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**VIRGINIA
WESTERN
COMMUNITY
COLLEGE
CATALOG**

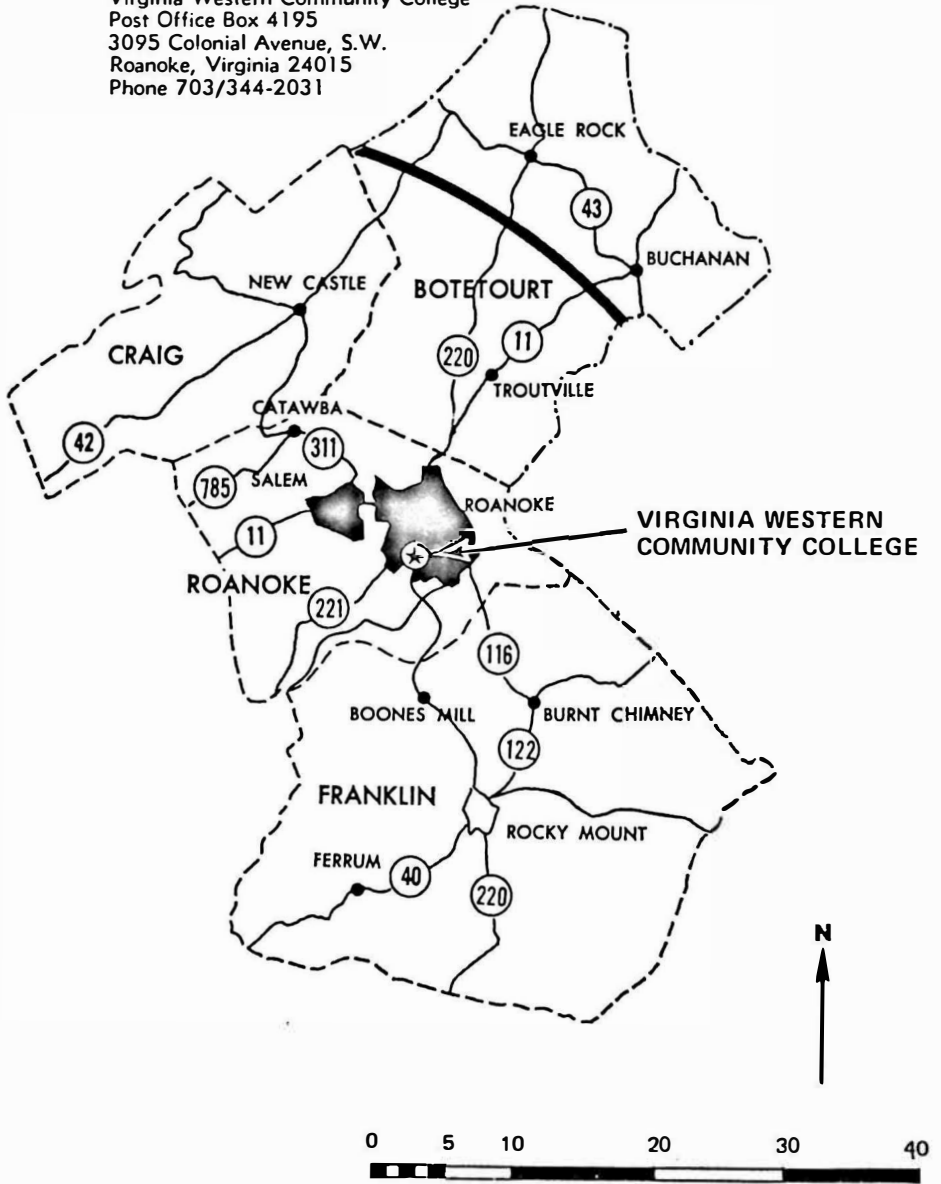


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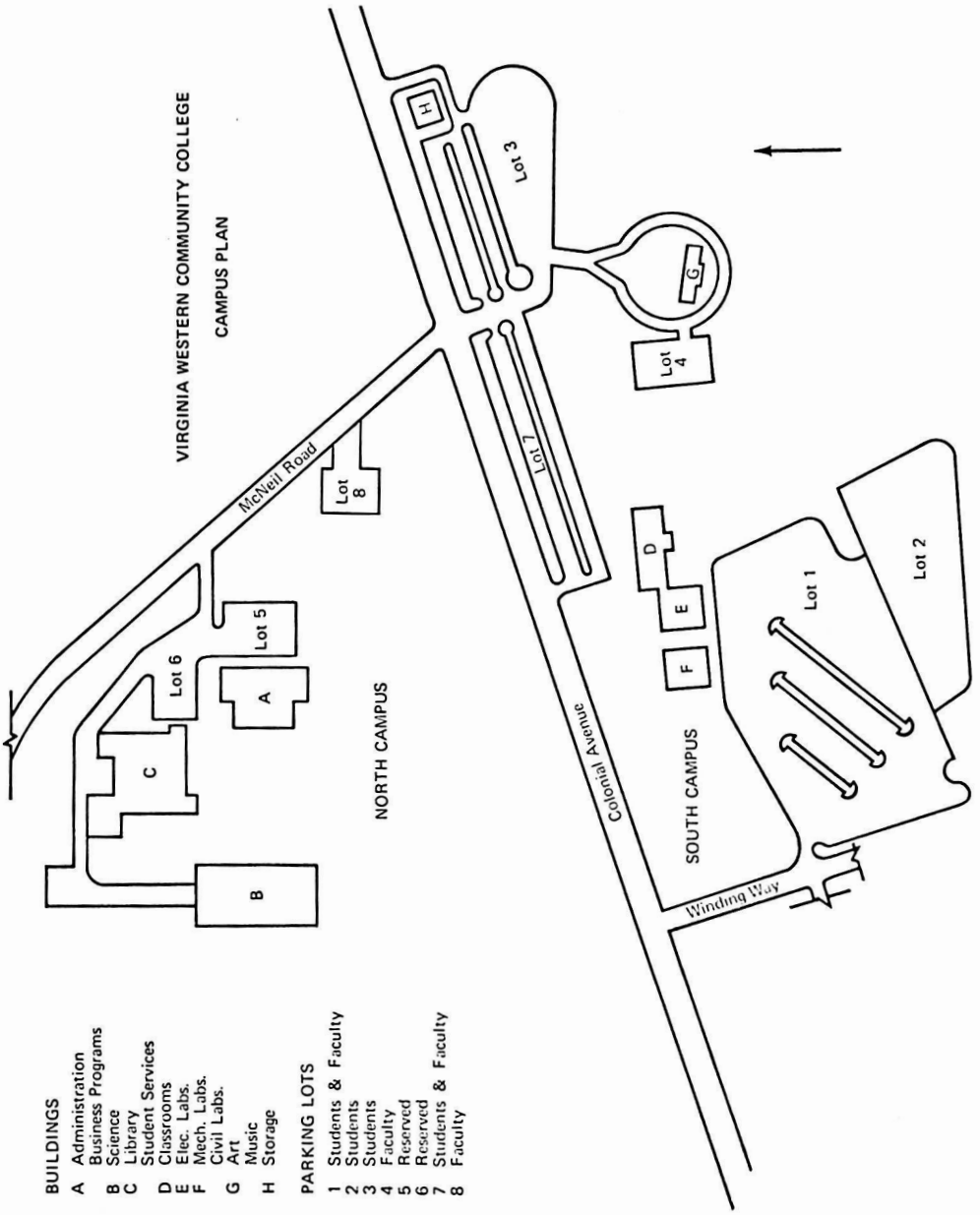
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ROANOKE AREA

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Virginia Western Community College
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3095 Colonial Avenue, S.W.
Roanoke, Virginia 24015
Phone 703/344-2031



VIRGINIA WESTERN COMMUNITY COLLEGE
CAMPUS PLAN



BUILDINGS

- A Administration
- B Business Programs
- C Science
- D Library
- E Student Services
- F Classrooms
- G Elec. Labs.
- H Mech. Labs.
- I Civil Labs.
- J Art
- K Music
- L Storage

PARKING LOTS

- 1 Students & Faculty
- 2 Students
- 3 Students
- 4 Faculty
- 5 Reserved
- 6 Reserved
- 7 Students & Faculty
- 8 Faculty

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

CALENDAR

FALL QUARTER 1970

New Faculty Report.....	Wednesday, September 16
Faculty Work Days.....	September 16-23
Orientation Day for New Students.....	Monday-Wednesday, September 21-23
Registration.....	Thursday-Friday, September 24-25
Classes Begin.....	Monday, September 28
Last Day to Add or Change Classes.....	Friday, October 2
Last Day for Withdrawal Without Penalty.....	Friday, October 16
Mid-term Grade Reports.....	Tuesday, November 3
Thanksgiving Recess.....	Thursday-Saturday, November 26-28
Classes End.....	Wednesday, December 9
Final Exams.....	Thursday-Saturday, December 10-12
Faculty Work Day.....	Monday, December 14

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WINTER QUARTER 1971

New Faculty Report.....Monday, December 28
 All Faculty Report.....Monday, January 4
 Orientation Day for New Students.....Monday, January 4
 Registration.....Monday-Tuesday, January 4-5
 Classes BeginWednesday, January 6
 Last Day to Add or Change Classes.....Tuesday, January 12
 Last Day for Withdrawal Without Penalty.....Tuesday, January 26
 Mid-Term Grade Reports.....Thursday, February 11
 Washington's Birthday.....Monday, February 22
 Classes End.....Tuesday, March 16
 Final ExamsWednesday-Friday, March 17-19
 Faculty Work Day.....Saturday, March 20

1970

DECEMBER

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SPRING QUARTER 1971

New Faculty Report.....	Thursday, March 18
Faculty Work Day.....	Tuesday, March 23
Orientation Day for Students.....	Wednesday, March 24
Registration.....	Thursday-Friday, March 25-26
Classes Begin.....	Monday, March 29
Last Day to Add or Change Classes.....	Friday, April 2
Last Day for Withdrawal Without Penalty.....	Friday, April 16
Mid-term Grade Reports.....	Monday, May 3
Memorial Day.....	Monday, May 31
Classes End	Saturday, June 5
Final Exams.....	Monday-Wednesday, June 7-9
Faculty Work Day.....	Thursday, June 10
Graduation.....	Saturday, June 12

1971

MARCH

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SUMMER QUARTER 1971

(Full ten-week session)

New Faculty Report-----Thursday, June 17
 Faculty Work Day-----Friday, June 18
 Orientation Day for New Students-----Friday, June 18
 Registration-----Friday, June 18
 Classes Begin-----Monday, June 21
 Last Day to Add or Change Classes-----Friday, June 25
 Independence Day-----Monday, July 5
 Last Day to Withdraw Without Penalty-----Friday, July 9
 Mid-term Grade Reports-----Monday, July 26
 Classes End -----Saturday, August 28
 Final Exams-----Monday-Wednesday, August 30-September 1
 Faculty Work Day-----Thursday, September 2

1971

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SUMMER QUARTER 1971

(Two five-week terms with double class periods)

FIRST TERM

New Faculty Report.....Thursday, June 17
 Faculty Work Day.....Friday, June 18
 Orientation Day for New Students.....Friday, June 18
 Registration.....Friday, June 18
 Classes Begin.....Monday, June 21
 Last Day to Add or Change Classes.....Wednesday, June 23
 Last Day for Withdrawal Without Penalty.....Wednesday, June 30
 Independence Day.....Monday, July 5
 Mid-tem Grade Reports.....Thursday, July 8
 Classes End.....Saturday, July 24
 Final Exams.....Monday-Tuesday, July 26-27
 Faculty Work Day.....Wednesday, July 28

SECOND TERM

New Faculty Report.....Tuesday, July 27
 Faculty Work Day.....Wednesday, July 28
 Orientation Day for New Students.....Wednesday, July 28
 Registration.....Wednesday, July 28
 Classes Begin.....Thursday, July 29
 Last Day to Add or Change Classes.....Monday, August 2
 Last Day for Withdrawal Without Penalty.....Monday, August 9
 Mid-term Grade Reports.....Monday, August 16
 Classes End.....Wednesday, September 1
 Final Exams.....Thursday-Friday, September 2-3
 Faculty Work Day.....Saturday, September 4

FALL QUARTER 1971

(Tentative)

New Faculty Report-----Thursday, September 16
 Faculty Work Days -----Thursday, September 16
 Saturday, September 18
 Orientation Day for New Students-----Monday, September 27
 Registration-----Tuesday-Wednesday, September 28-29
 Classes Begin-----Thursday, September 30
 Last Day to Add or Change Classes-----Wednesday, October 6
 Last Day for Withdrawal Without Penalty-----Wednesday, October 20
 Mid-term Grade Reports-----Monday, November 8
 Thanksgiving Recess-----Thursday-Saturday, November 25-27
 Classes End -----Saturday, December 11
 Final Exams-----Monday-Wednesday, December 13-15
 Faculty Work Day-----Thursday, December 16

1971

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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, classrooms, and faculty offices. In the center is the Library with its 20,000 volumes and the Student Services and Admissions 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 As-

sociation of Junior Colleges and has been approved by the Veterans Administration for V.A. assistance and by the U. S. Office of Education for various federal funding programs.

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

ADMINISTRATIVE INFORMATION

ADMISSION REQUIREMENTS

General Admission to the College

Any person who has a high school diploma or the equivalent, or 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 have been received by the Office of Admissions. The College reserves the right to evaluate special cases and to refuse admission to applicants when considered advisable in the best interest of the College.

For all regular students, the following items are required:

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

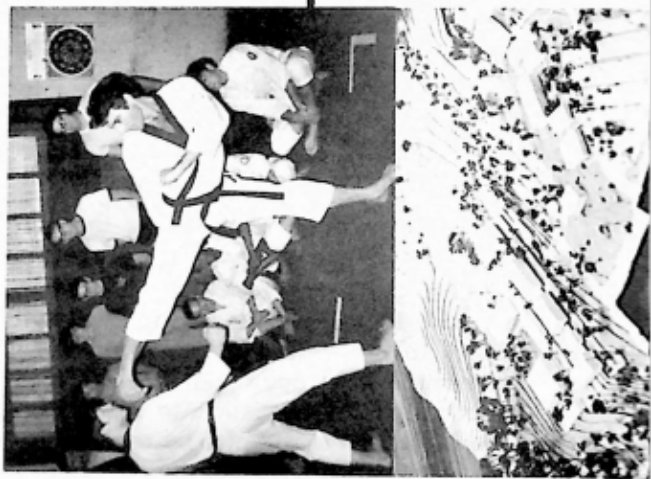
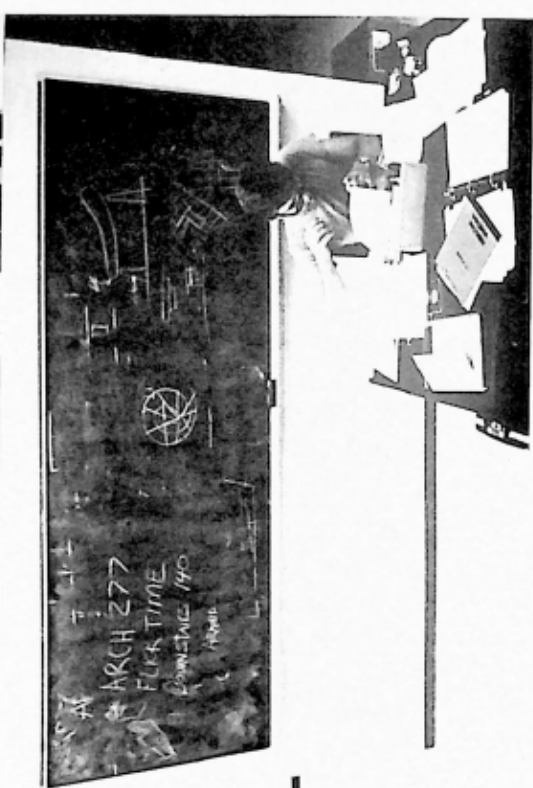
For all special students, the following items are required:

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

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

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

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.

Special Admission Requirements for Foreign Students

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

Residence Requirements

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

When enrollments must be limited for any curriculum or course, first priority must be given to all qualified students who are residents of the political 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 re-entrance at the last college shall also be eligible for admission to the College.

It is the role of the College to help each student succeed in a program from which he can benefit. If a transfer student is ineligible to return to a particular curriculum in a previous college, generally he will not be allowed to enroll in the same curriculum in the College until two quarters elapse or until he completes an approved 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 mid-term 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).

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 $\frac{2}{3}$ of the tuition;
2. Within first 16-35 class days of a quarter, refund will be $\frac{1}{3}$ of tuition;
3. After 35 class days of a quarter have elapsed, no refund will be made.

If a course is cancelled, there will be a refund of tuition for that course. No refunds for tuition will be made after the first week of classes for individual course changes or for an individual class

which is dropped. For part-time students who withdraw from the College, refunds will be prorated on the above schedule.

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

CREDITS

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

1. One hour of lecture plus an average of two hours of out-of-class study, or
2. Two hours of laboratory or shop study plus an average of one hour of out-of-class study, or
3. Three hours of laboratory or shop study with no regular out-of-class assignments.
4. Fixed credit and variable hours with behavioral objectives are assigned to each 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 "W" (Withdrawal) 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.

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 are 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 National 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 part-time employment. An effort is made to place students in job fields which are 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 are available each year under the Work-Study Program. Application forms are available in the office of the Placement and Financial Aid Officer.

Student Loans

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

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

Other financial aid plans may be added throughout the year. Interested students may inquire through the office of the Placement and Financial Aid Officer.

The College also participates in the National Defense Student Loan Program.

Vocational Rehabilitation

The College cooperates with the State Department 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.

SNACK BAR

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.

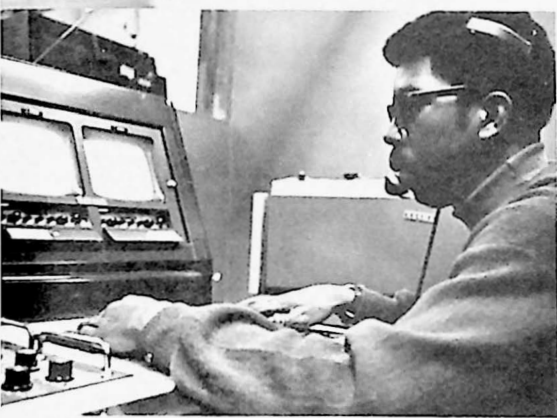
Special care is taken to assure due process and to spell out clearly-defined routes of appeal when a student feels his rights have been violated.

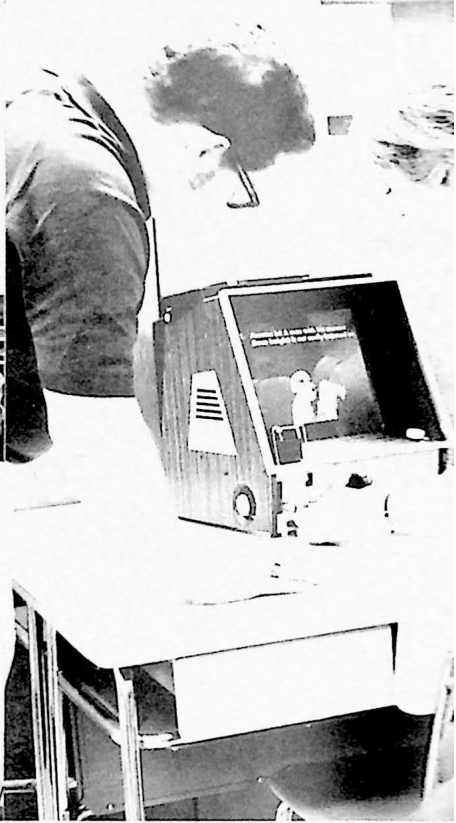
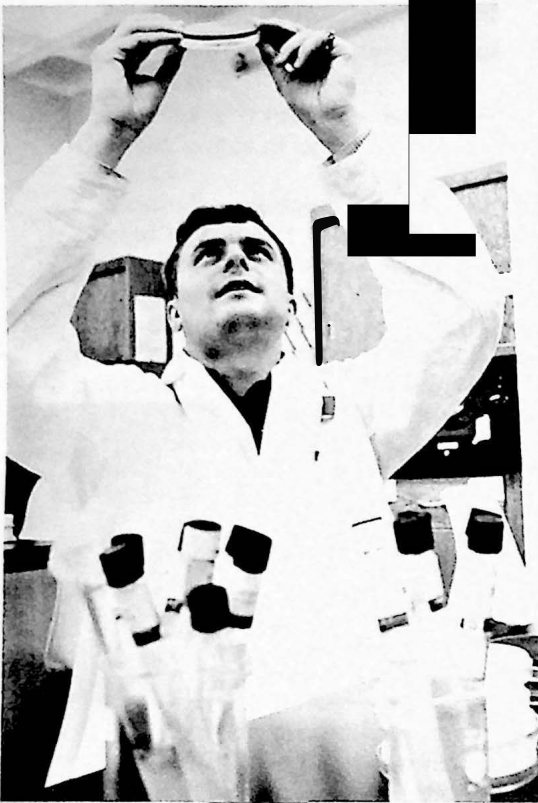
Basically, students of the Virginia community colleges are expected to conduct themselves as ladies and gentlemen, both within the colleges and elsewhere. For student conduct which tends to discredit or injure the College, the Chancellor is authorized by the State Board for Community Colleges to impose 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.





CURRICULUMS OF STUDY

Associate in Arts

Liberal Arts

Associate in Science

Business Administration
Pre-Engineering
Pre-Music
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
Secretarial Science
Television Production Technology
Traffic and Transportation Management

Diploma Curriculum

Automotive Technology

Certificate Curriculums

Air Conditioning and Refrigeration
Clerk-Typist
Dental Assistant
Mechanical Drafting
Stenographic

**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 Business Technology
Blue Ridge Community College
2. Broadcast Engineering Technology
Northern Virginia Community College
3. Civil Engineering Technology
Northern Virginia Community College
4. Electromechanical Technology
Danville Community College
5. Environmental Technology
Wytheville Community College
6. Hotel, Restaurant, and Institutional Management
Northern Virginia Community College
7. Forest Technology
Dabney S. Lancaster Community College
8. Marine Technology
Thomas Nelson Community College
9. Mortuary Science
John Tyler Community College
10. Radiologic Technology
Central Virginia Community College
11. Real Estate Management
Northern Virginia Community College
12. Television Productional Technology
Northern Virginia Community College
13. Textile Management
Danville 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	6
Literature (English, American, or World)	6-9	0-6	-
Speech	0-3	0-3	3
Art, Drama, Music, 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	0-9	3
Natural Sciences and Mathematics			
Natural Science (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 Field Requirements	3-21 ¹	57 ¹	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, 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%

(Approved by the State Board for Community Colleges June 18, 1969)

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

Admission Requirements: In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Arts Degree program in Liberal Arts requires the satisfactory completion of the following high school units or equivalent as a minimum: 4 units of English; 2 units of 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 who do not meet these requirements may be permitted to correct their deficiencies in the Foundation Program before entering the Liberal Arts curriculum.

Program Requirements: This curriculum consists of courses in the humanities including a foreign language, natural sciences, and social sciences usually required in the first two years of a baccalaureate liberal arts curriculum. A minimum of 97 credits is required for the Liberal Arts major in the Associate in Arts Degree program. **Each student is urged to acquaint himself with the requirements of the major department in the college or university to which transfer is contemplated and also to consult with the Counseling Department of the community college in planning his program and selecting his electives.** In order to help prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college which is comparable in length and courses to the first two years of the program at the four-year college or university. Upon satisfactory completion of the six-quarter program listed on the next page, the 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	<u>3</u>	<u>3</u>	<u>4</u>
	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	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	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	<u>3</u>	<u>3</u>	<u>4</u>
	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	<u>3</u>
	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	<u>3</u>	<u>0</u>	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	<u>3</u>	<u>0</u>	<u>3</u>
	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.

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 help 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 (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Science Degree curriculum in Business Administration requires the satisfactory completion of the following high school units or equivalent as a minimum:

- 4 units of English
- 2 units of mathematics (algebra and geometry)
- 1 unit of laboratory science
- 1 unit of social studies

Students who do not meet these requirements may be permitted to correct their deficiencies in the Foundation Program. 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 the every-day business technology. Thus, this curriculum requires courses in the humanities, natural sciences, and social sciences in addition to the principles of economics and principles of accounting usually required in the first two years of a baccalaureate business administration curriculum. **Each student is urged to acquaint himself with the requirements of the major department in the college or university to which transfer is contemplated and also to consult with the Counseling Department of the community college in planning his program and selecting his electives.** In order to help prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college which is comparable in length and courses to the first two years of the program at the four-year college or university. Upon completion of the six-quarter curriculum listed herein, 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	Mathematics (MATH 161 or 181)	3	0	3
	Natural Science (Lab.)	3	3	4
	Elective	<u>3</u>	<u>0</u>	<u>3</u>
	Total	16	4	17
SECOND QUARTER				
ENGL 112	English Composition II	3	0	3
HIST	American History or Hist. of West. Civ.	3	0	3
MATH	Mathematics (MATH 162 or 182)	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	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	<u>3</u>	<u>0</u>	<u>3</u>
	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

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.

CURRICULUMS OF STUDY

45

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
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	<u>6</u>	<u>0</u>	<u>6</u>
	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	<u>6</u>	<u>0</u>	<u>6</u>
	Total	15	0	15
Total Minimum Credits for the Business Administration Degree.....				97

¹In addition to the Economics requirements 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 (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Science Degree curriculum in Pre-Engineering requires 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 who do not meet the requirements listed above may be permitted to correct their deficiencies in the Foundation Program before entering the Pre-Engineering curriculum.

Program Requirements: This program includes the courses usually required in the first two years of a baccalaureate engineering curriculum. Each student is urged to acquaint himself with the requirements of the major department in the college or university to which he expects to transfer and also to consult with the Counseling Department of the community college in planning his program and selecting his electives. In order to help prepare for upper division (junior class) standing at a four-year college or university the student usually must complete a program at the community college which is comparable in length and courses to the first two-years of the program at the four-year college or university. Upon satisfactory completion of the six-quarter curriculum listed herein, 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	3	0	3
ENGR 101	Introduction to Engineering	1	2	2
ENGR 121	Engineering Graphics I	1	3	2
GENL 100	Orientation	1	1	1
MATH 141	Introductory Mathematical Analysis I	5	0	5
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	14-17	9-12	18-20
SECOND QUARTER				
CHEM 112	General Inorganic Chemistry II	3	3	4
ENGL 112	English	3	0	3
ENGR 102	Introduction to Engineering Methods	1	2	2
ENGR 122	Engineering Graphics II	1	3	2
MATH 142	Introductory Mathematical Analysis II	5	0	5
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	13-16	8-11	17-19
THIRD QUARTER				
CHEM 113	General Inorganic Chemistry III	3	3	4
ENGL 113	English	3	0	3
ENGR 123	Engineering Graphics III	1	3	2
	History Elective	3	0	3
MATH 143	Introductory Mathematical Analysis III	5	0	5
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	15-18	6-9	18-20
FOURTH QUARTER				
ECON	**Economics	3	0	3
ENGR 103	Conceptual Design and Analysis	1	2	2
ENGR 201	Mechanics of Particles	5	0	5
MATH 241	Advanced Mathematical Analysis	4	0	4
	Elective	-	-	<u>3-4</u>
	Total			17-18

* 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
GOVT	**Government	3	0	3
MATH 242	Advanced Mathematical Analysis II	4	0	4
PHYS 222	General University Physics II	3	3	4
	Elective	2	0	<u>2</u>
	Total			18
SIXTH QUARTER				
ENGR 203	Dynamics of Rigid Bodies	3	0	3
ENGR 206	Engineering Economy (or Elective)	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	<u>3</u>
	Total			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-MUSIC

Degree: Associate in Science

Length: Six-quarter (two-year) program

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

Admission Requirements: In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Science Degree program in Pre-Music 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 who do not meet these requirements may be permitted to correct their deficiencies in the Foundation Program before entering the Pre-Music curriculum. 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 this 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 passing a proficiency examination. A student satisfying the piano requirements in less than nine 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 the form of a jury examination and/or a student recital at the discretion of the instructor.

In order to prepare for upper division (junior class) standing at a four-year college or university, the students usually must complete a program at the community college which is comparable in length and courses to the first two years of the program at the four-year college or university. **Each student is urged to acquaint himself with the requirements of the major department in the college or university to which transfer is contemplated and also to consult with the Counseling Department of the community college in planning his program and selecting his electives.** Upon satisfactory completion of the six-quarter program listed on the next page the graduate will be awarded the Associate in Science Degree in Pre-Music.

PRE-MUSIC**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	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 Instrumental)	-	-	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)	-	-	1
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	-	-	18-20
THIRD QUARTER				
ENGL 113	English Composition III	3	0	3
HIST	History	3	0	3
MATH	Mathematics	3	0	3
MUSC 113	Music Theory III	3	2	4
MUSC	Applied Music (Major instrument)	-	-	2
MUSC	Applied Music (Minor instrument)	-	-	1
MUSC	Ensemble (Vocal or Instrumental)	-	-	1
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	-	-	18-20

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FOURTH QUARTER				
ECON	Economics ¹	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)	-	-	1
	Natural Science (Lab)	3	3	4
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	-	-	16-18
FIFTH QUARTER				
GOVT	Government ¹	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)	-	-	1
	Natural Science (Lab)	<u>3</u>	<u>3</u>	<u>4</u>
	Total	-	-	15
SIXTH QUARTER				
MUSC 213	Advanced Music Theory III	3	2	4
MUSC	Applied Music (Major instrument)	-	-	2
MUSC	Applied Music (Minor instrument)	-	-	1
MUSC	Ensemble (Vocal or Instrumental)	-	-	1
PSYC	Psychology ¹	3	0	3
	Natural Science (Lab)	<u>3</u>	<u>3</u>	<u>4</u>
	Total	-	-	15
Total Minimum Credits for the Pre-Music Degree				100

¹ A year sequence of Social Science is recommended in lieu of the Economics-Government-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 (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Science Degree program in Pre-Teacher Education 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 who do not meet these requirements may be permitted to correct their deficiencies in the Foundation Program before entering the Pre-Teacher Education curriculum.

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. The Pre-Teacher Education curriculum is designed to lead the student toward meeting the state teacher certification requirements for a Collegiate Professional Certificate. Eligible students may also qualify for the State Teacher's Scholarships. **Each student is urged to acquaint himself with the requirements of the major department in the college or university to which transfer is contemplated and also, to consult with the Counseling Department of the Community College in planning his program and selecting his electives.** In order to prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college which is comparable in length and courses to the first two years of the program at the four-year college or university. Upon satisfactory completion of the six-quarter program listed on the next page, the 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	3	0	3
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	<u>3</u>	<u>0</u>	<u>3</u>
	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
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Elective	3	<u>0</u>	<u>3</u>
	Total	15-18	3-6	17-19
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	<u>0</u>	<u>3</u>
	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
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	<u>0</u>	<u>3</u>
	Total	12-15	0-3	13-15

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
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	
SPRD 137	Public Speaking (or Elective)	5	0	5
	Elective	<u>3</u>	<u>0</u>	<u>3</u>
	Total	17	0	17
Total Minimum Credits for a Pre-Teacher Education Degree				97

SCIENCE

Degree: Associate in Science

Length: Six-quarter (two-year) program

Purpose: With the tremendous emphasis on scientific discoveries and technological developments in today's society, there is a great demand for scientists and scientifically-oriented persons in business, government, industry and the professions. The Associate in Science Degree Program with a major in Science is designed for persons who are interested in 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 (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Science Degree program with a major in Science requires satisfactory completion of the following high school units or equivalent as a minimum:

- 4 units of English
- 3 units of college preparatory mathematics
- 1 unit of laboratory science
- 1 unit of social studies

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

Program Requirements: Although the major emphasis in this curriculum is on mathematics, the biological sciences, and the physical sciences, the curriculum also includes courses in 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. **Each student is urged to acquaint himself with the requirements of the major department in the college or university to which transfer is contemplated and also to consult with the Counseling Department of the Community College in planning his program and selecting his electives.** In order to prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college which is comparable in length and courses to the first two years of the program at the four-year college or university. Students are advised to check the requirements for Junior standing at the four-year school which they plan to attend when initially planning their program. Upon satisfactory completion of the six-quarter program listed herein, the graduate will be awarded the Associate in Science Degree with a major 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	<u>0-3</u>	<u>1-3</u>
	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	<u>0-3</u>	<u>1-3</u>
	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	<u>0</u>	<u>2</u>
	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	<u>3</u>	<u>3</u>	<u>4</u>
	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	<u>3-4</u>	<u>0</u>	<u>3-4</u>
	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	<u>6-7</u>	<u>0</u>	<u>6-7</u>
	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 primarily 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 (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Applied Science Degree program in Accounting requires proficiency in high school English and mathematics. Students who are not proficient in English and mathematics will be required to correct their deficiencies in the Foundation Program.

Program Requirements: The first three quarters (first year) of the Associate in Applied Science Degree curriculum in Accounting 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. Each student is urged to consult with the Counseling Department and his faculty advisor in planning his program and selecting his electives. Courses within this curriculum may be applied to a four-year program at the discretion of the admitting institution. Upon satisfactory completion of the six-quarter curriculum listed below, 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	<u>3</u>	<u>0</u>	<u>3</u>
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	<u>0-3</u>	<u>1-3</u>
	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	<u>0-3</u>	<u>1-3</u>
	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	Prin. of Data Proc. (or DAPR Elective)	3	0	3
ENGL 180	Business English	3	0	3
ACCT 234	Cost Accounting	<u>3</u>	<u>0</u>	<u>3</u>
	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	<u>0-3</u>	<u>1-3</u>
	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)	<u>3</u>	<u>0</u>	<u>3</u>
	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: The program in Architectural Technology is concerned with design, construction, and supervision of buildings. The work is both creative and practical; students are exposed to design, working drawings, construction details, and methods. Emphasis is placed on development of drafting ability, understanding of design processes, and comprehension of construction methodology. The program is designed to prepare students for full-time employment immediately upon completion of the community college program.

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

Admission Requirements: In addition to the admission requirements established for the College (listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Applied Science degree curriculum in Architectural Technology requires the satisfactory completion of the following high school units or equivalent as a minimum:

4 units of English

3 units of mathematics (2 units algebra required, 1 unit geometry or trigonometry)

1 unit of laboratory science (preferably physical science)

1 unit of social studies

Students who do not meet these requirements may be permitted to correct their deficiencies in the Preparatory (Foundation) Program before entering the Architectural Technology curriculum.

Program Requirements: Approximately one-half of the curriculum will include courses in architectural technology with the remaining courses in related subjects, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in Architectural Technology. Each student is advised to consult with his faculty advisor and the Counseling Department in planning his program and selecting his electives. Upon satisfactory completion of the six-quarter program listed herein, the student will be awarded the Associate in Applied Science degree with a major 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 Architectural Technology	1	3	2
ARCH 111	Architectural Drafting I	1	6	3
ECON 160	American Economics	3	0	3
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
MATH 161	College Mathematics I	3	0	3
	Elective	<u>3</u>	<u>0</u>	<u>3</u>
	Total	15	10	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	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	12-15	12-15	17-19
THIRD QUARTER				
ARCH 113	Architectural Drafting III	1	6	3
ARCH 142	Materials and Methods of Construction II	2	3	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	<u>3</u>	<u>3</u>	<u>4</u>
	Total	13	15	18
FOURTH QUARTER				
ARCH 204	History of Architecture I	3	0	3
ARCH 211	Architectural Drafting IV	1	6	3
ENGR 152	Mechanics II (Strength of Materials)	3	3	4
GEOG 240	Introduction to Physical Geography	3	0	3
SPDR 137	Public Speaking	3	0	3
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	13-16	9-12	17-19
FIFTH QUARTER				
ARCH 212	Architectural Drafting V	1	6	3
ARCH 226	Art and Architecture	3	0	3
ARCH 237	Building Mechanical Equipment	3	0	3
ARCH 277	Building Codes and Contract Documents	3	0	3
GOVT 180	American Constitutional Government	3	0	3
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	13-16	6-9	16-18
SIXTH QUARTER				
ARCH 205	History of Architecture II	3	0	3
ARCH 213	Architectural Drafting VI	1	6	3
ARCH 298	Seminar and Project	-	-	4
CIVL 180	Principles of Surveying	3	3	4
PSYC 128	Human Relations	<u>3</u>	<u>0</u>	<u>3</u>
	Total			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 primarily 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 a managerial position or 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 (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Applied Science Degree program in Business Management requires proficiency in high school English and mathematics. Students who are not proficient in English and mathematics will be required to correct their deficiencies in the Foundation Program.

Program Requirements: The first three quarters (first year) of the Associate in Applied Science Degree 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. Each student is urged to consult with the Counseling Department and his faculty advisor in planning his program and selecting his electives. Courses within this curriculum may be applied to a four-year program at the discretion of the admitting institution. Upon completion of the six-quarter program listed below, 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 I	3	0	3
ENGL 102	Communication Skills II (or ENGL 112)	3	0	3
MATH 152	Introduction to Business Mathematics II	3	0	3
SECR 111	Typewriting ¹	2	3	3
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	14-17	5-8	17-19
THIRD QUARTER				
ACCT 113	Accounting III (or Business Elective)	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	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	15-18	2-5	17-19
FOURTH QUARTER				
BUAD 254	Applied Business Statistics	3	0	3
DAPR 106	Principles of Data Proc. (or DAPR Elective)	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	<u>0-3</u>	<u>1-3</u>
	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)	<u>2</u>	<u>3</u>	<u>3</u>
	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	<u>3</u>	<u>0</u>	<u>3</u>
	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 basic purpose of Civil Engineering Technology is to develop qualified engineering technicians proficient in the field of civil technology. To accomplish this purpose, the program is designed to give the student a high degree of proficiency in technical courses applicable to the field, and to solidly support the technical knowledge with a sound foundation of mathematics, science, and English. This enables the technician to communicate mathematically, scientifically, and linguistically with craftsmen and to supplement and assist in the work of the engineer and scientist. Typical among the wide 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 (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Applied Science Degree curriculum in Civil 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 and 1 unit of geometry or trigonometry), 1 unit of laboratory science (preferably physical science), and 1 unit of social studies. Students who do not meet these requirements may be permitted to correct their deficiencies in the Foundation Program before entering the Civil Engineering Technology curriculum.

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. Each student is advised to consult with his faculty advisor and the Counseling Department in planning his program and selecting his electives. Upon satisfactory completion of the six-quarter program listed below, 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
ECON 160	Survey of American Economics	3	0	3
ENGL 101	Communication Skills I	3	0	3
ENGR 100	Introduction to Engineering Technology	0	3	1
GENL 100	Orientation	1	1	1
MATH 121	Engineering Technical Mathematics	<u>5</u>	<u>0</u>	<u>5</u>
Total		16	7	18

CURRICULUMS OF STUDY

65

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
SECOND QUARTER				
CIVL 124	Civil Engineering Drafting I	1	3	2
ENGL 102	Communication Skills II	3	0	3
GOVT 180	American Constitutional Government	3	0	3
MATH 122	Engineering Technical Mathematics II	5	0	5
PHYS 111	Technical Physics I	3	3	4
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	15-18	6-9	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
PSYC 128	Human Relations	3	0	3
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	15-18	6-9	18-20
FOURTH QUARTER				
CIVL 181	Surveying I	3	3	4
CIVL 256	Soil Mechanics	3	3	4
ENGL 127	Technical Writing or SPDR 137 Public Speaking	3	0	3
ENGR 152	Mechanics II (Strength of Materials)	3	3	4
	Health, Physical Education, or Recreation	<u>0-3</u>	0-3	1-3
	Total	12-15	9-12	16-18
FIFTH QUARTER				
CIVL 182	Surveying II	3	3	4
CIVL 230	Structural Analysis	3	0	3
CIVL 258	Concrete Technology	3	3	4
CIVL 260	Hydraulics	3	0	3
CIVL 276	Traffic & Transportation Technology	<u>3</u>	<u>3</u>	<u>4</u>
	Total	15	9	18
SIXTH QUARTER				
CIVL 217	Reinforced Concrete Design	3	3	4
CIVL 218	Structural Steel Design	3	3	4
CIVL 259	Bituminous Technology	3	3	4
CIVL 284	Route Surveying & Highway Design	<u>3</u>	<u>3</u>	<u>4</u>
	Total	12	12	16
Total Minimum Credits for Civil Engineering Technology Degree-----104				

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. Several adjustments in the curriculum are possible for students who wish to transfer to a baccalaureate degree program in commercial art at a four-year college or university.

Occupational Objectives: Commercial Artist
Designer
Illustrator
Photographer

Admission Requirements: In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Applied Science Degree program in Commercial Art 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 who are not proficient in English will be required to correct their deficiencies in the Foundation Program before entering the Commercial Art curriculum.

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 work. Each student is urged to consult with the Counseling Department and his faculty adviser in planning his program and selecting his electives. Upon satisfactory completion of the six-quarter program listed below, 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 104	Introduction to the Arts I	3	0	3
ARTS 111	History and Appreciation of Art	3	0	3
ARTS 121	Theory and Practice of Drawing	1	5	3
ENGL 101	Communication Skills I	3	0	3
GOVT	Government	3	0	3
GENL 100	Orientation	1	1	1
Total		14	6	16

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
SECOND QUARTER				
ARTS 105	Introduction to the Arts II (or Elective)	3	0	3
ARTS 112	History and Appreciation of Art II	3	0	3
ARTS 122	Theory and Practice of Drawing II	1	5	3
ARTS 166	Fundamentals of Lettering I	1	6	3
ENGL 102	Communication Skills II	3	0	3
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	11-14	11-14	16-18
THIRD QUARTER				
ARTS 113	History and Appreciation of Arts III	3	0	3
ARTS 123	Theory and Practice of Drawing III	1	6	3
ARTS 186	Fundamentals of Photography	3	6	5
PSYC	Psychology	3	0	3
	English or Speech	<u>3</u>	<u>0</u>	<u>3</u>
	Total	13	12	17
FOURTH QUARTER				
ARTS 221	Advanced Drawing I (or Elective)	0	6	2
ARTS 231	Theory and Practice of Painting I	1	6	3
ARTS 261	Advertising Design I	2	3	3
ARTS 271	Graphic Techniques I (or Elective)	1	6	3
ARTS 281	Photography Workshop I (or Elective)	0	3	1
ECON	Economics	3	0	3
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	7-10	24-27	16-18
FIFTH QUARTER				
ARTS 222	Advanced Drawing II (or Elective)	0	6	2
ARTS 232	Theory and Practice of Painting II	1	6	3
ARTS 262	Advertising Design II	2	3	3
ARTS 272	Graphic Techniques II (or Elective)	1	6	3
ARTS 282	Photography Workshop II (or Elective)	0	3	1
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Elective	-	-	<u>3</u>
	Total	-	-	16
SIXTH QUARTER				
ARTS 223	Advanced Drawing III (or Elective)	0	6	2
ARTS 233	Theory and Practice of Painting III	1	6	3
ARTS 263	Advertising Design III	2	3	3
ARTS 273	Graphic Techniques III (or Elective)	1	6	3
ARTS 283	Photography Workshop III (or Elective)	0	5	1
ARTS 298	Seminar and Project	-	-	1-5
	Elective	-	-	<u>2</u>
	Total	-	-	15-19
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 (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Applied Science Degree program in Data Processing Technology requires a minimum of one unit of high school algebra or the equivalent and proficiency in high school English. Students who are not proficient in these areas will be required to correct their deficiencies in the Foundation Program before entering the Data Processing curriculum.

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. Each student is urged to consult with the Counseling Department and his faculty advisor in planning his program and selecting his electives. Courses within this curriculum may be applied to a four-year program at the discretion of the admitting institution. Upon satisfactory completion of the six-quarter curriculum with an overall 2.0 grade point average for all data processing courses attempted, 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

CURRICULUMS OF STUDY

69

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	<u>0-3</u>	<u>1-3</u>
	Total	14-17	5-8	17-19
THIRD QUARTER				
ACCT 113	Accounting III (or Elective)	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	<u>0-3</u>	<u>1-3</u>
	Total	14-17	5-8	17-19
FOURTH QUARTER				
BUAD 254	Applied Business Statistics I	3	0	3
DAPR 286	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	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	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 246	Computer Programming Applications	3	2	4
DAPR	Computer Programming Elective	3	2	4
	Elective	<u>3</u>	<u>0</u>	<u>3</u>
	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	<u>6</u>	<u>0</u>	<u>6</u>
	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 jobs available in the electronics industries, the curriculum offers a solid foundation in mathematics, science, and electronics. The Electrical/Electronics Engineering Technology curriculum is designed primarily for persons seeking employment in Electrical/Electronics Engineering Technology immediately upon completion of the community college program.

Occupational Objectives: Communications Electronics
Industrial Electronics

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 Associate in Applied Science Degree 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 who do not meet these requirements may be permitted to correct their deficiencies in the Foundation Program before entering the curriculum.

Program Requirements: Approximately one-half of the curriculum will include courses in electrical/electronics engineering technology with the remaining courses in related subjects, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in Electrical/Electronics Engineering Technology. Each student is advised to consult with his faculty advisor and the Counseling Department in planning his program and selecting his electives.

In order to specialize in the second year, each student may select an option as follows: Communications Electronics (ELEC 241-242-243), Industrial Electronics (ELEC 211-212-213). Upon satisfactory completion of the six-quarter curriculum listed herein, 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

TECHNICAL OPTIONS: Communications Electronics,
Industrial Electronics

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ELEC 111	Electrical Circuits I	3	3	4
ENGL 101	Communications Skills I	3	0	3
ENGR 100	Introduction to Engineering	0	3	1
GENL 100	Orientation	1	1	1
GOVT 180	American Constitutional Government	3	0	3
MATH 121	Engineering Technical Mathematics I	5	0	5
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	15-18	7-10	18-20
SECOND QUARTER				
DRFT 158	Electrical/Electronics Drafting	1	3	2
ELEC 112	Electrical Circuits II	5	3	6
ELEC 118	Electrical Shop	0	3	1
ENGL 102	Communication Skills II	3	0	3
MATH 122	Engineering Technical Mathematics II	5	0	5
	Health, Physical Education, or Recreation	0-3	0-3	1-3
	Total	14-17	9-12	18-20
THIRD QUARTER				
ELEC 125	Introduction to Electronics *	4	3	5
ENGL 127	Technical Report Writing or SPDR 137			
	Public Speaking	3	0	3
MATH 123	Engineering Technical Mathematics II	5	0	5
PHYS 113	Technical Physics	3	3	4
	Health, Physical Education, or Recreation	0-3	<u>0-3</u>	<u>1-3</u>
	Total	15-18	6-9	18-20
FOURTH QUARTER				
ELEC 201	Electrical Engineering Technology I	5	3	6
ELEC 277	Electrical Measurements	3	3	4
PHYS 111	Technical Physics I	3	3	4
	*Technical Option	<u>3</u>	<u>3</u>	<u>4</u>
	Total	14	12	18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIFTH QUARTER				
DAPR 106	Principles of Data Processing	3	0	3
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	<u>3</u>	<u>3</u>	<u>4</u>
	Total	14	12	18

SIXTH QUARTER				
ECON 160	American Economics	3	0	3
ELEC 203	Electrical Engineering Technology III	5	3	6
ELEC 298	Seminar and Project	1	3	2
	*Technical Option	3	3	4
	**Technical Elective	<u>3</u>	<u>0</u>	<u>3</u>
	Total	15	9	18

***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 299	Supervised Study (Electrical Data Processing) (3 cr.)
ELEC 248	Microwave Techniques (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 Mechanical Engineering Technology curriculum 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 (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Applied Science Degree curriculum in Mechanical Engineering Technology requires the 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 who do not meet these requirements may be permitted to correct their deficiencies in the Foundation Program before entering the Mechanical Engineering Technology curriculum.

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. Each student is advised to consult with his faculty advisor and the Counseling Department in planning his program and selecting his electives. Upon satisfactory completion of the six-quarter curriculum listed herein, 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
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FIRST QUARTER

DRFT 111	Technical Drafting I	1	3	2
ENGL 101	Communication Skills I	3	0	3
ENGR 100	Introduction to Engineering Technology	0	3	1
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	<u>1</u>	<u>3</u>	<u>2</u>
Total		14	10	17

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	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
Total		15-18	6-9	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	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
Total		15-18	6-9	18-20

FOURTH QUARTER

ECON 160	Survey of American Economics	3	0	3
ELEC 214	Advanced Electricity I	3	3	4
ENGR 152	Mechanics II (Strength of Materials)	3	3	4
MECH 264	Thermodynamics I	3	3	4
MECH 156	Mechanisms	1	3	2
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
Total		13-16	12-15	18-20

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

INDT 270	Industrial Management	3	0	3
INDT 280	Work Simplification	2	0	2
MECH 237	Machine Design	3	3	4
MECH 265	Thermodynamics II	3	3	4
PSYC 128	Human Relations	3	0	3
WELD 41	Welding Tests I	<u>1</u>	<u>3</u>	<u>2</u>
	Total	15	9	18

SIXTH QUARTER

GOVT 180	American Constitutional Government	3	0	3
MECH 238	Machine Design II	3	3	4
MECH 246	Metallurgy I	3	3	4
MECH 267	Fluid Mechanics	3	3	4
MECH 298	Seminar and Project	<u>0</u>	<u>6</u>	<u>2</u>
	Total	12	15	17

Total Minimum Credits for the Mechanical Engineering Technology Degree__106

POLICE SCIENCE

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

Purpose: The curriculum in Police Science has been developed and is maintained in cooperation with state and local police officials. The curriculum is not designed to train for any specialty, but rather to provide a broad foundation for entry into fields of law enforcement.

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 (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Applied Science Degree program in Police Science requires the following:

1. A written statement from the 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 Police Science Faculty is recommended.
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 police science 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 police science. **Each student is urged to consult with his faculty advisor and the Counseling Department in planning his program and selecting his electives.** Students who plan to transfer to a senior college or university to complete a baccalaureate degree program may be advised to substitute several other courses than those listed herein. Upon satisfactory completion of the six-quarter program listed herein, the graduate will be awarded the Associate in Applied Science Degree in Police Science.

POLICE SCIENCE

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
BIOL 101	General Biology I (or Elective)	3	3	4
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
PLCE 100	Introduction to Law Enforcement	3	0	3
PSYC	Psychology	3	0	3
SOCI 101	Introductory Sociology I (or SOCI Elective)	<u>3</u>	<u>0</u>	<u>3</u>
	Total	16	4	17
SECOND QUARTER				
BIOL 102	General Biology II (or Elective)	3	3	4
ENGL 102	Communication Skills II	3	0	3
PLCE 111	Police Organization & Administration	3	0	3
PSYC	Psychology	3	0	3
SOCI 102	Introductory Sociology II (or SOCI Elective)	3	0	3
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	15-18	3-6	17-19
THIRD QUARTER				
BIOL 103	General Biology III (or Elective)	3	3	4
PLCE 112	Police Organization & Administration II	3	0	3
PLCE 160	Police Comm. & Records (or PLCE Elective)	3	0	3
SOCI 103	Introductory Sociology (or SOCI Elective)	3	0	3
	English or Speech	3	0	3
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	15-18	3-6	17-19
FOURTH QUARTER				
GOVT 281	U. S. Government I (or GOVT Elective)	3	0	3
MATH	Mathematics (or Elective)	4	0	4
PLCE 126	Prevention & Control of Juvenile Delinquency	3	0	3
PLCE 130	Criminal Law	3	0	3
PLCE 244	Principles of Criminal Investigation	3	0	3
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>2-3</u>
	Total	16-19	0-3	18-19

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIFTH QUARTER				
GOVT 282	U. S. Government II (or Elective)	3	0	3
PLCE 136	Legal Evidence	3	0	3
PLCE 187	Traffic Admin. & Control (or PLCE Elective)	3	0	3
PLCE 245	Adv. Criminal Investigation (or Elective)	3	0	3
SOCI 186	Social Problems I (or Elective)	3	0	3
SOCI 276	Criminology	<u>3</u>	<u>0</u>	<u>3</u>
	Total	18	0	18
SIXTH QUARTER				
ECON	Economics	3	0	3
GOVT 283	United States Government III (or GOVT Elec.)	3	0	3
PLCE 237	Admin. of Justice (or PLCE Elective)	3	0	3
PLCE 270	Indust. & Comm. Security (or PLCE Elective)	3	0	3
PLCE 298	Seminar and Project		-	2
SOCI 187	Social Problems II (or Elective)	<u>3</u>	<u>0</u>	<u>3</u>
	Total			17
Total Minimum Credits for Police Science Degree				104

SECRETARIAL SCIENCE

Executive Secretary

Degree: Associate in Applied Science

Length: Six-quarter (two-year) curriculum

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 upon completion of the community college program. Both persons who are seeking their first employment in an office position and those who are seeking promotion may benefit from this curriculum.

Occupational Objectives:

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

Admission Requirements: In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Applied Science Degree curriculum in Secretarial Science requires proficiency in high school English and mathematics. Students who are not proficient in these areas will be required to correct their deficiencies in the Foundation Program before entering the curriculum. In addition, students who have completed training in shorthand and advanced typewriting, may petition for advance placement.

Program Requirements: The two-year curriculum in Secretarial Science combines instruction in the many areas required for competence as a secretary in business, government, industry, law offices, and other organizations. The curriculum will include courses in secretarial science, related areas, general education and electives. Students may be required to repeat shorthand or typewriting courses in which grades lower than "C" are received. The first year (three quarters) of the Secretarial Science curriculum is similar for all students. In the second year, students may elect to substitute for General Transcription either Legal or Medical Transcription. Students are advised to consult with their faculty advisors and the Counseling Department in planning their programs and selecting their electives. Upon satisfactory completion of the six-quarter curriculum the graduate will be awarded the Associate in Applied Science Degree in Secretarial Science.

SECRETARIAL SCIENCE

(Executive Secretary)

Associate in Applied Science Degree

FIRST QUARTER

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
BUAD 100	Introduction to Business	3	0	3
ENGL 101	Communication Skills I (or ENGL 111)	3	0	3
GENL 100	Orientation	1	1	1
MATH 151	Introduction to Business Mathematics I	3	0	3
SECR 111	Typewriting I ¹	2	3	3
SECR 121	Shorthand I ¹	<u>3</u>	<u>2</u>	<u>4</u>
Total		15	6	17

SECOND QUARTER

BUAD 164	Principles of Business Management	3	0	3
ENGL 102	Communication Skills II (or ENGL 112)	3	0	3
MATH 152	Introduction to Business Mathematics II	3	0	3
SECR 112	Typewriting II	2	3	3
SECR 122	Shorthand II	3	2	4
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
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	<u>3</u>	<u>0</u>	<u>3</u>
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	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
Total		13-16	8-11	18-20

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

CURRICULUMS OF STUDY

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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	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	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	<u>3</u>	<u>0</u>	<u>3</u>
	Total	-	-	13-17
Total Minimum Credits for the Secretarial Science (Executive Secretary) Degree -----				97

TELEVISION PRODUCTION TECHNOLOGY

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

Purpose: With the growth of both commercial and educational television in Virginia, the need for personnel trained in the production and direction of television programs and in the various phases of television studio operations is expanding. The purpose of this program is to meet this growing need. The Television Production Technology program is designed primarily for persons seeking employment in television immediately upon completion of the community college program.

Occupational Objectives: Television Advertising Agency Assistant
Television Cameraman
Television Production Assistant
Television Script Directors
Television Studio Technicians

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 Television Production Technology program requires a proficiency in high school English and some artistic talent to be determined by test and counseling. Students who are not proficient in English will be required to correct their deficiencies in the Foundation Program before entering the Television Production Technology curriculum.

Program Requirements: Approximately one-half of the curriculum will include courses in television production technology with the remaining courses in related areas, general education, and elective. Instruction will include both the theoretical concepts and practical applications needed for future success in Television Production Technology. Each student is advised to consult with his faculty advisor and the Counseling Department in planning his program and selecting his electives. Upon satisfactory completion of the six-quarter program listed below, the graduate will be awarded the Associate in Applied Science Degree in Television Production Technology.

TELEVISION PRODUCTION TECHNOLOGY

Associate in Applied Science Degree

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
ARTS 101	General Art 1	2	3	3
ECON 160	American Economics	3	0	3
ENGL 101	Communication Skills	3	0	3
GENL 100	Orientation	1	1	1
RDTV 111	Introduction to Television	3	3	4
RDTV 181	Television Workshop I (or Elective)	0	6	2
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	12-15	13-16	17-19

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

ARTS 102	General Art II	2	3	3
ENGL 102	Communication Skills II	3	0	3
RDTV 112	Introduction to Television II	3	3	4
RDTV 182	Television Workshop II (or Elective)	0	6	2
PSYC 128	Human Relations	3	0	3
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	11-14	12-15	16-18

THIRD QUARTER

ARTS 103	General Art III	2	3	3
GOVT 180	American Constitutional Government	3	0	3
RDTV 113	Introduction to Television III	0	6	2
RDTV 183	Television Workshop III (or Elective)	0	6	2
SPDR 137	Public Speaking	3	0	3
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	8-11	15-18	16-18

FOURTH QUARTER

ARTS 261	Advertising Design I	2	3	3
BUAD 100	Introduction to Business (or Elective)	3	0	3
RDTV 221	Television Production I	3	6	5
RDTV 231	Technical Problems of Television I	3	3	4
RDTV 281	Television Workshop IV (or Elective)	<u>0</u>	<u>6</u>	<u>2</u>
	Total	11	18	17

FIFTH QUARTER

ARTS 262	Advertising Design II	2	3	3
BUAD 164	Principles of Business Management (or Elective)	3	0	3
RDTV 222	Television Production II	3	6	5
RDTV 232	Technical Problems of Television II	3	3	4
RDTV 282	Television Workshop V (or Elective)	<u>0</u>	<u>6</u>	<u>4</u>
	Total	11	18	17

SIXTH QUARTER

ARTS 263	Advertising Design III (or Elective)	2	3	3
RDTV 223	Television Production III (or Elective)	3	6	5
RDTV 226	Television and Radio Newswriting	3	0	3
RDTV 283	Television Workshop VI (or Elective)	0	6	2
RDTV 298	Seminar and Project	-	-	<u>4</u>
	Total			17

Total Minimum Credits for the Television Production Technology Degree-----100

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 (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Applied Science Degree curriculum in Traffic and Transportation Management requires proficiency in high school English and mathematics. Students who are not proficient in English and mathematics will be required to correct their deficiencies in the Foundation Program.

Program Requirements: The first three quarters (first year) of the Associate in Applied Science Degree curriculum fulfills the basic requirements common to all curricula in business, but are supplemented with the 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. Each student is urged to consult with the Counseling Department and his faculty advisor in planning his program and selecting his electives. Courses within this curriculum may be applied to a four-year program at the discretion of the admitting institution. Upon satisfactory completion of the six-quarter program listed herein, the graduate will be awarded the Associate in Applied Science Degree in Traffic and Transportation Management.

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 I	3	0	3
MKTG 131	Traffic and Transportation I	<u>3</u>	<u>0</u>	<u>3</u>
	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	<u>0-3</u>	<u>1-3</u>
	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	<u>0-3</u>	<u>1-3</u>
	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	<u>0</u>	<u>3-5</u>
	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	<u>3-5</u>	<u>0</u>	<u>3-5</u>
	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	<u>3-5</u>	<u>0</u>	<u>3-5</u>
	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	Repair Service Salesman
Automotive Technician	Repair Service Writer
Auto Parts Sales and Service	Repair Technician
Customer Service Representative	Service Manager
Quality Control Technician	Tune-up Specialist
Repair Service Estimator	

Admission Requirements: In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), a minimum of a one-year comprehensive automotive shop program in high school or its equivalent and a good understanding of mathematics are usually required for entry into the program, 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	<u>1</u>	<u>3</u>	<u>2</u>
	Total	14	12	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	3	0	3
MATH 12	Elements of Mathematics II	2	2	3
PHYS 14	Applied Physics I	2	0	2
WELD 57	Oxyacetylene Welding & Cutting	<u>1</u>	<u>3</u>	<u>2</u>
	Total	14	11	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	<u>3</u>	<u>0</u>	<u>3</u>
	Total	11	21	18
FOURTH QUARTER				
AUTO 152	Automotive Power Trains II	2	6	4
AUTO 241	Automotive Electricity I	3	3	4
AUTO 266	Automotive Suspension & Braking Systems	3	3	4
AUTO 287	Shop Management I	3	0	3
GOVT 180	Government	<u>3</u>	<u>0</u>	<u>3</u>
	Total	14	12	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	Economics	3	0	3
	Health, Physical Education, or Recreation	<u>0-3</u>	<u>0-3</u>	<u>1-3</u>
	Total	13-16	12-15	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	<u>0-3</u>	<u>0-3</u>	<u>2-3</u>
	Total	9-12	21-24	16-17
Total Minimum Credits for Automotive Technology Diploma-----106				

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	6
ELEC 48	Electricity for Air Conditioning	3	3	4
ENGL	English	3	0	3
GENL 100	Orientation	1	1	1
MATH 41	Air Conditioning Mathematics I	<u>3</u>	<u>2</u>	<u>4</u>
Total		14	10	18
SECOND QUARTER				
AIRC 13-14	Air Conditioning III-IV	4	4	6
AIRC 25	Electric Power	3	4	4
ECON	Economics	3	0	3
MATH 42	Air Conditioning Mathematics II	<u>2</u>	<u>3</u>	<u>4</u>
Total		12	11	17
THIRD QUARTER				
AIRC 15-16	Air Conditioning V-VI	4	4	6
AIRC 26	Electrical and Control Systems	2	3	3
GOVT	Government	3	0	3
PSYC	Psychology	<u>3</u>	<u>0</u>	<u>3</u>
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---				55

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
SECR 137	Office Procedures	3	0	3
Total		16	5	18
THIRD QUARTER				
SPDR 136	Speech	3	0	3
SECR 113	Typewriting III	2	3	3
PSYC 128	Human Relations	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.

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	<u>3</u>	<u>0</u>	<u>3</u>
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	<u>3</u>	<u>0</u>	<u>3</u>
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	<u>3</u>	<u>0</u>	<u>3</u>
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	<u>3</u>	<u>0</u>	<u>3</u>
Total		10	21	17
Total Minimum Credits for Dental Assistant Certificate.....				70

* With typing proficiency demonstrated, elective may be substituted.

MECHANICAL DRAFTING

Degree: Certificate in Mechanical Drafting

Length: Three-quarter (one-year) program

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

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

Program Requirements: The Mechanical Drafting Program is designed to prepare students to work as mechanical draftsmen and to provide the student with an introduction to the basic problems associated with design and manufacturing of mechanical devices. The curriculum includes basic courses in the humanities (English, government, and psychology) to assist the student in social and business communications and to prepare the student to meet the obligations of the citizen in our democratic society.

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

MECHANICAL DRAFTING**One-Year Certificate Program**

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
FIRST QUARTER				
DRFT 116	Drafting I	1	9	4
ECON	Economics	3	0	3
ENGL	English	3	0	3
GENL 100	Orientation	1	1	1
INDT 111	Materials and Processes in Industry	3	0	3
MATH 11	Elements of Mathematics I	<u>2</u>	<u>2</u>	<u>3</u>
	Total	13	12	17
SECOND QUARTER				
DRFT 117	Drafting II	1	9	4
INDT 112	Materials and Processes of Industry II	3	0	3
MATH 12	Elements of Mathematics II	2	2	3
MECH 131	Machine Laboratory I	1	3	2
PSYC	Psychology	3	0	3
WELD 27	Arc Welding	<u>1</u>	<u>3</u>	<u>2</u>
	Total	11	17	17
THIRD QUARTER				
DRFT 118	Drafting III	1	9	4
ENGR 100	Introduction to Engineering Technology	0	3	1
GOVT	Government	3	0	3
MATH 13	Elements of Mathematics II	2	2	3
MECH 132	Machine Laboratory II	1	3	2
WELD 57	Oxyacetylene Welding & Cutting	<u>1</u>	<u>3</u>	<u>2</u>
	Total	8	20	15
Total Minimum Credits for Mechanical Drafting Certificate-----				49

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

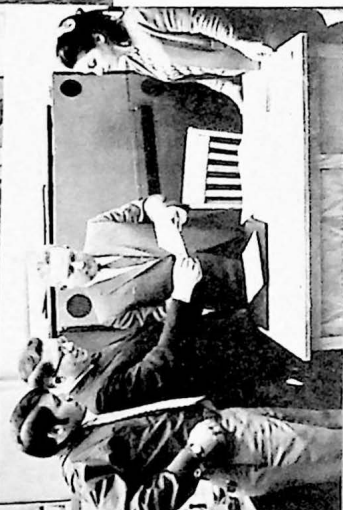
Admission Requirements: Applicant must meet the general requirements for admission to the College.

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	<u>3</u>	<u>2</u>	<u>4</u>
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	<u>3</u>	<u>2</u>	<u>4</u>
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	<u>1</u>	<u>2</u>	<u>2</u>
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 ADULT EDUCATION AND COMMUNITY SERVICE PROGRAMS

In order to fulfill the ever-increasing educational needs of its community, Virginia Western Community College offers a well-planned, diversified program which includes the following: (1) The opportunity to pursue degree, diploma, and certificate programs and college credit courses five days a week from 8:00 A.M. to 10:00 P.M. and the Week-End College on Saturdays from 8:00 A.M. to 3:00 P.M.; (2) Classes, institutes, forums, workshops, lectures, and short courses to promote community cultural affairs; (3) Various community development pro-

grams and seminars which focus attention on social, economic, and political issues; (4) Offerings of non-catalog special courses or programs for the various industries, businesses, and professions, directed by and taught at the College or at the client's site by College faculty or specialists; (5) Special services such as a speaker's/programs bureau, use of College facilities, tours, visits, and others as desired.

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 BUSINESS 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 BUSINESS 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, condensers, evaporators, expansion valves and capillary tubes used in

refrigeration systems. Freezing process of foods and refrigeration load calculators are included. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

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

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

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 4 hours, Total 7 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 ARCHITECTURAL TECHNOLOGY (2 cr.)—An intensive course outlining the history and impact of architecture. Emphasis on the dynamics and social aspects of architecture and society. Lecture 1 hour, Laboratory 3 hours, Total 4 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 2 hours, Laboratory 3 hours, Total 5 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 will be used to provide the draftsman with skills and knowledge in locating data and in using handbooks. Laboratory 9 hours per week.

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

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

ARCH 226 ART AND ARCHITECTURE (3 cr.)—Designed to emphasize architecture as an art form; emphasis on art values of components and details; structures are coordinated as art and architecture. Lecture 3 hours per week.

ARCH 237 BUILDING MECHANICAL EQUIPMENT (3 cr.)—Study of heating, air conditioning, plumbing and electrical equipment, materials and symbols. Building code 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 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 290 COORDINATED INTERNSHIP (4 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.

ARCH 298 SEMINAR AND PROJECT (4 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 90 ART WORKSHOP (1 cr.)—A workshop for individual special projects in basic art. Laboratory 3 hours per week.

ARTS 91 WORKSHOP IN WATERCOLOR (2 cr.)—A workshop for individual special projects in watercolor. Laboratory 6 hours per week.

ARTS 101-102-103 GENERAL ART I-II-III (3 cr.) (3 cr.) (3 cr.)—A general course for the student without previous training in art, designed to provide a broad background for understanding works of art in relation to the times and the media in which they were produced. Studio exercises in drawing, painting, sculpture, graphic arts, with an introduction to the major media used in these fields. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

ARTS 104-105-106 INTRODUCTION TO THE ARTS I-II-III (3 cr.) (3 cr.) (3 cr.)—A general survey of the arts which parallels the student's studio classes. Special emphasis on the arts of painting, sculpture, and architecture. Form and content are studied from the historical, sociological, and philosophical points of view. Lecture 3 hours per week.

ARTS 110 ART APPRECIATION (3 cr.)—A survey of art from prehistoric times to the present day. Architectural styles, sculpture, and painting by lecture and slide illustrations. Lecture 3 hours per week.

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 114 A HISTORY OF ART FOR MODERNS (2 cr.)—The history of western architecture, sculpture, painting, and graphic art focusing on those periods and movements which have influenced, both negatively and positively, the arts of the twentieth century and the molding of our physical environment. This approach, more stylistic than chronologic, will examine the interaction between art and society, design and industry. Lecture 2 hours per week.

ARTS 115 ART IN WORLD CULTURE (5 cr.)—The conceptual approach rather than historic with emphasis on the contemporary period. Designed to develop a non-technical, general, cultural understanding of the spatial arts such as architecture, painting, sculpture, graphics, and industrial design. Lecture 5 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 6 hours, Total 7 hours per week.

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

ARTS 151-152 DESIGN I-II (3 cr.) (3 cr.)—Experimentation and practice on design problems relating to visual communications with emphasis on techniques and solutions. Lecture 1 hour, Laboratory 5 hours, Total 6 hours 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 6 hours, Total 7 hours per week.

ARTS 171-172-173 TYPOGRAPHY I-II-III (3 cr.) (3 cr.) (3 cr.)—The visual design of type in relation to photography, printmaking, and other printing processes. Includes identification and specification of type, copy casting and proofing in the print shop. Lecture 2 hours, Laboratory 3 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 4 hours, Total 5 hours per week.

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

ARTS 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.

ARTS 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.

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 6 hours, Total 7 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 6 hours, Total 7 hours per week.

ARTS 277 ART PRINTMAKING (4 cr.)—Prerequisites ARTS 106 and ARTS 123. Provides the serious student with another channel for individual exploration. The traditional printmaking processes, relief, intaglio, with their many possibilities, provide a rich and varied field of expression. The relationship between the graphic orientation of our present commercial art curriculum and printmaking is ideal for student exploration. Lecture 3 hours, Laboratory 3 hours, Total 6 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.

ARTS 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.

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 and 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 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 266 AUTOMOTIVE SUSPENSION & BRAKING SYSTEMS (4 cr.)—Analysis of front end suspensions and adjustment. Rear springs, braking system, and tire inflation check. 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; their structure, physiology and evolution. Lecture 5 hours, Laboratory 3 hours, Total 8 hours per week.

BIOL 114-115 GENERAL BOTANY I-II (4 cr.) (4 cr.)—A study of the seedless plants, algae, fungi, mosses and liverworts, and ferns and their "allies" with emphasis on life cycles, morphology and taxonomy. 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.)—An introduction to the

invertebrates and vertebrates, presenting basic biological principles, and emphasizing evolutionary relationships, life histories, and economic importance. 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 function 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 166-167 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 relationship to individual and 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 251-252-253 HUMAN ANATOMY AND PHYSIOLOGY I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite BIOL 103 and one year of college chemistry, or departmental permission. A 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. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

BIOL 256-257 INTRODUCTORY GENETICS I-II (4 cr.) (4 cr.)—Prerequisite BIOL 103 or equivalent. Principles and concepts of classical and theoretical genetics with experimental work in Mendelian Genetics and Genetical statistics. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

BIOL 267 GENERAL ECOLOGY (3 cr.)—Prerequisite General Biology or departmental permission. A study of the interrelationships between organisms and the natural and cultural environments with emphasis on human influences on ecological systems; survey of populations, communities and ecosystems. Lecture 2 hours, Laboratory 2 hours, Total 4 hours per week.

BIOL 268 MICROBIOLOGY (6 cr.)—Prerequisite 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.

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

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

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

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

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

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

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

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

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

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

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

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

BUAD 278 PRODUCTION PLANNING (3 cr.)—The fundamentals of production planning and control; plant layout, manpower, equipment and inventory planning, production forecasting, scheduling and control, and statistical quality. Lecture 3 hours per week.

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

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

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

BUAD 298 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 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 and quantitative 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.)—Prerequisite CHEM 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 mechanism. 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 REINFORCED CONCRETE DESIGN (4 cr.)—Design, investigation and detailing of reinforced concrete structural members. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

CIVL 218 STRUCTURAL STEEL DESIGN (4 cr.)—Design, investigation and detailing of basic structural steel members. Lecture 3 hours, Laboratory 3 hours, Total 6 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 AASHTO 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 hydraulics 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 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 3 hours, Total 6 hours per week.

CIVL 229 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.

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 PRERIPHERAL 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 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 246 COMPUTER PROGRAM APPLICATIONS (4 cr.)—Prerequisite DAPR 286. 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 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 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 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 116 DRAFTING I (4 cr.)—Care and use of instruments, lettering practices, applied geometry, alphabet of lines, geometric constructions, fundamentals of orthographic projection, precedence of lines, reading of orthographic views, and angles of projections. Lecture 1 hour, Laboratory 9 hours, Total 10 hours per week.

DRFT 117 DRAFTING II (4 cr.)—Principles of rotation; sections and conventions; hidden detail; full, half, broken-out, revolved and removed sections; conventional symbols. Lecture 1 hour, Laboratory 9 hours, Total 10 hours per week.

DRFT 118 DRAFTING III (4 cr.)—Pictorial drawing; isometric, axonometric, and dimetric principles; oblique projection and drawings, starting planes, circles and arcs. Lecture 1 hour, Laboratory 9 hours, Total 10 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.

ECONOMICS

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

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

ECON 214-215 PRINCIPLES OF ECONOMICS I-II (5 cr.) (4 cr.)—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 226 INDUSTRIAL ECONOMICS (3 cr.)—The growth and development of industry and technology; industrial relationships; current problems including those presented by automation and computers. Lecture 3 hours per week.

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.

ELECTRICAL/ELECTRONICS ENGINEERING TECHNOLOGY

ELEC 48 ELECTRICITY FOR AIR CONDITIONING (4 cr.)—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 INTRODUCTION TO ELECTRICAL CIRCUITS I (4 cr.)—Corequisite MATH 111 or equivalent. The study of resistance, magnetism, inductance, capacitance, and the transient state. An introduction to circuit theorems as applied to direct current circuits. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 112 INTRODUCTION TO ELECTRICAL CIRCUITS II (6 cr.)—Prerequisite ELEC 111. Electrical circuits employing complex algebra, equivalent circuit theorems and modern techniques for the solution of complex circuit problems. Lecture 5 hours, Laboratory 3 hours, Total 8 hours per week.

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

ELEC 119 INTRODUCTION TO ELECTRICAL SHOP II (1 cr.)—Prerequisite ELEC 118. A continuation of ELEC 118 in which projects are developed, tested and reports written. It is intended that this course will be followed by ELEC 298 and 299. Laboratory 3 hours per week.

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

ELEC 145 INTRODUCTION TO ELECTRICAL MACHINES (4 cr.)—Prerequisite ELEC 125. Construction, theory of operation, and application of direct current machinery and transformers both in single phase and polyphase. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 201 ELECTRICAL ENGINEERING TECHNOLOGY I (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. Lecture 5 hours, Laboratory 3 hours, Total 8 hours per week.

ELEC 202 ELECTRONIC ENGINEERING TECHNOLOGY II (7 cr.)—Prerequisite ELEC 201. A continuation of ELEC 201 including more advanced semiconductor and tube theory. Amplifier operating characteristics and design considerations. Laboratory experiments demonstrate the application of vacuum tubes and transistors to various circuits. Lecture 5 hours, Laboratory 6 hours, Total 11 hours per week.

ELEC 203 ELECTRICAL ENGINEERING TECHNOLOGY III (6 cr.)—Prerequisite ELEC 202. The application of principles covered in ELEC 201 and ELEC 202 to complex electronic systems. Laboratory experiments demonstrate the operating characteristics of single-stage and multi-stage circuits. Lecture 5 hours, Laboratory 3 hours, Total 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 ADVANCED ELECTRICITY I (4 cr.)—Prerequisites MATH 123 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 COMMUNICATIONS I (4 cr.)—Prerequisite ELEC 125. A study of modulation and power in modulated waves; sinusoidal oscillations and oscillators, RF amplifiers and detectors, and AM receivers. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 242 COMMUNICATIONS II (4 cr.)—Prerequisite ELEC 241. A study of transmitters and receivers; FM receivers, RF power amplification, AM, SSB, and FM transmitters, and an introduction to transmission lines and antennas. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 243 COMMUNICATIONS SYSTEMS (4 cr.)—Prerequisite ELEC 242. A study of microwave systems; microwave tubes, 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 277 ADVANCED ELECTRICAL MEASUREMENTS (4 cr.)—Prerequisite ELEC 125. Electrical measuring devices; the development of standards, in common meters as AC and DC voltmeters, ammeters and wattmeters; the calibration of meters and the determination of instrumentation for simple measurements; principles of operation of such devices as VTVM's, oscilloscopes, potentiometers,

Ohmmeter, AC bridges, counters, and other special equipment. 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 (1 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. Laboratory 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 MECHANIC I (STATISTICS) (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 by numerical integration, 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 (5 cr.)—A foundation 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 individualized instruction. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hours.

ENGL 07 VERBAL EXPRESSION (5 cr.)—A foundation course designed to improve the students' written and spoken communication. Review of effective writing practices. Emphasis on practical application; the writing of instructions, explanations, business letters, job applications, summary paragraphs; methods of informative writing, outlining, reading for understanding, and vocabulary building; unity, development and organization in writing. Practice in listening and speaking, giving and following instructions, short informative talks. Intensified practice in varied speaking and writing problems. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hours.

ENGL 08 READING IMPROVEMENT (5 cr.)—A foundation course using modern techniques, equipment, and materials to increase the students' 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 99 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.

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 117 ADVANCED READING (2 cr.)—Designed to increase eye span and reading speed. Emphasis on comprehension and understanding. Lecture 2 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 121-122-123 JOURNALISM I-II-III (3 cr.) (3 cr.) (3 cr.)—Instruction and classroom practice in gathering, evaluating, and writing news. Techniques of page layout, newspaper make-up, rewriting, and editing. Lecture 3 hours per week.

ENGL 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 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.

ENGL 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.

ENGL 221 JOURNALISM—NEWS WRITING (3 cr.)—Prerequisite ENGL 121 or departmental approval. Intensive practice in reporting and news writing for local newspapers or the college newspaper under supervision of the journalism faculty and other professional journalists. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

ENGL 222 JOURNALISM—FEATURE WRITING (3 cr.)—Prerequisite ENGL 121 or departmental approval. Intensive practice in writing feature articles for newspapers and magazines under the supervision of professional journalists and the journalism faculty. Articles will be submitted for publication. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

ENGL 223 JOURNALISM—EDITING (3 cr.)—Prerequisite 9 hours of journalism and departmental approval. Qualified students will receive practical experience working with professional journalists in the preparation and production of copy. Emphasis on selective judgment, editing as a creative process, managerial functions of the editor. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

ENGL 245 ORAL LITERATURE (3 cr.)—Prerequisite ENGL 113, SPDR 136, or departmental approval. The study of historical and social aspects of oral communications media; analysis of folklore with emphasis on ballads and folk songs, epic and lyric poetry, oral traditions, television and radio plays, and their interrelation with literature. Lecture 3 hours per week.

ENGL 246 THE MODERN NOVEL (3 cr.)—A study of the modern novel. Emphasis on appreciation and interpretation of selected novels. Lecture 3 hours per week.

ENGL 247 THE MODERN DRAMA (3 cr.)—A study of the modern drama. Emphasis on the understanding and enjoyment of dramatic literature. Lecture 3 hours per week.

ENGL 248 THE MODERN SHORT STORY (3 cr.)—A study of the short story as a literary form. Emphasis on appreciation and interpretation of selected stories. Lecture 3 hours per week.

ENGL 249 MODERN POETRY (3 cr.)—A study of modern poetry. Emphasis on appreciation and interpretation of selected poems. Lecture 3 hours per week.

ENGL 250 MAJOR AMERICAN WRITERS (5 cr.)—Prerequisite ENGL 113 or departmental approval. A study of selected American writers representative of various periods. Students may receive credit for either the Survey of American Literature (ENGL 251, 252, 253) or ENGL 250. Lecture 5 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 260 MAJOR ENGLISH WRITERS (5 cr.)—Prerequisite ENGL 113 or departmental approval. A study of selected English writers representative of various periods. Students may receive credit for either the Survey of English Literature (ENGL 261, 262, 263) or ENGL 260. Lecture 5 hours per week.

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

ENGL 270 MAJOR WRITERS IN WORLD LITERATURE (5 cr.)—Prerequisite ENGL 113 or departmental approval. A study in depth of writers of various cultures. Students may receive credit for either the Survey of World Literature (271, 272, 273) or ENGL 270. Lecture 5 hours per week.

ENGL 271-272-273 SURVEY OF WORLD LITERATURE I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite ENGL 113 or equivalent. A course designed to familiarize the student with master works of world literature. Analytical reading and critical writing toward understanding of the periods, the writers, the literary works. Lecture 3 hours per week.

ENGL 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.

ENGL 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.

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

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

FREN 299 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.

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 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 100 ORIENTATION TO ALLIED CAREERS (1 cr.)—An orientation to the interrelated roles and functions of various members of the health team. Lecture 1 hour per week.

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

HLTH 105 FIRST AID II (2 cr.)—Safety and first aid according to the accepted content of an advanced first aid course with related safety projects and problems. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

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

HLTH 130 HEALTH EDUCATION (2 cr.)—A course designed to study health from the individual's mental, social and physical well-being, and to study the principles, techniques, methods, and procedures relating to health practices. Lecture 2 hours, Laboratory 1 hour, Total 3 hours per week.

HLTH 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.

HLTH 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.

HLTH 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.

HLTH 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.

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.

HIST 187-188 HISTORY OF AMERICAN NEGRO I-II (3 cr.) (3 cr.)—Prerequisite high school background in American History. The first quarter provides a survey of the essential events of Negro history from the earliest times to 1900. The second quarter is devoted to a detailed study of the relationships of the Negro to American society and his contributions to society since 1900. 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.

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, non-ferrous metals, woods, plastics and clay products in terms of design application, processing and fabrication methods. Cutting, cold forming, hot working, welding, foundry and chipless manufacturing processes employed in contemporary industry; the science of precision measurement as applied to inspection practices. Lecture 3 hours per week.

INDT 270 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 280 WORK SIMPLIFICATION (2 cr.)—Principles and practices of motion and time as applied to industry, application and influence on methods, material handling, and time study procedures. Lecture 2 hours per week.

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.)—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 07 BASIC ARITHMETIC (5 cr.)—A review of arithmetical principles and computations. Designed for persons who wish to broaden their knowledge and competence in general arithmetical operations. 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 21-22-23 SURVEY OF TECHNICAL MATHEMATICS I-II-III (4 cr.) (4 cr.) (4 cr.)—A survey of mathematics including algebra, geometry and trigonometry with practical application to technical problems. Provides a foundation in mathematics for technically-oriented students who need to develop their mathematical competencies before beginning more advanced technical mathematics courses. Lecture 4 hours per week.

MATH 31-32-33 ALGEBRA I-II-III (5 cr.) (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 39 ALGEBRA AND TRIGONOMETRY (5 cr.)—Prerequisite two and one-half units of high school mathematics. Trigonometric functions, graphic representations, logarithms, laws of sine and cosines, trigonometric equations, inverse functions, complex numbers. 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 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.

MUSC 214-215 COMPOSITION I-II (2 cr.) (2 cr.)—Prerequisite MUSC 111-112-113 or departmental permission. Individually supervised practice in writing short compositions in specified small forms. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

History and Literature

MUSC 121-122-123 MUSIC APPRECIATION I-II-III (3 cr.) (3 cr.) (3 cr.)—This course aims to increase the variety and depth of the student's interest in music and related cultural activities. Emphasis is upon the relation of music as an art to our daily lives and to society, to promote an understanding of the spirit of the

art which will lead to the emotional and aesthetic development of the individual, and enable him to enjoy intelligent listening. Lecture 3 hours per week.

MUSC 220 THE HISTORY OF JAZZ (3 cr.)—A study of the underlying elements of jazz concentrating on its cultural and historical development from its earliest stages to the present. Illustrated by musical examples through recordings and other audio-visual devices. No previous knowledge of music is required. Lecture 3 hours per week.

MUSC 221-222-223 HISTORY OF MUSIC I-II-III (3 cr.) (3 cr.) (3 cr.)—Primarily for music majors. A chronological study of musical styles from antiquity to the present time. Relationship of the historical development of music to parallel movements in art, drama, and literature. Development of techniques for listening analytically and critically to music. I. Music to 1600. II. 1600 to 1820. III. 1820 to present. Lecture 3 hours per week.

MUSC 224-225 THE HISTORY OF OPERA I-II (3 cr.) (3 cr.)—Development of operatic style through the study of representative works from 1600 to the present. Lecture 3 hours per week.

Pedagogy

MUSC 201 VOCAL METHODS AND MATERIALS (3 cr.)—A study of the problems, materials and techniques in the teaching of voice. Lecture 3 hours per week.

MUSC 202 CHORAL METHODS AND MATERIALS (3 cr.)—A study of the problems, materials and techniques in choral teaching and conducting. Lecture 3 hours per week.

MUSC 203 KEYBOARD METHODS AND MATERIALS (3 cr.)—A study of the problems, materials and techniques in keyboard teaching. Lecture 3 hours per week.

MUSC 204-205 SEMINAR IN METHODS AND MATERIALS I-II (3 cr.) (3 cr.)—A continuation of MUSC 201-202-203 with emphasis on more detailed analysis of the problems, materials and techniques. Lecture 3 hours per week.

MUSC 206-207-208 MUSIC FOR THE CLASSROOM TEACHER I-II-III (3 cr.) (3 cr.) (3 cr.)—Designed for pre-education majors. Includes basic elements of music and instruction in autoharp, rhythm instruments, folk music, and other classroom songs. 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.

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 104-105 INTRODUCTION TO PHILOSOPHY I-II (5 cr.) (5 cr.)—An introductory study of some philosophical issues concerning the perception and belief of man in society. Lecture 5 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 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.
- 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 224 LITERATURE OF THE BIBLE I (5 cr.)—A study of the literature of the Old Testament. Lecture 5 hours per week.
- PHIL 225 LITERATURE OF THE BIBLE II (5 cr.)—A study of the literature of the New Testament. Lecture 5 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.
- PHIL 227 COMPARATIVE RELIGION (5 cr.)—A survey of the literature of comparative religions of the world. Lecture 5 hours per week.
- PHIL 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.

PHYSICAL EDUCATION AND RECREATION

Fundamentals

PHED 106 PHYSICAL PERFORMANCE AND CONDITIONING (1 cr.)—Principles underlying the development of performance and conditioning factors such as strength, balance, power, agility, cardiovascular function, coordination. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

Outdoor Recreation

PHED 110 ANGLING AND CASTING (1 cr.)—The fundamentals of sport fishing, spinning, spin casting, bait casting and fly casting with the related knowledge of conservation and safety. Laboratory 3 hours per week.

PHED 111 ARCHERY (1 cr.)—The fundamentals of target archery and/or field archery; equipment, safety, and conservation. Laboratory 3 hours per week.

PHED 112 CAMPING (1 cr.)—The fundamentals of self-maintenance and survival out-of-doors; food selection, and maintenance; packing, preparation, preservation, and storage; shelter selection, construction, and maintenance; nature, conservation, camping facilities and equipment; application to varying age group; personal and group safety. Laboratory 3 hours per week.

PHED 113 BOATING (1 cr.)—Prerequisite appropriate skill in swimming. The fundamentals used in propelling and handling canoes, row boats, and other small craft; descriptive and functional terminology, construction and care of equipment, conservation, and safety. Laboratory 3 hours per week.

PHED 114 EQUITATION (1 cr.)—Basic riding seats, and preparation for riding; care and grooming of a horse; selection, use and care of equipment, and safety. Laboratory 3 hours per week.

PHED 115 ICE SKATING (1 cr.)—The fundamentals of ice skating; figures, equipment, types of skating, and safety. Laboratory 3 hours per week.

PHED 116 SAILING (1 cr.)—Prerequisite appropriate skill in swimming. The fundamentals of equipment, descriptive and functional terminology, and safety. Laboratory 3 hours per week.

PHED 117 SHOOTING AND FIREARM SAFETY (1 cr.)—The fundamentals of shooting; and firearm safety; arms, selection and care of equipment, forms of the sport of shooting; personal safety and survival in situations associated with hunting and sport shooting. Laboratory 3 hours per week.

PHED 118 SNOW SKIING (1 cr.)—The fundamentals of snow skiing; equipment and safety. Laboratory 3 hours per week.

PHED 119 WATER SKIING (1 cr.)—Prerequisite appropriate skill in swimming. The fundamentals of water skiing; equipment and safety. Laboratory 3 hours per week.

Lifetime Sports

PHED 130 BADMINTON (1 cr.)—The fundamentals of badminton; equipment, strategy for play, and rules. Laboratory 3 hours per week.

PHED 131 BOWLING (1 cr.)—A course designed to present the fundamentals of bowling; equipment, rules, and personal conduct. Laboratory 3 hours per week.

PHED 132 FAMILY RECREATIONAL ACTIVITIES (1 cr.)—The performance techniques, individual and team strategies and contests which are appropriate for all ages; horseshoes, table tennis, aerial tennis, croquet, paddle tennis, shuffle board. Adaptation of activities for varying age groups, selection and care of equipment, rules of performance and conduct, and safety. Laboratory 3 hours per week.

PHED 133 GOLF (1 cr.)—The fundamentals of golf; equipment, rules, strategy for play, and personal conduct. Laboratory 3 hours per week.

PHED 134 HANDBALL (1 cr.)—The fundamentals of handball; types of games, rules, equipment, and strategy for team and individual play. Laboratory 3 hours per week.

PHED 135 TENNIS (1 cr.)—The fundamentals of tennis; rules, strategy for team and individual play, and personal dress and conduct. Laboratory 3 hours per week.

Aquatic Activities

PHED 150 DIVING (1 cr.)—Prerequisite appropriate skill in swimming. The fundamentals of diving; performance and personal safety. Laboratory 3 hours per week.

PHED 151 SENIOR LIFE SAVING (1 cr.)—Prerequisite appropriate skill in swimming. The fundamentals of rescue and survival in the water; first aid and safety. Preparation for the examination for the Red Cross Senior Life Saving Certificate. Laboratory 3 hours per week.

PHED 153 SWIMMING (1 cr.)—The fundamentals of swimming; personal performance and safety. Laboratory 3 hours per week.

PHED 155 WATER SAFETY INSTRUCTOR (1 cr.)—Prerequisite appropriate skill in swimming. The fundamentals required for accreditation as an instructor of swimming. Preparation for the examination for the Red Cross Senior Life Saving Certificate. Laboratory 3 hours per week.

Dance and Gymnastics

PHED 160 CONTEMPORARY DANCE (1 cr.)—The fundamentals and techniques employed in dance as a creative art form; choreography and performance. Laboratory 3 hours per week.

PHED 161 FOLK DANCE (1 cr.)—The fundamental step patterns, rhythmic patterns positions, and formations of the traditional and ethnic group and individual dances emphasizing those of foreign origin; dance forms, their cultural environment, social performance, and significance. Laboratory 3 hours per week.

PHED 162 GYMNASTICS (1 cr.)—The fundamentals of the various recognized forms of gymnastics: mat work, stunts, tumbling, floor exercise, systematized rhythmic routines and systems, and apparatus such as parallel bars, side horse, rings, rope, and trampoline; personal performance and safety. Laboratory 3 hours per week.

PHED 163 SOCIAL DANCE (1 cr.)—The fundamental step patterns, rhythmic patterns and positions of the social or ballroom dance forms; dance as a significant form of social behavior. Laboratory 3 hours per week.

PHED 164 SQUARE DANCE (1 cr.)—The fundamental step and movement patterns, rhythmic patterns, and formations of the American square dance; historical significance and development. Laboratory 3 hours per week.

Special Interest Courses

PHED 200 AN INTRODUCTION TO HEALTH, PHYSICAL EDUCATION, AND RECREATION (2 cr.)—An introduction to the terms, aims, objectives, teacher preparation programs, career opportunities, professional organizations, and problems in the fields of health, physical education and recreation. Primarily for prospective majors in the field. Lecture 2 hours per week.

PHED 201 BODY DYNAMICS (2 cr.)—An understanding and performance of skilled movements in various activities. Essential factors affecting the human body in skilled movement and performance. Lecture 2 hours, Laboratory 1 hour, Total 3 hours per week.

PHED 202 RECREATIONAL LEADERSHIP (2 cr.)—The programs of recreation in the schools, home, church, youth groups, and other community organizations and institutions. Practical work in social and recreational activity leadership. Designed for those who may wish to engage or specialize in recreational leadership. Lecture 2 hours, Laboratory 1 hour, Total 3 hours per week.

PHED 203 SPORTS APPRECIATION (2 cr.)—A study of the history, trends, fundamental rules, methods, strategy, terminology, officiating, and other related areas of selected sports activities. Primary objective to develop intelligent sports spectators. Lecture 2 hours, Laboratory 1 hour, Total 3 hours per week.

PHYSICS

PHYS 14-15 APPLIED PHYSICS I-II (2 cr.) (2 cr.)—The fundamentals of physics with application. Physics I deals with the properties of matter and mechanics. Physics II 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 121-122-123 PRINCIPLES OF PHYSICS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite three units of high school mathematics including two units of algebra and one unit of geometry. An introductory course in Physics satisfying the science distribution requirements 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 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.

POLICE SCIENCE

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

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

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

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

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

PLCE 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.

PLCE 160 POLICE COMMUNICATIONS AND RECORDS (3 cr.)—Principles of organization and administration as applied to records and communications, custody, central services, and police logistics; police applications of electronic data processing and the collection of performance data. Lecture 3 hours per week.

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

PLCE 237 ADMINISTRATION OF JUSTICE (3 cr.)—Review of court systems with emphasis on procedures from incident to final disposition of the accused and on applicable principles of criminal and civil law. Includes field trips 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.

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

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

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

PLCE 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.

PLCE 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.

PLCE 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 110 PRINCIPLES OF APPLIED PSYCHOLOGY (3 cr.)—The general principles of perception, learning, and conscious and unconscious motivation which are operative in all practical applications of psychology to life and work. Lecture 3 hours per week.

PSYC 116 THE PSYCHOLOGY OF PERSONAL ADJUSTMENT (3 cr.)—Prerequisite PSYC 110. Characteristics of mental health. Psychological principles ap-

plied to the development of a mature personality and to the problems of everyday life. Effective methods in study and work. Lecture 3 hours per week.

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

PSYC 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 210 SOCIAL PSYCHOLOGY (3 cr.)—Prerequisite PSYC 201-202-203 or SOCI 101-102-103—A study of the individual in social contexts, his social role and socialization process. Personal and social factors in perceptive attitudes toward individuals and groups; group structures and intergroup relations. Lecture 3 hours per week.

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

PSYC 230 HUMAN GROWTH AND DEVELOPMENT (5 cr.)—The principles and processes of human development with emphasis upon the role of experience. Major aspects of the personality such as motive, emotion and intellect are traced through experimental stages and their characteristic interaction in organized behavior. Lecture 5 hours per week.

PSYC 231-232-233 HUMAN GROWTH AND DEVELOPMENT I-II-III (3 cr.) (3 cr.) (3 cr.)—The study and interpretation of human behavior from conception through adolescence. Concepts and principles describing the dynamics of human development and behavior and their relation to the work and purpose of the school. The scientific method, heredity, psychological development, perception, motivation, learning, emotions, cognitive processes, personality, frustration, intelligence, and mental processes. Lecture 3 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 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 execu-

tive 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 incorporat-

ing 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.)—Pre-requisite 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.)—Pre-requisite 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 ap-

proaches 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 107 INTRODUCTION TO STAGECRAFT (3 cr.)—Prerequisite SPDR 106 or departmental permission. The principles of stage scenery, lighting, and costume in relation to dramatic production. Practical application in student produc-

tions with existing facilities. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

SPDR 108 ACTING AND INTERPRETATION (3 cr.)—Prerequisite SPDR 106 or departmental permission. Introduction to acting through the study of techniques and style of acting; oral reading, individual and group performance of dramatic literature. 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 136 SPEECH COMMUNICATIONS (3 cr.)—Proficiency in oral communication through the learning of the basic forms, uses, and techniques of speech. Emphasis on practical aspects of speech writing, listening, and oral presentation. Lecture 3 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 256 GROUP DISCUSSION (3 cr.)—The principles of reflective thinking and group inquiry. Emphasis on conference leadership. Lecture 3 hours per week.

SPDR 266 THE ART OF THE FILM (3 cr.)—Prerequisite departmental approval. An introduction to the art of the film; a survey of the history of the film; viewing, discussion and analysis of selected films; introduction to the film techniques of composition, shot sequence, lighting, visual symbolism, sound effects, editing. Lecture 3 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.

RADIO & TELEVISION

RDTV 111-112-113 INTRODUCTION TO TELEVISION I-II-III (4 cr.) (4 cr.) (4 cr.)—Survey of the organization and principles of telecasting operations including positions and responsibilities, camera techniques, lighting, sound film, control room, setting, scenery, properties, floor directing, floor organization, scripting, television art, and on-camera performance. The TV industry; its history and development and its fundamental principles of operation from both the commercial and the non-commercial point of view. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

RDTV 181-182-183 TELEVISION WORKSHOP I-II-III (2 cr.) (2 cr.) (2 cr.)—Students are assigned to floor crew positions so that they may observe and then take part in studio operations at the local ETV station. Assignments include the positions of floor director, projection assistant, property supervisor, and cameraman. Laboratory 6 hours per week.

RDTV 221-222-223 TELEVISION PRODUCTION I-II-III (5 cr.) (5 cr.) (5 cr.)—Prerequisite RDTV 113. The responsibilities and duties of the television producer involved in organizing, planning, and producing television programs. Program formats, production techniques, program cost, technical facilities, crew management, selection of talent, and relationship between director and producer. Students study and write different types of television programs and produce them in the TV studio; gain practical experience as cameramen, microphone boom operators, announcers, floor and technical directors, continuity writer, lighting technician, property directors, studio managers, talent, and floor crews; the responsibilities of each crew position and of the performer under actual working conditions. Student productions are kinescope recorded for analysis and evaluation. Lecture 3 hours, Laboratory 6 hours, Total 9 hours per week.

RDTV 226 TELEVISION AND RADIO NEWSWRITING (3 cr.)—Prerequisite ENGL 102 or equivalent. A study of the fundamentals of radio and television newswriting. Preparation of newscasts using wire service copy, local news sources, interviews, still shots, and newsreels; practical experience in the production of newscasts and interviews at the local ETV station. Lecture 3 hours per week.

RDTV 231-232 TECHNICAL PROBLEMS OF TELEVISION I-II (4 cr.) (4 cr.)—Prerequisite RDTV 113. The design, construction, and handling of television scenery, special effects devices, visual materials, and sound effects; special lighting problems, using standard and rear projection scenery; the uses of motion picture film in television; cinematography as applied to television, editing of film, the care and handling of slide projection equipment; practice in the operation of the television camera and more advanced directing techniques. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

RDTV 281-282-283 ADVANCED TELEVISION WORKSHOP IV-V-VI (2 cr.) (2 cr.) (2 cr.)—Prerequisite RDTV 183 or equivalent. Advanced studio practice for "on the air" experience in all phases of television within the educational station. Laboratory 6 hours per week.

RDTV 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.

WELDING

WELD 27 ARC WELDING (2 cr.)—Fundamentals of arc welding; safety, set-up, welding procedures, vertical pipe welding. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

WELD 41-42-43 WELDING TESTS I-II-III (2 cr.) (2 cr.) (2 cr.)—Techniques and practices of testing welded joints; destructive and non-destructive tests, guiding, discoloration heat tests, porous examinations, tensile, hammer and free bond tests, visual, magnetic, fluorescent and radiographic tests. 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.

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PART VI

STATE AND LOCAL ORGANIZATION

GOVERNING BOARD COMMONWEALTH OF VIRGINIA

STATE BOARD FOR COMMUNITY COLLEGES

Eugene B. Sydnor, Jr., *Chairman*
Daniel C. Lewis, *Vice Chairman*

Michael McHale Collins	W. Wirt Shapard
Mrs. Mary Anne Franklin	D. Boyd Thomas
Mrs. John Galleher	Henry W. Tulloch
William P. Kanto	Carrington Williams
S. E. Liles, Jr.	Yarborough B. Williams, Jr.
John D. Meade	Gordon C. Willis
Benjamin W. Mears, Jr.	

STATE DEPARTMENT OF COMMUNITY COLLEGES

Dana B. Hamel, *Chancellor*

VIRGINIA WESTERN COMMUNITY COLLEGE

LOCAL BOARD

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Richard H. Hahn	Paul R. Thomson
Barton W. Morris, Jr.	W. Darnall Vinyard
Frank B. Wolfe, M. D.	Basil Watkins
	C. E. Webber

PRESIDENT

Harold H. Hooper

ADMINISTRATION

- HOPPER, HAROLD H. *President of the College*
 B.S.—Washington University, 1951
 M.S.—Washington University, 1954
 Ed.D.—University of Florida, 1965
- 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
- McCABE, JAMES N. *Dean of Financial and Administrative Services*
 A.B.—West Virginia University, 1940
- 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
- KUNZE, DONALD C. *Chairman, Division of Natural Sciences and Mathematics*
 M.S.—Baldwin Wallace College, 1945
 M.A.—Kent State University, 1952
- LICHTENBERGER, EDGAR W. *Chairman, Division of the Social Sciences*
 B.A.—Dickinson College, 1950
 M.A.—University of Nebraska, 1953
 Ed.D.—Arizona State University, 1968
- 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
- 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, DELORES *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
- 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
- RAINES, LYNN *Reference Librarian*
B.A.—Emory & Henry College, 1960
M.L.S.—University of North Carolina, 1969

FACULTY

- ADAMS, RICHARD P. *Assistant Professor*
 B.S.—Virginia Polytechnic Institute, 1949 *Accounting*
 C.P.A.—State of Virginia, 1958
- ARMINIO, ROBERT L. *Instructor*
 B. Arch.—University of Virginia, 1968 *Architecture*
- BLALOCK, DWIGHT E. *Assistant Professor*
 B.S.—University of Alabama, 1966 *Data Processing*
 M.S.—Virginia Commonwealth, 1970
- BLEASE, ALFRED D. *Assistant Professor*
 B.S.—Brown University, 1961 *Physics*
 M.S.—University of Maine, 1965
- BLOMBERG, ALBERT A. *Assistant Professor*
 A.S.—Boston University, 1960 *Automotive Technology*
 B.S.—Northeastern University, 1968
 Certificate—New England Aircraft School, 1950
- BOWMAN, BETTY R. *Assistant Professor*
 B.S.—Madison College, 1960 *Secretarial Science*
 M.Ed.—Virginia Polytechnic Institute, 1969
- BRADLEY, HARRY M. *Assistant Professor*
 B.S.—California (Pa.) State Teachers College, 1931 *Director, Continuing*
 M.Ed.—University of Pittsburgh, 1942 *Education*
- BRODY, MYRON R. *Assistant Professor*
 B.F.A.—University of Pennsylvania, 1965 *Art*
 M.F.A.—University of Pennsylvania, 1968
- BROKER, THOMAS O. *Associate Professor*
 B.A.—Wesleyan University, 1936 *Government*
 J.D.—Cornell Law School, 1939
 M.A.—Tufts University, 1969
- BROUGHTON, RICHARD I. *Instructor*
 B.A.—Florida State University, 1965 *Television Production Technology*
 M.A.—Florida State University, 1967
- BROWN, MARTHA L. *Assistant Professor*
 B.S.S.A.—Greensboro, N. C. Woman's College, 1957 *Secretarial Science*
 M.A.—East Carolina College, 1961
- BROWNSTEIN, HAROLD *Assistant Professor*
 D.D.S.—Chicago College of Dental Surgery, 1931 *Director of Dental*
Program
- BRUST, JOHN V. *Instructor*
 B.S.—University of Cincinnati, 1961 *Commercial Art*
- BURLESON, THOMAS W. *Instructor*
 B.S.—Appalachian State University, 1964 *Counseling*
 M.Ed.—University of Virginia, 1968
- CARR, GUY R. *Assistant Professor*
 B.S.—Virginia Polytechnic Institute, 1942 *Mechanical Engineering*
Technology

- CARTER, DOUGLAS *Instructor*
 B.A.—University of Arizona, 1966 *Speech*
 M.A.—University of Arizona, 1968
- COHRON, JOSEPH W. *Associate Professor*
 B.A.—College of William and Mary, 1933 *Speech and Drama*
 M.A.—Ohio University, 1941
- COOPER, JOHN J. *Associate Professor*
 B.M.E.—University of Kansas, 1957 *Chairman, Division of the Humanities*
 M.M.E.—University of Kansas, 1958
 Ed.D.—University of Colorado, 1965
- CRAIG, BETTY C. *Instructor*
 B.A.—Hollins College, 1946 *English*
- CRAWFORD, PATRICIA M. *Instructor*
 B.A.—University of Oregon, 1930 *English*
 M.A.—State University of Washington, 1933
- CRITES, RICHARD W. *Instructor*
 B.S.—Eastern Illinois University, 1967 *Biology*
 M.S.—Eastern Illinois University, 1968
- CROCKETT, S. R., JR. *Assistant Professor*
 B.A.—University of Virginia, 1958 *English*
 M.S.—Radford College, 1967
- CROTTY, A. EUGENE *Professor*
 B.S.—University of Virginia, 1955 *Business Administration*
 M.B.A.—University of Virginia, 1957
 C.P.A.—Virginia, 1959
- DAVIS, EARLE S. *Instructor*
 B.S.—U.S. Naval Academy, 1926 *Mathematics*
- DEARBORN, CHARLES E., JR. *Assistant Professor*
 B.S.—Boston University, 1965 *Automotive Technology*
 Certificate—Wentworth Institute, 1958
- DEVINS, GEORGE V. *Instructor*
 B.A.—San Jose State College, 1939 *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
- FELTON, JOHN S., JR. *Instructor*
 B.S.C.E.—Virginia Polytechnic Institute, 1924 *Civil Engineering Technology*
- FERRETTI, ELLEN J. *Instructor*
 B.S.—California (Pa.) State College, 1966 *Counseling*
 M.A.—West Virginia University, 1967

- FIGHTMASTER, JAMES W. *Instructor*
Mathematics
B.S.—Georgetown College, 1957
M.Ed.—University of Virginia, 1965
- GENTRY, CARROLL L. *Assistant Professor*
Business Management
B.S.—East Tennessee State University, 1965
M.B.A.—East Tennessee State University, 1967
- GILL, DAWN M. *Instructor*
Biology
B.S.—Mary Washington College, 1949
M.S.—Radford College, 1969
Registered Physical Therapist—Walter Reed Hospital, U. S. Army, 1950
- GLANVILLE, JAMES O *Associate Professor*
Chemistry
A.R.C.S.—The Royal College of Science, London, 1962
B.S.—University of London, 1962
Ph.D.—University of Maryland, 1967
- GRIGGS, MIGNONNE *Associate Professor*
Coordinator, Learning Laboratory
B.S.—Longwood College, 1941
M.Ed.—Virginia Polytechnic Institute, 1961
- GROW, VIRGIL B. *Instructor*
Civil Engineering Technology
B.S.C.E.—Virginia Military Institute, 1930
- HAMILTON, RUTH V. *Instructor*
Art
B.A.—Ohio State University, 1927
M.A.—Ohio State University, 1928
- HAMLAR, CONSTANCE J. *Assistant Professor*
English
A.B.—Virginia State College, 1942
M.A.—Northwestern University, 1945
- HARRIS, WILLIAM A. *Instructor*
Journalism
B.S.—University of Maryland, 1959
M.A.—East Tennessee State University, 1969
- HEADLAND, CHARLES J. *Associate Professor*
Physics
B.S.—State Teachers College, Slippery Rock, Pa., 1941
M.Ed.—University of Pittsburgh, 1951
- *HIEDEMANN, ROBERT E. *Associate Professor*
Chairman, Division of the Humanities
B.A.—Michigan State University, 1965
A.M.—University of Michigan, 1961
Ph.D.—University of Michigan, 1967
- HILL, JAMES P., JR. *Assistant Professor*
Chemistry
B.S.—Roanoke College, 1957
M.Ed.—University of Virginia, 1963
- HINCHCLIFFE, ALICE B. *Associate Professor*
Assistant Director, Dental Program
A.B.—Syracuse University, 1962
R.D.H.—Eastman School of Dental Hygiene, 1939
M.Ed.—University of Virginia, 1970
- HOFFMAN, WILLIAM E., JR. *Assistant Instructor*
Electrical Engineering
Technology
A.A.S.—Roanoke Technical Institute, 1964

* Until July 31, 1970

- HOOVEN, JAMES A. *Instructor*
 B.A.—New Mexico Highlands University, 1965 History and Government
 M.A.—New Mexico Highlands University, 1966
- 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 *Instructor*
 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 Counseling and Placement Office
 M.S.—Radford College, 1969
- JOHNS, DELORES *Instructor*
 B.S.—Virginia State, 1955 Counseling
 M.S.—Virginia Commonwealth, 1969
- JONES, CLYDE *Assistant Professor*
 B.A.—Furman University, 1956 English
 M.A.—George Peabody College for Teachers, 1957
- KELLETT, DIANE *Instructor*
 B.A.—Memphis State University, 1964 English
 M.A.—Memphis State University, 1968
- KIM, SUSAN H. *Instructor*
 B.A.—George Peabody College for Teachers, 1959 Librarian
 M.A.Ed.—George Peabody College for Teachers, 1960
 M.S.L.S.—Peabody Library School, 1968
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 A.B.—Rutgers University, 1962 Biology
 M.S.—University of Rhode Island, 1968
- KUNZE, DONALD C. *Associate Professor*
 B.S.—Baldwin Wallace College, 1945 Chairman, Division of Natural
 M.A.—Kent State University, 1952 Sciences and Mathematics
- LAWRENCE, VIRGINIA P. *Instructor*
 B.S.—Radford College, 1920 Reading
 M.A.—Columbia University, 1925
- 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, 1970

- LEVINE, MARTIN *Professor*
 B.E.E.—College of the City of New York, 1949 Electrical Engineering
 M.Litt.—University of Pittsburgh, 1956 Technology
 M.Ed.—University of Pittsburgh, 1960
 Ph.D.—University of Michigan, 1969
- LICHTENBERGER, EDGAR W. *Associate Professor*
 B.A.—Dickinson College, 1950 Chairman, Division of the Social Sciences
 M.A.—University of Nebraska, 1953
 Ed.D.—Arizona State University, 1968
- MAGRUDER, EDWARD G. *Assistant Professor*
 B.S.—Roanoke College, 1951 Business Management
 Diploma—Commercial Banking—Rutgers University and
 Stonier Graduate School of Banking, 1960
 M.S.—Radford College, 1970
- MARTIN, EDITH P. *Instructor*
 B.F.A.—Washington State University, 1964 Art
 M.F.A.—Pennsylvania State University, 1966
- MATHENY, GALLAIS E. *Associate Professor*
 B.S.—University of Illinois, 1929 Biology
 M.S.—Virginia Polytechnic Institute, 1939
- 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
- MACDONALD, ROBERTA C. *Associate Professor*
 B.A.—Regis College, 1935 Chairman, Division of Business Science
 M.C.S.—Boston University, 1941
 Ed.D.—University of Florida, 1966
- 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

* Part time.

- MUSGROVE, CHARLES P. *Assistant Professor*
 B.S.—East Tennessee State University, 1967
 M.S.—Virginia Polytechnic Institute, 1969
 Mathematics
- MYERS, RALPH G. *Instructor*
 B.A.—Bridgewater College, 1925
 M.A.—University of Virginia, 1934
 English
- NELSON, JAMES E. *Assistant Professor*
 B.S.—U.S. Merchant Marine Academy, 1944
 B.S.—Roanoke College, 1949
 M.S.—Appalachian State University, 1966
 Mechanical Engineering
 Technology
- NICKERSON, GWENDOLYN J. *Assistant Professor*
 B.S.—Roanoke College, 1951
 M.Ed.—University of Virginia, 1965
 Chemistry
- NININGER, EDWARD C. *Associate Professor*
 B.A.—Richmond College, 1931
 M.A.—Richmond College, 1932
 History
- PACK, JOEL C. *Assistant Professor*
 B.A.—Roanoke College, 1963
 M.A.—University of Virginia, 1967
 Mathematics
- PAYNE, ELIZABETH A. *Assistant Professor*
 B.S.—University of North Carolina, 1950
 M.Ed.—University of North Carolina, 1969
 Secretarial Science
- PEVERALL, MARY W. *Instructor*
 B.A.—Radford College, 1964
 M.S.—Radford College, 1968
 Counseling
- PHELPS, EMMA SUE *Assistant Professor*
 B.A.—Concord State Teachers College, 1939
 M.A.—State University of Iowa, 1946
 Speech and Drama
- PHELPS, HUGH B. *Associate Professor*
 B.M.E.—Clarkson College of Technology, 1950
 M.M.E.—Clarkson College of Technology, 1956
 Chairman, Division of
 Engineering Technologies
- POINDEXTER, J. CARL *Professor*
 B.S.—University of Virginia, 1933
 M.A.—University of Virginia, 1941
 Ph.D.—University of Virginia, 1944
 Economics
- PRIOR, DAVID F. *Instructor*
 B.S.—East Texas Baptist College, 1967
 M.S.T.—Middle Tennessee State University, 1969
 Mathematics
- RACE, HARRY C. *Associate Professor*
 B.S.E.E.—Northeastern University, 1942
 M.S.—Radford College, 1965
 Dean of Student Services
- RAINES, LYNN *Reference Librarian*
 B.A.—Emory & Henry College, 1960
 M.L.S.—University of North Carolina, 1969

- SAUNDERS, JEAN M. *Assistant Professor*
Business Management
B.S.—Radford College, 1954
M.Ed.—Virginia Polytechnic Institute, 1967
- SCHULTZ, L. DAVID *Instructor*
Mathematics
B.A.—University of California, Santa Barbara, 1967
M.A.—University of Arizona, 1969
- SEARS, JAMES C. *Instructor*
Electrical Engineering
Technology
A.A.S.—Roanoke Technical Institute, 1965
B.S.—Roanoke College, 1968
- SELANDER, EDWIN V. *Assistant Professor*
Mathematics
B.S.—Virginia Polytechnic Institute, 1955
M.S.—Virginia Polytechnic Institute, 1967
- SELANDER, MARY V. *Instructor*
Mathematics
B.S.—Virginia Polytechnic Institute, 1955
M.A.—Pennsylvania State University, 1959
- SHEPPARD, VERNON M., JR. *Assistant Professor*
Economics
B.S.—Virginia Polytechnic Institute, 1954
M.S.—Virginia Polytechnic Institute, 1960
- SHIREY, MARY M. *Instructor*
French
A.B.—West Virginia University, 1924
A.M.—Columbia University, 1935
- SHIRLEY, WILLIAM T. *Assistant Professor*
History
B.A.—Furman University, 1948
M.A.—University of North Carolina, 1950
- SHREEVE, WILLIAM E. *Assistant Professor*
Television Production Technology
B.S.—University of Oregon, 1967
M.S.—University of Oregon, 1969
- SINGER, MADELYN *Assistant Professor*
Mathematics
A.B.—Brooklyn College, 1942
M.A.—Columbia University, 1946
- SMITH, HUGH P. *Associate Professor*
Geology and Geography
B.A.—University of California, 1948
M.A.—University of California, 1950
Ph.D.—University of Utah, 1969
- SMITH, MILTON S. *Professor*
English
B.A.—Wesleyan University, 1933
M.A.—Harvard University, 1934
Ph.D.—Fordham University, 1955
- SOWER, RONALD D. *Assistant Instructor*
Biology
B.A.—Emory and Henry, 1969
- STARNES, JOHN N. *Instructor*
Mathematics
B.S.—East Tennessee State University, 1960
M.S.—East Tennessee State University, 1968
- STATON, RUTH J. *Assistant Professor*
English
B.A.—College of William and Mary, 1934
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. *Instructor*
 B.A.—Norwich University, 1944 *Director, Learning Resources*
 M.S.—Syracuse University, 1950
- TOWNSEND, MILLARD C. *Instructor*
 B.A.—Mercer University, 1928 *Accounting*
- 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 *Counselor*
 M.Ed.—University of Virginia, 1968
- TUBBS, ATHA MAXINE *Instructor*
 B.A.—University of Texas at Austin, 1968 *English*
 M.A.—University of Texas at Austin, 1969
- 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
- TURNER, BARBARA B. *Instructor*
 B.S.—Radford College, 1959 *Reading*
 M.Ed.—University of Virginia, 1966
- TYLER, JOSEPH REGINALD *Assistant Professor*
 B.S.—Virginia Polytechnic Institute, 1966 *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
- VILLANI, FRANK J. *Instructor*
 B.A.—State University of New York at Oneonta, 1966 *English*
 M.A.—University of Arkansas, 1969
- VINSON, W. BARRY *Instructor*
 B.S.—East Texas State University, 1965 *Sociology*
 M.S.—East Texas State University, 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, 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. *Assistant Instructor*
A.A.S.—Roanoke Technical Institute, 1965 *Mechanical Engineering*
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

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ADAMS, EVELYN P.	<i>Secretary to the Director, Learning Laboratory</i>
ADAMS, WILLIE I.	<i>Secretary to the Dean of Financial and Administrative Services</i>
ANDREW, SUE	<i>Procurement Secretary</i>
ARA, NANCY K.	<i>Secretary to the Dean of Instruction</i>
BARNETT, SARA P.	<i>Secretary to the Chairman, Humanities Division</i>
BRATTON, MARION B.	<i>Bookstore Manager</i>
BUCKNER, LEIGH	<i>Library Assistant</i>
COX, DUSTY T.	<i>Secretary, Office of Continuing Education</i>
DEERING, BARBARA	<i>Confidential Secretary to the President</i>
DeFELICE, VIRGINIA B.	<i>Secretary to the Chairman, Engineering Technologies Division</i>
DEYERLE, NANCY L.	<i>Secretary to the Coordinator of Counseling Services</i>
DILLON, PATRICIA M.	<i>Secretary to the Chairman, Natural Sciences and Mathematics Division</i>
DOSS, TONI M.	<i>Secretary to the Chairman, Social Sciences Division</i>
EQUI, FRANCES D.	<i>Technician in Charge of Duplication</i>
GAUT, BESS S.	<i>Clerk-Typist</i>
GRAY, MARIE L.	<i>Secretary</i>
GREGORY, JANE	<i>Secretary to the Faculty</i>
KOTCHISH, SUZANNE B.	<i>Clerk-Stenographer</i>
LAYMAN, MARY E.	<i>Supervisor, Data Processing Office</i>
McGLOTHLIN, LYNDIA G.	<i>Secretary to the Chairman, Business Science Division</i>
MEADOR, FRANCES M.	<i>Bookstore Assistant</i>
MITCHELL, MILDRED C.	<i>PBX Operator-Receptionist</i>
MOCK, DOROTHY C.	<i>Secretary to the Director, Continuing Education</i>
MUNDY, MARION D.	<i>Secretary to the Dean of Student Services</i>
NEAL, BETTIE T.	<i>Transcript and Government Clerk</i>
NEWELL, CHARLES P.	<i>Assistant Business Manager</i>
RAMEY, MONA N.	<i>PBX Operator-Receptionist</i>
ROOP, JANICE W.	<i>Secretary and Aid to Audio-Visual and Duplication</i>
SEARS, CAROL H.	<i>Secretary to the Coordinator of Admissions and Records</i>
SHUMAKER, DREWRY P.	<i>Secretary, Counseling Services</i>
TALIAFERRO, ULITA S.	<i>Secretary, Business Office</i>
WILLIAMS, SHIRLEY R.	<i>Secretary to the Faculty</i>
WHEELER, WILLIAM H.	<i>Laboratory Mechanical Technician</i>
WOOD, JOYCELYN J.	<i>Library Clerk</i>
YOUNG, JOHN R., JR.	<i>Buildings and Grounds Supervisor</i>

NOTES

NOTES



1970

JULY

S	M	T	W	T	F	S
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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

S	M	T	W	T	F	S
			1	2	3	4
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1971

JANUARY

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31						

FEBRUARY

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

MARCH

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

APRIL

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

MAY

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

JUNE

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

JULY

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

AUGUST

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

SEPTEMBER

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

OCTOBER

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

NOVEMBER

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

DECEMBER

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