19	3-6	16-20
	FOURTH QUARTER			
ENGL	Literature	3	0	3
ECON	Economics[1]	3	0	3
GOVT	Government[1]	3	0	3
MATH 241	Adv. Math Anal I (or MATH 271 or Elective)	4	0	4
	Science with Laboratory	3	3	4
	Total	16	3	17

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

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
ENGL	Literature	3	0	3
MATH 242	Adv. Math Anal II (or MATH 272 or Elective)	4	0	4
PSYC	Psychology[1]	3	0	3
	Science with Laboratory	3	3	4
	Elective	3-4	0	3-4
	Total	16-17	3	17-18
	SIXTH QUARTER			
ENGL	Literature	3	0	3
MATH 243	Adv. Math Anal III (or MATH 273 or Elective)	4	0	4
	Science with Laboratory	3	3	4
	Electives	6-7	0	6-7
	Total	16-17	3	17-18

Total Minimum Credits for the Associate in Science Degree---------- 97

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

ACCOUNTING

Degree: Associate in Applied Science

Length: Six-quarter (two-year) curriculum

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

Occupational Objectives:
Accounting Trainee
Accounting Technician
Junior Accountant
Accountant

Admission Requirements: In addition to the admission requirements established for the college, entry into the Accounting program requires proficiency in high school English and mathematics. Students with deficiencies will require Developmental Studies.

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

ACCOUNTING

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ACCT 111	Accounting I	3	2	4
BUAD 100	Introduction to Business	3	0	3
BUAD 108	Business Machines	1	2	2
ENGL 101	Communication Skills I (or ENGL 111)	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Introduction to Business Mathematics I	3	0	3
	Total	14	5	16

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	SECOND QUARTER			
ACCT 112	Accounting II	3	2	4
BUAD 164	Principles of Business Management	3	0	3
ENGL 102	Communication Skills II (or ENGL 112)	3	0	3
MATH 152	Introduction to Business Mathematics II	3	0	3
SECR 111	Typewriting I[1] (or Elective)	2	3	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	14-17	5-8	17-19
	THIRD QUARTER			
ACCT 113	Accounting III	3	2	4
BUAD 165	Prin. of Bus. Mgmt. II	3	0	3
ECON	Economics	3	0	3
PSYC	Psychology	3	0	3
	English or Speech	3	0	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	15-18	2-5	17-19
	FOURTH QUARTER			
ACCT 221	Intermediate Accounting I	4	0	4
BUAD 254	Applied Business Statistics I	3	0	3
DAPR 106	Principles of Data Processing	3	0	3
ENGL 180	Business English	3	0	3
ACCT 234	Cost Accounting	3	0	3
	Total	16	0	16
	FIFTH QUARTER			
ACCT 222	Intermediate Accounting II	4	0	4
GOVT	Government	3	0	3
ACCT 244	Business Taxes I	3	0	3
BUAD 241	Business Law I	3	0	3
DAPR 144	Computer Concepts I (or Elective)	2	3	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	15-18	3-6	17-19
	SIXTH QUARTER			
ACCT 229	Auditing (or Business Elective)	3	0	3
ACCT 245	Business Taxes II (or Bus. Elective)	3	0	3
ACCT 298	Seminar and Project			1-5
BUAD 242	Business Law II (or Elective)	3	0	3
BUAD 246	Business Finance (or Bus. Elective)	3	0	3
	Total	12	-	13-17

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

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

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 technicians, 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 program.

Occupational Objectives: Architectural Aide
Architectural Draftsman
Architectural Office Assistant
Field Assistant

Admission Requirements: In addition to the admission requirements established for the college, entry into the Architectural Technology program requires proficiency in high school English, mathematics, and science. Students with deficiencies will require Developmental Studies.

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

ARCHITECTURAL TECHNOLOGY

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ARCH 100	Introduction to Architecture	2	0	2
ARCH 111	Architectural Drafting I	1	6	3
ECON 160	Survey of American Economics	3	0	3
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
GOVT 180	American Constitutional Government	3	0	3
MATH 161	College Mathematics I	3	0	3
				18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	SECOND QUARTER			
ARCH 112	Architectural Drafting II	1	6	3
ARCH 141	Materials and Methods of Construction I	2	3	3
ENGL 102	Communication Skills II	3	0	3
MATH 162	College Mathematics II	3	0	3
PHYS 111	Technical Physics I	3	3	4
	Health, Physical Education, or Recreation	-	-	1-3
				17-19
	THIRD QUARTER			
ARCH 113	Architectural Drafting III	1	6	3
ARCH 142	Materials and Methods of Construction II	3	0	3
ARTS 180	Introduction to Photography	1	3	2
ENGR 151	Mechanics I (Statics)	3	0	3
MATH 163	College Mathematics III	3	0	3
PHYS 112	Technical Physics II	3	3	4
				18
	FOURTH QUARTER			
ARCH 204	History of Architecture I	3	0	3
ARCH 211	Architectural Drafting IV	1	6	3
ARCH 237	Building Mechanical Equipment	3	0	3
ENGR 152	Mechanics II (Strength of Materials)	3	3	4
PSYC 128	Human Relations	3	0	3
	Health, Physical Education, or Recreation	-	-	1-3
				17-19
	FIFTH QUARTER			
ARCH 212	Architectural Drafting V	1	6	3
ARCH 205	History of Architecture II	3	0	3
ARCH 276	Construction Estimating	3	0	3
ENGL 127	Technical Writing	3	0	3
GEOG 240	Introduction to Physical Geography	3	0	3
	Health, Physical Education, or Recreation	-	-	1-3
				16-18
	SIXTH QUARTER			
ARCH 213	Architectural Drafting VI	1	6	3
ARCH 277	Building Codes and Contract Documents	3	0	3
ARCH 298	Seminar and Project	-	-	4
CIVL 180	Principles of Surveying	3	3	4
CIVL 230	Structural Analysis	3	0	3
				17

Total Minimum Credits for Architectural Technology Degree----------103

BUSINESS MANAGEMENT

Degree: Associate in Applied Science

Length: Six-quarter (two-year) curriculum

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

Occupational Objectives:
Management Trainee
Supervisor
Department Head
Office Manager
Manager of Small Business
Branch Manager
Administrative Assistant

Admission Requirements: In addition to the admission requirements established for the college, entry into the Business Management program requires proficiency in high school English and mathematics. Students with deficiencies will require Developmental Studies.

Program Requirements: The first three quarters of the curriculum in Business Management are similar to other curriculums in business. However, in the second year each student will pursue his specialty in business management. The curriculum will include technical courses in business management, courses in related areas, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in business management. Students are urged to consult with the counseling office and their faculty advisor in planning their program and selecting electives. Upon satisfactory completion of the six-quarter program, the graduate will be awarded the Associate in Applied Science Degree in Business Management.

BUSINESS MANAGEMENT

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ACCT 111	Accounting I	3	2	4
BUAD 100	Introduction to Business	3	0	3
BUAD 108	Business Machines	1	2	2
ENGL 101	Communication Skills I (or ENGL 111)	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Introduction to Business Mathematics I	3	0	3
	Total	14	5	16

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	SECOND QUARTER			
ACCT 112	Accounting II	3	2	4
BUAD 164	Principles of Business Management	3	0	3
ENGL 102	Communication Skills II (or ENGL 112)	3	0	3
MATH 152	Introduction to Business Mathematics II	3	0	3
SECR 111	Typewriting I[1]	2	3	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	14-17	5-8	17-19
	THIRD QUARTER			
ACCT 113	Accounting III	3	2	4
BUAD 165	Principles of Business Management	3	0	3
ECON	Economics	3	0	3
PSYC	Psychology	3	0	3
	English or Speech	3	0	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	15-18	2-5	17-19
	FOURTH QUARTER			
BUAD 254	Applied Business Statistics	3	0	3
DAPR 106	Principles of Data Processing	3	0	3
ENGL 180	Business English	3	0	3
GOVT	Government	3	0	3
MKTG 100	Principles of Marketing (or Bus. Elective)	3	0	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	15-18	0-3	16-18
	FIFTH QUARTER			
ACCT 244	Business Taxes I	3	0	3
BUAD 241	Business Law I	3	0	3
BUAD 269	Purch. & Mat. Mgmt. (or Bus. Elective)	3	0	3
BUAD 276	Personnel Management	3	0	3
DAPR 144	Computer Concepts I (or Elective)	2	3	3
	Total	14	3	15
	SIXTH QUARTER			
BUAD 242	Business Law II	3	0	3
BUAD 246	Business Finance (or Bus. Elective)	3	0	3
BUAD 287	Pub. Rel. in Mgmt. (or Bus. Elective)	3	0	3
BUAD 298	Seminar and Project			1-5
	Elective	3	0	3
	Total	-	-	13-17

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

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

CIVIL ENGINEERING TECHNOLOGY

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

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

Occupational Objective: Civil Engineering Technician

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

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

CIVIL ENGINEERING TECHNOLOGY

Associate in Applied Science Degree

Course Number		Course Title	Lecture Hours	Lab Hours	Course Credits
		FIRST QUARTER			
CIVL	140	Construction Planning	3	0	3
DRFT	111	Technical Drafting I	1	3	2
ENGL	101	Communication Skills I	3	0	3
ENGR	100	Introduction to Engineering Technology	1	2	2
GENL	100	Orientation	1	1	1
MATH	121	Engineering Technical Mathematics	5	0	5
					16

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	SECOND QUARTER			
CIVL 124	Civil Engineering Drafting I	1	3	2
ENGL 102	Communication Skills II	3	0	3
GOVT 180	American Constitutional Government	3	0	3
MATH 122	Engineering Technical Mathematics II	5	0	5
PHYS 111	Technical Physics I	3	3	4
	Health, Physical Education, or Recreation			1-3
				18-20
	THIRD QUARTER			
CIVL 125	Civil Engineering Drafting II	1	3	2
ENGR 151	Mechanics I (Statics)	3	0	3
MATH 123	Engineering Technical Mathematics III	5	0	5
PHYS 113	Technical Physics III	3	3	4
ENGL 127	Technical Writing or SPDR 137 Public Speaking	3	0	3
	Health, Physical Education, or Recreation			1-3
				18-20
	FOURTH QUARTER			
CIVL 181	Surveying I	3	3	4
CIVL 256	Soil Mechanics	3	3	4
CIVL 258	Concrete Technology	3	3	4
ENGR 152	Mechanics II (Strength of Materials)	3	3	4
	Health, Physical Education, or Recreation			1-3
				17-19
	FIFTH QUARTER			
CIVL 182	Surveying II	3	3	4
CIVL 218	Reinforced Concrete Design	4	0	4
CIVL 230	Structural Analysis	3	0	3
CIVL 268	Water and Sewage Systems	3	0	3
CIVL 276	Traffic & Transportation Technology	3	3	4
				18
	SIXTH QUARTER			
ECON 160	Survey of American Economics	3	0	3
CIVL 217	Structural Steel Design	4	0	4
CIVL 259	Bituminous Technology	3	3	4
CIVL 284	Route Surveying & Highway Design	2	6	4
PSYC 128	Human Relations	3	0	3
				18

Total Minimum Credits for Civil Engineering Technology Degree_____105

COMMERCIAL ART

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

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

Occupational Objectives: Commercial Artist
Designer
Illustrator
Photographer

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

Program Requirements: Approximately one-half of the curriculum will include courses in commercial art with the remaining courses in related areas, general concepts and practical applications needed for future success in commercial art. Students are urged to consult with the counseling office and their faculty advisor in planning their program and selecting electives. Upon satisfactory completion of the six-quarter program, the graduate will be awarded the Associate in Applied Science Degree in Commercial Art.

COMMERCIAL ART

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ARTS 111	History and Appreciation of Art	3	0	3
ARTS 121	Theory and Practice of Drawing	1	4	3
ARTS 151	Fundamentals of Design	1	4	3
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
GOVT	Government	3	0	3
	Total	12	9	16

Course Number		Course Title	Lecture Hours	Lab Hours	Course Credits
		SECOND QUARTER			
ARTS	112	History and Appreciation of Art II	3	0	3
ARTS	122	Theory and Practice of Drawing II	1	4	3
ARTS	152	Fundamentals of Design II	1	4	3
ARTS	166	Fundamentals of Lettering I	1	4	3
ENGL	102	Communication Skills II	3	0	3
		Health, Physical Education, or Recreation	0	3	1
		Total	9	12	16
		THIRD QUARTER			
ARTS	113	History and Appreciation of Art III	3	0	3
ARTS	123	Theory and Practice of Drawing III	1	4	3
ARTS	180	Introduction to Photography	1	3	2
PSYC		Psychology	3	0	3
		English or Speech	3	0	3
		Total	11	7	14
		FOURTH QUARTER			
ARTS	221	Advanced Drawing I (or Elective)	0	6	2
ARTS	231	Theory and Practice of Painting I	1	4	3
ARTS	261	Advertising Design I	2	3	3
ARTS	271	Graphic Techniques I (or Elective)	1	4	3
ARTS	281	Photography Workshop I (or Elective)	0	3	1
ECON		Economics	3	0	3
		Health, Physical Education, or Recreation	0	3	1
		Total	7	23	16
		FIFTH QUARTER			
ARTS	222	Advanced Drawing II (or Elective)	0	6	2
ARTS	232	Theory and Practice of Painting II	1	4	3
ARTS	262	Advertising Design II	2	3	3
ARTS	272	Graphic Techniques II (or Elective)	1	4	3
ARTS	282	Photography Workshop II (or Elective)	0	3	1
		Health, Physical Education, or Recreation	0	3	1
		Elective	-	-	3
		Total	-	-	16
		SIXTH QUARTER			
ARTS	223	Advanced Drawing III (or Elective)	0	6	2
ARTS	233	Theory and Practice of Painting III	1	4	3
ARTS	263	Advertising Design III	2	3	3
ARTS	273	Graphic Techniques III (or Elective)	1	4	3
ARTS	283	Photography Workshop III (or Elective)	0	3	1
ARTS	298	Seminar and Project	-	-	1-5
		Elective	-	-	3
		Total	-	-	16-20

Total Minimum Credits for the Commercial Art Degree 97

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 types of education and training which will be required by both industry and business. Specifically, this includes the skills, knowledges, attitudes, and abilities which will enable employees to function in positions of responsibility in the current employment market. Education of the student will include the use of data processing devices and equipment, and formal instruction which will provide an understanding of the employment environment.

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

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

Program Requirements: The curriculum will include technical courses in data processing, courses in related areas, general education, and electives. Instruction will include both theoretical concepts and practical applications needed for future success in data processing technology. Students are urged to consult with the counseling office and their faculty advisor in planning their program and selecting electives. Upon satisfactory completion of the six-quarter curriculum, the graduate will be awarded the Associate in Applied Science Degree in Data Processing Technology with a specialization in Computer Programming.

DATA PROCESSING TECHNOLOGY

(Computer Programming)

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ACCT 111	Accounting I	3	2	4
BUAD 100	Introduction to Business	3	0	3
DAPR 106	Principles of Data Processing	3	0	3
ENGL 101	Communication Skills I (or ENGL 111)	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Intro. to Bus. Math. I (or MATH Elective)	3	0	3
	Total	16	3	17

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	SECOND QUARTER			
ACCT 112	Accounting II	3	2	4
DAPR 110	Peripheral Equipment (or DAPR Elective)	3	0	3
DAPR 144	Computer Programming (Computer Concepts I)	2	3	3
ENGL 102	Communication Skills II (or ENGL 112)	3	0	3
MATH 152	Intro. to Bus. Math. II (or MATH Elective)	3	0	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	14-17	5-8	17-19
	THIRD QUARTER			
ACCT 113	Accounting III	3	2	4
BUAD 164	Principles of Business Management I	3	0	3
DAPR 147	Computer Programming (Cobol)	2	3	3
PSYC	Psychology	3	0	3
	English or Speech	3	0	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	14-17	5-8	17-19
	FOURTH QUARTER			
BUAD 254	Applied Business Statistics I	3	0	3
DAPR 256	Computer Programming (Advanced Cobol)	2	3	3
DAPR 281	Systems Analysis I	3	0	3
ECON	Economics	3	0	3
ENGL 180	Business English (or Elective)	3	0	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	14-17	3-6	16-18
	FIFTH QUARTER			
BUAD 255	Applied Business Statistics II	3	0	3
DAPR 282	Systems Analysis II	3	0	3
DAPR 286	Computer Programming Applications	3	2	4
DAPR	Computer Programming Elective	3	2	4
	Elective	3	0	3
	Total	15	4	17
	SIXTH QUARTER			
DAPR 298	Seminar and Project			1-5
DAPR	Computer Programming Elective	3	2	4
GOVT	Government	3	0	3
	Electives	6	0	6
	Total	-	-	14-18

Total Minimum Credits for the Data Processing Technology (Computer Programming) Degree---------- 97

ELECTRICAL/ELECTRONICS ENGINEERING TECHNOLOGY

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

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

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

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

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

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

In order to specialize in the second year, each student may select an option as follows: Communications (ELEC 241-242-243), Computer Electronics (ELEC 251-252-253), Power (ELEC 212-213-214), Electronic Controls (ELEC 271-272-273), Electromechanical (ELEC 261-262-263).

Upon satisfactory completion of the six-quarter curriculum, the graduate will be awarded the Associate in Applied Science Degree in Electrical/Electronics Engineering Technology.

ELECTRICAL/ELECTRONICS ENGINEERING TECHNOLOGY

Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ELEC 111	Electrical Circuits I	3	3	4
ENGL 101	Communication Skills I	3	0	3
ENGR 100	Introduction to Engineering	1	2	2
GENL 100	Orientation	1	1	1
GOVT 180	American Constitutional Government	3	0	3
MATH 121	Engineering Technical Mathematics I	5	0	5
	Total	-	-	18
	SECOND QUARTER			
ELEC 112	Electrical Circuits II	5	3	6
ENGL 102	Communication Skills II	3	0	3
MATH 122	Engineering Technical Mathematics II	5	0	5
PHYS 111	Technical Physics I	3	3	4
	Total			18
	THIRD QUARTER			
ELEC 125	Introduction to Electronics	4	3	5
ENGL 127	Technical Report Writing or SPDR 137	3	0	3
MATH 123	Engineering Technical Mathematics III	5	0	5
PHYS 112	Technical Physics	3	3	4
	Health, Physical Education, or Recreation	0-3	0 3	1-3
	Total	-	-	18 20
	FOURTH QUARTER			
DRFT 158	Electrical/Electronics Drafting	1	3	2
ELEC 118	Electrical Shop	0	3	1
ELEC 201	Electrical Engineering Technology	5	3	6
ELEC 276	Instruments and Measurements	3	3	4
	*Technical Option	3	3	4
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	-	-	18-20

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
ELEC 119	Electrical Shop II	0	3	1
ELEC 202	Electrical Engineering Technology II	5	6	7
PSYC 128	Human Relations	3	0	3
	*Technical Option	3	3	4
	**Technical Elective	3	0	3
	Total			18
	SIXTH QUARTER			
ECON 160	Survey of American Economics	3	0	3
ELEC 203	Electrical Engineering Technology III	5	3	6
ELEC 298	Seminar and Project	0	0	1
	*Technical Option	3	3	4
	**Technical Elective	3	0	3
	Health, Physical Education, or Recreation	-	-	1-3
	Total			18-20

***Technical Options**

ELEC 241 Communications I (4 cr.)
ELEC 242 Communications II (4 cr.)
ELEC 243 Communications Systems (4 cr.)
ELEC 145 Introduction to Electrical Machines (4 cr.)
ELEC 212 Electrical Machines and Industrial Controls (4 cr.)
ELEC 213 Advanced Industrial Controls (4 cr.)

****Technical Electives**

ELEC 248 Microwave Techniques (3 cr.)
ELEC 299 Supervised Study (Electrical Data Processing) (3 cr.)
ENGR 206 Engineering Economy (3 cr.)
INDT 170 Industrial Management (3 cr.)

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

MECHANICAL ENGINEERING TECHNOLOGY

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

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

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

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

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

MECHANICAL ENGINEERING TECHNOLOGY

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
DRFT 111	Technical Drafting I	1	3	2
ENGL 101	Communication Skills I	3	0	3
ENGR 100	Introduction to Engineering Technology	1	2	2
GENL 100	Orientation	1	1	1
INDT 111	Materials and Processes in Industry	3	0	3
MATH 121	Engineering Technical Mathematics	5	0	5
MECH 131	Machine Laboratory	1	3	2
	Total	-	-	18
	SECOND QUARTER			
DRFT 112	Technical Drafting II	1	3	2
ENGL 102	Communication Skills II	3	0	3
INDT 112	Materials and Processes of Industry II	3	0	3
MATH 122	Engineering Technical Mathematics II	5	0	5
PHYS 111	Technical Physics I	3	3	4
	Health, Physical Education, or Recreation	-	-	1-3
	Total	-	-	18-20
	THIRD QUARTER			
DRFT 113	Technical Drafting III	1	3	2
ENGL 127	Technical Writing or SPDR 137 Public Speaking	3	0	3
ENGR 151	Mechanics I (Statics)	3	0	3
MATH 123	Engineering Technical Mathematics III	5	0	5
PHYS 112	Technical Physics II	3	3	4
	Health, Physical Education, or Recreation	-	-	1-3
	Total	-	-	18-20
	FOURTH QUARTER			
ECON	Economics	3	0	3
ELEC 214	Electricity	3	3	4
ENGR 152	Mechanics II (Strength of Materials)	3	3	4
MECH 156	Mechanisms	1	3	2
MECH 264	Thermodynamics I	3	3	4
	Health, Physical Education, or Recreation	-	-	1-3
	Total	-	-	18-20

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
INDT 170	Industrial Management	3	0	3
MECH 237	Machine Design I	3	3	4
MECH 246	Metallurgy	3	3	4
MECH 265	Thermodynamics II	3	3	4
PSYC 128	Human Relations	3	0	3
	Total	15	9	18
	SIXTH QUARTER			
GOVT 180	American Constitutional Government	3	0	3
MECH 238	Machine Design II	3	3	4
MECH 267	Fluid Mechanics	3	3	4
MECH 298	Seminar and Project	1	3	2
WELD 15	Arch and Gas Welding	3	3	4
	Total	-	-	17

Total Minimum Credits for the Mechanical Engineering Technology Degree . . 107

POLICE SCIENCE

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

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

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

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

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

Program Requirements: Approximately one-half of the curriculum will include courses in law enforcement with the remaining courses in related areas, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in law enforcement or related activities. Students are urged to consult with their faculty advisor and the counseling office in planning their program and selecting electives. Upon satisfactory completion of the six-quarter program, the graduate will be awarded the Associate in Applied Science Degree in Police Science.

POLICE SCIENCE

Associate in Applied Science Degree

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

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
GOVT 282	U. S. Government II (or Elective)	3	0	3
LWNF 135	Criminal Law II	3	0	3
LWNF 136	Legal Evidence	3	0	3
LWNF 187	Traf. Admin. & Control (or LWNF elective)	3	0	3
SOCI 186	Social Problems I (or Elective)	3	0	3
	Mathematics (or Elective)	-	-	3-4
	Total	-	-	18-19
	SIXTH QUARTER			
ECON	Economics	3	0	3
LWNF 117	Special Enforcement Problems (or LWNF Elective)	3	0	3
LWNF 237	Admin. of Justice (or LWNF Elective)	3	0	3
LWNF 276	Indust. & Comm. Security (or Elective)	3	0	3
LWNF 298	Seminar and Project	1	3	2
SOCI 187	Social Problems II (or Elective)	3	0	3
	Total			17

Total Minimum Credits for the Police Science Degree----------100

SECRETARIAL SCIENCE

Options: Educational Secretary
Executive Secretary
Legal Secretary
Medical Secretary
Technical Secretary

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

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

Occupational Objectives:

Educational Secretary	Medical Secretary	Stenographer
Executive Secretary	Technical Secretary	Administrative Assistant
Legal Secretary	Office Manager	Related Office Occupations

Admission Requirements: In addition to the admission requirements established for the college, entry into the Secretarial Science program requires proficiency in high school English and mathematics. Students with deficiencies will require Developmental Studies. In addition, students who have completed training in shorthand and advanced typewriting, may petition for advance placement with credit by examination.

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

SECRETARIAL SCIENCE

(Executive Secretary)

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
BUAD 100	Introduction to Business	3	0	3
ENGL 101	Communication Skills I (or ENGL 111)	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Introduction to Business Mathematics I	3	0	3
SECR 111	Typewriting I[1]	2	3	3
SECR 121	Shorthand I[1]	3	2	4
	Total	15	6	17
	SECOND QUARTER			
BUAD 164	Principles of Business Management	3	0	3
ENGL 102	Communication Skills II (or ENGL 112)	3	0	3
MATH 152	Introduction to Business Mathematics II	3	0	3
SECR 112	Typewriting II	2	3	3
SECR 122	Shorthand II	3	2	4
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	14-17	5-8	17-19
	THIRD QUARTER			
ACCT 111	Accounting I	3	2	4
SECR 113	Typewriting III	2	3	3
SECR 123	Shorthand III	3	2	4
SECR 136	Filing & Records Management	3	0	3
	English or Speech	3	0	3
	Total	14	7	17
	FOURTH QUARTER			
BUAD 108	Business Machines	1	2	2
ENGL 180	Business English	3	0	3
PSYC	Psychology	3	0	3
SECR 216	Executive Typewriting	2	2	3
SECR 221	Transcription I	2	2	3
SECR 241	Secretarial Procedures I	2	2	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	13-16	8-11	18-20

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

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
BUAD 241	Business Law (or Elective)	3	0	3
ECON	Economics	3	0	3
SECR 222	Transcription II	2	2	3
SECR 242	Secretarial Procedures II	2	2	3
SECR 256	Machine Transcription	2	2	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	12-15	6-9	16-18
	SIXTH QUARTER			
GOVT 180	Government	3	0	3
SECR 223	(General) Transcription	2	2	3
SECR 243	Secretarial Procedures III	2	2	3
SECR 298	Seminar and Project			1-5
	Elective	3	0	3
	Total	-	-	13-17
	Total Minimum Credits for the Secretarial Science (Executive Secretary) Degree			97

RADIO AND TELEVISION PRODUCTION TECHNOLOGY

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

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

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

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

Program Requirements: Approximately two-thirds of the curriculum will include courses in broadcasting with the remaining courses in related subjects, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in the broadcasting industry. Each student is advised to consult with his faculty advisor and the Counseling Department in plannning his program and selecting his electives. Students satisfactorily completing the six-quarter program listed will be awarded an Associate in Applied Science degree with specialization in the field of broadcasting.

RADIO AND TELEVISION PRODUCTION TECHNOLOGY

Associate in Applied Science Degree

Course Number		Course Title	Lecture Hours	Lab Hours	Course Credits
		FIRST QUARTER			
ARTS	151	Fundamentals of Design I	1	4	3
BCST	110	Introduction to Radio/TV	3	0	3
BCST	121	Radio/TV Production I	0	6	3
ENGL	101	Communication Skills I	3	0	3
GENL	100	Orientation	1	1	1
SPDR	137	Public Speaking	3	0	3
		Health, Physical Education, or Recreation			1-3
		Total	-	-	17-19
		SECOND QUARTER			
BCST	122	Radio/TV Production II	0	6	3
BCST	134	Speech for Radio/TV I	2	3	3
BCST	139	TV Studio Art	2	3	3
ENGL	102	Communication Skills II	3	0	3
PSYC		Psychology	3	0	3
		Health, Physical Education, or Recreation			1-3
		Total	-	-	16-18
		THIRD QUARTER			
BCST	123	Radio/TV Production III	0	6	3
BCST	135	Speech for Radio/TV II	2	3	3
ECON		Economics	3	0	3
SPDR	137	Public Speaking	3	0	3
GOVT		Government	3	0	3
SPDR	106	Introduction to Theatre Arts (or Elective)	2	3	3
		Total	-	-	18
		FOURTH QUARTER			
ARTS	180	Introduction to Photography (or Elective)			2-3
BCST	214	Technical Problems of Radio/TV I	2	3	3
BCST	226	Writing for Radio/TV	0	6	3
BCST	281	Advanced Radio/TV Production	3	6	5
		Elective	3	0	3
		Total	-	-	16-17

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
BCST 215	Technical Problems of Radio/TV II	2	3	3
BCST 216	Radio/TV Station Management & Operation	3	0	3
BCST 282	Advanced Radio/TV Production II	3	6	5
BUAD 100	Introduction to Business (or Elective)	3	0	3
	Elective	3	0	3
	Total	-	-	17
	SIXTH QUARTER			
BCST 217	Radio/TV News	3	0	3
BCST 257	Social Problems in American Broadcasting	3	0	3
BCST 283	Advanced Radio/TV Production III	3	6	5
BCST 298	Seminar and Project	1	3	2
	Elective	3	0	3
	Health, Physical Education, or Recreation			1-3
	Total	-	-	17-19

Total Minimum Credits for Radio and Television Production Technology Degree ---------- 101

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

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

Admission Requirements: In addition to the admission requirements established for the college, entry into the Traffic and Transportation Management curriculum requires proficiency in high school English and mathematics. Students with deficiencies will require Developmental Studies.

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

TRAFFIC AND TRANSPORTATION MANAGEMENT

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ACCT 111	Accounting I	3	2	4
BUAD 100	Introduction to Business	3	0	3
ENGL 101	Communication Skills I (or ENGL 111)	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Introduction to Business Mathematics	3	0	3
MKTG 131	Traffic and Transportation I	3	0	3
	Total	16	3	17
	SECOND QUARTER			
BUAD 164	Principles of Business Management	3	0	3
ECON	Economics	3	0	3
ENGL 102	Communication Skills II (or ENGL 112)	3	0	3
MKTG 132	Traffic and Transportation II	3	0	3
SECR 111	Typewriting I[1]	2	3	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	16-19	3-6	16-18
	THIRD QUARTER			
DAPR 106	Principles of Data Proc. (or DAPR Elective)	3	0	3
SPDR 137	Public Speaking	3	0	3
MKTG 100	Principles of Marketing	3	0	3
MKTG 133	Traffic and Transportation III	3	0	3
MKTG 135	Economics of Transportation	3	0	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	15-18	0-3	16-18
	FOURTH QUARTER			
BUAD 254	Applied Business Statistics I	3	0	3
GOVT	Government	3	0	3
MKTG 231	Interstate Commerce Law I	3	0	3
MKTG 236	Physical Distribution	3	0	3
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Elective	3-5	0	3-5
	Total	15-20	0-3	16-19

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

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
BUAD 276	Personnel Management (or Bus. Elective)	3	0	3
MKTG 232	Interstate Commerce Law II	3	0	3
MKTG 237	Tariffs and Rates	3	0	3
PSYC	Psychology	3	0	3
	Elective	3-5	0	3-5
	Total	15-17	0	15-17
	SIXTH QUARTER			
MKTG 233	Interstate Commerce Law III	3	0	3
MKTG 238	Traffic Management	3	0	3
MKTG 239	Problems in Transportation	3	0	3
MKTG 298	Seminar and Project	-	-	1-5
	Elective	3-5	0	3-5
	Total	12-14	0	15-19

Total Minimum Credits for a Traffic and Transportation Management Degree_ 97

AUTOMOTIVE TECHNOLOGY

Degree: Diploma

Length: Six-quarter (two-year) program

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

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

Occupational Objectives:

Automotive Diagnostician
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 good understanding of mathematics is usually required for entry into the program, as well as results of any tests that may be required by the Counseling Department. For one to advance successfully in this program, 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 in the Preparatory Foundations Program before entering the Automotive Technology Program. Upon satisfactory completion of the six-quarter program listed herein, the graduate will be awarded the Diploma in Automotive Technology.

AUTOMOTIVE TECHNOLOGY

Two-Year Diploma Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
AUTO 111	Automotive Engines I	3	3	4
AUTO 136	Automotive Lubrication & Cooling Systems	2	3	3
DRFT 144	Automotive Drawing Interpretation I	2	0	2
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
MATH 11	Elements of Mathematics	2	2	3
WELD 27	Arc Welding	1	3	2
	Total			18
	SECOND QUARTER			
AUTO 112	Automotive Engines II	3	3	4
AUTO 121	Automotive Fuel Systems I	3	3	4
ENGL 102	Communication Skills II (optional)	-	-	0-3
MATH 12	Elements of Mathematics II	2	2	3
PHYS 14	Applied Physics I	2	0	2
WELD 57	Oxyacetylene Welding & Cutting	1	3	2
	Total			15-18
	THIRD QUARTER			
AUTO 122	Automotive Fuel Systems II	3	3	4
AUTO 151	Automotive Power Trains I	2	6	4
AUTO 199	Supervised Study	0	6	2
PHYS 16	Applied Physics III	3	0	3
MECH 20	Machine Shop Practice	0	6	2
SPDR 137	Public Speaking (optional)	-	-	0-3
	Total			15-18
	FOURTH QUARTER			
AUTO 152	Automotive Power Trains II	2	6	4
AUTO 241	Automotive Electricity I	3	3	4
AUTO 267	Automotive Suspension & Braking Systems	3	3	4
AUTO 287	Shop Management I	3	0	3
GOVT 180	Government	3	0	3
	Total			18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
AUTO 153	Automotive Power Trains III	2	6	4
AUTO 242	Automotive Electricity II	3	3	4
AUTO 284	Automotive Service Procedures & Tune Up I	2	3	3
AUTO 288	Shop Management II	3	0	3
ECON 160	Survey of American Economics	3	0	3
	Health, Physical Education, or Recreation	-	-	1-3
	Total			18-20
	SIXTH QUARTER			
AUTO 238	Automotive Air Conditioning	3	0	3
AUTO 268	Automotive Alignment	1	3	2
AUTO 285	Automotive Service Procedures & Tune Up II	2	3	3
AUTO 290	Coordinated Internship	0	15	3
PSYC 128	Psychology	3	0	3
	Health, Physical Education, or Recreation	-	-	1-3
	Total			15-17
Total Minimum Credits for Automotive Technology Diploma				99

AIR CONDITIONING AND REFRIGERATION

Degree: Certificate in Air Conditioning and Refrigeration

Length: Four-quarter (one-year) program

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

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

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

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

Students successfully completing the four-quarter sequence in Air Conditioning and Refrigeration receive the Certificate in Air Conditioning and Refrigeration.

AIR CONDITIONING AND REFRIGERATION

One-Year Certificate Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
AIRC 11-12	Air Conditioning I-II	4	4	4
ELEC 48	Electricity for Air Conditioning	3	3	4
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
MATH 41	Air Conditioning Mathematics	3	2	4
	Total	14	10	18
	SECOND QUARTER			
AIRC 13-14	Air Conditioning III-IV	4	4	6
AIRC 25	Electric Power	3	3	4
ECON 160	Survey of American Economics	3	0	3
MATH 42	Air Conditioning Mathematics II	2	3	3
	Total	12	10	16
	THIRD QUARTER			
AIRC 15-16	Air Conditioning V-VI	4	4	6
AIRC 26	Electrical and Control Systems	2	3	3
GOVT 180	American Constitutional Government	3	0	3
PSYC 128	Human Relations	3	0	3
	Total	12	7	15
	FOURTH QUARTER			
AIRC 31-32	Circuits and Controls I-II	4	4	5

Total Minimum Credits for Air Conditioning and Refrigeration Certificate--- 54

*AUTOMOTIVE MECHANICS

Degree: Certificate

Length: Four-quarter (one-year) program

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

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

Occupational Objectives:

Automotive Diagnostician
Repair Service Estimator
Repair Service Writer
Repair Technician
Service Manager

Admission Requirements: Admission to the program, in addition to the requirements for general admission to the College, requires that the student possess high mechanical aptitude and dexterity as measured by appropriate tests administered by the college counseling department.

Program Requirements: The Automotive Mechanics program is designed to provide training in the general repair and service of the modern automobile. The student will receive theoretical and practical training in engine overhaul, engine tune-up, automatic transmissions, mechanical repair, replacement of units, front-end alignment, carburetion and electrical systems. The curriculum includes basic courses in the humanities to assist the student in social and business communications and to prepare the student to meet the obligations of the citizen in our democratic society. Students successfully completing the four-quarter sequence in Automotive Mechanics receive a Certificate of Completion.

*Pending Approval.

*AUTOMOTIVE MECHANICS

One-Year Certificate Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
AUTO 111	Automotive Engines I	3	3	4
AUTO 136	Automotive Lubrication & Cooling Systems	2	3	3
DRFT 144	Automotive Drawing Interpretation I	2	0	2
ENGL 101	Communication Skills	3	0	3
GENL 100	Orientation	1	1	1
MATH 11	Elements of Mathematics	2	2	3
WELD 27	Arc Welding	1	3	2
	Total			18
	SECOND QUARTER			
AUTO 112	Automotive Engines II	3	3	4
AUTO 121	Automotive Fuel Systems I	3	3	4
GOVT	Government	3	0	3
MATH 12	Elements of Mathematics II	2	2	3
MECH 20	Machine Shop Practice	0	6	2
PHYS 14	Applied Physics I	2	0	2
	Total			18
	THIRD QUARTER			
AUTO 122	Automotive Fuel Systems II	3	3	4
AUTO 151	Automotive Power Trains I	2	6	4
AUTO 290	Coordinated Internship	0	10	2
ECON	Economics	3	0	3
PSYC	Psychology	3	0	3
WELD 57	Oxyacetylene Welding & Cutting	1	3	2
	Total			18
	FOURTH QUARTER			
AUTO 267	Automotive Suspension & Braking Systems	3	3	4
AUTO 152	Automotive Power Trains II	2	6	4
AUTO 241	Automotive Electricity I	3	3	4
AUTO 284	Automotive Service Procedures	2	3	3
AUTO 290	Coordinated Internship	0	10	2
	Total			17
Total Minimum Credits for Automotive Mechanics Certificate----------				71

*Pending Approval.

CLERK-TYPIST CERTIFICATE PROGRAM

Degree: Clerk-Typist Certificate

Length: Three-quarter (one-year) program

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

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

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

Program Requirements: This curriculum requires the student to take English, mathematics, and speech, in addition to required courses needed by qualified clerks or general office personnel. Upon completion of the three-quarter program the student will be awarded the Clerk-Typist Certificate.

CLERK-TYPIST CERTIFICATE

Course Number		Course Title	Lecture Hours	Lab Hours	Course Credits
		FIRST QUARTER			
ENGL	101	Communication Skills I	3	0	3
GENL	100	Orientation	1	1	1
BUAD	100	Introduction to Business	3	0	3
SECR	111	Typewriting I[1]	2	3	3
MATH	151	Introduction to Business Mathematics I[1]	3	0	3
GOVT	180	American Constitutional Government	3	0	3
		Total	15	4	16
		SECOND QUARTER			
ENGL	102	Communication Skills II	3	0	3
ECON	160	American Economics	3	0	3
SECR	112	Typewriting II	2	3	3
SECR	138	Office Record Keeping	2	2	3
SECR	136	Filing and Records Management	3	0	3
PSYC	128	Human Relations	3	0	3
		Total	16	5	18
		THIRD QUARTER			
SPDR	137	Speech	3	0	3
SECR	113	Typewriting III	2	3	3
SECR	137	Office Procedures	3	0	3
DAPR	36	Basic Key Punch/Key Tape Operations (or BUAD/SECR Electives)	3	15	8-9
		Total	11	18	17-18
Total Minimum Credits for Clerk-Typist Certificate					51

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

DENTAL ASSISTANT

Degree: Certificate in Dental Assistance

Length: Four-quarter (one-year) program

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

Occupational Objectives: Employment opportunities for the dental assistant include:

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

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

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

Students who do not meet these requirements may be permitted to correct their deficiencies in the Preparatory (Foundation) Program before entering the Dental Assistant curriculum. A personal interview by the Counseling Department and Dental Director is required.

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

Students will be totally responsible for transportation to and from the College and health agencies utilized for clinical experiences. They will also be required to purchase their own personal liability insurance.

Upon satisfactory completion of the program listed herein, the student will be awarded a Dental Assistant Certificate.

DENTAL ASSISTANT

One-Year Certificate Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
DENT 100	Introduction to Dental Assisting	2	3	3
DENT 101	Dental Science I	2	6	4
DENT 110	Dental Materials	2	6	4
ENGL 101	Communication Skills	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Business Mathematics	3	0	3
	Total	13	16	18
	SECOND QUARTER			
DENT 102	Dental Science II	2	6	4
DENT 111	Clinical Procedures I	2	6	4
DENT 121	Chairside Assisting I	2	6	4
ENGL 102	Communication Skills II	3	0	3
GOVT 180	American Constitutional Government	3	0	3
	Total	12	18	18
	THIRD QUARTER			
DENT 103	Dental Science III	2	6	4
DENT 112	Clinical Procedures II	2	6	4
DENT 122	Chairside Assisting II	2	6	4
DENT 260	First Aid for Dental Auxiliaries	1	3	2
PSYC 128	Human Relations	3	0	3
	Total	10	21	17
	FOURTH QUARTER			
DENT 190	Coordinated Practice	0	15	5
DENT 199	Supervised Study	2	3	3
ECON 160	American Economics	3	0	3
SECR 111	Typewriting I*	2	3	3
SECR 137	Office Procedures	3	0	3
	Total	10	21	17
	Total Minimum Credits for Dental Assistant Certificate			70

* With typing proficiency demonstrated, elective may be substituted.

*ENGINEERING/TECHNICAL ASSISTANT

Degree: Certificate

Length: Three-quarters (one-year) program

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

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

Occupational Objectives: Engineering Assistant or Aid

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

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

*Pending Approval.

* ENGINEERING/TECHNICAL ASSISTANT

One-Year Certificate Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
DRFT 111	Technical Drafting I	1	3	2
ECON 160	Survey of American Economics	3	0	3
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
MATH 31	Algebra I (or Mathematics Elective)	3-5	0	3-5
	Technical Elective			3-4
				15-18
	SECOND QUARTER			
DRFT 112	Technical Drafting II	1	3	2
ENGL 102	Communication Skills II	3	0	3
GOVT 180	American Constitutional Government	3	0	3
MATH 32	Algebra II (or Mathematics Elective)	3-5	0	3-5
	Technical Elective			3-4
				14-17
	THIRD QUARTER			
DRFT 113	Technical Drafting III	1	3	2
ENGL 127	Technical Writing	3	0	3
ENGR 100	Introduction to Engineering Technology	1	2	2
MATH 38	Trigonometry (or Mathematics Elective)	3-5	0	3-5
PSYC 128	Human Relations	3	0	3
	Technical Elective			3-4
				16-19

Total Minimum Credits for Engineering Technology Foundation Certificate__ 45

Technical Electives:

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

*Pending Approval.

*INDUSTRIAL MANAGEMENT

Degree: Certificate

Length: Three-quarters (one-year) program

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

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

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

Program Requirements: This program is designed to offer general education courses along with special courses in the field of Industrial Management which are essential for the success of the graduate. Upon satisfactory completion of this curriculum the student will be awarded a certificate in Industrial Management.

*Pending Approval.

*INDUSTRIAL MANAGEMENT

One-Year Certificate Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
DRFT 171	Blueprint Reading I	1	3	2
ECON	Economics	3	0	3
ENGL 101	Communication Skills	3	0	3
GENL 100	Orientation	1	1	1
INDT 111	Materials & Processes of Industry I (or Elective)	3	0	3
INDT 176	Industrial Safety	2	0	2
MATH	Mathematics Elective			3-5
	Total	13	4	17-19
	SECOND QUARTER			
ENGL 27	Technical Report Writing I	3	0	3
GOVT	Government	3	0	3
INDT 112	Materials & Processes of Industry II (or Elective)	3	0	3
INDT 170	Industrial Management	3	0	3
MATH	Mathematics Elective			3-5
MECH 181	Machine Laboratory I (or Elective)	1	3	2
	Total	13	3	17-19
	THIRD QUARTER			
DAPR 106	Principles of Data Processing	3	0	3
INDT 276	Time and Motion Study I	3	0	3
INDT 286	Quality Control	2	2	3
INDT 288	Production Planning and Control	3	0	3
MECH 132	Machine Laboratory II (or Elective)	1	3	2
PSYC	Psychology	3	0	3
	Total	15	5	17

Total Minimum Credits for Industrial Management Certificate---------- 51

*Pending Approval.

STENOGRAPHIC CERTIFICATE PROGRAM

Degree: Stenographic Certificate

Length: Three-quarter (one-year) program

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

Occupational Objectives: Stenographer
Typist
File Clerk
General Office Work

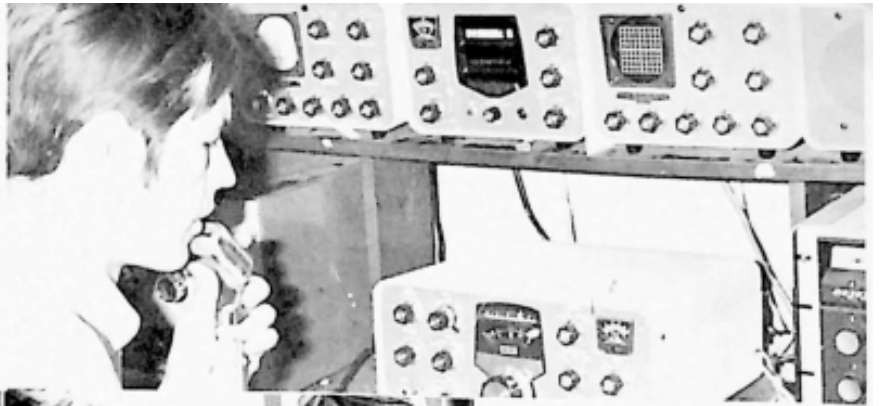
Admission Requirements: Applicant must meet the general requirements for admission to the College.

Program Requirements: This curriculum requires the student to take English, mathematics, and speech, in addition to required courses needed by qualified stenographers. Upon completion of the three-quarter program the student will be awarded the Stenographic Certificate.

STENOGRAPHIC CERTIFICATE PROGRAM

Course Number		Course Title	Lecture Hours	Lab Hours	Course Credits
		FIRST QUARTER			
BUAD	100	Introduction to Business	3	0	3
ENGL	101	Communications Skills I	3	0	3
GENL	100	Orientation	1	1	1
MATH	151	Business Mathematics I	3	0	3
SECR	111	Typewriting I[1]	2	3	3
SECR	121	Shorthand I[1]	3	2	4
		Total	15	6	17
		SECOND QUARTER			
ECON	160	American Economics	3	0	3
ENGL	102	Communications Skills II	3	0	3
MATH	152	Business Mathematics II	3	0	3
SECR	112	Typewriting II	2	3	3
SECR	136	Filing and Records Management	3	0	3
SECR	122	Shorthand II	3	2	4
		Total	17	5	19
		THIRD QUARTER			
PSYC	128	Human Relations	3	0	3
SECR	113	Typewriting III	2	3	3
SECR	123	Shorthand III	3	2	4
SECR	256	Machine Transcription	2	2	3
GOVT	180	American Constitutional Government	3	0	3
BUAD	108	Office Machines	1	2	2
		Total	14	9	18
Total Minimum Credits for Stenographic Certificate					54

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



PART V

DESCRIPTIONS OF COURSES

FOUNDATION PROGRAM

Foundation, developmental or preparatory programs are offered to prepare individuals for admission to the occupational-technical and university parallel-college transfer programs in the College. These foundation programs are designed to 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 foundation program after an analysis of his high school transcript, test scores, and other data available concerning his past achievement.

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 to reveal his progress.

The student may use either of two approaches to improve his knowledges and skills in the foundation program: (1) he may enroll in the regular foundation courses scheduled each quarter at the College; (2) he 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 will be available to provide individual student assistance. Progressing at his own rate, the student may complete the unit of study at any time he demonstrates sufficient mastery of the minimum requirements for the unit or course.

A student in the foundation program may take all of his study in foundation courses, or he may elect some associate degree courses for which he is qualified in addition to one or more foundation courses. Many of the foundation courses will provide credit applicable to the requirements of a diploma or certificate program. In addition, if the student takes associate degree courses while in the foundation program, 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 Office of the College in planning his program and selecting his courses.

CONTINUING EDUCATION AND COMMUNITY SERVICES PROGRAMS

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

Course Numbers

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

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

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

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

Course Credits

The credit for each course is indicated after the title in the course description. One credit is equivalent to one collegiate quarter hour credit or two-thirds of a collegiate semester hour credit.

Course Hours

The number of lecture hours in class each week (including lecture, seminar and discussion hours) and/or the number of laboratory hours in class each week (including laboratory, shop, supervised 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, as listed in the course description, each student also must spend some time on out-of-class assignments under his own direction. Usually each credit per course requires an average of three hours of in-class and out-of-class study each week.

Course Prerequisites

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

ACCOUNTING

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

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

ACCT 211-212-213 PRINCIPLES OF ACCOUNTING I-II-III (3 cr.) (3 cr.) (3 cr.)—Accounting principles and their application to various forms of business inventory valuation, internal control systems, manufacturing processes, budgeting, and analysis of financial statements. Lecture 3 hours per week.

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

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

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

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

ACCT 245 TAXES II (3 cr.)—Prerequisite ACCT 244. Federal taxation principles and theories concerning partnership and corporation income tax concepts and problems. Emphasis on evaluation of business transactions from a tax point of view, partnership and corporate tax minimization and tax return preparation. Lecture 3 hours per week.

ACCT 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

ACCT 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

AIR CONDITIONING AND REFRIGERATION

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

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

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

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

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

AIRC 25 ELECTRIC POWER (4 cr.)—Prerequisite ELEC 48 or equivalent. Electricity for air conditioning which includes circuit elements, direct current circuits and motors, single and three-phase circuits and motors, power distribution systems and protective devices. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

AIRC 26 ELECTRICAL AND CONTROL SYSTEMS (3 cr.)—A short course for trouble shooting and servicing the electrical components of small refrigeration systems including basic electricity for refrigeration, electrical controls of the refrigeration systems, electrical motors, motor control, motor starters, relays, overloads, instruments, and control circuits. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

AIRC 31 CIRCUITS AND CONTROLS I (2 cr.)—A study of the fundamentals of control, definitions, electric controls circuits, and electric control units. Lecture 2 hours, Laboratory 1 hour, Total 3 hours per week.

AIRC 32 CIRCUITS AND CONTROLS II (3 cr.)—Prerequisite AIRC 31. Circuit diagrams, reading and drawing circuits diagrams, types of electrical controls, measuring electrical units, and house wiring circuits. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

ARCHITECTURAL TECHNOLOGY

ARCH 100 INTRODUCTION TO ARCHITECTURE (2 cr.)—An intensive course outlining the history and impact of architecture. Emphasis on the dynamics and social aspects of architecture and society. Lecture 2 hours per week.

ARCH 111 ARCHITECTURAL DRAFTING I (3 cr.)—Designed to provide the fundamental knowledge of the principles of drafting. Skills and techniques of drafting including use of drafting equipment, lettering, freehand orthographic and pictorial sketching, geometric construction, and orthographic instrument drawing of principle views. Projection problems dealing with principles of descriptive geometry involving points, lines, planes and connectors. The principles of isometric, oblique and perspective drawings. Lecture 1 hour, Laboratory 6 hours, Total 7 hours per week.

ARCH 112 ARCHITECTURAL DRAFTING II (3 cr.)—Prerequisite ARCH 111 or equivalent. 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 prepared from preliminary sketches. Applications of descriptive geometry 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 prepared from preliminary sketches. Lecture 1 hour, Laboratory 6 hours, Total 7 hours per week.

ARCH 141 MATERIALS AND METHODS OF CONSTRUCTION I (3 cr.)—Prerequisite ARCH 100 or ENGR 100. Designed to introduce the materials used in erection of structures, the physical properties and the architecture and characteristics of steel, concrete, timber, glass, related materials and the methods used in testing materials. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

ARCH 142 MATERIALS AND METHODS OF CONSTRUCTION II (3 cr.)—Prerequisite ARCH 141. Designed to introduce the practical use of materials and methods of structures. The architectural and structural relationship of concrete, steel, and timber structures are analyzed with an introduction to cost analysis and the economic aspect involved in construction. Lecture 3 hours per week.

ARCH 204-205 HISTORY OF ARCHITECTURE I-II (3 cr.) (3 cr.)—The history of architecture from ancient times to the present but with emphasis on the designs and forms of twentieth century development. Lecture 3 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 drawings necessary for construction and fabrication of structural members. Reference materials provide skills and knowledge in locating data and in using handbooks. Lecture 1 hour, Laboratory 6 hours, Total 7 hours per week.

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

ARCH 213 ARCHITECTURAL DRAFTING VI (3 cr.)—Prerequisite ARCH 212. Preparation of a complete set of working drawings for the architectural structure. Preparation of millwork drawings, cabinets and built-in-equipment detail. Final assembly of the complete document for construction purposes. Lecture 1 hour, Laboratory 6 hours, Total 7 hours per week.

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

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

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

ARCH 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objectives, and a study of approaches to the selection of career opportunities in the field. Variable hours.

ARTS

ARTS 111-112-113 HISTORY AND APPRECIATION OF ART I-II-III (3 cr.) (3 cr.) (3 cr.)—The history and interpretation of architecture, sculpture and painting beginning with prehistoric art and following the mainstream of western civilization to the present. Lecture 3 hours per week.

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

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

ARTS 166-167 FUNDAMENTALS OF LETTERING I-II (3 cr.) (3 cr.)—Calligraphy as an introduction to script and the constructed letter; creative, freehand, and mechanical lettering; other forms of letters used in today's graphic layout and design. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

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

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

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

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

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

ARTS 261-262-263 ADVERTISING DESIGN I-II-III (3 cr.) (3 cr.) (3 cr.)—A study of the principles of visual communications as applied to advertising design

in newspaper, magazine, direct mail advertising, house organs, etc. Analysis of the influence on layout by contemporary art. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

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

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

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

ARTS 281-282-283 PHOTOGRAPHY WORKSHOP I-II-III (1 cr.) (1 cr.) (1 cr.) —Prerequisite ARTS 186. Advanced practical study in the photography laboratory covering all phases of photography pertinent to graphic arts. Laboratory 3 hours per week.

ARTS 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

AUTOMOTIVE TECHNOLOGY

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

AUTO 121-122-123 AUTOMOTIVE FUEL SYSTEMS I-II-III (4 cr.) (4 cr.) (4 cr.)—Analysis of automotive fuel systems to include carburetors, fuel injection, superchargers, fuel pumps, filters, instruments, tanks and connecting lines. Complete overhaul, repairs and adjustment of fuel system components. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

AUTO 136 AUTOMOTIVE LUBRICATION AND COOLING SYSTEMS (3 cr.)—Testing and analysis of lubrication systems to include lubricants, pumps, lines, filter, and vents. Analysis of cooling systems, coolants, pumps, fans, lines and connections. Estimating repairs, adjustments needed and their costs. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

AUTO 151-152-153 AUTO POWER TRAINS I-II-III (4 cr.) (4 cr.) (4 cr.)—The operation, design, construction and repair of power train components, standard and automatic transmissions; clutches, propeller shaft, universal joints, rear axle assemblies, fluid couplings, torque converters; 2, 3 ad 4 speed standard, overdrive and automatic transmissions. Lecture 2 hours, Laboratory 6 hours, Total 8 hours per week.

AUTO 199 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

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

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

AUTO 267 AUTOMOTIVE SUSPENSION & BRAKING SYSTEMS (4 cr.)—Operation, design, construction, repair and servicing of braking and suspension systems; use of tools and test equipment, evaluation of test results, estimation of repair cost, front and rear suspension alignment, power and standard steering, and power, standard and disc brakes. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

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

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

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

AUTO 290 COORDINATED INTERNSHIP (1-5 cr.)—Supervised on-the-job training in selected business, industrial or service firms coordinated by the College. Credit/Work Ratio 1:5 hours. May be repeated for credit. Variable hours.

BIOLOGY

BIOL 101-102-103 GENERAL BIOLOGY I-II-III (4 cr.) (4 cr.) (4 cr.)—Fundamental characteristics of living matter from the molecular level to the ecological community with emphasis on general biological principles. Diversity of living organisms, their structure, physiology and evolution. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

BIOL 104-105 GENERAL BIOLOGY I-II (6 cr.) (6 cr.)—Fundamental characteristics of living matter from the molecular level to the ecological community with emphasis on general biological principles. Diversity of living organisms, the structure, physiology and evolution. Lecture 4 hours, Laboratory 6 hours, Total 10 hours per week.

BIOL 114-115 GENERAL BOTANY I-II (4 cr.) (4 cr.)—Prerequisite BIOL 101 (not open to students who have completed BIOL 102 and 103). A study of the seedless plants, algae, fungi, mosses and liverworts, and ferns and their "allies" with emphasis on life cycles, morphology and taxonomy. A study of the seed plants, conifers and flowering plants with emphasis on anatomy, morphology, taxonomy, and evolution; principles of genetics, ecology, and physiology are considered. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

BIOL 124-125 GENERAL ZOOLOGY I-II (4 cr.) (4 cr.)—Prerequisite BIOL 101 (not open to students who have completed BIOL 102 and 103). Introduction to the invertebrates and vertebrates, presenting basic biological principles, and emphasizing evolutionary relationships, life histories, and economic importances. Cellular structure and physiology are considered. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

BIOL 154-155 HUMAN ANATOMY AND PHYSIOLOGY I-II (4 cr.) (4 cr.)—Structure and functioning of the normal human body as a basis for understanding nursing theory and practice. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

BIOL 174-175 MICROBIOLOGY I-II (3 cr.) (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 their relationships to individual community health. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

BIOL 198 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

BIOL 199 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

BIOL 206 BIOLOGICAL PROBLEMS IN CONTEMPORARY SOCIETY (3 cr.)—Prerequisite BIOL 103 or departmental permission. Designed to develop soundly-based understanding of some of the major problems of today's living. Contemporary readings will include such topics as overpopulation, pollution, drug abuse, famine, ecology, conservation, and others. Lecture 3 hours per week.

BIOL 214 INTRODUCTION TO NON-VASCULAR PLANTS (4 cr.)—Prerequisites BIOL 103 or equivalent (not open to students having had BIOL 114-115). Designed to cover the lower plants including the algae, fungi, and bryophytes. Studies of major taxonomic groups—their morphology, life cycles, ecology, physiology, economic importance. Sight recognition and collections may be required. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

BIOL 215 INTRODUCTION TO VASCULAR PLANTS (4 cr.)—Prerequisites BIOL 103 or equivalent (not open to students having had BIOL 114-115). Designed to cover the higher plants beginning with those that have vascular tissue, and including flowering and non-flowering plants. Studies of major taxonomic groups—their morphology, life cycles, ecology, physiology, economic importance. Sight recognition and collections may be included. Lecture 3 hours, Laboratory 3 hours. Total 6 hours per week.

BIOL 224 INTRODUCTORY INVERTEBRATE ZOOLOGY (4 cr.)—Prerequisite BIOL 103 or the equivalent (not open to students having had BIOL 124-125). The biology of invertebrate animals with special reference to structure, embryology, function, ecology, classification, and evolution. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

BIOL 225 INTRODUCTORY VERTEBRATE ZOOLOGY (4 cr.)—Prerequisite BIOL 103 or equivalent (not open to students having had BIOL 124-125). Fundamentals of vertebrate anatomy, physiology, embryology, classification and evolution. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

BIOL 251-252 HUMAN ANATOMY AND PHYSIOLOGY I-II (4 cr.) (4 cr.)—Prerequisites BIOL 103 and one year of college chemistry, or departmental permission. Consideration of basic biological principles as revealed by anatomical and physiological studies. An integrated study of the systems of the human body including gross and microscopic structures and their physiology. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

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

BIOL 267 GENERAL ECOLOGY (5 cr.)—Prerequisite BIOL 103 or departmental permission. This course is a study of the interrelationships between organisms and the natural and cultural environments with emphasis on human influences on ecological structures, survey of populations, communities and ecosystems. Lecture 4 hours, Laboratory 3 hours, Total 7 hours per week.

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

BIOL 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

BIOL 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

BROADCASTING

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

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

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

BCST 139 TV STUDIO ART (3 cr.)—Prerequisite ARTS 151. Designed for the prospective producer-director; the design and use of graphics, scenery and props, the use of color, special effects and animation. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

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

chroma and hue, FCC license requirements. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

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

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

BCST 226 WRITING FOR RADIO/TV (3 cr.)—Prerequisite ENGL 102. The written communications process; writing and planning of continuity for radio and television; documentary writing. Laboratory 6 hours per week.

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

BCST 267 FILM PRODUCTION (3 cr.)—The study of form and structure in film-making including interrelationship of work and image, major problems and accomplishments in film production, and techniques of elementary film-making. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

BCST 2B1-282-283 ADVANCED RADIO/TV PRODUCTION I-II-III (5 cr.) (5 cr.) (5 cr.)—Prerequisite BCST 122. Advanced radio and television program production and direction: production environment and organization; producer-director responsibilities and techniques; practical exercises in student production and direction. Lecture 3 hours, Laboratory 6 hours, Total 9 hours per week.

BCST 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

BUSINESS MANAGEMENT AND ADMINISTRATION

BUAD 100 INTRODUCTION TO BUSINESS (3 cr.)—The role and function of business enterprise within our economic framework. Includes organization, finance, marketing, personnel administration, production and economics. Designed primarily to help students select their field of business specialization. Lecture 3 hours per week.

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

BUAD 110 HUMAN RELATIONS & LEADERSHIP TRAINING (3 cr.)—The task of management involved in getting things done through people; understanding of human motivation and behavior patterns, performance, and analysis of manpower growth in an organization. Lecture 3 hours per week.

BUAD 117 PRINCIPLES OF SECURITIES INVESTMENT (3 cr.)—Designed to aid the student in developing a broad perspective in the area of stocks and bonds. Mechanics of stock exchanges, types of securities, types of orders, and specific investment objectives. Lecture 3 hours per week.

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

BUAD 164 PRINCIPLES OF BUSINESS MANAGEMENT I (3 cr.)—Management and management functions; planning, organizing, staffing, directing, and controlling. Management examined as both a science and art with emphasis on both the body of knowledge and the personal abilities required to be successful as a manager. Lecture 3 hours per week.

BUAD 165 PRINCIPLES OF BUSINESS MANAGEMENT II (3 cr.)—Prerequisite BUAD 164. The application of management principles to realistic management situations. The case method of study in analyzing management problems with emphasis on application to various types of business enterprises. Lecture 3 hours per week.

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

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

BUAD 241 BUSINESS LAW I (3 cr.)—An introduction to the field of law, how it developed and how it operates as a method of control; study of the purpose of law in our present-day complex society, the law of contracts, and the agency. Lecture 3 hours per week.

BUAD 242 BUSINESS LAW II (3 cr.)—Prerequisite BUAD 241. A continuation of BUSINESS LAW I (BUAD 241). The main topic to be studied is the Uniform Commercial Code as adopted in the various states. Lecture 3 hours per week.

BUAD 243 BUSINESS LAW III (3 cr.)—Prerequisite BUAD 241-242. Continuation of BUSINESS LAW I & II (BUAD 241-242). Employment, bailment, partnerships, corporations, property, and the Uniform Commercial Code. Lecture 3 hours per week.

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

BUAD 254 APPLIED BUSINESS STATISTICS I (3 cr.)—An introductory course in statistics. Collection, presentation, and analysis of data through ratios, percentages, and averages. Emphasis on the practical application of statistical measures to business situations. Lecture 3 hours per week.

BUAD 255 APPLIED BUSINESS STATISTICS II (3 cr.)—Prerequisite BUAD 254. A continuation of the application of principles taught in BUAD 254 with emphasis on the graphic presentation of data concerning business activity and some advanced statistical concepts such as probability and sampling. Lecture 3 hours per week.

BUAD 269 PURCHASING AND MATERIALS MANAGEMENT (3 cr.)—Principles of purchasing and management of inventories including determination of requirements, pricing, source selection, and inventory policy and control. Lecture 3 hours per week.

BUAD 276 PERSONNEL MANAGEMENT (3 cr.)—The problems and issues in the administration of personnel actions. Includes organization and tasks of personnel development, significant personnel considerations and an appraisal of the position of labor in business today. Lecture 3 hours per week.

BUAD 287 PUBLIC RELATIONS IN MANAGEMENT (3 cr.)—A survey of public relations as a management responsibility. Includes philosophy and techniques of public relations; application to employee, public customer, and stockholdrer relations; lecture, demonstrations, and problem cases for practical application. Lecture 3 hours per week.

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

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

BUAD 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

BUAD 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

CHEMISTRY

CHEM 101-102-103 GENERAL CHEMISTRY I-II-III (4 cr.) (4 cr.) (4 cr.)—Introduction to the fundamental laws and the theories of chemistry; most important elements and their compounds; properties and uses of the more important metallic and non-metallic elements and their general importance. Laboratory in the third quarter includes qualitative analysis. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

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

CHEM 114-115 GENERAL INORGANIC CHEMISTRY I-II (6 cr.) (6 cr.)—Fundamental principles and laws underlying chemical action with special emphasis on the non-metals and their compounds, theories and problems. Laboratory for the first half of the course deals with the non-metallic elements and their compounds. The second half deals with the theories of qualitative analysis. Lecture 4 hours, Laboratory 5 hours, Total 9 hours per week.

CHEM 198 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

CHEM 199 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

CHEM 221-222-223 QUANTITATIVE ANALYSIS I-II-III (4 cr.) (4 cr.) (5 cr.)—Prerequisite CHEM 113. Theory and practice in standard methods of gravimetric, volumetric, colorimetric, and electrometric analysis; special emphasis on equilibrium in acid-base and oxidation-reduction equations and stoichiometry of chemical reactions. The third quarter is devoted to instrumental analysis. Lecture 2-2-3 hours, Laboratory 6 hours, Total 8-8-9 hours per week.

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

CHEM 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

CHEM 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

CIVIL ENGINEERING TECHNOLOGY

CIVL 124-125 CIVIL ENGINEERING DRAFTING I-II (2 cr.) (2 cr.)—Introduction to terminology and drafting procedures related to structural steel, reinforced concrete, and timber detailing. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

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

CIVL 180 PRINCIPLES OF SURVEYING (4 cr.)—Prerequisite Basic Trigonometry. Introduction to the elements of surveying. Use and care of modern survey equipment and the application of surveying in engineering construction. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

CIVL 181-182 SURVEYING I-II (4 cr.) (4 cr.)—Prerequisites Algebra, Plane Geometry, Basic Trigonometry, or MATH 111. Introduction to surveying, chaining and pacing, direct and profile leveling, measurements of angles, transit-tape traversing, traverse analysis, calculation of areas, adjustment of instruments. Basic complex circular curves, stadia surveying, topographic surveying analysis and preparation of topographic maps. Field work parallels classroom instruction. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

CIVL 217 STRUCTURAL STEEL DESIGN (4 cr.)—Design, investigation and detailing of basic structural steel members. Lecture 4 hours per week.

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

CIVL 230 STRUCTURAL ANALYSIS (3 cr.)—Analysis of statically determinate structures based on both the principles of statics and geometric conditions of the deformed structure. Lecture 3 hours per week.

CIVL 256 SOIL MECHANICS (4 cr.)—Soil in its relationship to engineering construction. Includes soil density, sampling soil frost action, stabilization, stress, consolidation, settlement, shearing strength, stability, embankments, dams, retaining walls, piles and underground conduits. Laboratory includes ASTM and AASHO specifications used in classifying and predicting the behavior of soils. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

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

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

CIVL 260 HYDRAULICS (3 cr.)—Principles of fluid flow and development of practical hyraulics resulting from study of fluid statics, flow of real fluid in pipes, multiple pipe lines, liquid flow in open channels, and fluid measurement techniques. Lecture 3 hours per week.

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

CIVL 276-277 TRAFFIC AND TRANSPORTATION TECHNOLOGY I-II (4 cr.) (4 cr.)—Introduction to the techniques of traffic and transportation surveys. The application of survey data to the planning, design and operation of modern transportation systems. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

CIVL 284 ROUTE SURVEYING AND HIGHWAY DESIGN (4 cr.)—Prerequisite CIVL 180 or equivalent. Principles of route surveying; simple, compound and

transition curves; grades and vertical curves; earthwork and haul quantities. Lecture 3 hours, Laboratory 5 hours, Total 8 hours per week.

CIVL 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

DATA PROCESSING

DAPR 36 KEY PUNCH/KEY TAPE OPERATION (8 cr.)—Prerequisite typing skill of 30 wpm or departmental permission. A comprehensive occupational course designed to prepare students to function as key punch/key tape operators in the current data processing employment market; an introduction to data processing principles. Lecture 3 hours, Laboratory 15 hours, Total 18 hours per week.

DAPR 100 INTRODUCTION TO DATA PROCESSING (4 cr.)—Prerequisite one year of high school algebra. An introduction to methods, techniques, and systems of manual, mechanical, electronic and automatic data processing. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

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

DAPR 110 PERIPHERAL EQUIPMENT (3 cr.)—Prerequisite DAPR 106 or equivalent. Operating, wiring, and control of data processing machines other than electronic digital computers. Experience is provided with the equipment in the data processing center using business problems for "hands-on" machine concepts. Lecture 3 hours per week.

DAPR 130 INTRODUCTION TO COMPUTER OPERATIONS (3 cr.)—Prerequisite DAPR 106 or equivalent. Various types of hardware and related software systems including compilers, macro generators, utility routines, I/O, sort/merge, print. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 136 COMPUTER OPERATIONS (3 cr.)—Prerequisite DAPR 130. An introduction to operating procedure using a computer. A study of the console used to control the machine manually, correct errors, determine the status of machine circuits, registers, and determine the content of storage. The procedure for using input and output devices, punched paper tape, magnetic tape, random access devices, and printer. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

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

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

DAPR 256 COMPUTER PROGRAMMING (ADVANCED COBOL) (3 cr.)—Prerequisite DAPR 147. Experience in programming in a Disc-Operating System environment. In addition to learning the characteristics of DOS, the student will use job control language, add and delete files, use utility programs and analyze error messages making necessary corrections. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

DAPR 257 INTRODUCTION TO SYSTEMS 360 PROGRAMMING LANGUAGE (3 cr.)—Prerequisite DAPR 106 or equivalent. A course in programming languages designed to provide full access to the computer and the operating system. The language applies to both business and scientific problems and is relatively independent of the machine. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

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

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

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

DAPR 282 SYSTEMS ANALYSIS II (3 cr.)—Prerequisite DAPR 281. The systems design and implementation phases relating to initial automation; up-grading or revision of business data processing systems; system documentation including summaries for management schedules and cost analysis; equipment selection, acquisition and detailed review of pre- and post-installation considerations. Lecture 3 hours per week.

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

DAPR 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

DAPR 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

DECORATING

DECO 11 INTERIOR DECORATING I (3 cr.)—The fundamental principles involved in good interior decorating. Lecture 3 hours per week.

DECO 12 INTERIOR DECORATING II (3 cr.)—Application of fundamental decorating principles to house furnishings and interior design. Lecture 3 hours per week.

DENTAL ASSISTANT

DENT 100 INTRODUCTION TO DENTAL ASSISTING (3 cr.)—Introduction to the career of dental assisting; history and development of dentistry and its related fields; the modern role of the dental assistant in practice and in relation to other members of the dental health team; personal and ethical requirements for safe and effective practice. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

DENT 101-102-103 DENTAL SCIENCE I-II-III (4 cr.) (4 cr.) (4 cr.)—Bacteriology, anatomy and physiology, gross and oral dental anatomy, oral pathology, pharmacology, diet and nutrition, and first aid and dental emergencies as related to dental science and the role of the dental assistant. Lecture 2 hours, Laboratory 6 hours, Total 8 hours per week.

DENT 110 DENTAL MATERIALS (4 cr.)—Introduction to the restorative phase of dentistry; identification of dental materials, characteristics of each, evaluation of quality, and principles and procedures related to manipulation and storage of various dental materials; history, property and use of various dental laboratory materials including dentures, bridges, and similar dental appliances. Lecture 2 hours, Laboratory 6 hours, Total 8 hours per week.

DENT 111-112 CLINICAL PROCEDURES I-II (4 cr.) (4 cr.)—Prerequisites DENT 100, 110, 101-102 or corequisite. Principles and procedures related to radiology, dental instruments and equipment; role of the dental assistant in various dental specialties such as endodontics, periodontics, orthodontics, prosthetics, and oral surgery. Lecture 2 hours, Laboratory 6 hours, Total 8 hours per week.

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

DENT 190 COORDINATED INTERNSHIP (1-5 cr.)—Supervised on-the-job training in selected business, industrial or service firms coordinated by the College. Credit/Work Ratio 1:5 hours. May be repeated for credit.

DENT 199 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

DENT 260 FIRST AID FOR DENTAL AUXILIARIES (2 cr.)—The principles of emergency treatment of general medical problems and acceptable treatment methods applicable both in limited and mass disaster situations. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

DRAFTING

DRFT 111 TECHNICAL DRAFTING I (2 cr.)—Introduction to the techniques and instruments required for success as a draftsman in industry. Use of instruments, lettering, simple descriptive and analytic geometry principles as applied

to drafting and freehand sketching, basic principles of orthographic projection in the preparation of simple drawings. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

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

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

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

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

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

ECONOMICS

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

ECON 211-212-213 PRINCIPLES OF ECONOMICS I-II-III (3 cr.) (3 cr.) (3cr.)— The principles of economics and the bearing of these principles on present American conditions; structural and functional aspects of the economy. Analysis, problems and issues relating to the organization of business, labor, and government institutions and their economic stability and growth. Measurements of economic activity. Private enterprise, economic growth and stabilization policies, monetary and fiscal policy. International economic relationships, alternative economic systems. Lecture 3 hours per week.

ECON 214-215 PRINCIPLES OF ECONOMICS I-II (5 cr.) (4 cr.)—An introductory course covering the structure, organization, and operation of the United States economy. Analysis, problems, and issues relating to the organization of business, labor, and government institutions and their economic stability and growth. Measurements of economic activity. Private enterprise, economic growth and stabilization policies, monetary and fiscal policy. International economic relationships, alternative economic systems. Lecture 5 hours per week in ECON 214 and Lecture 4 hours per week in ECON 215.

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

ECON 298 SEMINAR PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

ECON 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

EDUCATION

EDUC 190 COORDINATED INTERNSHIP (1-5 cr.)—Supervised on-the-job training in selected business, industrial or service firms coordinated by the College. Credit/Work Ratio 1:5 hours. May be repeated for credit. Variable hours.

EDUC 191-192-193 SEMINAR IN TECHNIQUES FOR HEAD START PERSONNEL I-II-III (3 cr.) (3 cr.) (3 cr.)—Discussion topics: production of instructional materials, audio-visual instruction, appropriate educational objectives. Lectures: music, art, science, mathematics, first aid, health, physical education. Lecture 3 hours per week.

EDUC 198 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

EDUC 199 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

EDUC 246 EDUCATIONAL LAW (3 cr.)—The application of rules of law to the operation of the public schools in Virginia. Legal aspects of the principal instruments of school activities, rights and liabilities of school employees, legal aspects of negotiable instruments and securities. Lecture 3 hours per week.

ELECTRICITY AND ELECTRONICS

ELEC 11-12-13 ELECTRICITY I-II-III (4 cr.) (4 cr.) (4 cr.)—Principles of electricity covering resistance, current, and voltage in both AC and DC circuits. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 21-22-23 ELECTRONICS I-II-III (4 cr.) (4 cr.) (4 cr.)—Introduction to vacuum tube, semiconductor principles and circuitry. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 48 ELECTRICITY (4 cr.)—Designed for non-electrical majors. The nature of electricity, basic electrical quantities, Ohm's law, electrical circuits, magnetism, circuit elements, power and heating effect. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

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

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

ELEC 125 INTRODUCTION TO ELECTRONICS (5 cr.)—Corequisite ELEC 112 or 115. The theory, properties, and application of vacuum tube and solid state devices, including power supplies. Lecture 4 hours, Laboratory 3 hours, Total 7 hours per week.

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

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

ELEC 212 ELECTRICAL MACHINES AND INDUSTRIAL CONTROLS (4 cr.)—Prerequisite ELEC 112. Construction, theory of operation, characteristics, and application of alternator, synchronous motors, induction motors, and fractional horsepower motors. Introduction to the principles of industrial control, circuit diagram functions and symbols to "traditional" motor control, the principles of operation and application of the devices used for control and protection. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

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

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

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

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

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

ELEC 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

ELEC 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

ENGINEERING

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

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

ENGR 102 INTRODUCTION TO ENGINEERING METHODS (2 cr.)—Prerequisite ENGR 101. Slide-rule practice, an introduction to analog and digital computers, programming of digital computer, vector geometry, graphical representation of data; field trips to nearby computer center. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

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

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

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

ENGR 123 ENGINEERING GRAPHICS III (2 cr.)—Prerequisite ENGR 121 or equivalent. A study of the analysis and graphic presentation of the space relationship of fundamental geometric elements: point, line, plane, curved surfaces, development and vectors. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

ENGR 151 MECHANICS I (STATICS) (3 cr.)—Corequisite MATH 122 or MATH 112. Principles and applications of free body diagrams for force systems, shear and moment diagrams, deflection of beams and determination of section properties. Lecture 3 hours per week.

ENGR 152 MECHANICS II (STRENGTH OF MATERIALS) (4 cr.)—Prerequisite ENGR 151. Strength of material concepts with laboratory demonstrations and experiments. Stress and strain analysis, both elastic and plastic, with emphasis on elastic analysis of axially loaded members, connectors, beams, and columns. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

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

ENGR 202 MECHANICS OF DEFORMABLE SOLIDS (5 cr.)—Corequisite MATH 242. Structural mechanics applied to trusses, frames; introductory mechanics of continuous media; concepts of stress, strain, stress-strain relations; stress and deformation due to longitudinal loads, torsion, and bending; eccentric loads on short posts, Euler column theory. Lecture 5 hours per week.

ENGR 203 DYNAMICS OF RIGID BODIES (3 cr.)—Prerequisite ENGR 201. Corequisite MATH 242. Vector treatment using index notation of planar and three-dimensional kinematics and kinetics of rigid bodies; mass moments of inertia, Newton's laws, work and energy, impulse and momentum, vibration applied to rigid bodies. Lecture 3 hours per week.

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

ENGLISH

ENGL 01 VERBAL STUDIES LABORATORY (1-5 cr.)—A developmental course in composition designed for students who need help in all areas of writing to bring their proficiency to the level necessary for entrance into their respective curriculums. Emphasis on individual instruction. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hours.

ENGL 08 READING IMPROVEMENT (1-5 cr.)—A developmental course using modern techniques, equipment, and materials to increase the student's comprehension, skill, and speed in reading. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hours.

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

ENGL 111-112-113 ENGLISH COMPOSITION I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite satisfactory score on appropriate English proficiency examinations and 4 units of high school English or equivalent. Expository and argumentative writing, ranging from single paragraphs to essays of some length and complexity. Study of logical, rhetorical, and linguistic structures; the methods and conventions of preparing research papers; and the practical criticism of literary types. Lecture 3 hours per week.

ENGL 114-115 ENGLISH COMPOSITION I-II (5 cr.) (4 cr.)—Prerequisite satisfactory score on appropriate English proficiency examinations and 4 units of high school English or equivalent. Expository and argumentative writing, ranging from single paragraphs to essays of some length and complexity. Study of logical, rhetorical, and linguistic structures; the methods and conventions of preparing research papers; and the practical criticism of literary types. Lecture 5-4 hours per week.

ENGL 118 READING AND STUDY DEVELOPMENT (3 cr.)—A multi-level reading course with emphasis on structural analysis, critical reading, and study techniques for the development of individual skills; laboratory provides enrichment and application of techniques. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

ENGL 127 TECHNICAL WRITING (3 cr.)—Prerequisite ENGL 102 or departmental approval. Designed to develop writing proficiency in technical fields. Emphasis on collecting, organizing, and presenting materials applicable to various specialized areas. Lecture 3 hours per week.

ENGL 180 FUNDAMENTALS OF BUSINESS ENGLISH (3 cr.)—Prerequisite ENGL 102. An intensive study of the qualities and techniques required in the preparation of business correspondence, reports, articles, and memoranda. A practical course in the reading and writing of business-related materials with emphasis on comprehension, analysis, and organization of ideas in a logical pattern. Lecture 3 hours per week.

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

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

FRENCH

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

FREN 199 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

FREN 201-202-203 INTERMEDIATE FRENCH I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite FREN 103 or successful completion of two years of high school French and departmental permission. Advanced study in the understanding, speak-

ing, reading, and writing of French. French used in the classroom. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

FREN 231-232-233 INTRODUCTION TO FRENCH CIVILIZATION AND LETERATURE I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite FREN 203 or equivalent. An introduction to the background of French life and culture and to the outstanding contributions of France to world civilization from medieval times to the present. Reading is in the original French and French is used in the classroom. Lecture 3 hours per week.

FREN 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

GENERAL

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

GENL 199 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

GEOGRAPHY

GEOG 240 INTRODUCTION TO PHYSICAL GEOGRAPHY (3 cr.)—A study of the major elements of the natural environment such as land forms, weather and climate, natural vegetation, and soils. Lecture 3 hours per week.

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

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

GEOG 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

GEOG 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

GEOLOGY

GEOL 101-102-103 GENERAL GEOLOGY I-II-III (4 cr.) (4 cr.) (4 cr.)—Physical geology, the various modifying agencies at work upon the earth, and their effects. The composition and structure of the earth as a whole. Historical geology, the history of the earth and its plants and animals from the beginning to the present, with emphasis on the principles involved in interpreting geologic evidence. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

GEOL 104-105 GENERAL GEOLOGY I-II (6 cr.) (6 cr.)—Physical geology, the various modifying agencies at work upon the earth, and their effects. The composition and structure of the earth as a whole, and historical geology, the history of the earth and its plants and animals from the beginning to the present, with emphasis on the principles involved in interpreting geologic evidence. Lecture 5 hours, Laboratory 3 hours, Total 8 hours per week.

GEOL 198 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

GEOL 199 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

GERMAN

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

GERM 199 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

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

GERM 231-232-233 INTRODUCTION TO GERMAN LITERATURE I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite GERM 203 or equivalent. Readings in selected works of German literature. German is used in the classroom. Lecture 3 hours per week.

GERM 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

GOVERNMENT

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

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

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

GOVT 281-282-283 UNITED STATES GOVERNMENT I-II-III (3 cr.) (3 cr.) (3 cr.)—Elements of political science, powers, organization, and functions of the legislative, executive, and judicial branches of the national, state and local governments in the United States; democracy, federalism, the Constitution, and civil liberties. Lecture 3 hours per week.

GOVT 284-285 UNITED STATES GOVERNMENT I-II (5 cr.) (4 cr.)—Elements of political science, powers, organization, and functions of the legislative, executive, and judicial branches of the national, state and local governments in the United States; democracy, federalism, the Constitution, and civil liberties. Lecture 5-4 hours per week.

GOVT 298 SEMINAR IN PUBLIC AFFAIRS (2 cr.)—Prerequisite GOVT 180 or equivalent. Seminar in current public affairs concerning domestic and foreign policy of the United States to develop the ability to analyze and critically evaluate present problems as they relate to the functioning of the United States. Lecture 2 hours per week.

GOVT 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

HEALTH

HLTH 110 CONCEPTS OF PERSONAL AND COMMUNITY HEALTH (3 cr.)—A course designed to study the concepts related to the maintenance of health and the prevention of illness at the personal and community level. Lecture 3 hours per week.

HISTORY

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

HIST 111-112-113 AMERICAN HISTORY I-II-III (3 cr.) (3 cr.) (3 cr.)—A survey of United States history from its beginning in early colonial times to the present. Lecture 3 hours per week.

HIST 114-115 AMERICAN HISTORY I-II (5 cr.) (4 cr.)—A survey of United States history from its beginning in early colonial times to the present. Lecture 5-4 hours per week.

HISTORY 187-188-189 HISTORY OF THE AFRO-AMERICAN I-II-III (3 cr.) (3 cr.) (3 cr.)—A survey of the history of the Afro-American, his relationships and contributions to the American society; the period of slavery; the period of caste subordination; the period of new mobility and growing Black protest. Lecture 3 hours per week.

HIST 198 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

HIST 199 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

HIST 221-222-223 AMERICAN ECONOMIC HISTORY I-II-III (3 cr.) (3 cr.) (3 cr.)—First quarter deals with economic history of the 19th century and early 20th century in the United States. The second quarter places emphasis on the 1920's and 1930's. The third quarter covers the period since 1930. Lecture 3 hours per week.

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

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, Neo-Classical, and Modern. Lecture 3 hours per week.

HUMN 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

HUMN 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

INDUSTRIAL TECHNOLOGY

INDT 111-112 MATERIAL AND PROCESSES OF INDUSTRY I-II (3 cr.) (3 cr.)—The materials and processes of modern industry from the drafting and design point of view. The physical properties of industrial materials such as ferrous, nonferrous metals, woods, plastics and clay products in terms of design application, processing and fabrication methods. Cutting, cold forming, hot working, welding, foundry and chipless manufacturing processes employed in contemporary industry; the science of precision measurement as applied to inspection practices. Lecture 3 hours per week.

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

INDT 176 PRINCIPLES OF INDUSTRIAL SAFETY (2 cr.)—Principles and practices of accident prevention, analysis of accident causes, mechanical safeguards, fire prevention, housekeeping, occupational diseases, first aid, safety organization, protection equipment and general safety principles and promotion. Lecture 2 hours per week.

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

INDT 286 QUALITY CONTROL (3 cr.)—Principles of inspection and quality control with emphasis on setting up, maintaining, and interpreting control charts. Includes dimensional control, basic sizes, applications of tolerances, allowances,

limits, precision measurements, comparison measurements, industrial applications, optical, electrical and air limit gauges, comparator, inspection techniques, control charts, and statistics as quality instruments. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

INDT 288 PRODUCTION PLANNING AND CONTROL (3 cr.)—The preparation and analysis of production, planning based on sales forecasts, operation sheets, routing, scheduling, dispatching, follow-up, inventory control, receiving stores and shipping, control forms and reports. Lecture 3 hours per week.

LAW ENFORCEMENT

LWNF 100 INTRODUCTION TO LAW ENFORCEMENT (3 cr.)—The philosophy and history of law enforcement; overview of crime and police problems; organization and jurisdiction of local, state, and federal law enforcement agencies, survey of professional career opportunities and qualifications required. Lecture 3 hours per week.

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

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

LWNF 117 SPECIAL ENFORCEMENT PROBLEMS (3 cr.)—Crowd control during civil demonstrations, picketing, rioting, and other emergency situations; the police role in civil defense; police problems caused by narcotics addiction; the handling of mentally or emotionally disturbed persons. Lecture 3 hours per week.

LWNF 126 PREVENTION AND CONTROL OF JUVENILE DELINQUENCY (3 cr.)—Survey of youth crime, stressing the police role in community programs of prevention and control. The philosophy and functioning of the juvenile courts as related to the juvenile problems. Lecture 3 hours per week.

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

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

LWNF 130 INTRODUCTION TO CRIMINAL LAW (3 cr.)—An overview of considerations pertaining to major crimes; including such factors as classifications, elements of proof, intent, responsibility, parties, and defenses. Emphasis on the common law and Virginia adaptations. Lecture 3 hours per week.

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

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

LWNF 176 CRIMINOLOGY (3 cr.)—Volume and scope of crime, the background of criminal behavior in the American setting; organized crime and its affiliated problems; subjective theories and explanation of crime; the control, treatment and rehabilitation of the criminal offender. Lecture 3 hours per week.

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

LWNF 188 TRAFFIC ACCIDENT INVESTIGATION (3 cr.)—Prerequisite LWNF 187 or equivalent. Conduct at the scene of a traffic accident; required tests and measurements, collection and handling of evidence, interviewing and interrogations, note-taking, case preparation and court appearances, practical exercises. Lecture 3 hours per week.

LWNF 198 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

LWNF 199 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

LWNF 231-232-233 CRIMINAL LAW, EVIDENCE, AND PROCEDURES I-II-III (3 cr.) (3 cr.) (3 cr.)—Major crimes; their classification, elements of proof, intent, conspiracy, responsibility, parties, and defenses. Emphasis on the common law and Virginia adaptations. Kinds, degrees, and admissibility of evidence; methods and techniques of its acquisition, use in criminal proceedings, moot court activities. Review of court systems with emphasis on procedures from incident to final disposition of the accused and on applicable principles of criminal and civil law. Intended to satisfy transfer requirements for one year of Criminal Law. Lecture 3 hours per week.

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

LWNF 237 ADMINISTRATION OF JUSTICE (3 cr.)—Review of court systems with emphasis on procedures from incident to final disposition of the accused and on applicable principles of criminal and civil law. Includes field trips and guest lectures by representatives of local agencies and tribunals. Limited to students who have successfully completed five quarters of the Associate in Applied Science Degree program in Police Science, or who have secured departmental permission. Lecture 3 hours per week.

LWNF 240 CONSTITUTIONAL LAW FOR POLICE (3 cr.)—A survey of the background and application of Constitutional provisions, both State and Federal, pertinent to the functions of law enforcement officers. Includes such topical areas as speech; press and assembly, arrest and detention, search and seizure; inter-

rogations and confessions; self-incrimination and assistance of counsel; double jeopardy; speedy and fair trial; humane punishment; and civil rights. Lecture 3 hours per week.

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

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

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

LWNF 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

LWNF 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

MARKETING

MKTG 100 PRINCIPLES OF MARKETING (3 cr.)—The principles, methods, and problems involved in the distribution and marketing of goods and services. The various marketing agents: wholesaler, broker, agent, cooperative, and trade associations. Discussions of present day problems and policies connected with the distribution and sale of commodities, pricing, advertising and promotion, and buyer motivation. Lecture 3 hours per week.

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

MKTG 131-132-133 TRAFFIC AND TRANSPORTATION I-II-III (3 cr.) (3 cr.) (3 cr.)—The requirements for traffic managers in such fields as railroading, trucking, and air travel. Each quarter is based on the Chicago College of Traffic materials which are required for licensing examination. The course outlines the development of transportation, transportation regulations, and the regulations and applications of traffic management. Lecture 3 hours per week.

MKTG 135 ECONOMICS OF TRANSPORTATION (3 cr.)—Economic analysis and understanding of transportation systems. Rail, water, air and motor carrier modes are examined for economic cost, utility, and comparative advantages. Transportation from a macro-economic viewpoint. The economic effect of government

regulation and the quasi-utility status of the transportation industry. The potential role of current legislation in transportation competition and development. Lecture 3 hours per week.

MKTG 136 RETAIL ORGANIZATION & MANAGEMENT (3 cr.)—The organization of business to accomplish their goals in the most effective and efficient manner. Location, layout, internal management, policy development, methods of operation, merchandise control and protection, property maintenance, and analysis of results. Lecture 3 hours per week.

MKTG 150 PRINCIPLES OF INSURANCE (3 cr.)—A course in insurance principles and practices. Includes an examination of risks and applications in the principal fields of insurance including life, accident and health, fire, liability, surety, and property. Lecture 3 hours per week.

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

MKTG 164 PRINCIPLES OF REAL ESTATE I (3 cr.)—Practical applications of real estate management principles. Includes a study of contracts, deeds, mortgages, bonds, leases, search, real property leasing and appraisal. Lecture 3 hours per week.

MKTG 165 PRINCIPLES OF REAL ESTATE II (3 cr.)—Prerequisite MKTG 164. Continued examination of marketing fundamentals. Emphasis on the techniques required for proper selection, analysis and listing of real estate properties. How to determine needed data, how to analyze forms and records for recording and presenting data. Lecture 3 hours per week.

MKTG 227 ADVERTISING AND DISPLAY (4 cr.)—A survey of the forms of advertising and the principles of display as they apply to retail and other distributive businesses. Emphasis on the principles of layout and copy, media selection, analysis of cost and results, and the coordination of advertising and display activities within the store. Lecture 3 hours per week, Laboratory 2 hours per week, Total 5 hours per week.

MKTG 228 SALES PROMOTION AND CUSTOMER RELATIONS (3 cr.)—The scope and total activities of a sales promotion program designed to coordinate advertising, display and publicity. Effective use of the sales forces and store policies to develop favorable customer relationships. Institutional practices which develop goodwill for the store. Lecture 3 hours per week.

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

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

MKTG 237 TARIFFS AND RATES (3 cr.)—Prerequisite MKTG 133. Traffic composition, traffic interpretation, and rate application in motor, rail, water, and air service. Lecture 3 hours per week.

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

MKTG 239 PROBLEMS IN TRANSPORTATION (3 cr.)—Prerequisite MKTG 133. Preparation and presentation of cases as Interstate Commerce Commission practitioner and witness; drafting of pleadings, briefs, and petitions, submission of testimony and exhibits in written and oral form with experience on the witness stand. Lecture 3 hours per week.

MKTG 266 REAL ESTATE SALES (3 cr.)—The fundamentals of sales principles as they apply to real estate. The prospect, his motives, his needs, and his abilities to buy real estate. Relations of broker and salesman, salesman and client and community responsibilities. Writing contracts, closing and settlement, and follow-up relations. Lecture 3 hours per week.

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

MKTG 277 LEGAL ASPECTS OF REAL ESTATE (3 cr.)—A study of Virginia real estate law including rights incident to property ownership and management, agency contract and application to real estate transfer, conveyancing, probate proceedings, trust transactions. Lecture 3 hours per week.

MKTG 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

MKTG 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

MATHEMATICS

MATH 01 DEVELOPMENTAL MATHEMATICS (5 cr.)—A foundation course which bridges the gap between a weak mathematical foundation and the knowledge necessary for the study of mathematical courses in technical and professional programs. Arithmetic, algebra, geometry and trigonometry will be covered. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hours.

MATH 11-12-13 ELEMENTS OF MATHEMATICS I-II-III (3 cr.) (3 cr.) (3 cr.)—Designed for the occupational student. Practical applications of elementary mathematics including algebra, geometry, and trigonometry to everyday problems in the manufacturing and trade world. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

MATH 31-32 ALGEBRA I-II (5 cr.) (5 cr.)—Fundamental algebraic calculations for students who need a survey of the basic principles of algebra. Includes the essential topics of the first two years of high school algebra. Lecture 5 hours per week.

MATH 36 PLANE GEOMETRY (5 cr.)—Prerequisite one unit of high school algebra or equivalent. Fundamentals of plane geometry and an introduction to coordinate geometry. Lecture 5 hours per week.

MATH 38 TRIGONOMETRY (5 cr.)—Prerequisite one unit of high school algebra and one-half unit of high school geometry or equivalent. Fundamentals of trigonometry for students who need a survey or review of the basic principles of trigonometry. Lecture 5 hours per week.

MATH 41 AIR-CONDITIONING MATHEMATICS I (4 cr.)—Fractions, decimals, signs of operations, equations, Ohm's Law, subtraction, multiplication, and division of signed numbers, work and power problems. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

MATH 42 AIR-CONDITIONING MATHEMATICS II (3 cr.)—Prerequisite MATH 41. Equations, Kirchoff's Law, electrical problems, functions of angle, trigonometric functions, angles of elevation and depression, powers and roots. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

MATH 60 MATHEMATICAL ANALYSIS (5 cr.)—A course in trigonometry with an introduction to mathematical analysis for students entering the engineering and science curricula who lack the fourth unit of high school mathematics required for admission to MATH 141. Lecture 5 hours per week.

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

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

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

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

MATH 164-165 COLLEGE MATHEMATICS I-II (5 cr.) (4 cr.)—Prerequisite a satisfactory score on appropriate mathematics proficiency examinations and three units of high school mathematics including two units of algebra and one unit of

geometry or equivalent. A modern unified course in algebra, trigonometry, analytic geometry, and calculus for students other than those in physics or engineering. Lecture 5-4 hours per week.

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

MATH 184-185 GENERAL COLLEGE MATHEMATICS I-II (5 cr.) (4 cr.)—Intended for students with majors other than mathematics, science or engineering. Prerequisite Algebra I and either Algebra II or Geometry and a satisfactory score on appropriate mathematics proficiency examinations. Includes sets, the logic of algebra, the real number system, algebraic and transcendental functions, relations and graphs, permutations, combination, probability and elementary statistics. Lecture 5-4 hours per week.

MATH 198 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

MATH 199 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

MATH 202 INTRODUCTION TO MATRIX ALGEBRA (4 cr.)—Prerequisite MATH 163 or MATH 143 or equivalent. Operations with matrices, determinants, systems of linear equations, vector spaces and linear transformations, bilinear and quadratic forms. Lecture 4 hours per week.

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

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

MATH 280 INTRODUCTORY STATISTICS (5 cr.)—Prerequisite MATH 162 or equivalent. Introduction to statistics including a brief treatment of descriptive statistics, problems of sampling, estimation, testing of hypotheses, regression, and correlation. Lecture 5 hours per week.

MATH 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

MATH 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

MECHANICAL

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

MECH 116-117 NUMERICAL CONTROL PROGRAMMING I-II (4 cr.) (4 cr.)—A study dealing with the newer concepts of work handling and automatic machining processes. New techniques in metal forming and machine processes; analysis of electrosonic machining, electrolytic metal removal, numerical controls and simplified building block numerical control system. Lecture 3 hours, Laboratory 3 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, cutting speeds, tool care, tool grinding, surface grinder, milling machine operations and tools. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

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

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

MECH 237-238 MACHINE DESIGN I-II (4 cr.) (4 cr.)—The analytical design of bearings, clutches, coupling, brakes, springs, gearing systems, and power shafting. Emphasis on methods of constructing machine parts and specifications of materials and manufacturing processes. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 246 METALLURGY I (4 cr.)—Prerequisite INDT 112. Fundamentals of metallurgy, grain size, effect on carbon content, and hardness testing devices. Different alloys will be tested to determine the effect of heat treatment. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 264 THERMODYNAMICS I (4 cr.)—Prerequisite MATH 113 or equivalent. Characteristics of gases; applied study of steam cycles and combustion processes. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 265 THERMODYNAMICS II (4 cr.)—Prerequisite MECH 264. Advanced thermodynamics with emphasis on applications relating to internal combustion engines and gas turbines. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 267 FLUID MECHANICS (4 cr.)—Properties of fluids and fluid flow, Bernoulli's Theorem, measuring devices, viscosity and dimensional analysis. Emphasis on pumps, piping, and fluid motors. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

MUSIC

Theory and Composition

MUSC 111-112-113 MUSIC THEORY I-II-III (4 cr.) (4 cr.) (4 cr.)—Elements of musical notation. Structure of scales, intervals, triads and chords. Development of ability to sing at sight and write from dictation melodies in all keys, clefs, and meters. Beginning analysis of the Bach chorale style and construction of cadential phrases in that style. Similar experience at the keyboard. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

MUSC 211-212-213 ADVANCED MUSIC THEORY I-II-III (4 cr.) (4 cr.) (4 cr.) —Continuation of MUSC 111-112-113. Development of facility in the analysis and usage of diatonic and chromatic harmonies. Continued study in analysis of Bach style, sight-singing, ear-training, and keyboard harmony. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

History and Literature

MUSC 121-122-123 MUSIC APPRECIATION I-II-III (3 cr.) (3 cr.) (3 cr.)— This course aims to increase the variety and depth of the student's interest in music and related cultural activities. Emphasis is upon the relation of music as an art to our daily lives and to society, to promote an understanding of the spirit of the art which will lead to the emotional and aesthetic development of the individual, and enable him to enjoy intelligent listening. Lecture 3 hours per week.

Applied Music

Private lessons are available for either one or two hours of credit per quarter. The length of the lessons will be ½ hour for 1 hour credit and 1 hour for 2 hours credit. All courses in Applied Music may be repeated for credit for a total of 12 hours for the major and 6 hours for the minor. Laboratory 1-2 hours per week.

MUSC 137 APPLIED MUSIC—VOICE (1-2 cr.)—Singing, proper breath control, diction and development of tone. Standard vocal repertoire will be studied. Departmental permission required. One-two half-hour lessons per week. 4-8 hours practice required.

MUSC 237 ADVANCED APPLIED MUSIC—VOICE (1-2 cr.)—
A continuation of MUSC 137.

MUSC 147 APPLIED MUSIC—KEYBOARD (1-2 cr.)—Instruction in piano or organ. Standard repertoire will be studied. Departmental permission required. One-two half-hour lessons per week. 4-8 hours practice required.

MUSC 247 ADVANCED APPLIED MUSIC—KEYBOARD (1-2 cr.)—
A continuation of MUSC 147.

MUSC 157 APPLIED MUSIC—WOODWINDS (1-2 cr.)—Instruction in fundamentals of the woodwind instruments. Standard repertoire will be studied. Departmental permission required. One-two half-hour lessons per week. 4-8 hours practice required.

MUSC 257 ADVANCED APPLIED MUSIC—WOODWINDS (1-2 cr.)—
A continuation of MUSC 157.

MUSC 167 APPLIED MUSIC—STRINGS (1-2 cr.)—Instruction in fundamentals of the string instruments. Standard repertoire will be studied. Departmental permission required. One-two half-hour lessons per week. 4-8 hours practice required.

MUSC 267 ADVANCED APPLIED MUSIC—STRINGS (1-2 cr.)—
A continuation of MUSC 167.

MUSC 177 APPLIED MUSIC—BRASS (1-2 cr.)—Instruction in fundamentals of the brass instruments. Standard repertoire will be studied. Departmental permission required. One-two half-hour lessons per week. 4-8 hours practice required.

MUSC 277 ADVANCED APPLIED MUSIC—BRASS (1-2 cr.)—
A continuation of MUSC 177.

MUSC 187 APPLIED MUSIC—PERCUSSION (1-2 cr.)—Instruction in fundamentals of percussion instruments. Standard repertoire will be studied. Departmental permission required. One-two half-hour lessons per week. 4-8 hours practice required.

MUSC 287 ADVANCED APPLIED MUSIC—PERCUSSION (1-2 cr.)—
A continuation of MUSC 187.

Ensemble

Courses in Ensemble consist of performance from the standard repertoires including study of ensemble techniques and interpretation. Departmental permission required. May be repeated for credit. Laboratory 3 hours per week.

MUSC 138 CHORUS (1 cr.)

MUSC 238 CHORUS (1 cr.)—
A continuation of MUSC 138.

MUSC 139 SMALL VOCAL ENSEMBLE (1 cr.)

MUSC 239 SMALL VOCAL ENSEMBLE (1 cr.)—
A continuation of MUSC 139.

MUSC 148 ORCHESTRA (1 cr.)

MUSC 248 ORCHESTRA (1 cr.)—
A continuation of MUSC 148.

MUSC 149 BAND (1 cr.)

MUSC 249 BAND (1 cr.)—
A continuation of MUSC 149.

MUSC 159 WOODWIND ENSEMBLE (1 cr.)

MUSC 259 WOODWIND ENSEMBLE (1 cr.)—
A continuation of MUSC 159.

MUSC 169 STRING ENSEMBLE (1 cr.)

MUSC 269 STRING ENSEMBLE (1 cr.)—
A continuation of MUSC 169.

MUSC 179 BRASS ENSEMBLE (1 cr.)

MUSC 279 BRASS ENSEMBLE (1 cr.)—
A continuation of MUSC 179.

MUSC 189 PERCUSSION ENSEMBLE (1 cr.)

MUSC 289 PERCUSSION ENSEMBLE (1 cr.)—
A continuation of MUSC 189.

NATURAL SCIENCE

NASC 21-22-23 SCIENCE I-II-III (3 cr.) (3 cr.) (3 cr.)—Designed to familiarize the student with the basic principles of Chemistry, Physics, and Biology. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

NASC 125 CONSERVATION OF NATURAL RESOURCES (3 cr.)—A course for the non-science major. The management of natural resources, balance of nature and man's importance in his environment. Lecture 3 hours per week.

PHILOSOPHY AND RELIGION

PHIL 101-102 INTRODUCTION TO PHILOSOPHY I-II (3 cr.) (3 cr.)—An introductory study of some philosophical issues concerning the perception and belief of man in society. Lecture 3 hours per week.

PHIL 110 LOGIC (3 cr).—The study of logic as the scientific investigation of valid reasoning. Lecture 3 hours per week.

PHIL 221 LITERATURE OF THE BIBLE I (3 cr.)—A study of the literature of the Old Testament. Lecture 3 hours per week.

PHIL 222 LITERATURE OF THE BIBLE II (3 cr.)—A study of the literature of the New Testament. Lecture 3 hours per week.

PHIL 226 COMPARATIVE RELIGION (3 cr.)—A survey of the literature of comparative religions of the world. Lecture 3 hours per week.

PHYSICAL EDUCATION AND RECREATION

PHED 101-102-103 PHYSICAL EDUCATION I-II-III (1 cr.) (1 cr.) (1 cr.)—The study of recreational activities which will have value for more effective use of leisure time. The development of skills and methods in archery, badminton, bowling, golf, tennis, volleyball and other sports and activities appropriate to the local season, and facilities available. Lecture 1 hour, Laboratory 1 hour, Total 2 hours per week.

PHYSICS

PHYS 14-15 APPLIED PHYSICS I-II (2 cr.) (2 cr.)—The fundamentals of physics with application. PHYS 14 deals with the properties of matter and mechanics. PHYS 15 includes the study of heat, light, optics, and sound. Lecture 2 hours per week.

PHYS 16 APPLIED PHYSICS III (3 cr.)—The fundamentals of electricity and magnetism; electrostatic sources, effects of electric current, basic direct current circuits, electromagnetism, alternating current, and generators and motors. Lecture 3 hours per week.

PHYS 111-112-113 TECHNICAL PHYSICS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite three units of high school mathematics; corequisite MATH 121. Precision measurement, properties of matter, hydrostatics and hydraulics; force and motion, Newtonian mechanics, vectors and graphic solutions, statics, dynamics, rotary motion, heat and thermodynamics, heat engines, sound acoustics; the theory of wave motion, light and optics, magnetism and electricity, DC and AC circuits and machines. An introduction to electronics and nuclear energy for industrial purposes. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

PHYS 114-115 TECHNICAL PHYSICS I-II (6 cr.) (6 cr.)—Prerequisite three units of high school mathematics; corequisite MATH 121. Precision measurement, properties of matter, hydrostatics and hydraulics, force and motion, Newtonian mechanics, vectors and graphic solutions, statics, dynamics, rotary motion, motion, light and optics, magnetism and electricity, DC and AC circuits and machines. An introduction to electronics and nuclear energy for industrial purposes. Lecture 5 hours, Laboratory 3 hours, Total 8 hours per week.

PHYS 121-122-123 PRINCIPLES OF PHYSICS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite or corequisite three units of high school mathematics including two units of algebra and one unit geometry. An introductory course in Physics satisfying the science distribution requirement for non-science majors. The fundamental principles of mechanics, heat, electricity and magnetism, wave, motion, atomic and nuclear physics. Attention is given to the historical development and philosophical significance of physical concepts and theories. Application to elementary problems and the role of physics in the modern world. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

PHYS 124-125 PRINCIPLES OF PHYSICS I-II (6 cr.) (6 cr.)—Prerequisite three units of high school mathematics including two units of algebra and one unit of geometry. An introductory course in Physics satisfying the science distribution requirement for non-physics or engineering majors. The fundamental principles of mechanics, heat, electricity and magnetism, wave motion, atomic and nuclear physics. Attention is given to the historical development and philosophical significance of physical concepts and theories. Application to elementary problems and the role of physics in the modern world. Lecture 5 hours, Laboratory 3 hours, Total 8 hours per week.

PHYS 198 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

PHYS 199 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

PHYS 221-222-223-224 GENERAL UNIVERSITY PHYSICS I-II-III-IV (4 cr.) (4 cr.) (4 cr.) (4 cr.)—Corequisite MATH 241 or equivalent. General University Physics designed for students in engineering, physics or mathematics. Includes mechanics, relativity, electromagnetism, ray and wave optics, statistical and quantum mechanics, solid state and nuclear physics. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

PHYS 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

PHYS 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

PSYCHOLOGY

PSYC 128 HUMAN RELATIONS (3 cr.)—The study of human personality and its reaction upon other personalities. The application of psychology to problems in industry and private life. Some introduction to such matters as selection, training and placement of employees. Lecture 3 hours per week.

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

PSYC 204-205 GENERAL PSYCHOLOGY I-II (5 cr.) (4 cr.)—The principles of behavior relating experimental data to practical problems: the measurement of ability, sensory and perceptive processes, organic basis of behavior, heredity, maturation, learning and thinking, motivation, emotion, personality and social factors in behavior. Lecture 5-4 hours per week.

PSYC 246 EDUCATIONAL PSYCHOLOGY (5 cr.)—Prerequisite PSYC 202, 130 or equivalent. Human behavior and learning treated in the context of educational processes. The nature of various mental characteristics such as intelligence, interest, knowledge; their measurement and appraisal and their significance for educational goals. Lecture 5 hours per week.

PSYC 257 LAW ENFORCEMENT PSYCHOLOGY (3 cr.)—Prerequisite PSYC 117 or PSYC 110 and 116. Intergroup relations and police work. Some facts about racial, religious and national differences. Prejudice, suggestion, emotion, frustration and aggression in interpersonal and intergroup situations. Types of abnormal behavior likely to be encountered in police work. Lecture 3 hours per week.

PSYC 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

PSYC 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

SECRETARIAL SCIENCE

SECR 20 BASIC STENOGRAPHIC SKILLS (3 cr.)—Elementary skills fundamental to the effectiveness of shorthand: sensitivity to phonetic sounds; mechanics of spelling and word differentiation with emphasis on the vocabulary of business; word syllabification, division and capitalization; mechanics of punctuation and sentence structure common to transcription; introduction to first lessons of shorthand theory. Lecture 5 hours per week.

SECR 111 TYPEWRITING I (3 cr.)—Introduction to keyboard with emphasis on good technique and machine mastery; letter format and styles, tabulation and centering, manuscript typing. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

SECR 112 TYPEWRITING II (3 cr.)—Prerequisite SECR 111 or departmental permission. Continuation of skill building with emphasis on standards required to meet job requirements in production typing. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

SECR 113 TYPEWRITING III (3 cr.)—Prerequisite SECR 112 or departmental permission. Skill development with high standard required to meet job requirements in production typing. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

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

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

SECR 123 SHORTHAND III (4 cr.)—Prerequisite SECR 122 or departmental permission. Increased speed in general business dictation, introduction of specialized business dictation with emphasis on vocabularies. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

SECR 136 FILING AND RECORDS MANAGEMENT (3 cr.)—Indexing principles, filing procedures and techniques as applied to filing systems, establishment of filing system, selection of equipment and supplies, survey of system using electronics and microfilm, solution of records management problems. Lecture 3 hours per week.

SECR 137 OFFICE PROCEDURES (3 cr.)—General office routine such as work flow, time scheduling, filing, and communications. Lecture 3 hours per week.

SECR 138 OFFICE RECORDKEEPING (3 cr.)—Concentration on the types of recordkeeping duties performed by secretaries including financial, tax, payroll, personnel and inventory. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 216 EXECUTIVE TYPEWRITING (3 cr.)—Prerequisite SECR 113 or departmental permission. Further development of speed and accuracy on production typing with emphasis on employment standards. Instruction in use of the executive style typewriters, reports, tabulations, statistical materials and justified copy. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 217 TYPEWRITING SKILL BUILDING (3 cr.)—Prerequisite SECR 113 or departmental permission. Further development of speed and accuracy on production typing with emphasis on employment standards. Preparation for employer's secretarial placement examinations. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

SECR 221 TRANSCRIPTION I (3 cr.)—Prerequisites SECR 113 and SECR 123 or 133. Review of principles of shorthand, development of vocabulary and phrases, speed building on general business dictation and transcription. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 222 TRANSCRIPTION II (3 cr.)—Prerequisite SECR 221 or departmental permission. Continuation of speed building with emphasis on particular areas of

general business, developing special vocabularies, phrases, and shortcuts. Emphasis on spelling, grammar, and other transcription skills. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 223 (GENERAL) TRANSCRIPTION (3 cr.)—Prerequisite SECR 222 or departmental permission. Speed building in typical business dictation with speed and accuracy in transcription from shorthand notes. Preparation for employers' secretarial placement examinations. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 224-225 (LEGAL) TRANSCRIPTION I-II (3 cr.) (3 cr.)—Prerequisite SECR 221 or departmental permission. Legal secretary preparation. Skill in taking dictation and transcribing material involving legal shorthand forms and phrases. Proficiency in use of legal vocabulary, forms, and procedures. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 227 (MEDICAL) TRANSCRIPTION (3 cr.)—Prerequisite SECR 222 or departmental permission. Medical secretary preparation. Development of skill in taking dictation and transcribing material involving medical shorthand forms and phrases. Proficiency in use of medical vocabulary forms, and procedures. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 241 SECRETARIAL PROCEDURES I (3 cr.)—Prerequisite SECR 113. Development of skills in operation of stencil and spirit duplicating machines. Preparation of copy for reproduction of offset, stencil, and spirit process. Criteria for selecting a duplicating process. Study of type styles, paper, typewriter ribbons, and carbon paper. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 242 SECRETARIAL PROCEDURES II (3 cr.)—Prerequisite SECR 241. Emphasis on the secretary's routine office responsibilities including mail handling, communication services, telephone techniques, and the use of reference materials. Emphasis on application of skills gained in typewriting and shorthand. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 243 SECRETARIAL PROCEDURES III (3 cr.)—Prerequisite 242. Continued emphasis on the secretary's office responsibilities including handling of banking transactions, maintaining records on securities transactions, travel arrangements, planning of office layouts, and personnel policies. Practical experience in solving office problems. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 256 ADVANCED MACHINE TRANSCRIPTION (3 cr.)—Prerequisite SECR 216 or departmental permission. Introduction to modern transcription incorporating good listening techniques, grammar, punctuation, and correct business English. Emphasis on mailability of copy with good production rates. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 264-265 LEGAL SECRETARIAL PROCEDURES I-II (3 cr.) (3 cr.)—Prerequisite SECR 241. Instruction in law office procedures, law office filing and record keeping, extension of legal vocabulary, court rules, reference materials, preparation of forms and pleadings. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 274-275 MEDICAL SECRETARIAL PROCEDURES I-II (3 cr.) (3 cr.)—Prerequisite SECR 241. Instruction in medical office procedures, medical office filing and record keeping, extension of medical vocabulary, preparation of medical reports, and special correspondence requirements. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

SECR 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

SOCIAL SCIENCE

SOSC 121-122-123 CURRENT AMERICAN SOCIAL PROBLEMS I-II-III (3 cr.) (3 cr.) (3 cr.)—-A survey of contemporary America from the perspective of the Social Sciences designed to provide a basis for the forming of individual judgments of major American domestic issues. The Constitution of the United States provides a primary vehicle for exploration of problems underlying current political, economic, social and individual behavioral patterns and for discussions of relevant applications in the news of today. Lecture 3 hours per week.

SOCIOLOGY

SOCI 101-102-103 INTRODUCTORY SOCIOLOGY I-II-III (3 cr.) (3 cr.) (3 cr.)—The fundamental concepts and the general principles of sociology; social institutions, population study, human ecology and community study, culture, human nature and personality, social interaction and stratification, and social problems. Lecture 3 hours per week.

SOCI 104-105 INTRODUCTORY SOCIOLOGY I-II (5 cr.) (4 cr.)—The fundamental concepts and the general principles of sociology; social institutions, population study, human ecology and community study, culture, human nature and personality, social interaction and stratification, and social problems. Lecture 5-4 hours per week.

SOCI 186-187 SOCIAL PROBLEMS I-II (3 cr.) (3 cr.)—Application of sociological concepts and methods to the analysis of current social problems in the United States including delinquency and crime, mental illness, drug addiction, alcoholism, and sexual behavior; population crisis, race relations, family and community disorganization, poverty, automation, wars and disarmament. Lecture 3 hours per week.

SOCI 198 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

SOCI 199 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

SOCI 236 MARRIAGE AND THE FAMILY (3 cr.)—Prerequisite SOCI 101, 104, or 185. A study of comparative family systems and problems related to marriage and the family. Lecture 3 hours per week.

SOCI 240 INTRODUCTORY ANTHROPOLOGY (3 cr.)—A study of the origin and evolution of man based upon the fossil record, and an analysis of the status of modern racial grouping. Lecture 3 hours per week.

SOCI 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.

SPANISH

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

SPAN 199 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

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

SPAN 231-232-233 SURVEY OF SPANISH LITERATURE AND CIVILIZATION I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite SPAN 203 or equivalent. An introduction to Spanish life and culture and to the contributions of Spain to world civilization from medieval times to the present. Readings in the original Spanish. Spanish is used in the classroom. Lecture 3 hours per week.

SPAN 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

SPEECH AND DRAMA

SPDR 106 INTRODUCTION TO THE THEATRE ARTS (3 cr.)—The principles of drama; development of theatre as an art; study of selected plays in terms of theatrical presentation; the living theatre as evidenced on stage, in the motion pictures, and on television. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

SPDR 118 DIRECTING AND ACTING (3 cr.)—Principles and methods of directing and acting in the theatre and historical dimensions. Lecture 3 hours per week.

SPDR 119 THEATRE WORKSHOP (3 cr.)—Practical experience on college productions in stagecraft, scenery, lighting, costume, acting, and makeup. Lecture 1 hour, Laboratory 6 hours, Total 7 hours per week.

SPDR 137 PUBLIC SPEAKING (3 cr.)—Development of skill in speechmaking, with emphasis upon expository speaking for an introduction to persuasive speaking. Logical analysis and the use of evidence; organization and phrasing of the speech; development of effective control of voice and action. Lecture 3 hours per week.

SPDR 140 VOICE AND DICTION (3-5 cr.)—A study of the principles of the speech process. Training and improvement in pronunciation, articulation, and vocal quality. Lecture 3 hours per week.

SPDR 148 PERSUASION (3 cr.)—Emphasis upon class practice of persuasive speaking. Logical and psychological factors in speech organization and composition; methods of audience analysis; forms of public discussions; discussion groups, the debate; analysis of contemporary speeches. Lecture 3 hours per week.

SPDR 156 FORENSICS (2 cr.)—Designed for students participating in competitive debate, oratory, extemporaneous speaking, prose reading, and poetry reading. May be repeated for credit. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

SPDR 157 ARGUMENTATION AND DEBATE (3 cr.)—Prerequisite SPDR 130, 136, or 137. The presentation of oral argument and debate. Emphasis upon effectiveness in the analysis of issues, study of public problems, evidence, the reasoning process, the brief as preparation for argumentation and debate, and skill in oral presentation. Lecture 3 hours per week.

SPDR 176 INTERPRETIVE SPEECH (3 cr.)—Emphasis upon oral reading of a variety of literature for comprehension of the author's content and attitude. Emphasis on developing directness, vividness, and appropriate interpretation. Lecture 3 hours per week.

SPDR 198 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

SPDR 230 ADVANCED PUBLIC SPEAKING (5 cr.)—Prerequisite departmental approval. A study of the organization and techniques of speaking in public. Development of skill in speechmaking with emphasis on the effective control of voice and action. Practice in the preparation and delivery of speech by use of tape recorder and before various size groups. Lecture 5 hours per week.

SPDR 298 SEMINAR AND PROJECT (1-5 cr.)—Completion of a project or research report related to the student's occupational objective, and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours.

SPDR 299 SUPERVISED STUDY (1-5 cr.)—Assignment of problems for independent study incorporating previous instruction and supervised by the instructor. May be repeated for credit. Variable hours.

WELDING

WELD 15 ARC AND GAS WELDING (4 cr.)—Arc and gas welding practices. Safety, general welding practices, and effects of welding on metal. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

WELD 27 ARC WELDING (2 cr.)—Fundamentals of arc welding; safety, set-up, welding procedures, vertical pipe welding. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

WELD 57 OXYACETYLENE WELDING & CUTTING (2 cr.)—Fundamentals of oxyacetylene welding and cutting; safety, setup, welding and cutting procedures, plate and pipe welding. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

PART VI

STATE AND LOCAL ORGANIZATION

GOVERNING BOARD

COMMONWEALTH OF VIRGINIA

STATE BOARD FOR COMMUNITY COLLEGES

Eugene B. Sydnor, Jr., *Chairman*
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Mrs. John Galleher
William P. Kanto
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Carrington Williams
Yarborough B. Williams, Jr.
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VIRGINIA WESTERN COMMUNITY COLLEGE

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Mrs. Hunter M. Painter
S. Colston Snead, Jr.
Paul R. Thomson
W. Darnall Vinyard
Basil Watkins
C. E. Webber

PRESIDENT

Harold H. Hopper

ADMINISTRATION

HOPPER, HAROLD H. — *President of the College*
B.S.—Washington University, 1951
M.S.—Washington University, 1954
Ed.D—University of Florida, 1965

McCABE, JAMES N. — *Administrative Assistant to the President*
A.B.—West Virginia University, 1940

MOSHER, BRYAN J. — *Dean of Instruction*
Ed.B.—University of Buffalo, 1948
Ed.M.—University of Buffalo, 1950
M.S.—State University of New York at Buffalo, 1955
Ph.D.—Syracuse University, 1967

RACE, HARRY C. — *Dean of Student Services*
B.S.E.E.—Northeastern University, 1942
M.S.—Radford College, 1965

JOHNSON, E. WYLIE — *Dean of Financial and Administrative Services*
B.S.—Virginia Polytechnic Institute, 1953

BRADLEY, HARRY M. — *Director, Continuing Education*
B.S.—California (Pa.) State Teachers College, 1931
M.Ed.—University of Pittsburgh, 1942

COOPER, JOHN J. — *Chairman, Division of the Humanities*
B.M.E.—University of Kansas, 1957
M.M.E.—University of Kansas, 1958
Ed.D.—University of Colorado, 1965

HARRIS, WILLIAM A. — *Assistant Director of Continuing Education*
B.S.—University of Maryland, 1959
M.A.—East Tennessee State University, 1969

HEADLAND, CHARLES J. — *Assistant Chairman, Div. of Natural Sciences and Mathematics*
B.S.—State Teachers College, Slippery Rock, Pa., 1941
M.Ed.—University of Pittsburgh, 1951

KUNZE, DONALD C. — *Chairman, Division of Natural Sciences and Mathematics*
M.S.—Baldwin Wallace College, 1945
M.A.—Kent State University, 1952

MACDONALD, ROBERTA C. — *Chairman, Division of Business Science*
B.A.—Regis College, 1935
M.C.S.—Boston University, 1941
Ed.D.—University of Florida, 1966

PHELPS, HUGH B. — *Chairman, Division of Engineering Technologies*
B.M.E.—Clarkson College of Technology, 1950
M.M.E.—Clarkson College of Technology, 1956

SHIRLEY, WILLIAM T. — *Chairman, Division of the Social Sciences*
B.A.—Furman University, 1948
M.A.—University of North Carolina, 1950

SYKES, CYRIL H. — *Director, Learning Resources*
B.A.—Norwich University, 1944
M.S.—Syracuse University, 1950

GRIGGS, MIGNONNE — *Coordinator, Learning Laboratory*
B.S.—Longwood College, 1941
M.Ed.—Virginia Polytechnic Institute, 1961

VANDYKE, J. KEITH — *Coordinator, Audio-Visual Services*
B.S.—Appalachian State University, 1962
M.S.—Appalachian State University, 1969

TYLER, JOSEPH REGINALD — *Manager, Data Processing*
B.S.—Virginia Polytechnic Institute, 1966
M.S.—Virginia Commonwealth University, 1970

MUSIC, WILLIAM O., JR. — *Coordinator of Admissions and Records*
B.S.—Lynchburg College, 1963
M.S.—University of Tennessee, 1964

STRAUSBAUGH, MAURICE — *Coordinator of Counseling Services*
B.A.—Juniata College, 1950
B.D.—Bethany Theological School, 1953
M.Ed.—Johns Hopkins University, 1966.

BURLESON, THOMAS W. — *Counselor*
B.S.—Appalachian State University, 1964
M.Ed.—University of Virginia, 1968

FERRETTI, ELLEN J. — *Counselor*
B.S.—California (Pa.) State College, 1966
M.A.—West Virginia University, 1967

JOHNS, DOLORES — *Counselor*
B.S.—Virginia State, 1955
M.S.—Virginia Commonwealth University, 1969

PEVERALL, MARY W. — *Counselor*
B.A.—Radford College, 1964
M.S.—Radford College, 1968

SEARS, JAMES C. — *Counselor*
A.A.S.—Roanoke Technical Institute, 1965
B.S.—Roanoke College, 1968
M.Ed.—University of Virginia, 1971

WU, FRANK — *Counselor*
B.S.—Rocky Mount College, 1958
M.A.—Montclair State College, 1965

JAMES, DAVID P., JR. — *Placement and Financial Aid Officer*
B.S.—Virginia Polytechnic Institute, 1960
M.S.—Radford College, 1969

TRAYNOR, MARGARET H. — *Coordinator of Student Activities*
B.S.Ed.—Longwood College, 1933
M.Ed.—University of Virginia, 1968

KIM, SUSAN H. — *Reference Librarian*
B.A.—George Peabody College for Teachers, 1959
M.A.Ed.—George Peabody College for Teachers, 1960
M.S.L.S.—Peabody Library School, 1968

LEE, PIER M. — *Cataloging Librarian*
B.A.—National Taiwan University, 1959
M.A.L.S.—George Peabody Teachers College, 1962

RAINES, LYNN — *Reference Librarian*
B.A.—Emory & Henry College, 1960
M.L.S.—University of North Carolina, 1969

FACULTY

ADAMS, RICHARD P. — *Assistant Professor*, Accounting
B.S.—Virginia Polytechnic Institute, 1949
C.P.A.—State of Virginia, 1958

ARMINIO, ROBERT L. — *Instructor*, Architecture
B. Arch.—University of Virginia, 1968

BANKS, ROBERT G. — *Assistant Professor*, Music
B.S.—Indiana (Pa.) State University, 1948
M.Ed.—Pennsylvania State University, 1952

BASS, J. LOUIS — *Assistant Professor*, Biology
B.S.—University of Tennessee, 1960
M.A.—Vanderbilt University, 1971

BENSON, G. DON — *Associate Professor*, Physics
B.S.—Texas Western College, 1964
Ph.D.—Vanderbilt University, 1971

BLALOCK, DWIGHT E. — *Assistant Professor*, Data Processing
B.S.—University of Alabama, 1966
M.S.—Virginia Commonwealth, 1970

BLEASE, ALFRED D. — *Assistant Professor*, Physics
B.S.—Brown University, 1961
M.S.—University of Maine, 1965

BLOMBERG, ALBERT A. — *Assistant Professor*, Automotive Technology
A.S.—Boston University, 1960
B.S.—Northeastern University, 1968
Certificate—New England Aircraft School, 1950

BOWMAN, BETTY R. — *Assistant Professor*, Accounting
B.S.—Madison College, 1960
M.Ed.—Virginia Polytechnic Institute, 1969

BRADLEY, HARRY M. — *Assistant Professor*, Director, Continuing Education
B.S.—California (Pa.) State Teachers College, 1931
M.Ed.—University of Pittsburgh, 1942

BRODY, MYRON R. — *Assistant Professor*, Art
B.F.A.—University of Pennsylvania, 1965
M.F.A.—University of Pennsylvania, 1968

BROKER, THOMAS O. — *Associate Professor*, Government
B.A.—Wesleyan University, 1936
J.D.—Cornell Law School, 1939
M.A.—Tufts University, 1969

BROUGHTON, RICHARD I. — *Instructor*, Television Production Technology
B.A.—Florida State University, 1965
M.A.—Florida State University, 1967

BROWN, MARTHA L. — *Assistant Professor*, Secretarial Science
B.S.S.A.—Greensboro, N. C. Woman's College, 1957
M.A.—East Carolina College, 1961

BROWNSTEIN, HAROLD
D.D.S.—Chicago College of Dental Surgery, 1931
Assistant Professor
Director of Dental Program

BURLESON, THOMAS W.
B.S.—Appalachian State University, 1964
M.Ed.—University of Virginia, 1968
Instructor
Counseling

CARR, GUY R.
B.S.—Virginia Polytechnic Institute, 1942
Assistant Professor
Mechanical Engineering Technology

CARTER, DOUGLAS
B.A.—University of Arizona, 1966
M.A.—University of Arizona, 1968
Instructor
Speech

COHRON, JOSEPH W.
B.A.—College of William and Mary, 1933
M.A.—Ohio University, 1941
Associate Professor
Speech and Drama

COOPER, JOHN J.
B.M.E.—University of Kansas, 1957
M.M.E.—University of Kansas, 1958
Ed.D.—University of Colorado, 1965
Associate Professor
Chairman, Division of the Humanities

CRAIG, BETTY C.
B.A.—Hollins College, 1946
M.A.—Hollins College, 1971
Instructor
English

CRAWFORD, PATRICIA M.
B.A.—University of Oregon, 1930
M.A.—State University of Washington, 1933
Instructor
English

CRITES, RICHARD W.
B.S.—Eastern Illinois University, 1967
M.S.—Eastern Illinois University, 1968
Assistant Professor
Biology

CROCKETT, S. R., JR.
B.A.—University of Virginia, 1958
M.S.—Radford College, 1967
Assistant Professor
English

CROTTY, A. EUGENE
B.S.—University of Virginia, 1955
M.B.A.—University of Virginia, 1957
C.P.A.—Virginia, 1959
Professor
Business Administration

DAVIS, EARLE S.
B.S.—U.S. Naval Academy, 1926
Instructor
Mathematics

DEARBORN, CHARLES E., JR.
B.S.—Boston University, 1965
Certificate—Wentworth Institute, 1958
Assistant Professor
Automotive Technology

DESAUTELL, EUGENE G.
B.S.L.E.—Bryant College, 1970
Instructor
Police Science

DEVINS, GEORGE V.
B.A.—San Jose State College, 1939
M.S.—Radford College, 1970
Instructor
Physical Education

DUDLEY, H. HADDON — *Assistant Professor*
B.A.—Richmond College, 1928 — Psychology
M.A.—College of William and Mary, 1941

DURLING, MARJORIE S. — *Assistant Professor*
B.S.—West Virginia University, 1946 — Reading
M.A.—West Virginia University, 1950

EADS, SALLY A. — *Instructor*
B.A.—Agnes Scott College, 1965 — History
M.A.—University of Virginia, 1967

ELLIS, WILLIAM P., JR. — *Instructor*
B.A.—Lynchburg College, 1959 — Physical Education
M.Ed.—Lynchburg College, 1971

FERRETTI, ELLEN J. — *Instructor*
B.S.—California (Pa.) State College, 1966 — Counseling
M.A.—West Virginia University, 1967

FIGHTMASTER, JAMES W. — *Instructor*
B.S.—Georgetown College, 1957 — Mathematics
M.Ed.—University of Virginia, 1965

GENTRY, CARROLL L. — *Assistant Professor*
B.S.—East Tennessee State University, 1965 — Business Management
M.B.A.—East Tennessee State University, 1967

GILL, DAWN M. — *Instructor*
B.S.—Mary Washington College, 1949 — Biology
M.S.—Radford College, 1969
Registered Physical Therapist—Walter Reed Hospital, U. S. Army, 1950

GLANVILLE, JAMES O . — *Associate Professor*
A.R.C.S.—The Royal College of Science, London, 1962 — Chemistry
B.S.—University of London, 1962
Ph.D.—University of Maryland, 1967

GRIGGS, MIGNONNE — *Associate Professor*
B.S.—Longwood College, 1941 — Coordinator, Learning Laboratory
M.Ed.—Virginia Polytechnic Institute, 1961

GROW, VIRGIL B. — *Instructor*
B.S.C.E.—Virginia Military Institute, 1930 — Civil Engineering Technology

HAMILTON, RUTH V. — *Instructor*
B.A.—Ohio State University, 1927 — Art
M.A.—Ohio State University, 1928

HAMLAR, CONSTANCE J. — *Assistant Professor*
A.B.—Virginia State College, 1942 — English
M.A.—Northwestern University, 1945

HARRIS, WILLIAM A. — *Instructor*
B.S.—University of Maryland, 1959 — Assistant Director of Continuing
M.A.—East Tennessee State University, 1969 — Education

HEADLAND, CHARLES J. — *Associate Professor*
B.S.—State Teachers College, Slippery Rock, Pa., 1941 — Assistant Chairman
M.Ed.—University of Pittsburgh, 1951 — Division of Natural Sciences and Mathematics

HILL, JAMES P., JR. — *Assistant Professor*
B.S.—Roanoke College, 1957 — Chemistry
M.Ed.—University of Virginia, 1963

HINCHCLIFFE, ALICE B. — *Associate Professor*
A.B.—Syracuse University, 1962 — Assistant Director, Dental Program
R.D.H.—Eastman School of Dental Hygiene, 1939
M.Ed.—University of Virginia, 1970

HOFFMAN, WILLIAM E., JR. — *Instructor*
A.A.S.—Roanoke Technical Institute, 1964 — Electrical Engineering Technology
B.S.—Roanoke College, 1971

HOOVEN, JAMES A. — *Instructor*
B.A.—New Mexico Highlands University, 1965 — History and Government
M.A.—New Mexico Highlands University, 1967

HOOVEN, JUDITH — *Instructor*
B.A.—New Mexico Highlands University, 1963 — English
M.A.—New Mexico Highlands University, 1966

HOPPER, HAROLD H. — *President of the College*
B.S.—Washington University, 1951
M.S.—Washington University, 1954
Ed.D.—University of Florida, 1965

HOUCHINS, WILLIAM A. — *Assistant Professor*
B.S.—Concord College, 1949 — Health and Physical Education
M.P.H.—University of North Carolina, 1961

HOUGH, RICHARD KENT — *Assistant Professor*
B.B.A.—Roanoke College, 1967 — Photography

HOUSTON, CHARLES A. — *Instructor*
B.S.—University of Tennessee, 1964 — Mathematics
M.M.—University of Tennessee, 1969

JAMES, DAVID P., JR. — *Instructor*
B.S.—Virginia Polytechnic Institute, 1960 — Placement and Financial Aid Officer
M.S.—Radford College, 1969

JOHNS, DOLORES — *Instructor*
B.S.—Virginia State, 1955 — Counseling
M.S.—Virginia Commonwealth, 1969

JOHNSON, E. WYLIE — *Assistant Professor*
B.S.—Virginia Polytechnic Institute, 1953 — Dean of Financial and Administrative Services

JONES, CLYDE — *Assistant Professor*, English
B.A.—Furman University, 1956
M.A.—George Peabody College for Teachers, 1957

KIM, SUSAN H. — *Instructor*, Librarian
B.A.—George Peabody College for Teachers, 1959
M.A.Ed.—George Peabody College for Teachers, 1960
M.S.L.S.—Peabody Library School, 1968

KOUR, EDNA LYNNE — *Assistant Professor*, Biology
A.B.—Rutgers University, 1962
M.S.—University of Rhode Island, 1968

KUNZE, DONALD C. — *Associate Professor*, Chairman, Division of Natural Sciences and Mathematics
B.S.—Baldwin Wallace College, 1945
M.A.—Kent State University, 1952

LAWRENCE, VIRGINIA P.* — *Instructor*, Reading
B.S.—Radford College, 1920
M.A.—Columbia University, 1925

LEE, PIER M. — *Instructor*, Cataloging Librarian
B.A.—National Taiwan University, 1959
M.A.L.S.—George Peabody Teachers College, 1962

LEE, WILLIAM WEI-LIM — *Associate Professor*, Mechanical Engineering Technology
B.S.—National Taiwan University, Taipei, Taiwan, China, 1959
M.S.—Virginia Polytechnic Institute, 1964
Ph.D.—Virginia Polytechnic Institute and State University, 1971

LEVINE, MARTIN — *Professor*, Electrical Engineering Technology
B.E.E.—College of the City of New York, 1949
M.Litt.—University of Pittsburgh, 1956
M.Ed.—University of Pittsburgh, 1960
Ph.D.—University of Michigan, 1969

MACDONALD, ROBERTA C. — *Associate Professor*, Chairman, Division of Business Science
B.A.—Regis College, 1935
M.C.S.—Boston University, 1941
Ed.D.—University of Florida, 1966

MAGRUDER, EDWARD G. — *Assistant Professor*, Business Management
B.S.—Roanoke College, 1951
Diploma—Commercial Banking—Rutgers University and Stonier Graduate School of Banking, 1960
M.S.—Radford College, 1970

MARTIN, EDITH P. — *Assistant Professor*, Art
B.F.A.—Washington State University, 1964
M.F.A.—Pennsylvania State University, 1966

MATHENY, GALLAIS E. — *Associate Professor*, Biology
B.S.—University of Illinois, 1929
M.S.—Virginia Polytechnic Institute, 1939

* Part time.

MAYO, LINDA L. — *Instructor*
B.A.—Glenville State College, 1961 — Health and Physical Education
M.S.—Indiana University, 1968

MAYS, CLARENCE C., JR. — *Associate Professor*
B.S.—University of Virginia, 1961 — Spanish
M.Ed.—University of Virginia, 1965
Ed.D.—University of Virginia, 1971

McCABE, JAMES N. — *Instructor*
A.B.—West Virginia University, 1940 — Administrative Assistant to the President

MC FARLAND, ROSALIND L. — *Instructor*
B.A.—Radcliffe College, 1939 — Mathematics

MICHIE, WAYNE R. — *Instructor*
A.A.S.—Roanoke Technical Institute, 1964 — Electrical Engineering
B.S.—Roanoke College, 1969 — Technology

MILES, ROY G. — *Assistant Professor*
B.S.—Missouri School of Mines, 1951 — Geology
M.S.—Northwestern University, 1957

MITCHELL, FRANCES T. — *Assistant Professor*
B.S.—Radford College, 1942 — Secretarial Science
M.S.—Radford College, 1968

MOORE, DOLORES K — *Instructor*
Diploma—Lehrerinnen Seminar, 1945 — German
Interpreter's Diploma—Rackow Schule, 1947

MOSHER, BRYAN J. — *Associate Professor*
Ed.B.—University of Buffalo, 1948 — Dean of Instruction
Ed.M.—University of Buffalo, 1950
M.S.—State University of New York at Buffalo, 1955
Ph.D.—Syracuse University, 1967

MUSGROVE, CHARLES P. — *Assistant Professor*
B.S.—East Tennessee State University, 1967 — Mathematics
M.S.—Virginia Polytechnic Institute, 1969

MUSIC, WILLIAM O., JR. — *Instructor*
B.S.—Lynchburg College, 1963 — Coordinator of Admissions and Records
M.S.—University of Tennessee, 1964

NELSON, JAMES E. — *Assistant Professor*
B.S.—U.S. Merchant Marine Academy, 1944 — Mechanical Engineering
B.S.—Roanoke College, 1949 — Technology
M.S.—Appalachian State University, 1966

NICKERSON, GWENDOLYN J. — *Assistant Professor*
B.S.—Roanoke College, 1951 — Chemistry
M.Ed.—University of Virginia, 1965

NININGER, EDWARD C. — *Associate Professor*
B.A.—Richmond College, 1931 — History
M.A.—Richmond College, 1932

PACK, JOEL C.
B.A.—Roanoke College, 1963
M.A.—University of Virginia, 1967
Assistant Professor
Mathematics

PAYNE, ELIZABETH W.
B.S.—University of North Carolina, 1950
M.Ed.—University of North Carolina, 1969
Assistant Professor
Secretarial Science

PEVERALL, MARY W.
B.A.—Radford College, 1964
M.S.—Radford College, 1968
Instructor
Counseling

PHELPS, EMMA SUE
B.A.—Concord State Teachers College, 1939
M.A.—State University of Iowa, 1946
Assistant Professor
Speech and Drama

PHELPS, HUGH B.
B.M.E.—Clarkson College of Technology, 1950
M.M.E.—Clarkson College of Technology, 1956
Associate Professor
Chairman, Division of
Engineering Technologies

POINDEXTER, J. CARL
B.S.—University of Virginia, 1933
M.A.—University of Virginia, 1941
Ph.D.—University of Virginia, 1944
Professor
Economics

PRIOR, DAVID F.
B.S.—East Texas Baptist College, 1967
M.S.T.—Middle Tennesee State University, 1969
Instructor
Mathematics

RACE, HARRY C.
B.S.E.E.—Northeastern University, 1942
M.S.—Radford College, 1965
Associate Professor
Dean of Student Services

RAINES, LYNN
B.A —Emory & Henry College, 1960
M.L.S.—University of North Carolina, 1969
Instructor
Reference Librarian

SAUNDERS, JEAN M.
B.S.—Radford College, 1954
M.Ed.—Virginia Polytechnic Institute, 1967
Assistant Professor
Business Management

SCHULTZ, L. DAVID
B.A.—University of California, Santa Barbara, 1967
M.A.—University of Arizona, 1969
Instructor
Mathematics

SEARS, JAMES C.
A.A.S.—Roanoke Technical Institute, 1965
B.S.—Roanoke College, 1968
M.Ed.—University of Virginia, 1971
Instructor
Counseling

SELANDER, EDWIN V.
B.S.—Virginia Polytechnic Institute, 1955
M.S.—Virginia Polytechnic Institute, 1967
Assistant Professor
Mathematics

SELANDER, MARY V.
B.S.—Virginia Polytechnic Institute, 1955
M.A.—Pennsylvania State University, 1959
Instructor
Mathematics

SHEPPARD, VERNON M., JR. — *Assistant Professor*
B.S.—Virginia Polytechnic Institute, 1954 — Economics
M.S.—Virginia Polytechnic Institute, 1960

SHIREY, MARY M. — *Instructor*
A.B.—West Virginia University, 1924 — French
A.M.—Columbia University, 1935

SHIRLEY, WILLIAM T. — *Associate Professor*
B.A.—Furman University, 1948 — Chairman, Division of the Social Sciences
M.A.—University of North Carolina, 1950

SINGER, MADELYN — *Assistant Professor*
A.B.—Brooklyn College, 1942 — Mathematics
M.A.—Columbia University, 1946

SMITH, HUGH P. — *Associate Professor*
B.A.—University of California, 1948 — Geology and Geography
M.A.—University of California, 1950
Ph.D.—University of Utah, 1969

SMITH, MILTON S. — *Professor*
B.A.—Wesleyan University, 1933 — English
M.A.—Harvard University, 1934
Ph.D.—Fordham University, 1955

STARNES, JOHN N. — *Instructor*
B.S.—East Tennessee State University, 1960 — Mathematics
M.S.—East Tennessee State University, 1968

STATON, RUTH J. — *Assistant Professor*
B.A.—College of William and Mary, 1934 — English
M.Ed.—University of Virginia, 1954
M.A.—University of Michigan, 1968

STEWART, ALBERT W. — *Assistant Professor*
B.S.E.E.—Virginia Polytechnic Institute, 1957 — Electrical Engineering Technology

STRAUSBAUGH, MAURICE — *Assistant Professor*
B.A.—Juniata College, 1950 — Coordinator of Counseling Services
B.D.—Bethany Theological School, 1953
M.Ed.—Johns Hopkins University, 1966

SYKES, CYRIL H. — *Assistant Professor*
B.A.—Norwich University, 1944 — Director, Learning Resources
M.S.—Syracuse University, 1950

TRAHIN, LAVERNE L. — *Instructor*
B.A.—Radford College, 1960 — Psychology
M.S.—Radford College, 1965

TRAYNOR, MARGARET H. — *Instructor*
B.S.Ed.—Longwood College, 1933 — Coordinator of Student Activities
M.Ed.—University of Virginia, 1968

TUCKER, RAY B. — *Assistant Professor*
B.S.—Southern Illinois University, 1956 — Mathematics
M.A.T.—Southeastern State College, 1966
M.A.—University of Illinois, 1969

TYLER, JOSEPH REGINALD — *Assistant Professor*
B.S.—Virginia Polytechnic Institute, 1966 — Manager, Data Processing
M.S.—Virginia Commonwealth University, 1970

VANDYKE, J. KEITH — *Instructor*
B.S.—Appalachian State University, 1962 — Coordinator, Audio-Visual Services
M.S.—Appalachian State University, 1969

VAN LIERE, RUTH B. — *Instructor*
B.A.—Roanoke College, 1967 — Psychology
M.S.—Radford College, 1968

VAUGHN, MARY B. — *Instructor*
B.M.—University of Alabama, 1961 — Music
M.A.—Radford College, 1970

VILLANI, FRANK J. — *Instructor*
B.A.—State University of New York at Oneonta, 1966 — English
M.A.—University of Arkansas, 1969

WALL, HOYET M. — *Instructor*
B.S.—Winthrop College, 1965 — Secretarial Science

WEINMAN, DANIEL J. — *Instructor*
B.S.—Loyola University, 1967 — Government
M.A.—Northern Illinois University, 1969

WHITE, G. CARY — *Associate Professor*
B.A.—University of Richmond, 1926 — Sociology
M.Ed.—Temple University, 1941
Ph.D.—University of Pennsylvania, 1952

WHITE, ROY R. — *Associate Professor*
B.S.—Florida Southern College, 1954 — History
M.A.—University of Florida, 1957
Ph.D.—University of Florida, 1960

WILSON, JAMES H. — *Instructor*
A.A.S.—Roanoke Technical Institute, 1965 — Mechanical Engineering
B.S.—Virginia Polytechnic Institute and State University, 1971 — Technology

WU, FRANK — *Instructor*
B.S.—Rocky Mount College, 1958 — Counseling
M.A.—Montclair State College, 1965

ZIRKLE, BENJAMIN F., III — *Assistant Professor*
B.S.—Roanoke College, 1965 — Mathematics
M.S.—Florida State University, 1968

STAFF PERSONNEL

ADAMS, EVELYN P.	*Secretary to the Director, Learning Laboratory*
ADAMS, WILLIE I.	*Secretary to the Dean of Financial and Administrative Services*
ARA, NANCY K.	*Secretary to the Dean of Instruction*
ARRINGTON, MARVIN L.	*Campus Policeman*
BOLLING, ESTHER A.	*Secretary to the Chairman, Business Science Division*
BONHAM, SANDRA L.	*Secretary to the Chairman, Humanities Division*
BRANDSTETTER, DOROTHY I.	*Library Clerk*
BRATTON, MARION B.	*Bookstore Manager*
DEERING, BARBARA	*Confidential Secretary to the President*
DeFELICE, VIRGINIA B.	*Secretary to the Chairman, Engineering Technologies*
DEYERLE, NANCY L.	*Secretary*
DOSS, TONI M.	*Secretary to the Chairman, Social Sciences Division*
EQUI, FRANCES D.	*Technician in Charge of Duplication*
FARMER, JUDY JANE	*Library Assistant*
GAUT, BESS S.	*Clerk Typist, Admissions & Records*
GRAY, MARIE L.	*Secretary*
GREENE, MARY J.	*Secretary to the Coordinator of Counseling Services*
GREGORY, JANE F.	*Library Assistant*
JANNEY, BETTY	*Secretary, Office of Continuing Education*
MATTOX, CHARLES A.	*Campus Policeman*
MAUK, JOHN W.	*Campus Policeman*
MEADOR, FRANCES M.	*Bookstore Assistant*
MITCHELL, MILDRED C.	*Supervisor, PBX Operator and Receptionist*
MOCK, DOROTHY C.	*Secretary to the Director, Continuing Education*
MUNDY, MARION D.	*Secretary to the Dean of Student Services*
NEAL, BETTIE T.	*Transcript and Government Clerk*
NELMS, CATHIE D.	*Secretary to the Chairman, Natural Sciences & Mathematics Division*
NEWELL, CHARLES P., JR.	*Accountant*
PREVO, PATRICIA L.	*Instructional Aide—Chemistry*
QUINN, ANNE M.	*Secretary to the Director, Learning Resources*
RAMEY, MONA N.	*PBX Operator-Receptionist*

ROOP, JANICE W.	*Secretary and Aide to Audio-Visual and Duplication*
SARGENT, JUDITH B.	*Secretary to the Data Processing Manager*
SEARS, CAROL H.	*Secretary to the Coordinator of Admissions and Records*
SHAVER, JOYCE M.	*Secretary, President's Office*
SHUMAKER, DREWRY P.	*Secretary, Counseling Services*
SINK, ROBERT L.	*Campus Policeman*
SOWER, RONALD D.	*Instructional Aide—Biology*
STOVALL, MARSHA C.	*Secretary, Duplicating Room*
TALIAFERRO, ULITA S.	*Secretary, Business Office*
WHEELER, WILLIAM H.	*Laboratory Mechanical Technician*
WILLIAMS, JANE W.	*Secretary, Business Office*
WILLIAMS, SHIRLEY R.	*Secretary to the Director, Dental Assistant Program*
WOOD, JOYCELYN J.	*Clerk Typist, Admissions & Records Office*
YOUNG, JOHN R., JR.	*Buildings and Grounds Supervisor*
YOUNG, ROBERT N., JR.	*Accountant*

1971

JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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JANUARY

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FEBRUARY

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MARCH

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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