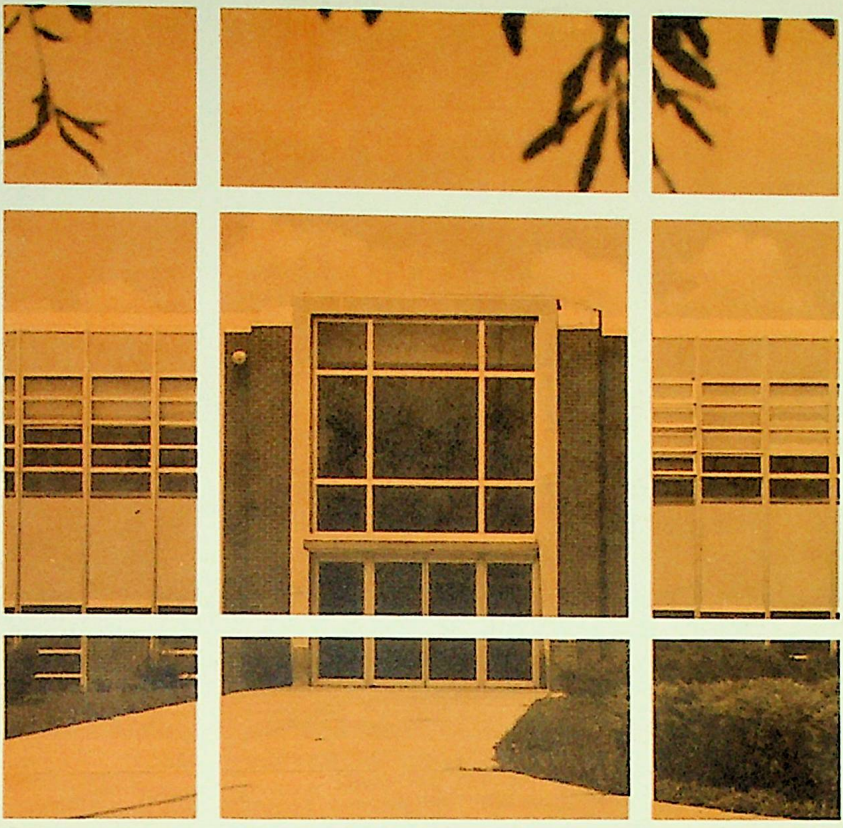
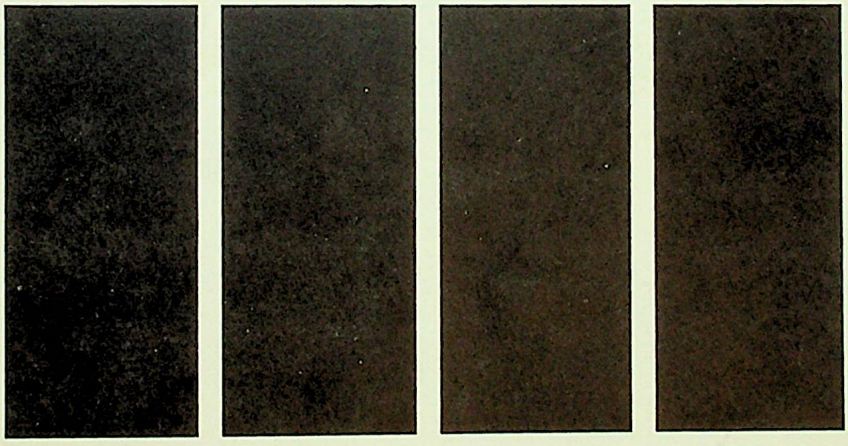
Barbara J.



VIRGINIA WESTERN COMMUNITY COLLEGE



CATALOG 1969-70

VIRGINIA WESTERN COMMUNITY COLLEGE

BULLETIN

CATALOG ISSUE 1969-1970

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Roanoke, Virginia 24015
Telephone (703) 344-2031

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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.

PART I

GENERAL INFORMATION

THE COLLEGE

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

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

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.

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 preprofessional 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. In December of 1967, the Southern Association of Schools and Colleges accepted Virginia Western Community College as a recognized candidate for accreditation.

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

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

COLLEGE CALENDAR

FALL QUARTER 1969

New Faculty Report	Tuesday, September 16
Faculty Work Days	Tuesday, September 16-23
Orientation Day for Students	Tuesday-Wednesday September 23-24
Registration	Thursday-Friday, September 25-26
Classes Begin	Monday, September 29
Last Day to Add or Change Classes	Friday, October 3
Last Day for Withdrawal Without Penalty	Friday, October 17
Mid-term Grade Reports	Tuesday, November 4
Thanksgiving Recess	Thursday-Saturday, November 27-29
Classes End	Wednesday, December 10
Final Exams	Thursday-Saturday, December 11-13
Faculty Work Day	Monday, December 15

WINTER QUARTER 1970

New Faculty Report	Monday, December 29
Faculty Work Day	Friday, January 2
Orientation Day for Students	Friday, January 2
Registration	Friday-Saturday, January 2-3
Classes Begin	Monday, January 5
Last Day to Add or Change Classes	Friday, January 9
Last Day for Withdrawal Without Penalty	Friday, January 23
Mid-term Grade Reports	Tuesday, February 10
Washington's Birthday Holiday	Monday, February 23
Classes End	Tuesday, March 17
Final Exams	Wednesday-Friday, March 18-20
Faculty Work Day	Saturday, March 21

SPRING QUARTER 1970

New Faculty Report	Thursday, March 19
Faculty Work Day	Tuesday, March 24
Orientation Day for Students	Wednesday, March 25

Registration	Thursday-Friday, March 26-27
Classes Begin	Monday, March 30
Last Day to Add or Change Classes	Friday, April 3
Last Day for Withdrawal Without Penalty	Friday, April 17
Mid-term Grade Reports	Tuesday, May 5
Memorial Day Holiday	Friday, May 29
Classes End	Monday, June 8
Final Exams	Tuesday-Thursday, June 9-11
Faculty Work Day	Friday, June 12
Graduation	Saturday, June 13

SUMMER QUARTER 1970
(Full ten-week session)

New Faculty Report	Wednesday, June 10
Orientation Day for Students	Friday, June 12
Faculty Work Day	Monday, June 15
Registration	Monday, June 15
Classes Begin	Tuesday, June 16
Last Day to Add or Change Classes	Monday, June 22
Independendence Day Holiday	Friday, July 3
Last Day for Withdrawal Without Penalty	Tuesday, July 7
Mid-term Grade Reports	Wednesday, July 22
Classes End	Tuesday, August 25
Final Exams	Wednesday-Friday, August 26-28
Faculty Work Day	Saturday, August 29

SUMMER QUARTER 1970
(Two five-week terms with double class periods)

First Term

New Faculty Report	Wednesday, June 10
Orientation Day for Students	Friday, June 12
Faculty Work Day	Monday, June 15
Registration	Monday, June 15
Classes Begin	Tuesday, June 16
Last Day to Add or Change Classes	Thursday, June 18
Last Day for Withdrawal Without Penalty	Thursday, June 25
Independence Day Holiday	Friday, July 3
Mid-term Grade Reports	Monday, July 6
Classes End	Tuesday, July 21

Final Exams	Wednesday-Thursday, July 22-23
Faculty Work Day	Friday, July 24

Second Term

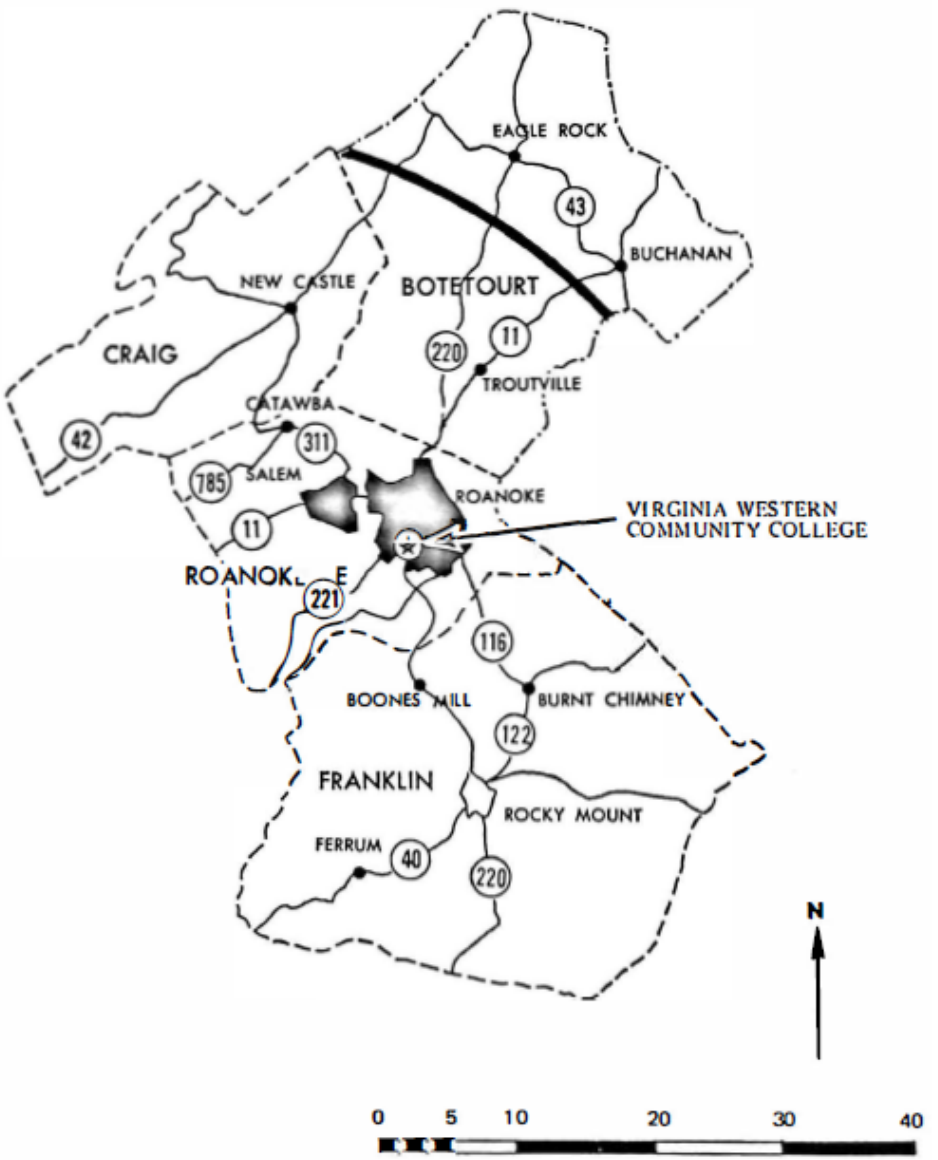
New Faculty Report	Tuesday, July 21
Faculty Work Day	Friday, July 24
Orientation Day for Students	Friday, July 24
Registration	Friday, July 24
Classes Begin	Monday, July 27
Last Day to Add or Change Classes	Wednesday, July 29
Saturday Classes (Monday Sections)	Saturday, August 1
Last Day for Withdrawal Without Penalty	Wednesday, August 5
Mid-term Grade Reports	Thursday, August 13
Saturday Classes (Tuesday Sections)	Saturday, August 15
Classes End	Wednesday, August 26
Final Exams	Thursday-Friday, August 27-28
Faculty Work Day	Saturday, August 29

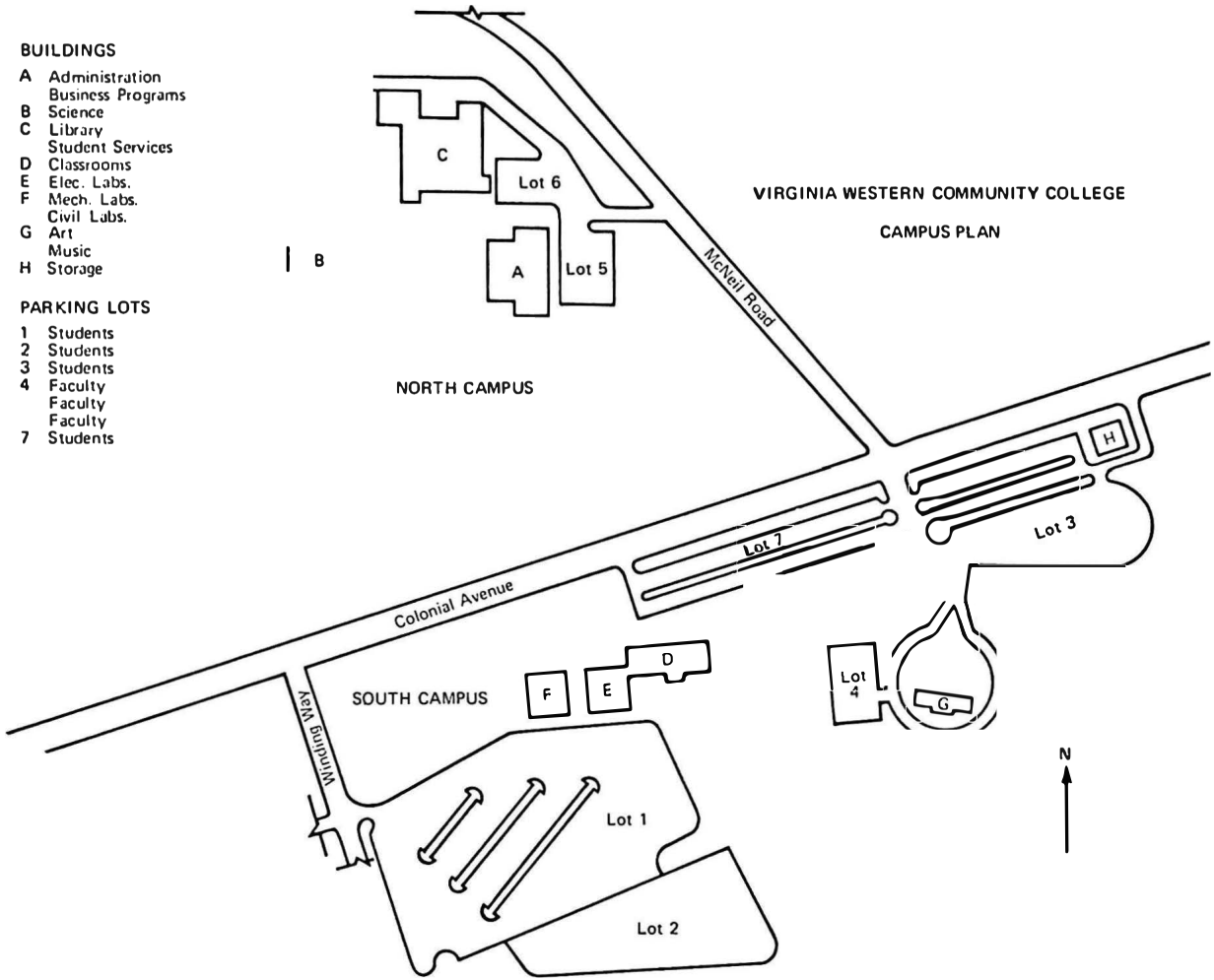
FALL QUARTER 1970

New Faculty Report	Wednesday, September 16
Faculty Work Days	September 16-23
Orientation Day for Students	Monday, Tuesday, September 21-22
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

ROANOKE AREA

DR. HAROLD H. HOPPER, *President*
Virginia Western Community College
Post Office Box 4195
3095 Colonial Avenue, S.W.
Roanoke, Virginia 24015
Phone: 344-2031




BUILDINGS
A Administration
Business Programs
B Science
C Library
Student Services
D Classrooms
E Elec. Labs.
F Mech. Labs.
Civil Labs.
G Art
Music
H Storage
PARKING LOTS
1 Students
2 Students
3 Students
4 Faculty
Faculty
Faculty
7 Students
VIRGINIA WESTERN COMMUNITY COLLEGE
CAMPUS PLAN
NORTH CAMPUS
SOUTH CAMPUS
McNeil Road
Colonial Avenue
Wrighting Way
B
C
Lot 6
A
Lot 5
H
Lot 7
Lot 3
D
F
E
Lot 4
G
Lot 1
Lot 2
N

GOVERNING BOARD

COMMONWEALTH OF VIRGINIA

STATE BOARD FOR COMMUNITY COLLEGES

EUGENE B. SYDNOR, JR., *Chairman*
WILLIAM S. HOOFNAGLE, *Vice Chairman*

MRS. MARY ANNE FRANKLIN
MRS. JOHN GALLEHER
WILLIAM P. KANTO
THOMAS J. LENNON
DANIEL C. LEWIS
S. E. LILES, JR.
JOHN D. MEADE
BENJAMIN W. MEARS, JR.
W. WIRT SHAPARD
D. BOYD THOMAS
HENRY W. TULLOCH
GORDON C. WILLIS

STATE DEPARTMENT OF COMMUNITY COLLEGES

DANA B. HAMEL, *Chancellor and Director*

VIRGINIA WESTERN COMMUNITY COLLEGE BOARD

WILLIAM S. RUSSELL, *Chairman*	January 1, 1967—December 31, 1970
HENRY E. THOMAS, *Vice Chairman*	January 1, 1967—December 31, 1969
RICHARD H. HAHN	January 1, 1969—December 31, 1972
BARTON W. MORRIS, JR.	January 1, 1967—December 31, 1970
MRS. HUNTER M. PAINTER	January 1, 1969—December 31, 1972
S. COLSTON SNEAD, JR.	January 1, 1967—December 31, 1970
PAUL R. THOMSON	January 1, 1967—December 31, 1969
W. DARNALL VINYARD	January 1, 1967—December 31, 1969
BASIL WATKINS	January 1, 1969—December 31, 1972
DR. FRANK B. WOLFE	January 1, 1967—December 31, 1970

ADMINISTRATIVE FACULTY

HAROLD H. HOPPER — *President*
B.S.—Washington University, 1951
M.S.—Washington University, 1954
Ed.D.—University of Florida, 1965

HARRY M. BRADLEY — *Director of Continuing Education*
B.S.—California (Pa.) State Teachers College, 1931
M.Ed.—University of Pittsburgh, 1942

MIGNONNE GRIGGS — *Coordinator of Learning Laboratory*
B.S.—Longwood College, 1941
M.Ed.—Virginia Polytechnic Institute, 1961

JAMES S. KELLEY, JR. — *Coordinator of Admissions and Records*
B.S.—Virginia Polytechnic Institute, 1961
M.Ed.—University of Virginia, 1966

DONALD C. KUNZE — *Chairman, Division of Natural Sciences and Mathematics*
B.S.—Baldwin Wallace College, 1945
M.A.—Kent State University, 1952

RICHARD F. LANCASTER — *Coordinator of Library Services*
B.A.—Roanoke College, 1959
M.S.L.S.—University of North Carolina, 1964

ARTHUR J. LAND — *Dean of Student Services*
B.A.—University of Florida, 1958
M.R.C.—University of Florida, 1959
Ed.D.—University of Florida, 1968

JAMES N. MCCABE — *Business Manager*
A.B.—West Virginia University, 1940

HARRY C. RACE — *Chairman, Division of Engineering Technologies and Acting Dean of Instruction*
B.S.E.E.—Northeastern University, 1942
M.S.—Radford College, 1965

J. KEITH VAN DYKE — *Coordinator of Audio-Visual Services*
B.S.—Appalachian State University, 1962
M.S.—Appalachian State University, 1969

FACULTY

FULL-TIME

T. Franklin Belvin — Instructor, Economics
B.S.—Virginia Polytechnic Institute, 1965

Alfred D. Blease — Asst. Professor, Physics
B.S.—Brown University, 1961
M.S.—University of Maine, 1965

Albert A. Blomberg — Asst. Professor, Automotive Technology
A.S.—Boston University, 1960
B.S.—Northeastern University, 1968
Certificate—New England Aircraft School, 1950

Betty R. Bowman — Instructor, Secretarial Science
B.S.—Madison College, 1960
M.Ed.—Virginia Polytechnic Institute, 1969

Harry M. Bradley — *Director of Continuing Education*
B.S.—California (Pa.) State Teachers College, 1931
M.Ed.—University of Pittsburgh, 1942

Thomas O. Broker — Asst. Professor, Political Science
B.A.—Wesleyan University, 1936
LL.B.—Cornell Law School, 1939
M.A.—Tufts University, 1969

R. Irving Broughton — Instructor, Speech Communications
B.A.—Florida State University, 1965
M.A.—Florida State University, 1967

John V. Brust — Instructor, Art
B.S.—University of Cincinnati, 1963

Thomas W. Burleson — Instructor, Counselor
B.S.—Appalachian State University, 1964
M.Ed.—University of Virginia, 1968

José L. Camiña — Instructor, Architectural Technology
B. Arch.—University of Virginia, 1968

Guy R. Carr — Asst. Professor, Mechanical Technology
B.S.—Virginia Polytechnic Institute, 1942

Joseph W. Cohron — Assoc. Professor, Speech and Drama
B.A.—College of William and Mary, 1933
M.A.—Ohio University, 1941

John J. Cooper — Assoc. Professor, Music
B.M.E.—University of Kansas, 1957
M.M.E.—University of Kansas, 1958
Ed.D.—University of Colorado, 1963

Betty C. Craig — Instructor, English
B.A.—Hollins College, 1946

Patricia M. Crawford — Instructor
B.A.—University of Oregon, 1931 — English
M.A.—State University of Washington, 1933

Richard W. Crites — Instructor
B.S.—Eastern Illinois University, 1967 — Biology
M.S.—Eastern Illinois University, 1968

S. Robert Crockett, Jr. — Instructor
B.A.—University of Virginia, 1958 — English
M.S.—Radford College, 1967

A. Eugene Crotty — Professor
B.S.—University of Virginia, 1955 — Business Administration
M.B.A.—University of Virginia, 1957
C.P.A.—Virginia, 1959

Earle S. Davis — Instructor
B.S.—U.S. Naval Academy, 1926 — Mathematics

Charles E. Dearborn, Jr. — Asst. Professor
B.S.—Boston University, 1965 — Automotive Technology
Certificate—Wentworth Institute, 1958

George V. Devins — Asst. Instructor
B.S.—San Jose State College, 1939 — Physical Education

H. Haddon Dudley — Asst. Professor
B.A.—Richmond College, 1928 — Psychology
M.A.—College of William and Mary, 1941

Marjorie S. Durling — Instructor
B.S.—West Virginia University, 1946
M.A.—West Virginia University, 1950 — Reading

Sally A. Eads — Instructor
B.A.—Agnes Scott College, 1965 — History
M.A.—University of Virginia, 1967

Martin K. Edgard — Instructor
B.S.—University of London, 1965 — Mathematics
M.S.—Florida State University, 1968

John S. Felton — Instructor
B.S.C.E.—Virginia Polytechnic Institute, 1924 — Civil Eng. Technology

Ellen Ferretti — Instructor
B.S.—California (Pa.) State College, 1966 — Counselor
M.A.—West Virginia University, 1967

James W. Fightmaster — Instructor
B.S.—Georgetown College, 1957 — Mathematics
M.Ed.—University of Virginia, 1965

Carroll L. Gentry — Asst. Professor
B.S.—East Tennessee State University, 1966 — Business Management
M.B.A.—East Tennessee State University, 1967

P. Joseph Giampocaro — Instructor
B.S.—Virginia Polytechnic Institute, 1964 — Counselor
M.S.—Radford College, 1966

Dawn M. Gill — Asst. Instructor, Biology
B.S.–Mary Washington College, 1949
Registered Physical Therapist-Walter Reed Hospital, U. S. Army, 1950

James O. Glanville — Assoc. Professor, Chemistry
A.R.C.S–The Royal College of Science, London, 1962
B.S.–The University of London, 1962
Ph.D.–University of Maryland, 1967

Mignonne Griggs — Asst. Professor, Coordinator, Learning Laboratory
B.S.–Longwood College, 1941
M.Ed.–Virginia Polytechnic Institute, 1961

Virgil B. Grow — Instructor, Architectural Technology
B.S.C.E.–Virginia Military Institute, 1930

Ruth V. Hamilton — Instructor, Art
B.A.–Ohio State University, 1927
M.A.–Ohio State University, 1928

Charles J. Headland — Asst. Professor, Physics
B.S.–State Teachers College, Slippery Rock, Pa., 1941
M.Ed.–University of Pittsburgh, 1951

James P. Hill, Jr. — Asst. Professor, Chemistry
B.S.–Roanoke College, 1957
M.Ed.–University of Virginia, 1963

Alice B. Hinchcliffe — Assoc. Professor, Asst. Director, Dental Assistant Program
B.A.–Syracuse University, 1962
R.D.H.–Eastman School of Dental Hygiene

William E. Hoffman, Jr. — Asst. Instructor, Electrical Technology
A.A.S.–Roanoke Technical Institute, 1964

James A. Hooven — Instructor, History
B.A.–New Mexico Highlands University, 1965
M.A.–New Mexico Highlands University, 1967

Judith L. Hooven — Instructor, English
B.A.–New Mexico Highlands University, 1963
M.A.–New Mexico Highlands University, 1966

Harold H. Hopper — President
B.S.–Washington University, 1951
M.S.–Washington University, 1954
Ed.D.–University of Florida, 1965

William M. Houchins — Asst. Professor, Health and Physical Education
B.S.–Concord College, 1949
M.P.H.–University of North Carolina, 1961

Richard Kent Hough — Instructor, Commercial Art
B.B.A.–Roanoke College, 1967

Charles A. Houston — Instructor, Mathematics
B.S.–University of Tennessee, 1964
M.M.–University of Tennessee, 1969

David P. James, Jr. — Instructor, Counselor
B.S.—Virginia Polytechnic Institute, 1960i
M.S.—Radford College, 1969i

Clyde Jones — Asst. Professor, English
B.A.—Furman University, 1956i
M.A.—George Peabody College for Teachers, 1957i

Diane Kellett — Instructor, English
B.A.—Memphis State University, 1964i
M.A.—Memphis State University, 1968i

James S. Kelly, Jr. — Instructor, Coordinator of Admissions and Records
B.S.—Virginia Polytechnic Institute, 1961i
M.Ed.—University of Virginia, 1966i

Edna L. Kour — Asst. Professor, Biology
B.A.—Rutgers University, 1962i
M.S.—University of Rhode Island, 1968i

Donald C. Kunze — Assoc. Professor, Chairman, Division of Natural Sciences and Mathematics
B.S.—Baldwin Wallace College, 1945i
M.A.—Kent State University, 1952i

Richard F. Lancaster — Instructor, Coordinator of Library Services
B.A.—Roanoke College, 1959i
M.S.L.S.—University of North Carolina, 1964i

Arthur J. Land — Dean of Student Services
B.A.—University of Florida, 1958
M.R.C.—University of Florida, 1959i
Ed.D.—University of Florida, 1968i

Martin Levine — Assoc. Professor, Electrical Technology
B.E.E.—College of the City of New York, 1949
M.Litt.—University of Pittsburgh, 1956i
M.Ed.—University of Pittsburgh, 1960i

John L. Madison — Instructor, Counselor
B.A.—Wake Forest College, 1956i
M.Ed.—University of North Carolina, 1959i

Edward G. Magruder — Instructor, Business Management
B.S.—Roanoke College, 1951i
Diploma—Commercial Banking—Rutgers University and Stonier Graduate School of Banking, 1960

Edith P. Mardin — Instructor, Art
B.A.—Washington State University, 1964i
M.F.A.—Pennsylvania State University, 1966i

Gallais E. Matheny — Assoc. Professor, Biology
B.S.—Virginia Polytechnic Institute, 1929i
M.S.—Virginia Polytechnic Institute, 1939i

Clarence C. Mays, Jr. — Asst. Professor, Spanish
B.S.—University of Virginia, 1961i
M.Ed.—University of Virginia, 1965i

Rosalind L. McFarland — Instructor, Mathematics
B.A.—Radcliffe College, 1939i

Kathryn S. McSurdy — Instructor, English
B.A.—Radford College, 1962
M.S.—Radford College, 1965

Wayne R. Michie — Instructor, Electrical Technology
A.A.S.—Roanoke Technical Institute, 1964
B.S.—Roanoke College, 1969

Roy G. Miles — Asst. Professor, Geology
B.S.—Missouri School of Mines, 1947
M.S.—Northwestern University, 1958

Frances T. Mitchell — Instructor, Secretarial Science
B.S.—Radford College, 1962
M.S.—Radford College, 1968

Dolores K. Moore — Instructor, German
Diploma—Lehrerinnen Siminar, 1945
Interpreter's Diploma—Rackow Schule, 1947

Charles P. Musgrove — Asst. Professor, Mathematics
B.S.—East Tennessee State University, 1967
M.S.—Virginia Polytechnic Institute, 1969

Ralph G. Myers — Instructor, English
B.A.—Bridgewater College, 1925
M.A.—University of Virginia, 1934

James E. Nelson — Asst. Professor, Mechanical Technology
B.S.—U.S. Merchant Marine Academy, 1944
B.S.—Roanoke College, 1949
M.S.—Appalachian State University, 1966

Gwendolyn J. Nickerson — Asst. Professor, Chemistry
B.S.—Roanoke College, 1951
M.Ed.—University of Virginia, 1965

Edward C. Nininger — Assoc. Professor, History
B.A.—Richmond College, 1932
M.A.—Richmond College, 1932

Joel C. Pack — Asst. Professor, Mathematics
B.A.—Roanoke College, 1963
M.A.—University of Virginia, 1967

Emma Sue Phelps — Asst. Professor, Speech and Drama
B.A.—Concord State Teachers College, 1939
M.A.—State University of Iowa, 1946

Hugh B. Phelps — Assoc. Professor, Mechanical Technology
B.M.E.—Clarkson College of Technology, 1950
M.M.E.—Clarkson College of Technology, 1956

J. Carl Poindexter — Professor, Economics
B.S.—University of Virginia, 1933
M.A.—University of Virginia, 1941
Ph.D.—University of Virginia, 1944

David F. Prior — Instructor, Mathematics
B.S.—East Texas Baptist College, 1967
M.S.—Middle Tennessee State University, 1969

Harry C. Race — Chairman, Division of Engineering Technologies
B.S.E.E.—Northeastern University, 1942
M.S.—Radford College, 1965

William R. Ricketts, Jr. — Assoc. Professor Mechanical Technology
B.S.—Virginia Polytechnic Institute, 1956
M.E.—University of Florida, 1968

Mary K. Sanders — Professor English
B.A.—Coker College, 1936
M.A.—University of South Carolina, 1937
Ph.D.—University of North Carolina, 1967

William A. Sar — Instructor Physics
B.A.—Bridgewater College, 1964
M.S.—Clemson University, 1966

Jean M. Saunders — Asst. Professor Business Management
B.S.—Radford College, 1954
M.Ed.—Virginia Polytechnic Institute, 1967

Leslie David Schultz — Instructor Mathematics
B.A.—University of California, Santa Barbara, 1967
M.A.—University of Arizona, 1969

James C. Sears — Instructor Electrical Technology
B.S.—Roanoke College, 1968

Edwin V. Selander — Asst. Professor Mathematics
B.S.—Virginia Polytechnic Institute, 1955
M.S.—Virginia Polytechnic Institute, 1967

Mary V. Selander — Instructor Mathematics
B.S.—Virginia Polytechnic Institute, 1955
M.A.—Pennsylvania State University, 1959

Mary M. Shirey — Instructor French
B.A.—West Virginia University, 1924
M.A.—Columbia University, 1935

William T. Shirley — Asst. Professor History
B.A.—Furman University, 1948
M.A.—University of North Carolina, 1950

Madelyn R. Singer — Asst. Professor Mathematics
B.A.—Brooklyn College, 1942
M.A.—Columbia University, 1946

Milton S. Smith — Professor English
B.A.—Wesleyan University, 1933
M.A.—Harvard University, 1934
Ph.D.—Fordham University, 1955

John N. Starnes — Instructor Mathematics
B.S.—East Tennessee State University, 1960
M.S.—East Tennessee State University, 1968

Albert W. Stewart — Asst. Professor Electrical Technology
B.S.—Virginia Polytechnic Institute, 1957

Maurice Strausbaugh B.A.–Juniata College, 1950 B.D.–Bethany Theological School, 1953 M.Ed.–Johns Hopkins University, 1966	Asst. Professor Head, Counseling Services
John L. Thompson B.A.–Roanoke College, 1928	Asst. Instructor English
Millard C. Townsend B.A.–Mercer University, 1928	Instructor Business Administration
Laverne L. Trahin B.A.–Radford College, 1960 M.S.–Radford College, 1965	Asst. Professor Psychology
Margaret H. Traynor B.S.–Longwood College, 1933 M.Ed.–University of Virginia, 1968	Instructor Counselor
Atha Maxine Tubbs B.A.–University of Texas at Austin, 1968 M.A.–University of Texas at Austin, 1969	Instructor English
Ray B. Tucker B.S.–Southern Illinois University, 1956 M.A.–University of Illinois, 1969	Asst. Professor Mathematics
Barbara B. Turner B.S.–Radford College, 1959 M.Ed.Reading–University of Virginia, 1966	Instructor Reading
J. Keith Van Dyke B.S.–Appalachian State University, 1962 M.S.–Appalachian State University, 1969	Instructor Coordinator of Audio-Visual Services
Frank J. Villani B.A.–State University of New York, 1966 M.A.–University of Arkansas, 1969	Instructor English
W. Barry Vinson B.S.–East Texas State University, 1965	Instructor Sociology
Eleanor H. Wall B.S.–Winthrop College, 1965	Instructor Secretarial Science
Daniel J. Weinman B.S.–Loyola University, 1967 M.A.–Northern Illinois University, 1969	Instructor Political Science
Barbara H. White B.A.–Longwood College, 1949 M.S.–Radford College, 1966	Asst. Professor English
Roy R. White B.S.–Florida Southern College, 1954 M.A.–University of Florida, 1956 Ph.D.–University of Florida, 1960	Assoc. Professor History and Government
Robert J. Wilkinson, Jr. B.S.L.–University of Louisville, 1957 M.Ed.–University of Virginia, 1968	Instructor Sociology

E. Russ Williams, Jr.
B.M.E.—Southeastern Louisiana College, 1956
M.Ed.—University of Southern Mississippi, 1966
Assoc. Professor
History

James H. Wilson
A.A.S.—Roanoke Technical Institute, 1965
Asst. Instructor
Mechanical Technology

Benjamin F. Zirkle, III
B.S.—Roanoke College, 1965
M.S.—Florida State University, 1968
Instructor
Mathematics

COUNSELING SERVICES

Maurice Strausbaugh
B.A.—Juniata College, 1950
B.D.—Bethany Theological School, 1953
M.Ed.—Johns Hopkins University, 1966
Asst Professor
Head, Counseling Services

Thomas W. Burleson
B.S.—Appalachian State University, 1964
M.Ed.—University of Virginia, 1968
Instructor
Counselor

Ellen Ferretti
B.S.—California (Pa.) State College, 1966
M.A.—West Virginia University, 1967
Instructor
Counselor

P. Joseph Giampocaroi
B.S.—Virginia Polytechnic Institute, 1964
M.S.—Radford College, 1966
Instructor
Counselor

David P. James, Jr.
B.S.—Virginia Polytechnic Institute, 1960
M.S.—Radford College, 1969
Instructor
Counselor

John L. Madison
B.A.—Wake Forest College, 1956
M.Ed.—University of North Carolina, 1959
Instructor
Counselor

Margaret H. Traynor
B.S.—Longwood College, 1933
M.Ed.—University of Virginia, 1968
Instructor
Counselor

LIBRARY SERVICES

Richard F. Lancaster
B.A.—Roanoke College, 1959
M.S.I.S.—University of North Carolina, 1964
Instructor
Coordinator of Library Services

Susan H. Kim
B.A.—George Peabody College for Teachers, 1959
M.A.Ed.—George Peabody College for Teachers, 1960
Reference Librarian

PART-TIME FACULTY

Richard P. Adams
B.S.—Virginia Polytechnic Institute, 1949
Business Administration

Ralph E. Bice, Jr.
B.S.E.E.—University of Alabama, 1955
Mathematics

Alan C. Bostwick — Music
B. Mus.—North Texas State University, 1959i
B.A.—North Texas State University, 1960i
S.M.M.—Union Theological Seminary, 1962i

Harold M. Brown — Police Science
B.S.—Queens College, 1955i
FBI Training School, Washington, D. C., 1955i

C.i Dale Elliotti — Mathematics
B.S.--Virginia Polytechnic Institute, 1967i
M.S.E.E.—University of Tennessee, 1968i

Helen B. Evans — Biology
B.S.—Roanoke College, 1936i

Charles B. Farrelly — Interior Decorating
B.F.A.—University of Notre Dame, 1960

Leigh B. Hanes, Jr. — Police Science
B.A.—Hampden Sydney College, 1940
LL.B.—University of Maryland, 1948i

E.i Paul Hayesi — Traffic Management
B.S.—Georgia Institute of Technology, 1966i

Edwin C. Hollenbach — Engineering
B.S.--Virginia Polytechnic Institute, 1961i

Kenneth W. Jones — Preflight
B.A.--Toccoa Falls Bible College, 1968i
Federal Aviation Agency License No. 1448339i

Richard L. Lawrence — Business Law
B.A.—Roanoke College, 1961i
LL.B.—Washington and Lee University, 1964i

John R. McMichael — Traffic Management
B.A.--University of Pittsburgh, 1954i

Kathryn L. Minnich — Mathematics
B.A.—University of Cincinnati, 1943i

Malcolm L. Minnick, Jr. — Philosophy
B.A.—Roanoke College, 1955i
B.D.—Lutheran Theological Southern Seminary, 1958i

Jack V. Place — Business Administration
B.A.—College of William and Mary, 1954i
M.L.T.—College of William and Mary, 1957i

Sammy A. Scott — Mathematics
B.S.--Longwood College, 1929i
M.Ed.—Duke University, 1949i

Robert A. Young — Typography
Vocational Industrial Education Certificate

OFFICE PERSONNEL

Evelyn P. Adams	Faculty Secretary
Willie I. Adams	Secretary, Business Manager
Marion B. Bratton	Bookstore Manager
Doyne B. Broadhurst	Secretary, Director of Continuing Education
Donna Cloaninger	Clerk-Stenographer, Counseling
Barbara Deering	Confidential Secretary to the President
Virginia Devins	Library Assistant
Nancy N. Deyerle	Secretary, Chairman, Engineering Technologies
Patricia M. Dillon	Secretary, Chairman, Natural Sciences and Math
Betty Dobbs	PBX Operator-Receptionist
Nellie W. Dunnigan	Procurement Secretary
Mary E. Layman	Data Processing Clerk
Mildred Mitchell	PBX Operator–Receptionist
Marion D. Mundy	Secretary, Dean of Student Services
Toni Myers	Secretary
Bettie T. Neal	Transcript and Government Records Clerk, Admissions
Martha C. Peterson	Secretary, Librarian
Carol H. Sears	Secretary, Coordinator of Admissions and Records
Joyce Matherly Shaver	Clerk-Stenographer, Admissions
Drewry P. Shumaker	Secretary, Counseling Department
Donna Smoot	Bookstore Secretary
Ulita S. Taliaferro	Cashier
Carolyn Taylor	Records Clerk, Admissions
Frances F. Trenka	Secretary, English Department
Elsa White	Circulation Assistant, Library
Shirley Rae Williams	Faculty Secretary
Joycelyn J. Wood	Clerk-Typist, Library

PART II

ADMINISTRATIVE INFORMATION

ADMISSION REQUIREMENTS

Any person who has a high school diploma or the equivalent, or is 18 years of age, and in any case is able to benefit from a program at Virginia Western Community College may be admitted to the College as a regular student or as a special student when the following items have been received by the Office of Admissions. 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 official "Application for Admission" (NOTE: Social Security Number is required).
2. A $5.00 application fee (non-refundable unless the requested program or course is not offered).
3. Official transcripts from all high schools, colleges, and universities attended.

For all special students, the following items are required:

1. A completed 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 Office of Continuing Education at the College for additional information.

After a person has been admitted to the College, 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) and any additional information required by the College for admission to a specific program or curriculum.

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 Curricula

In addition to the general admission requirements listed above, specific requirements are usually prescribed for each curriculum within the College. Among the items generally considered in determining the

eligibility of a student for admission to a curriculum in the College are his educational and occupational experiences, and other reasonable standards to insure that the student possesses the potential to meet program requirements.

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

All regular students entering the College will be required to take the ACT test battery of the American College Testing Program. The ACT test battery is administered at the College and other test centers prior to registration.

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

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

Special Admissions Requirements for Foreign Students

In addition to the general admissions 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 sub-divisions 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 sub-divisions supporting the College, (2) other Virginia residents, (3) out-of-state and foreign students.

Students Transferring from Other Colleges

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

It is the role of the Community College to help each student succeed in a program from which he can benefit. If a transfer student is

ineligible to return to a particular curriculum in a previous college, generally he will not be allowed to enroll in the same curriculum in the College until two quarters elapse or until he completes an approved preparatory program at the College. The Admissions Committee of the College shall decide on each case and usually shall impose special conditions for the admittance of such students, including placement on probation.

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

Student Applying for Credit or Waiver of Requirements

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

Auditing

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

CLASSIFICATION OF STUDENTS

All students are classified according to the following categories:

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

(1) A full- or part-time student working toward completion of an associate degree, diploma, certificate, or foundations program;
(2) A full- 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 a course(s) as an 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(s);
(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 person who has not yet fulfilled all of the requirements as a regular student but who is admitted under special consideration by the Admissions Committee of the College. It is expected that such persons 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 credits of course work.

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

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

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

EXPENSES

Application Fee

An application fee of $5.00 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	$ 45.00 per quarter
Out-of-State Resident	150.00 per quarter
Part-time Student (less than 12 credits):	
Virginia Resident	4.00 per credit (or equivalent)
Out-of-State Resident	12.50 per credit (or equivalent)

A Virginia resident is one who has been domiciled in, and is and has been an actual bona fide legal resident of Virginia, for a period of at 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 school property (such as laboratory or shop equipment, supplies, library books and materials) that they damage or lose.

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 degree, diploma, or certificate, 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: (a) within first 15 class days of a quarter, refund will be 2/3 of tuition; (b) within first 16-35 class days of a quarter, refund will be 1/3 of tuition; (c) after 35 class days of a quarter have elapsed, no refund will be made. If a course is cancelled, there will be 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, and 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 college semester hour credit. Usually, one credit for a course is given for approximately three hours of work *weekly* by each student as follows:

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

GRADING SYSTEM

A — Excellent — Four grade points per credit.

B — Good — Three grade points per credit.

C — Average — Two grade points per credit.e

D — Poor — One grade point per credit.e

F — Failure — 0 grade points.e

S — Satisfactory — No grade point credit (Applies only to specializede courses and seminars.)

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

W — Withdrawal — No credit (A grade of withdrawal implies that student was making satisfactory progress in the course at the time of his withdrawal or that the withdrawal was officially made before the "deadline" date published in the College calendar.)

I — Incomplete — No credit (A grade of incomplete is assigned only in cases of student absence from a limited number of class sessions near the end of a term or grading period and when the absence was for a verifiable unavoidable reason; i.e., sickness verified by medical statement, accident verified by police records, etc. or absence from final examination for a verifiable and unavoidable reason. An "incomplete" must be 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.)

X — Audit — No credit (Permission of the Instructor and the Dean of Instruction is required to audit a class.)

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

DEGREES, DIPLOMAS, AND CERTIFICATES

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

(1)e *Associate in Arts degree (A. A.)* is awarded to students majoringe in the liberal arts and who may plan to transfer to a four-year college or university after completing their community college program.

(2)e *Associate in Science degree (A. S.)* is awarded to students majoring in specialized curriculums such as business administration, teacher education, pre-engineering, and other pre-professional programs and

who may plan to transfer to a four-year college or university after completing their community college program.

(3) *Associate in Applied Science degree (A. A. S.)* is awarded to students majoring in one of the occupational-technical curriculums and who may plan to obtain a full-time job immediately upon graduation from the community college.

(4) *Diploma* is awarded to students who complete one of the two-year diploma occupational curriculums.

(5) *Certificate* is awarded to students who complete one of the approved curriculums that are 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 particular 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 (course work 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 work attempted and which is applicable toward graduation in his particular curriculum;
(6) Have filed an application for graduation in the Office of Admissions and Records;
(7) Have resolved all financial obligations to the College and returned all materials including library books;
(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 particular 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 (course work 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 materials including library books;
(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 Instructon, 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 change 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 penalty may be made

within the first three weeks after the beginning of a quarter. If a student's work has been passing up to that time, he will receive a grade of "W" for withdrawal. After that time the student may receive a grade of "W" if his work has been satisfactory or will receive a failing grade of "F" if his work has been unsatisfactory up to the time of official withdrawal. In all cases the word "Withdrawn" will be written on his permanent academic record.

(2) Addition of a course:

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

(3) Withdrawal from the College:

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

Academic Warning

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

Academic Probation

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

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

Academic Suspension

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

Academic Dismissal

Students who have been placed on academic suspension and achieve a 2.0 average for the quarter following their reinstatement must maintain at least a 1.5 in each subsequent quarter of attendance. The student remains on probation until his over-all grade point average arises to 1.5 or higher. Failure to make a 1.5 in each subsequent quarter will result in academic dismissal.

Examinations

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

Normal Academic Load

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

PART III

STUDENT SERVICES

COUNSELING

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

The counseling office functions to assist 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 the Counseling Office. The test battery of the American College Testing Program (ACT) is required for all new students planning to enter one of the associate degree, diploma, or certificate programs. This ACT test battery is administered at the College and other test centers prior to registration. In addition, all students who plan to transfer to a four-year college or university which requires the College Board Scholastic Aptitude Test (SAT) of the College Entrance Examination Board will be requested to submit these test scores to the Community College.

Applicants must take the ACT test battery at a national test center (Virginia Western Community College is a national test center) on a national test date, as described in the ACT *Student Registration Manual.* For information about registering to take the ACT test battery, or to secure a copy of the *Student Registration Manual,* contact your high school guidance office, the College Counseling Office, or write to:

Registration Department
American College Testing Program
P. O. Box 414
Iowa City, Iowa 52240.

Tests for students interested in one of the occupational-technical programs are available to provide special information for helping students determine their future occupational and educational plans. In addition, other special tests and interest inventories are available at the Counseling Office.

Instructors in each curriculum of the College also have tests established for their courses and programs.

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

An orientation 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—composed of representatives of the administrative, counseling, and instructional staffs—is appointed by the President of the College for the purpose of providing information concerning aid programs, administering funds granted by donors, determining need, assessing applications, and granting awards.

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

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 Counseling Office.

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 relate to their college programs. Students who work more than 20 hours per week are advised to adjust their course loads accordingly. (Also see section "Placement Service.")

Individual assistance in securing part-time employment is available through the Counseling Office.

Work-Study Program

Numerous jobs on campus are available each year under the Work-Study Program. Application forms are available in the Counseling Office.

Student Loans

Students who need student loans should contact the Counseling Office for information.

Students who are residents of Virginia are eligible to apply for loans under the State Education Assistance Authority Plans. Loans are made through commercial banks at a 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 patricipating banks, contact the College or write to State Education Assistance Authority, 1010 State-Planters Building Richmond, Virginia 23219.

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

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

The awarding of financial aid requires that the student complete an application for the aid desired, which is deposited with the Financial Aids Officer, who is located in the Counseling Office.

Students desiring financial assistance are urged to contact the Financial Aids Officer as early as practicable before enrollment at the College in order to ensure the greatest possible consideration for the students' individual financial needs.

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.

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.

PLACEMENT SERVICE

The College maintains a placement service in the Counseling Office for students who wish to secure part-time or full-time employment while attending college, during vacations, or after graduation. Occupational information on job requirements and opportunities is provided in the Counseling Office. 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 snack areas 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 is available to provide additional information of interest. The handbook will describe student activities and organizations and will also list the College rules and regulations. It serves as a valuable reference for the student and the student is expected to be familiar with its contents.

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 individual is considered a responsible adult, and it is assumed that men and women of college age will maintain standards of conduct appropriate to membership in the college community. Emphasis is placed on standards of student conduct rather than on limits or restrictions of students. Guidelines and regulations governing student conduct usually are developed by representatives of the students, faculty, counseling staff, and administration. The College refrains from imposing a rigid code of discipline but reserves the right to take disciplinary action compatible with 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 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 State Director 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 Director to the Administration of each Community College, subject to review by the Director or his delegated representative. When the penalty for misconduct is suspension or dismissal the student may appeal the decision to the Virginia Western Community 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 of the Virginia Community College System 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 constitute a 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 that are prohibited by law.
4. Any person currently not a student is not allowed to participate in demonstrations on the campus.

PART IV

CURRICULA

Associate in Applied Science Degree

Accounting
Architectural Engineering Technology
Business Management
Civil Engineering Technology
Commercial Arts
Communication Technology (Television & Radio)
Electrical Engineering Technology
Mechanical Engineering Technology
Police Science
Secretarial Science

Associate in Arts

Liberal Arts

Associate in Science

Business Administration
Pre-Engineering
Pre-Teacher Education
Science

Diploma Curriculum

Automotive Mechanics

Certificate Curricula

Dental Assistant
Mechanical Drafting
Traffic and Transportation Management

Proposed Curricula and Programs

Aeronautical Maintenance Technology
Data Processing
Inhalation Therapy
Radiologic Technology

ACCOUNTING

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

Occupational Objectives:

Bank Teller	Comptroller Aide
Bookkeeper	Junior Accountant

Admission Requirements: In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Applied Science degree program in Accounting requires proficiency in high school English and high school mathematics. Students who are not proficient in English and mathematics will be required to correct their deficiencies in the Preparatory (Foundation) Program before entering the Accounting curriculum.

Program Requirements: The first three quarters (first year) of the Associate in Applied Science degree program in Accounting are similar to the program in Business Management. In the second year each student will pursue his special field in accounting and will be required to complete BUAD 214, 215, and 220. Approximately one-half of the curriculum will include courses in accounting with the remaining courses in related subjects, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in accounting. Each student is urged to consult with the Counseling Department and his faculty advisor in planning his program and selecting his electives. Upon satisfactory completion of the six-quarter program listed herein, the student will be awarded the Associate in Applied Science degree with a major in Accounting.

ACCOUNTING

Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
BUAD 100	Introduction to Business	3	0	3
BUAD 111	Accounting I	3	2	4
BUAD 156	Office Machines	1	2	2
ENGL 101	Communication Skills I	3	0	3
MATH 151	Business Mathematics I	3	0	3
GENL 100	Orientation	1	1	1
	Total	14	5	16
	SECOND QUARTER			
BUAD 112	Accounting II	3	2	4
BUAD 170	Business Organization & Management	3	0	3
ECON 160	American Economics	3	0	3
ENGL 102	Communication Skills II	3	0	3
MATH 152	Business Mathematics II	3	0	3
PHED 101	Health, Phys. Ed., or Recreation			1
	Total			17
	THIRD QUARTER			
BUAD 106	Office Procedures (or Elective)	2	0	2
BUAD 113	Accounting III	3	2	4
ENGL 136	Speech Communications	3	0	3
NASC 100	Survey of Science (or Elective)	3	2	4
PSYC 128	Human Relations	3	0	3
PHED 102	Health, Phys. Ed., or Recreation			1
	Total			17
	FOURTH QUARTER			
BUAD 214	Intermediate Accounting I	4	0	4
BUAD 294	Introduction to Business Statistics	3	0	3
DAPR 100	Introduction to Data Processing (or DAPR Elective)	3	2	4
ECON 226	Industrial Economics (or Elective)	3	0	0-3
ENGL 280	Business English	3	0	3
	Total			14–17

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
BUAD 215	Intermediate Accounting II	4	0	4
BUAD 220	Cost Accounting	3	0	3
BUAD 240	Business Finance	3	0	3
BUAD 241	Business Law I	3	0	3
GOVT 180	American Constitutional Government	3	0	3
PHED 103	Health, Phys. Ed., or Recreation			1
	Total			17
	SIXTH QUARTER			
BUAD 227	Auditing	3	0	3
BUAD 242	Business Law II	3	0	3
BUAD 246	Money and Banking	3	0	3
BUAD 248	Business Taxes	3	0	3
BUAD 299	Seminar & Project in Business Administration	2	0	2
SECR 110	Personal Typing* (or Elective)	1	3	2
	Total	15		16

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

ARCHITECTURAL ENGINEERING TECHNOLOGY

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

Purpose: Architectural Engineering Technology is concerned with the design, supervision, and construction of homes, factories, schools, stores and municipal projects. The work is both creative and practical; the students are taught to design, draw plans, and follow through with construction details and methods. Emphasis is placed on architectural practices, which include such subjects as building specification and codes, building design costs and estimates, and materials and methods of construction, as well as the basic skills of drawing and sketching. The Associate in Applied Science degree curriculum in architectural engineering technology is designed to prepare persons for full-time employment immediately upon completion of the community college program.

Occupational Obectives: Successful graduates of this program are presented with many varied job opportunities in architectural offices and with building contractors.

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 Appied Science degree curriculum in Architectural 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 algebra required, 1 unit geometry or trigonometry)
unit of laboratory science (preferably physical science)
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 Engineering Technology curriculum.

Program Requirements: Approximately one-half of the curriculum will include courses in architectural engineering technology with the remaining courses in related subects, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in Architectural 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 herein, the student will be awarded the Associate in Applied Science degree with a major in Architectural Engineering Technology.

ARCHITECTURAL ENGINEERING TECHNOLOGY

Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
DRFT 126	Introduction to Graphic Presentation	2	3	3
ENGL 101	Communication Skills I	3	0	3
ENGR 100	Introduction to Engineering	0	3	1
PHED 101	Health, Phys. Ed., or Recreation	0		1
MATH 121	Engineering Technical Mathematics 1	5	0	5
PHYS 121	General Physics I	3	3	4
GENL 100	Orientation	1	1	1
	Total			18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	SECOND QUARTER			
ARCH 114	Architectural Drafting I	1	3	2
ARCH 141	Materials & Methods of Construction I	2	3	3
ENGL 102	Communication Skills II	3	0	3
MATH 122	Engineering Technical Mathematics II	5	0	5
PHED 102	Health, Phys. Ed., or Recreation			1
PHYS 122	General Physics II	3	3	4
	Total			18
	THIRD QUARTER			
ARCH 115	Architectural Drafting II	1	3	2
ENGR 151	Mechanics I (Statics)	3	0	3
ENGL 136	Speech Communications	3	0	3
MATH 123	Engineering Technical Mathematics III	5	0	5
PHYS 123	General Physics III	3	3	4
PHED 103	Health, Phys. Ed., or Recreation			1
	Total			18
	FOURTH QUARTER			
ARCH 142	Materials & Methods of Construction II	2	3	3
ARCH 221	Architectural Design I	2	6	4
ARCH 226	Art and Architecture	3	0	3
ENGR 152	Mechanics II (Strength of Materials)	3	3	4
CIVL 180	Elements of Surveying	3	3	4
	Total			18
	FIFTH QUARTER			
ARCH 222	Architectural Design II	2	6	4
ARTS 126	Free-Hand Sketching	0	6	2
ARCH 204	History of Architecture I	3	0	3
ARCH 236	Building Electric Power Equipment	3	0	3
GOVT 180	American Constitutional Government	3	0	3
PSYC 128	Human Relations	3	0	3
	Total			18
	SIXTH QUARTER			
ARCH 205	History of Architecture II	3	0	3
ARCH 223	Architectural Design III	2	6	4
ARCH 237	Building Mechanical Equipment	3	0	3
ARCH 277	Building Codes & Contract Documents	3	0	3
ARCH 299	Seminar and Project in Architectural Technology			2
ECON 160	American Economics	3	0	3
	Total			18
	Total Minimum Credits for an Architectural Technology Major			97

AUTOMOTIVE MECHANICS

Degree: Diploma

Length: Six-Quarter (two-year) Program

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

The Automotive Mechanics curriculum is designed to advance the individual's mechanical knowledge of the principles of operation and theory of modern automobiles, to develop his mechanical skills to a point where he 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 efficiently analyze automobile defects, repair and adjustment needs, along with the estimation of customer cost for the repairs and adjustments.

Occupational Objectives:

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

Admission Requirements: In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), a good understanding of mathematics and science is needed. The Counseling Office may administer tests to determine if the applicant has sufficient background in these areas to be successful in the program. Students who do not meet these minimum requirements may correct their deficiencies in the Preparatory Foundations Program.

Program Requirements: Approximately one-half of the curriculum will include courses in automotive 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 Automotive Technology. Each student is advised to consult with his faculty advisor and the Counseling Department of the College in planning his program. Students completing the six-quarter planned program listed here will be awarded a Diploma in Automotive Technology.

AUTOMOTIVE MECHANICS

Two-Year Diploma Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
AUTO 111	Automotive Engines I	2	6	4
AUTO 121	Automotive Fuel Systems I	2	3	3
AUTO 151	Auto Power Trains I	2	7	4
ENGL 101	Communication Skills I	3	0	3
MATH 011	Mathematics I	2	2	3
GENL 100	Orientation	1	1	1
	Total			18
	SECOND QUARTER			
AUTO 112	Automotive Engines II	2	6	4
AUTO 122	Automotive Fuel Systems II	2	3	3
AUTO 152	Auto Power Trains II	2	7	4
ENGL 102	Communication Skills II	3	0	3
MATH 012	Mathematics II	2	2	3
PHED 100	Phys. Ed.			1
	Total			18
	THIRD QUARTER			
AUTO 113	Automotive Engines III	2	6	4
AUTO 123	Automotive Fuel Systems III	2	3	3
AUTO 153	Auto Power Trains III	2	7	4
ENGL 136	Speech Communications	2	2	3
MATH 013	Mathematics III	2	2	3
	Total			17

Name _____

Address _____

City_____ **State**_____ **Zip No.**_____

I am interested in enrolling at Virginia Western Community College and would like additional information. Please send me the following:

___Catalog ___Application blanks

___I am a new college student ___I am a transfer student

___I am planning to attend Summer Quarter only

My major field of interest is_____

(Tear Out and Mail)

Place
Stamp
Here

Coordinator of Admissions and Records
Virginia Western Community College
P. O. Box 4195
3095 Colonial Avenue, S.W.
Roanoke, Virginia 24015

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FOURTH QUARTER			
AUTO 241	Automotive Electrical Systems I	2	3	3
AUTO 269	Automotive Suspension & Braking	2	9	5
PSYC 128	Human Relations	3	0	3
PHYS 014	Physics I	3	0	3
MECH 020	Machine Shop Practice	0	6	2
HLTH 100	Health	2	0	2
	Total			18
	FIFTH QUARTER			
AUTO 242	Electrical Systems II	2	3	3
AUTO 288	Automotive Service Procedures	0	9	3
AUTO 271	Shop Management I	3	0	3
ECON 160	American Economics	3	0	3
PHYS 015	Physics II	3	0	3
WELD 026	Welding	1	6	3
	Total			18
	SIXTH QUARTER			
AUTO 243	Electrical Systems III	2	3	3
AUTO 238	Air Conditioning	2	3	3
AUTO 272	Shop Management II	3	0	3
AUTO 289	Automotive Service Procedures II	0	9	3
AUTO 299	Seminar and Project	0	6	2
GOVT 180	American Government	3	0	3
	Total			17

BUSINESS ADMINISTRATION

Degree: Associate in Science

Length: Six-Quarter (two-year) Program

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

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

Admission Requirements: In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in

Science degree program in Business Administration requires the satisfactory completion of the following high school units or equivalent as a minimum:

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

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

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 science, and social sciences in addition to the principles of economics and principles of accounting usually required in the first two years of a baccalaureate business administration curriculum. *Each student is urged to acquaint himself with the requirements of the major department in the college or university to which transfer is contemplated and also to consult with the Counseling Department of the Community College in planning his program and selecting his electives.* In order to help prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college that is comparable in length and courses to the first two years of the program at the four-year college or university. Upon completion of the six-quarter program listed herein, the student will be awarded the Associate in Science degree with a major in Business Administration.

*Students are urged to check the mathematics requirements of the four-year college or university to which they plan to transfer to determine the proper mathematics course to be taken in the community college.

BUSINESS ADMINISTRATION

Associate in Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ENGL 111	English Composition I	3	0	3
	Natural Science (Lab)	3	3	4
MATH 161	College Mathematics I	3	0	3
HIST	Amer. History or History of West. Civ.	3	0	3
GENL 100	Orientation	1	1	1
	Elective	-	-	2-4
	Total			16-18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	SECOND QUARTER			
ENGL 112	English Composition II	3	0	3
	Natural Science (Lab)	3	3	4
MATH 162	College Mathematics II	3	0	3
HIST	Amer. History or History of West. Civ.	3	0	3
PHED 101	Health, Phys. Ed., or Recreation	0	3	1
	Elective	-	-	2-4
				16-18
	THIRD QUARTER			
ENGL 113	English Composition II	3	0	3
	Natural Science (Lab)	3	3	4
MATH 170	Introduction to Calculus	4	0	4
HIST	Amer. History or History of West. Civ.	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	0	3	1
	Elective	-	-	2-3
	Total			16-18
	FOURTH QUARTER			
ENGL	English and/or American Literature	3	0	3
ECON 211	Principles of Economics I	3	0	3
BUAD 211	Principles of Accounting I	3	2	4
PSYC	Psychology or Human Relations*	3-5	0	3-5
PHED 103	Health, Phys. Ed., or Recreation	0	3	1
	Elective	-	-	0-3
	Total			16-18
	FIFTH QUARTER			
ENGL	English and/or American Literature	3	0	3
ECON 212	Principles of Economics II	3	0	3
BUAD 212	Principles of Accounting II	3	2	4
GOVT	Government*	3-5	0	3-5
	Elective	-	-	0-3
	Total			15-18
	SIXTH QUARTER			
ENGL	Literature or Speech	-	-	3-5
BUAD 213	Principles of Accounting III	3	2	4
ECON 213	Principles of Economics III	3	0	3
	Humanities Elective	-	-	3-5
	Other Elective	-	-	0-4
	Total			15-18

Total Minimum Credits for a Business Administration Major 97

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

BUSINESS MANAGEMENT

Degree: Associate in Applied Science

Length: Six-Quarter (two-year) Program

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

Occupational Objectives:

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

Admission Requirements: In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Applied Science degree program in Business Management requires proficiency in high school English and high school mathematics. Students who are not proficient in English and mathematics will be required to correct their deficiencies in the Preparatory Foundations Program before entering the Business Management curriculum.

Program Requirements: The first three quarters (first year) of the Associate in Applied Science degree program in Business Management are similar to the program in Accounting. However, in the second year each student will pursue his specialty in business management. Approximately one-half of the curriculum will include courses in business management with the remaining courses in related subjects, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in business management. Each student is urged to consult with the Counseling Department and his faculty advisor in planning his program and selecting his electives. Upon completion of the six-quarter program listed on the next pages, the student will be awarded the Associate in Applied Science degree with a major in Business Management.

BUSINESS MANAGEMENT

Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
BUAD 111	Accounting I	3	2	4
BUAD 100	Introduction to Business	3	0	3
BUAD 156	Office Machines	1	2	2
ENGL 101	Communication Skills I	3	0	3
MATH 151	Business Mathematics I	3	0	3
GENL 100	Orientation	1	1	1
	Total	14	5	16
	SECOND QUARTER			
BUAD 170	Business Organization & Management	3	0	3
BUAD 112	Accounting II	3	2	4
ENGL 102	Communication Skills II	3	0	3
MATH 152	Business Mathematics II	3	0	3
GOVT 180	American Constitutional Government	3	0	3
PHED 101	Health, Phys. Ed., or Recreation			1
	Total			17
	THIRD QUARTER			
BUAD 113	Accounting III	3	2	4
BUAD 106	Office Procedures	2	0	2
ENGL 136	Speech Communications	3	0	3
NASC 100	Survey of Science (or Elective)	3	2	4
PSYC 128	Human Relations	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	0	3	1
	Total			17
	FOURTH QUARTER			
BUAD 294	Introduction to Business Statistics	3	0	3
BUAD 277	Purchasing & Materials Management (or BUAD Elec.)	3	0	3
DAPR 100	Introduction to Data Processing	3	2	4
ENGL 280	Business English	3	0	3
ECON 160	American Economics	3	0	3
	Total			16

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
BUAD 240	Business Finance	3	0	3
BUAD 241	Business Law I	3	0	3
BUAD 278	Production Planning (or BUAD Elective)	3	0	3
ECON 226	Industrial Economics (or Elective)	3	0	3
PSYC 226	Psych. Aspects of Management (or Elective)	3	0	3
PHED 103	Health, Phys. Ed., or Recreation	0	3	1
	Total			16
	SIXTH QUARTER			
BUAD 242	Business Law II	3	0	3
BUAD 246	Money and Banking	3	0	3
BUAD 286	Personnel Management	3	0	3
BUAD 299	Seminar and Project in Business Administration	2	0	2
SECR 110	Personal Typing* (or Elective)	0	6	2
	Elective	2-3	0	2-3
	Total			15-16
	Total Minimum for a Business Management Major			97

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

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 subjects applicable to the field, and to solidly support the technical knowledge with a sound foundation of mathematics, basic science, and English. This enables the technician to communicate mathematically, scientifically, and linguistically with craftsmen as well as the engineer or scientist, and to direct the work of the 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 aid.

Occupational Objectives: 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 the catalog), entry into the Associate in Applied Science degree curriculum in Civil Engineering Technology requires the satisfactory competition of the following high school units or their equivalent as a minimum:

4 units of English
4 units of mathematics (2 units of algebra, 1 unit of 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 Civil Technology curriculum.

Program Requirements: Approximately one-half of the curriculum will include courses in Civil 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 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 student will be awarded the Associate in Applied Science degree with a major in Civil Engineering Technology.

CIVIL ENGINEERING TECHNOLOGY

Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
DRFT 126	Introduction to Graphic Representation	2	3	3
ENGR 100	Introduction to Engineering	0	3	1
ENGL 101	Communication Skills I	3	0	3
MATH 121	Engineering Technical Mathematics 1	5	0	5
PHYS 121	General Physics I	3	3	4
PHED 101	Health, Phys. Ed., or Recreation			1
GENL 100	Orientation	1	1	1
	Total			18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	SECOND QUARTER			
CIVL 124	Civil Engineering Drafting I	1	3	2
CIVL 140	Construction Planning	2	3	3
ENGL 102	Communication Skills II	3	0	3
MATH 122	Engineering Technical Mathematics II	5	0	5
PHYS 122	General Physics II	3	3	4
PHED 102	Health, Phys. Ed., or Recreation			1
	Total			18
	THIRD QUARTER			
CIVL 125	Civil Engineering Drafting II	1	3	2
ENGR 151	Mechanics I (Statics)	3	0	3
ENGL 136	Speech Communications	3	0	3
MATH 123	Engineering Technical Mathematics III	5	0	5
PHYS 123	General Physics III	3	3	4
PHED 103	Health, Phys. Ed., or Recreation			1
	Total			18
	FOURTH QUARTER			
CIVL 180	Elements of Surveying	3	3	4
CIVL 256	Soil Mechanics	2	3	3
CIVL 266	Water and Sanitation	3	0	3
ENGR 152	Mechanics II	3	3	4
GOVT 180	American Constitutional Government	3	0	3
	Total			17
	FIFTH QUARTER			
CIVL 217	Reinforced Concrete Design	3	3	4
CIVL 230	Elementary Structural Analysis	3	0	3
CIVL 276	Transportation Engineering	3	0	3
CIVL 280	Advanced Surveying	3	3	4
PSYC 128	Human Relations	3	0	3
	Total			17
	SIXTH QUARTER			
CIVL 218	Structural Steel Design	4	0	4
CIVL 259	Bituminous Technology	3	3	4
CIVL 284	Route Surveying and Highway Design	2	6	4
CIVL 299	Seminar	2	0	2
ECON 160	American Economics	3	0	3
	Total			17
	Total Minimum Credits Required for a Civil Engineering Technology Major			102

COMMERCIAL ARTS

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 in 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 Preparatory (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 subjects, 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 advisor 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 Commercial Art.

COMMERCIAL ARTS

Associate in Applied Science Degree Program

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 I	3	0	3
ARCH 114	Architectural Drafting I	1	3	2
ARTS 121	Theory and Practice of Drawing I	1	5	3
ENGL 101*	Communication Skills I	3	0	3
GOVT 180	American Constitutional Government	3	0	3
GENL 100	Orientation	1	1	1
	Total			18
	SECOND QUARTER			
ARTS 105	Introduction to the Arts II	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	1	6	3
ENGL 102*	Communication Skills II	3	0	3
PSYC 110 or	Applied Psychology			
PSYC 128	Human Relations	3	0	3
	Total			18
	THIRD QUARTER			
ARTS 106	Introduction to the Arts III	3	0	3
ARTS 113	History and Appreciation of Art III	3	0	3
ARTS 123	Theory and Practice of Drawing III	1	5	3
ARTS 180	Introduction to Photography	1	3	2
ECON 160	American Economics	3	0	3
ENGL 136*	Speech Communications	3	0	3
PHED 101	Health, Phys. Ed., or Recreation			1
	Total			18
	FOURTH QUARTER			
ARTS 171	Typography I	2	3	3
ARTS 221	Advanced Drawing I	0	6	2
ARTS 231	Theory and Practice of Painting I	1	5	3
ARTS 261	Advertising Design I	2	3	3
ARTS 271	Graphic Techniques I	1	6	3
ARTS 281	Photography Workshop I	0	3	1
PHED 102	Health, Phys. Ed., or Recreation			1
	Total			16

*English 111, 112, 113 sequence is recommended in place of English 101, 102, and 136 if the student plans to transfer to a baccalaureate program.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
ARTS 172	Typography II	2	3	3
ARTS 187	Color Photography	1	4	2
ARTS 222	Advanced Drawing II	0	6	2
ARTS 232	Theory and Practice of Painting II	1	5	3
ARTS 262	Advertising Design II	2	3	3
ARTS 272	Graphic Techniques II	1	6	3
PHED 103	Health, Phys. Ed., or Recreation			1
	Total			17
	SIXTH QUARTER			
ARTS 223	Advanced Drawing III	0	6	2
ARTS 233	Theory and Practice of Painting III	1	6	3
ARTS 263	Advertising Design III	2	3	3
ARTS 282	Photography Workshop II	0	3	1
ARTS 299	Seminar and Project in Art	2	0	2
ARTS	Elective	-	-	3
	Total			14
	Total Minimum Credits Required for a Commercial Arts Major			98

SUGGESTED ELECTIVES:

ARTS 196	Art Workshop
ARTS 274	Art Printing
ARTS 283	Photography Workshop III
ARTS 241	Theory and Practice of Sculpture
ARTS 091	Workshop in Watercolor

COMMUNICATION TECHNOLOGY

(Radio and Television)

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 operation is expanding. The purpose of this program is to meet this growing need. The Communication 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 Technician

Admission Requirements: In addition to the admissions requirements established for the college (as listed in the section on admissions requirements in Part II of this catalog), entry into the Communication Technology program requires a proficiency in high school English and some artistic talent to be determined by tests and counseling. Students who are not proficient in English will be required to correct their deficiencies in the Preparatory (Foundation) Program before entering the Communication Technology curriculum.

Program Requirements: Approximately one-half of the curriculum will include courses in communication 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 Communication Technology. Each student is advised to consult with his faculty advisor and the Counseling Department in planning his program and selecting his electives. Students satisfactorily completing the six-quarter program listed below will be awarded an Associate in Applied Science degree with a major in Communication Technology with specialization in the field of Television.

COMMUNICATION TECHNOLOGY

(Radio and Television)

Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ARTS 101	General Art I	2	3	3
ENGL 101**	Communication Skills I	3	0	3
GOVT 180	American Constitutional Government	3	0	3
PHED 101	Health, Phys. Ed., or Recreation	-	-	1
RDTV 111	Introduction to Television I	3	3	4
RDTV 181	Television Workshop I	0	6	2
GENL 100	Orientation	1	1	1
	Total			17

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	SECOND QUARTER			
ARTS 102	General Art II	2	3	3
ENGL 102**	Communication Skills II	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	-	-	1
PSYC 128	Human Relations	3	0	3
RDTV 112	Introduction to Television II	3	3	4
RDTV 182	Television Workshop II	0	6	2
	Total			16
	THIRD QUARTER			
ARTS 103	General Art III	2	3	3
ECON 160	American Economics	3	0	3
ENGL 136**	Speech Communications	3	0	3
PHED 103	Health, Phys. Ed., or Recreation	-	-	1
RDTV 113	Introduction to Television III	3	3	4
RDTV 183	Television Workshop III	0	6	2
	Total			16
	FOURTH QUARTER			
ARTS 261	Advertising Design I	2	3	3
BUAD 100	Introduction to Business	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	0	6	2
	Total			17
	FIFTH QUARTER			
ARTS 262	Advertising Design II	2	3	3
BUAD 170	Business Organization and 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	0	6	2
	Total			17
	SIXTH QUARTER			
ARTS 263	Advertising Design III (or Elective)	2	3	3
RDTV 223	Television Production III	3	6	5
RDTV 226	Television & Radio Newswriting	3	0	3
RDTV 283	Television Workship VI	0	6	2
RDTV 299	Seminar & Project in Communication Technology	3	3	4
	Total	11	18	17
	Total Minimum Credits for a Communication Technology (Television) Major			97

**English 111, 112, 113 sequence is recommended in place of English 101, 102, and 136 if the student plans to transfer to a baccalaureate program.

DENTAL ASSISTANT

Degree: Certificate

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 Counseling Department and Department Chairman is required.

Program Requirements: Upon admission, and during the course of the program the dental faculty will carefuly 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

(Four-Quarter Certificate Program)

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
GENL 100	Orientation	1	1	1
ENGL 101	Communication Skills I	3	0	3
MATH 151	Business Mathematics I	3	0	3
DENT 100	Introduction to Dental Assisting	2	0	2
DENT 101	Dental Science I	2	6	4
DENT 110	Dental Materials	2	6	4
	Total			17
	SECOND QUARTER			
ENGL 102	Communication Skills II	3	0	3
DENT 102	Dental Science II	2	6	4
DENT 111	Clinical Procedures I	2	6	4
DENT 121	Chairside Assisting I	2	6	4
	Total			15
	THIRD QUARTER			
SPDR 136	Speech Communications	3	0	3
PSYC 110 or PSYC 128	Principles of Applied Psychology; or Human Relations	3	0	3
SECR 110*	Personal Typing	1	3	2
DENT 112	Clinical Procedures II	2	6	4
DENT 122	Chairside Assisting II	2	6	4
	Total			16
	FOURTH QUARTER			
ECON 160	American Economics	3	0	3
GOVT 180	American Constitutional Government	3	0	3
SECR 136	Filing and Records Management	1	2	2
DENT 190	Supervised Clinical Experience	1	12	5
DENT 199	Dental Assistant Seminar	2	0	2
	Total			15
	Total Minimum Credits for a Dental Assistant Major			62-63

*With typing proficiency demonstrated, elective may be substituted. Recommend Elective MATH 151 or BUAD 110.

ELECTRICAL 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 math, science, and electronics. In addition, the student can specialize in one of the two options—communication electronics, or industrial electronics. The Electrical Engineering Technology curriculum is designed primarily for persons seeking employment in Electrical Engineering Technology immediately upon completion of the community college program.

Occupational Objectives:

Communication Electronics Technician
Industrial Electronics Technician

Admission Requirements: In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of the catalog), entry into the Associate in Applied Science degree curriculum in Electrical 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)
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 Electrical Engineering Technology curriculum.

Program Requirements: Approximately one-half of the curriculum will include courses in electrical 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 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:

Communication Electronics ELEC 241-242-243
Industrial Electronics ELEC 211-212-213

Upon satisfactory completion of the six-quarter curriculum listed herein, the student will be awarded the associate in Applied Science degree with a major in Electrical Engineering Technology.

ELECTRICAL ENGINEERING TECHNOLOGY

Associate in Applied Science Degree Program

Technical Options: Communication Electronics, Industrial Electronics

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ENGL 101	Communication Skills I	3	0	3
MATH 121	Engineering Technical Mathematics I	5	0	5
ENGR 121	Engineering Graphics	1	3	2
ENGR 100	Introduction to Engineering Technology	0	3	1
PHYS 121	College Physics I	3	3	4
PHED 101	Health, Phys. Ed., or Recreation			1
GENL 100	Orientation	1	1	1
	Total			17
	SECOND QUARTER			
ENGL 102	Communication Skills II	3	0	3
MATH 122	Engineering Technical Mathematics II	5	0	5
PHYS 122	College Physics II	3	3	4
ELEC 111	Electrical Circuits I	4	3	5
ELEC 118	Electrical Shop I	0	3	1
	Total			18
	THIRD QUARTER			
ENGL 136	Speech Communications	3	0	3
MATH 123	Engineering Technical Mathematics III	5	0	5
PHYS 123	College Physics III	3	3	4
DRFT 256	Electronics Drafting	1	3	2
ELEC 112	Electrical Circuits II	3	4	4
	Total			18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FOURTH QUARTER			
GOVT 180	American Constitutional Government	3	0	3
ELEC 119	Electrical Shop II	0	3	1
ELEC 201	Electrical Engineering Technology	5	3	6
	*Technical Option	3	3	4
ELEC 277	Electrical Measurements	3	3	4
	Total			18
	FIFTH QUARTER			
PSYC 128	Human Relations	3	0	3
ELEC 202	Electrical Engineering Technology II	5	6	7
	*Technical Option	3	3	4
PHED 102	Health, Phys. Ed., or Recreation	-	-	1
	**Technical Elective	3	0	3
	Total			18
	SIXTH QUARTER			
ECON 160	American Economics	3	0	3
ELEC 203	Electrical Engineering Technology III	5	6	7
	*Technical Option	3	3	4
PHED 103	Health, Phys. Ed., or Recreation	-	-	1
ELEC 299	Seminar and Project in Electrical Technology	2	0	2
	Total			17

*Technical Options

Communications Electronics—ELEC 241, 242, 243
Industrial Electronics—ELEC 211, 212, 213

**Technical Electives

Microwave Techniques—ELEC 248
Electronic Data Processing—ELEC 258

LIBERAL ARTS

Degree: Associate in Arts

Length: Six-Quarter (two-year) Program

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

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

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

4 units of English
2 units of mathematics (algebra and geometry)*
1 unit of laboratory science
1 unit of history

The remaining units are elective subjects, but at least two units of a foreign language are recommended. Students who do not meet these requirements may be permitted to correct their deficiencies in the Preparatory (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 that is comparable in length and courses to the first two years of the program at the four-year college or university. Upon satisfactory completion of the six-quarter program listed herein, the student will be awarded the Associate in Arts degree with a major in the Liberal Arts.

*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.

LIBERAL ARTS

Associate in Arts Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ENGL 111	English Composition I	3	0	3
	Natural Science (Lab)	3	3	4
MATH 181	General College Math I	3	0	3
HIST	Amer. History or History of West. Civ.	3	0	3
	Foreign Language I*	3	2	4
GENL 100	Orientation	1	1	1
	Total			18
	SECOND QUARTER			
ENGL 112	English Composition II	3	0	3
	Natural Science (Lab)	3	3	4
MATH 182	General College Math II	3	0	3
HIST	Amer. History or History of West. Civ.	3	0	3
	Foreign Language II*	3	2	4
PHED 101	Health, Phys. Ed., or Recreation	-	-	1
	Total			18
	THIRD QUARTER			
ENGL 113	English Composition III	3	0	3
	Natural Science (Lab)	3	3	4
MATH 183	General College Math III	3	0	3
HIST	Amer. History or History of West. Civ.	3	0	3
	Foreign Language III*	3	2	4
PHED 102	Health, Phys. Ed., or Recreation	-	-	1
	Total			18
	FOURTH QUARTER			
ENGL	English and/or American Literature	3	0	3
	Foreign Language IV*	3	2	3
GOVT	Government**	3-5	0	3-5
PHED 103	Health, Phys. Ed., or Recreation	-	-	1
	Humanities Elective	-	-	3-5
	Other Elective	-	-	0-3
	Total			15-18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
ENGL	English and/or American Literature	3	0	3
	Foreign Language V*	3	2	3
PSYC	Psychology or Human Relations**	3-5	0	3-5
	Humanities or Social Science Elective	-	-	3-5
	Other Elective	-	-	0-3
	Total			14-18
	SIXTH QUARTER			
ENGL	English and/or American Literature	3	0	3
	Foreign Language VI*	3	2	3
ECON	Economics**	3-5	0	3-5
	Humanities or Social Science or Speech Elec.	–	-	3-5
	Other Elective	-	-	0-3
	Total			14-17
	Total Minimum Credits for a Liberal Arts Major			97

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

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

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 local area, 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 Department.

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 as-

sociated 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 of Completion. Job opportunities for mechanical draftsmen exist in many areas, primarily in the manufacturing industries.

MECHANICAL DRAFTING

One-Year Certificate Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
DRFT 131	Mechanical Drafting I	2	12	5
ENGL 101	Communication Skills I	3	0	3
MATH 011	Elements of Mathematics I	2	2	3
INDT 141	Methods of Manufacture II	2	3	3
GENL 100	Orientation	1	1	1
ECON 160	American Economics	3	0	3
	Total	13	18	18
	SECOND QUARTER			
DRFT 132	Mechanical Drafting II	2	12	5
ENGL 102	Communication Skills II	3	0	3
MATH 012	Elements of Mathematics II	2	2	3
INDT 142	Methods of Manufature II	2	3	3
PSYC 128	Human Relations	3	0	3
	Total	12	17	17
	THIRD QUARTER			
DRFT 133	Mechanical Drafting III	2	12	5
ENGL 136	Speech Communications	3	0	3
GOVT 180	American Constitutional Government	3	0	3
MATH 013	Elements of Mathematics III	2	2	3
INDT 143	Methods of Manufacture	2	3	3
	Total	12	17	17

MECHANICAL ENGINEERING TECHNOLOGY

Degree: Associate in Applied Science

Length: Six-quarter (two-year) program

Purpose: The Mechanical Engineering Technology curriculum is designed primarily 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, and, as such, enters into every business, industrial, and community activity.

Occupational Objectives: The technician usually serves as a liaison between the engineering and production departments, and he should be capable of doing such things as working in design and development of engineering plans; drafting; erecting and commissioning engineering equipment; estimating; inspecting and testing engineering equipment; maintaining engineering machinery or engineering services and locating faults; operating, maintaining, and repairing engineering plants; or performing activities connected with research and development, sales and representation, servicing and testing of materials and components, advising consumers, and training and education.

Admission Requirements: In addition to the admission requirements established for the college (as listed in this 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, 1 unit of geometry or trigonometry)
1 unit of a laboratory science (preferably a physical science)
1 unit of social studies

Students who do not meet these requirements may be permitted to correct their deficiencies in the Preparatory (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 subjects, 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 student will be awarded the Associate in Applied Science degree with a major in Mechanical Engineering Technology.

MECHANICAL ENGINEERING TECHNOLOGY

Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ENGL 101	Communication Skills I	3	0	3
ENGR 100	Introduction to Engineering Technology	0	3	1
ENGR 121	Engineering Graphics I	1	3	2
GENL 100	Orientation	1	1	1
MATH 121	Engineering Technical Mathematics I	5	0	5
PHED and/or HEALTH	Physical Education and/or Health	-	-	2
PHYS 121	College Physics I	3	3	4
	Total			18
	SECOND QUARTER			
ENGL 102	Communication Skills II	3	0	3
ENGR 122	Engineering Graphics II	1	3	2
INDT 141	Methods of Manufacturing I	2	3	3
MATH 122	Engineering Technical Mathematics II	5	0	5
PHED and/or HEALTH	Physical Education and/or Health	-	-	1
PHYS 122	College Physics II	3	3	4
	Total			18
	THIRD QUARTER			
ENGL 136	Speech Communications	3	0	3
ENGR 123	Descriptive Geometry	2	3	3
ENGR 151	Mechanics I (Statics)	3	0	3
MATH 123	Engineering Technical Mathematics III	5	0	5
PHYS 123	College Physics III	3	3	4
	Total			18
	FOURTH QUARTER			
ELEC 214	Electricity I	3	3	4
ENGR 152	Mechanics II (Materials)	3	3	4
GOVT 180	American Constitutional Government	3	0	3
INDT 142	Methods of Manufacturing II	3	0	3
MECH 264	Thermodynamics I	3	3	4
	Total			18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
INDT 270	Industrial Management	3	0	3
ENGR 153	Mechanics III (motion)	2	3	3
MECH 214	Mechanical Engineering Design	3	3	4
MECH 265	Thermodynamics II	3	3	4
PSYC 128	Human Relations	3	0	3
	Total			17
	SIXTH QUARTER			
ECON 160	American Economics	3	0	3
MECH 215	Mechanical Engineering Design II	3	3	4
MECH 248	Physical Metallurgy	3	3	4
MECH 267	Mechanics of Fluids	3	3	4
MECH 299	Mechanical Seminar	0-2	0-6	2
	Total			17

POLICE SCIENCE

Degree: Associate in Applied Science

Length: Six-Quarter (two-year) Program

Purpose: The curiculum 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 which will prepare the student to enter any of the many fields of law enforcement. Although the curriculum is primarily designed for persons who seek full-time employment in law enforcement, several adjustments are possible to enable a student to prepare for transfer to a baccalaureate degree program in Police Science.

Occupational Objectives:

Commercial and Industrial Security Officer
Local, State, and Federal Enforcement Officers
Policeman
Private or Government Investigator

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

1. A written statement from the 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 a representative of the Police Science Department.
3. Satisfactory results on any additional tests required.
4. *Special Requirements:* Students who wish to enroll in the Police Science program with the objective of obtaining employment with law enforcement agencies are advised that the following qualifications are generally prerequisite to such employment:
   a. Excellent physical condition, free from any physical or mental condition which might adversely affect acceptance or performance as a law enforcement officer.
   b. Possess normal hearing and normal color vision. Eye functions must be normal. Visual acuity must not be less than 20/40 in either eye without correction.
   c. Weight should be in proportion to height. Very few law enforcement agencies will accept male applicants who are less than 5′ 8″ in height.
   d. Must be of excellent moral character. Must not have been convicted of any crime involving moral turpitude or any felony. Must not have received an 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 subjects, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in police science. Each student is urged to consult with his faculty advisor and the Counseling Department of the Community College in planning his program and selecting his electives. Students who plan to transfer to a senior college or university to complete a baccalaureate degree program in Police Science (Law Enforcement) may be advised to substitute several other courses than those listed herein. Uopn satisfactory completion of the six-quarter program listed, the student will be awarded the Associate in Applied Science degree with a major in Police Science.

POLICE SCIENCE

Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
BIOL 101	General Biology I (or Science elective)	3	3	4
ENGL 101*	Communication Skills I	3	0	3
PLCE 100	Introduction to Law Enforcement	3	0	3
PSYC 110*	Applied Psychology or Human Relations	3	0	3
SOCI 101	Introductory Sociology I (or Sociology elective)	3	0	3
GENL 100	Orientation	1	1	1
	Total			17
	SECOND QUARTER			
BIOL 102	General Biology II (or elective)	3	3	4
ENGL 102*	Communication Skills II	3	0	3
PLCE 111	Police Administration and Organization I	3	0	3
PSYC 116*	Psychology of Personal Adjustment (or PSYC elec.)	3	0	3
SOCI 102	Introductory Sociology II (or elective)	3	0	3
	Total			16
	THIRD QUARTER			
BIOL 103	General Biology III (or elective)	3	3	4
ENGL 136*	Speech Communications	3	0	3
PLCE 112	Police Administration and Organization II	3	0	3
PLCE 160	Police Communications and Records	3	0	3
SOCI 103 or	Introductory Sociology III (or elective)	3	0	3
PLCE 120*	Special Enforcement Problems			
PHED 101	Health, Physical Education, or Recreation			1
	Total			17
	FOURTH QUARTER			
GOVT 281	United States Government I (or GOVT elective)	3	0	3
MATH*	Mathematics (or elective)	3-5	0	3-5
PLCE 126	Prevention and Control of Juvenile Delinquency	3	0	3
PLCE 130	Criminal Law	3	0	3
PLCE 244	Principles of Criminal Investigation	3	0	3
PHED 102	Health, Physical Education, or Recreation	-	-	1
				16-18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
ARTS 180	Introduction to Photography (or elective)	1	3	2
GOVT 282	United States Government II (or GOVT elective)	3	0	3
PLCE 136	Legal Evidence	3	0	3
PLCE 187*	Traffic Administration and Control (optional)	0-3	0	0-3
PLCE 245	Advanced Criminal Investigation (or elective)	3	0	3
SOCI 276	Criminology	3	0	3
PHED 103	Health, Physical Education, or Recreation			1
	Total			15-18
	SIXTH QUARTER			
ECON 160	American Economics	3	0	3
GOVT 283	United States Government III (or GOVT elective)	3	0	3
PLCE 237	Administration of Justice (or PLCE elective)	3	0	3
PLCE 270*	Industrial and Commercial Security (or elective)	3	0	3
PLCE 299	Seminar and Project in Law Enforcement	-	-	2
SECR 110	Personal Typing (optional)	0-1	0-3	0-2
	Total	-	-	16-18
	Total Minimum Credits for a Police Science Major			97

*Students planning to transfer to a four-year college or university should consult with their counselor to select alternate courses for their program.

PRE-ENGINEERING

Degree: Associate in Science

Length: Six-Quarter (two-year) Program

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

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

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

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

4 units of English
4 units of mathematics (2 units of algebra, 1 unit of plane geometry, 1 unit of advanced math or trigonometry and solid geometry)
1 unit of a laboratory science
1 unit of social studies

Students who do not meet the requirements listed above may be permitted to correct their deficiencies in the Preparatory Foundations Program before entering the Pre-Engineering curriculum.

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

PRE-ENGINEERING

Associate in Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
CHEM 111	General Inorganic Chemistry I	3	3	4
ENGL 111	English Composition I	3	0	3
ENGR 101	Introduction to Engineering	1	2	2
ENGR 121	Engineering Graphics I	1	3	2
MATH 141	Introductory Mathematical Analysis	5	0	5
PHED 101	PHED/Health	0	2	1
GENL 100	Orientation	1	1	1
	Total			18
	SECOND QUARTER			
CHEM 112	General Inorganic Chemistry II	3	3	4
ENGL 112	English Composition II	3	0	3
ENGR 102	Introduction to Engineering Methods	1	2	2
ENGR 122	Engineering Graphics II	1	3	2
MATH 142	Mathematics Analysis II	5	0	5
PHED 102	PHED/Health	0	2	1
	Total	13	10	17
	THIRD QUARTER			
CHEM 113	General Inorganic Chemistry III	3	3	4
ENGL 113	English Composition III	3	0	3
ENGR 103	Conceptual Design and Analysis	1	2	2
ENGR 123	Descriptive Geometry	2	3	3
MATH 143	Mathematical Analysis III	5	0	5
PHED 103	PHED/Health	0	2	1
	Total	14	10	18
	FOURTH QUARTER			
ENGR 201	Mechanics of Particles	5	0	5
MATH 241	Advanced Mathematical Analysis	4	0	4
ECON 211*	Principles of Economics I	3	0	3
	**Electives	-	-	6
	Total			18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
ENGR 202	Mechanics of Deformable Solids	4	0	4
MATH 242	Advanced Mathematical Analysis II	4	0	4
ECON 212*	Principles of Economics II	3	0	3
PHYS 226	Engineering Physics I	3	3	4
	**Electives	-	-	3
	Total			18
	SIXTH QUARTER			
ENRG 203	Dynamics of Deformable Bodies	3	0	3
MATH 243	Advanced Mathematical Analysis III	4	0	4
ECON 213*	Principles of Economics III	3	0	3
PHYS 227	Engineering Physics II	3	3	4
	**Electives	-	-	4
	Total			18

*A year sequence of GOVT or PSYC may be substituted.

**Electives should be chosen so as to meet the needs of the program to which the student is transferring.

PREPARATORY (FOUNDATION) PROGRAM

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 colleges.

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

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

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

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

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

PREPARATORY (FOUNDATION) PROGRAM

A typical schedule in the Developmental Program may be planned with the Counseling Department, depending on individual needs, from the following courses:

1. Orientation:

   GENL 100

2. Science:

   NASC 021—Survey of ScienceI
   NASC 022—Survey of Science II
   NASC 023—Survey of Science III

3. Language:

   ENGL 011—Verbal Expression I
   ENGL 012—Verbal Expression II
   ENGL 013—Verbal Expression III
   ENGL 040—Reading Improvement
   ENGL 041, 042—Reading Improvement

Firm _____

Street Address _____

City _____ **State** _____ **Zip No.** _____

Person to contact _____

We would appreciate assistance in arranging Training or Review programs for our employees in the following area(s); specify or check below:

___Administrative Services
___Finance
___General Management
___Manufacturing Procedures
___Marketing
___Packaging
___Drafting
___Electrical Technology
___Mechanical Technology
___Air Conditioning/Refrigeration
___Welding

(Tear Out and Mail)

Place

Stamp

Here

Director of Continuing Education
Virginia Western Community College
P. O. Box 4195
3095 Colonial Avenue, S.W.
Roanoke, Virginia 24015

4. Mathematics

MATH 031, 032—Basic Algebra
MATH 036—Basic Plane Geometry
MATH 037 or 038—Geometry and Trigonometry
MATH 039—Review of Algebra and Trigonometry

Students may register for other courses for which prerequisites have been met.

Because of the laboratory experience required in the Developmental Program a student should not register for more than 12-14 credits each quarter.

The above courses are not counted on any degree program.

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 mathematics (algebra and geometry)*
1 unit of laboratory science
1 unit of social studies

Students who do not meet these requirements may be permitted to correct their deficiencies in the Preparatory (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 the subjects they plan to teach and in general education. Thus, this curriculum requires

*Students are urged to check the mathematics requirements of the four-year college or university to which they plan to transfer to determine the proper mathematics course to be taken in the community college.

courses in the humanities, natural sciences, and 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 Teachers' 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 help prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college that is comparable in length and courses to the first two years of the program at the four-year college or university. Upon satisfactory completion of the six-quarter program listed herein, the student will be awarded the Associate in Science degree with a major in Pre-Teacher Education.

PRE-TEACHER EDUCATION

Associate in Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ENGL 111	English Composition I	3	0	3
	Natural Science (Lab)	3	3	4
MATH 181	General College Math I	3	0	3
HIST 111	American History I	3	0	3
GENL 100	Orientation	1	1	1
	Elective	-	-	3
	Total			17
	SECOND QUARTER			
ENGL 112	English Composition II	3	0	3
	Natural Science (Lab)	3	3	4
MATH 182	General College Math II	3	0	3
HIST 112	American History II	3	0	3
PHED 101	Health, Phys. Ed., or Recreation	-	-	1
	Elective	-	-	3
	Total			17

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	THIRD QUARTER			
ENGL 113	English Composition III	3	0	3
	Natural Science (Lab)	3	3	4
MATH 183	General College Math III	3	0	3
HIST 113	American History III	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	-	-	1
	Elective	-	-	3
	Total			17
	FOURTH QUARTER			
ENGL 261	English Literature	3	0	3
PSYC 201	General Psychology I	3	0	3
GOVT	Government*	3-5	0	3-5
	Humanities Elective (Art or Music)	-	-	3-5
PHED 103	Health, Phys. Ed., or Recreation	-	-	1
	Other Elective	-	-	0-3
	Total			15-18
	FIFTH QUARTER			
ENGL 262	English Literature	3	0	3
PSYC 202	General Psychology II	3	0	3
ECON	Economics*	3-5	0	3-5
PHED	Health Education (or Elective)	-	-	3-5
	Elective	-	-	0-3
	Total			14-18
	SIXTH QUARTER			
ENGL 250	American Literature (or Elective)	3	0	3
SPDR 137	Public Speaking (or Elective)	2	2	3
PSYC 203	General Psychology III (or Elective)	3	0	3
SOC	Sociology (or Elective)	3	0	3
	Other Elective	-	-	3-5
	Total			15-17
	Total Minimum Credits for a Pre-Teacher Education Major			97

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

SCIENCE

Degree: Associate in Science

Length: Six-Quarter (two-year) Program

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

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

Agriculture	Forestry	Nursing
Biology	Home Economics	Pharmacy
Chemistry	Mathematics	Physics
Dentistry	Medicine	

Admission 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 the satisfactory completion of the following high school units or equivalent as a minimum:

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

Students who do not meet these requirements may be permitted to correct their deficiencies in the Preparatory (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 the humanities and social sciences. Numerous electives are provided so that the student can select the appropriate courses for his pre-professional or scientific program as required in the first two years of the four-year college or university. *Each student is urged to acquaint himself with the requirements of the major department in the college or university to which transfer is contemplated and also to consult with the Counseling Department of the Community College in planning his program and selecting his electives.* In order to help prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college that is comparable in length and courses to the first two years of the pro-

gram at the four-year college or unversity. Upon satisfactory completion of the six-quarter program listed herein, the student will be awarded the Associate in Science degree with a major in Science.

SCIENCE

Associate in Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ENGL 111	English Composition I	3	0	3
	Natural Science (Lab)	3	3	4
MATH 141 or 161	Mathematics	3-5	0	3-5
GENL 100	Orientation	1	1	1
PHED 101	Health, Phys. Ed., or Recreation	-	-	1
	Electives	-	-	3-6
	Total			15-18
	SECOND QUARTER			
ENGL 112	English Composition II	3	0	3
	Natural Science (Lab)	3	3	4
MATH 142 or 162	Mathematics	3-5	0	3-5
HIST	History Elective	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	-	-	1
	Other Elective	-	-	3-4
	Total			17-18
	THIRD QUARTER			
ENGL 113	English Composition III	3	0	3
	Natural Science (Lab)	3	3	4
MATH 143	Mathematics	3-5	0	3-5
or 170	Introduction to Calculus	4	0	4
PSYC 201 or 128	Psychology or Human Relations*	3	0	3
	Electives	-	-	3-5
	Total			16-18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FOURTH QUARTER			
ENGL 261	English Literature	3	0	3
	Advanced Natural Science (Lab)	3	3	4
MATH	Advanced Mathematics (or Elective)	-	-	3-4
GOVT 281 or 180	Government*	3-5	0	3-5
PHED 103	Health, Phys. Ed., or Recreation	-	-	1
	Other Elective	-	-	0-3
	Total			14-18
	FIFTH QUARTER			
ENGL 262	Literature (or Elective)	3	0	3
	Advanced Natural Science (Lab)	3	3	4
MATH	Advanced Mathematics (or Elective)	-	-	3-4
	Humanities Elective	-	-	3-5
	Other Elective	-	-	0-4
	Total			14-18
	SIXTH QUARTER			
ENGL 250	Literature or Speech	3-4	0-2	3-5
	Advanced Natural Science (Lab)	3	3	4
MATH	Advanced Mathematics (or Elective)	-	-	3-4
ECON 211 or 160	Economics*	3-5	0	3-5
	Other Electives	-	-	0-4
	Total			14-18
	Total Minimum Credits for a Science Major			97

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

SECRETARIAL SCIENCE

Degree: Associate in Applied Science

Length: Six-Quarter (two-year) Program

Purpose: There is a steady demand for qualified secretaries, stenographers, typists, and office machine operators in Virginia. The Associate in Applied Science degree curriculum in Secretarial Science is designed to prepare persons for full-time employment immediately upon completion of the community college curriculum offerings.

Occupational Objectives: The general secretarial course is offered to those who wish to prepare for positions as stenographers or secretaries in any major field of business.

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

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

SECRETARIAL SCIENCE

Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
BUAD 100	Introduction to Business	3	0	3
ENGL 101	Communication Skills I	3	0	3
MATH 151	Business Mathematics I	3	0	3
PHED 101	Health, Phys. Ed., or Recreation	-	-	1
SECR 111**	Typewriting I	1	4	3
SECR 121**	Shorthand I	3	2	4
GENL 100	Orientation	1	1	1
	Total			18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	SECOND QUARTER			
ENGL 102	Communication Skills II	3	0	3
MATH 152	Business Mathematics II	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	-	-	1
SECR 112	Typewriting II	1	4	3
SECR 122	Shorthand II	3	2	4
SECR 136	Filing and Records Management	1	2	2
	Total			16
	THIRD QUARTER			
BUAD 156	Office Machines	1	2	2
ENGL 136	Speech Communications	3	0	3
GOVT 180	American Constitutional Government	3	0	3
PHED 103	Health, Phys. Ed., or Recreation	-	-	1
SECR 113	Typewriting III	1	4	3
SECR 123	Shorthand III	3	2	4
	Total			16
	FOURTH QUARTER			
ENGL 280	Business English	3	0	3
PSYC 110 or	Principles of Applied Psychology			
PSYC 128	Human Relations	3	0	3
SECR 216	Executive Typing	1	2	2
SECR 221	Shorthand Transcription I	1	4	3
SECR 241	Secretarial Procedures I	2	2	3
	*Elective	-	-	3
	Total			17
	FIFTH QUARTER			
BUAD 241	Business Law I (or elective)	3	0	3
ECON 160	American Economics	3	0	3
SECR 222	Shorthand Transcription II	1	4	3
SECR 242	Secretarial Procedures II	2	2	3
SECR 266	Machine Transcription (or elective)	2	2	3
	Total			15
	SIXTH QUARTER			
BUAD 242	Business Law II (or elective)	3	0	3
SECR 217	Typewriting Skill Building	1	2	2
SECR 223	Shorthand Transcription (or elective)	1	4	3
SECR 243	Secretarial Procedures III	2	2	3
SECR 299	Seminar & Project in Secretarial Science	-	-	2
	*Elective	-	-	2
	Total			15
	Total Minimum Credits for a Secretarial Science Major			97

*Electives from BUAD and SECR programs.

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

TRAFFIC AND TRANSPORTATION MANAGEMENT

Degree: Certificate

Length: Six-quarters (part-time)

Purpose: To instruct people in the information needed to take Certification Examination given by the American Society of Traffic and Transportation.

Admission Requirements: Any person actively working in the field of transportation may enroll. To qualify for the Society's examination a student must: (1) Be at least 21 years old, (2) Be of good moral character, (3) Have completed two years of college or have had 5 years of increasingly responsible traffic and transportation experience.

TRAFFIC AND TRANSPORTATION MANAGEMENT

(Six-Quarter Certificate Program)

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
GENL 100	Orientation	1	0	1
BUAD 100	Introduction to Business	3	0	3
		4	0	4
	SECOND QUARTER			
ECON 160	American Economics	3	0	3
ENGL 101	Communication Skills I	3	0	3
		6	0	6
	THIRD QUARTER			
BUAD 140	Economics of Transportation	3	0	3
GOVT 180	American Constitutional Government	3	0	3
		6	0	6
	FOURTH QUARTER			
BUAD 141	Interstate Commerce Law I	3	0	3
PSYC 128	Human Relations	3	0	3
		6	0	6

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIFTH QUARTER			
BUAD 142	Interstate Commerce Law II	3	0	3
ENGL 102	Communication Skills II	3	0	3
		6	0	6
	SIXTH QUARTER			
BUAD 143	Interstate Commerce Law III	3	0	3
ENGL 136	Speech Communications	3	0	3
		6	0	6
	Total Minimum Credits for a Traffic and Transportation Management Major			34

PART V

DESCRIPTION OF COURSES

Course Numbers

Courses numbered 000-099 are freshman level courses for the preparatory foundations program and for the occupational programs. The credits earned in these courses are applicable toward diploma and certificate programs but are not applicable toward an associate degree.

Courses numbered 100-199 are freshman level courses applicable toward an associate degree.

Courses numbered 200-299 are sophomore level courses applicable toward an associate degree.

Course Credits

The credits 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 work each week.

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 the instructor of the course.

ARCHITECTURAL TECHNOLOGY

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

ARCH 114 ARCHITECTURAL DRAFTING I (2 cr.)—An introductory study of the principles and methods of architectural graphics. This subject equips the student with the basic knowledge of the purpose and methods of translating the materials of building construction into graphic presentation. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

ARCH 115 ARCHITECTURAL DRAFTING II (2 cr.)—Prerequisite ARCH 114. Specific emphasis in developing the student's capabilities in planning, organization, and graphical presentation of building plans, elevations, sections, and details, and the introductory study of reading architectural plans. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

ARCH 141-142 MATERIALS AND METHODS OF CONSTRUCTION I-II (3 cr.) (3 cr.)—Prerequisite ARCH 110 or ENGR 100. A subject designed to familiarize the student with physical properties and the methods used in the erection of structures, with brief descriptions of their manufacture. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

ARCH 204-205 HISTORY OF ARCHITECTURE I-II (3 cr.) (3 cr.)—Prerequisite ARCH 113 or ARCH 115. A study of the history of architecture from ancient times to the present but with emphasis on the designs and forms of the twentieth century developments. Lectures 3 hours per week.

ARCH 221 ARCHITECTURAL DESIGN I (4 cr.)—Prerequisite ARCH 115. Specific emphasis on masonry and masonry veneer construction as they relate to wood and steel framing. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

ARCH 222 ARCHITECTURAL DESIGN II (4 cr.)—Prerequisite ARCH 221. Specific emphasis in the development of the steel framed structure using both bearing and curtain-type enclosing walls. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

ARCH 223 ARCHITECTURAL DESIGN III (4 cr.)—Prerequisite ARCH 222. Specific emphasis on the development of the concrete framed structure using both bearings and curtain-type enclosing walls. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

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

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

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

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

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

ARTS AND CRAFTS

ARTS 091 WORKSHOP IN WATERCOLOR (2 cr.)—A special 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 give a broad background for understanding works of art in relation to the times and the media in which they were produced. Studio exercises will be 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 study and survey of the arts which parallels the student's studio classes. Special emphasis is placed on the arts of painting, sculpture, and architecture. Form and content are studied from the historical, sociological, and philosophical points of view. Lectures 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. The course begins with prehistoric art and follows the main stream of Western civilization to the present. Lectures 3 hours per week.

ARTS 121-122-123 THEORY AND PRACTICE OF DRAWING I-II-III (3 cr.) (3 cr.) (3 cr.)—Representational and non-representational drawing in charcoal, wash, pencil, and varied combinations of media. Lecture 1 hour, Laboratory 5 hours, Total 6 hours per week.

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

ARTS 166 FUNDAMENTALS OF LETTERING (3 cr.)—Calligraphy as an introduction to script and the constructed letter as used in graphic layout and design. Lectures 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. Lectures 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. Lectures 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 arts and crafts. Laboratory 6 hours per week.

ARTS 221-222-223 ADVANCED DRAWING I-II-III (2 cr.) (2 cr.) (2 cr.)—The purpose of this course is to analyze the structure and forms of the environment (nature and human) so that they become memorized like language. This frees 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 5 hours, Total 6 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. Lectures 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 optical communications as applied to advertising design in newspapers, magazines, direct mail advertising, house organs, etc. Analysis is made of the influences on layout by contemporary art. Lectures 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 course is designed to familiarize the student with the use of drawing instruments and materials and to introduce him 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.)—The purpose of the course is to offer the serious student another channel for individual exploration. The traditional printmaking processes, relief, intaglio, with their many possibilities, provide a rich and varied field of expression. Combinations of these and their use with other media have become current practice. The obvious relationship between the graphic orientation of our present commercial art curriculum and printmaking makes this an ideal media for the student to explore. Lecture 2 hours, Laboratory 6 hours, Total 8 hours per week.

ARTS 281-282-283 PHOTOGRAPHY WORKSHOP I-II-III (1 cr.) (1 cr.) (1 cr.)—Practical work in the photography lab, covering all phases of photography work that are pertinent to graphic arts. Laboratory 3 hours per week.

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

AUTOMOTIVE MECHANICS

AUTO 111-112-113 AUTOMOTIVE ENGINES I-II-III (4 cr.) (4 cr.) (4 cr.)—The analysis of power, cylinder condition, valves, and bearings in the automotive

engine to establish the present condition, repairs or adjustments. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

AUTO 121-122 123 AUTOMOTIVE FUEL SYSTEMS I-II-III (3 cr.) (3 cr.) (3 cr.)—The analysis of carburetors, fuel pumps, and fuel lines. Estimation of repairs and adjustments to be made and the cost of these repairs and adjustments. Basic adjustments. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

AUTO 151 AUTO POWER TRAINS I (4 cr.)—This course is a study of the operation, design, construction, and repair of power train components. Units studied include clutches, propeller shaft, universal joints, and rear axle assemblies. Lecture 2 hours, Laboratory 7 hours, Total 9 hours per week.

AUTO 152 AUTO POWER TRAINS II (4 cr.)—This course is a study of the operation, design, construction, and repair of standard transmission, followed by an introduction to automatic transmissions. Units studied include 3 and 4 speed standard and overdrive transmissions followed by an introduction to the two speed automotive transmission. Lecture 2 hours, Laboratory 7 hours, Total 9 hours per week.

AUTO 153 AUTO POWER TRAINS III (4 cr.)—This course is a study of the operation, design, construction, and repair of automatic transmission. Units studied include fluid couplings, torque converters and the various 3 and 4 speed automatic transmissions. Lecture 2 hours, Laboratory 7 hours, Total 9 hours per week.

AUTO 238 AUTOMOTIVE AIR CONDITIONING (3 cr.)—Study of the principles of refrigeration, air conditioning controls, and the adjustment and general servicing of automotive air conditioning systems. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

AUTO 241-242-243 AUTOMOTIVE ELECTRICAL SYSTEMS I-II-III (3 cr.) (3 cr.) (3 cr.)—Testing and analysis of battery, coil, distributor, starter, alternator or generator, voltage regulator and spark plugs. Estimation of repairs and adjustments to be made and the cost of these. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

AUTO 269 AUTOMOTIVE BRAKING AND SUSPENSION SYSTEMS (5 cr.)—This course is a study of the operation, design, construction, repair, and servicing of braking and suspension systems. Emphasis is placed on the use of tools and test equipment, evaluation of test results, estimation of repair cost, and performance of required repairs and servicing. Front and rear suspension alignment, power and standard steering along with standard, power, and disc brakes are among the units studied. Lecture 2 hours, Laboratory 9 hours, Total 11 hours per week.

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

AUTO 288-289 AUTOMOTIVE SERVICE PROCEDURES I II (3 cr.)—These courses are a study of diagnostic and service procedures for automotive electrical and mechanical systems. Emphasis is placed on the use of tools and test equipment, evaluation of test results, estimation of repair cost, and performance of required service. Lecture 0 hours, Laboratory 9 hours, Total 9 hours per week.

AUTO 299 SEMINAR AND PROJECT IN AUTOMOTIVE TECHNOLOGY (2 cr.)—A selection and completion of an individual project related to the student's occupational objective and designed to combine theoretical concepts with

practical applications by cooperative arrangements with industry and automotive businesses. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in automotive technology.

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 structural, physiology and evolution. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

BIOL 251-252 HUMAN ANATOMY AND PHYSIOLOGY I-II (4 cr.) (4 cr.)—Prerequisite BIOL 103 and one year of college chemistry. A consideration of basic biological principles as revealed by anatomical and physiological studies. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

BIOL 256 INTRODUCTORY GENETICS (5 cr.)—Prerequisite BIOL 101 or equivalent—principles and concepts of classical and theoretical genetics, with experimental work in Mendelian Genetics and Genetical statistics. Lectures 4 hours, Laboratory 2 hours, Total 6 hours per week.

BIOL 268 MICROBIOLOGY (6 cr.)—Prerequisite BIOL 103 and one year of colege chemistry. Introduction to microbiology, morphology and activities of micro-organisms, control of micro-organisms, infection, immunity and other antigen—antibody reaction, study of infections and infectious diseases. Lectures 3 hours, Laboratory 6 hours, Total 9 hours per week.

BUSINESS ADMINISTRATION

BUAD 071-072-073-074 TRANSPORTATION AND TRAFFIC MANAGEMENT I-II-III-IV (3 cr.) (3 cr.) (3 cr.) (3 cr.)—Basic to this course are the requirements for traffic managers in the fields of railroading, trucking, air travel, etc. Each quarter is based on the Chicago College of Traffic Materials which are required for licensing examination. Lectures 3 hours per week.

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

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

BUAD 110 ACCOUNTING FOR NON-ACCOUNTANTS (3 cr.)—Helps develop breadth of perspective and sharpens technical skills needed to make accounting policy decisions in everyday business. Lectures 3 hours per week.

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

BUAD 140 ECONOMICS OF TRANSPORTATION (3 cr.)—The economic functions of Transportation enterprises, including such things as organization, services, rates, operation, and practices. Lecture 3 hours, Total 3 hours per week.

BUAD 141-142-143 INTERSTATE COMMERCE LAW I-II-III (3 cr.) (3 cr.) (3 cr.)—The study of the Interstate Commerce Act and related Acts and the law and procedures, including freight loss and damage. Lectures 3 hours, Total 3 hours per week.

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

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

BUAD 211-212-213 PRINCIPLES OF ACCOUNTING I-II-III (4 cr.) (4 cr.) (4 cr.)—This course is designed to provide a thorough understanding of accounting principles and the application of these principles to various forms of business inventory valuation, internal control systems, manufacturing processes, budgeting, and analysis of financial statements. Lectures 3 hours, Laboratory 2 hours, Total 5 hours per week.

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

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

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

BUAD 227 AUDITING (3 cr.)—Prerequisite BUAD 111-112-113. Purposes of audit, relationships of auditor and client, kinds of audits, working papers, internal controls and examination of accounting systems, audit reports. Lectures 3 hours per week.

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

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

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

BUAD 248 BUSINESS TAXES (3 cr.)—A study of applicable federal, state, and

local taxes and their implications in terms of business ownership, policy, and operations. Lectures 3 hours per week.

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

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

BUAD 286 PERSONNEL MANAGEMENT (3 cr.)—A course in the problems and issues involved in the administration of personnel actions. Includes organization and tasks of personnel development, significant personnel considerations, and an appraisal of the position of labor in business today. Lectures 3 hours per week.

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

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

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

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

CHEMISTRY

CHEM 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 and their compounds, and theories and problems concerning them. The laboratory work for the first two quarters of the course deals chiefly with the non-metallic elements and their compounds. The last quarter deals with the theories of qualitative analysis. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

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

CIVIL (ENGINEERING) TECHNOLOGY

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

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

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

CIVL 217 REINFORCED CONCRETE DESIGN (4 cr.)—Design, investigation and detailing of basic reinforced concrete structural members. Lectures 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. Lectures 4 hours per week.

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

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

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

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

CIVL 266 WATER AND SANITATION (3 cr.)—Introduction to rainfall, stream flow and ground water. Survey of water supply, water treatment, sewage problems, and sewage treatment. Lectures 3 hours per week.

CIVL 276 TRANSPORTATION ENGINEERING (3 cr.)—Prerequisite CIVL 180.dLocation, design, construction and maintenance of highways, streets, railroads,e and airports, planning and economic considerations. Lectures 3 hours per week.e

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

CIVL 284 ROUTE SURVEYING AND HIGHWAY DESIGN I (4 cr.)—Prerequisite CIVL 180. Principles of route surveying; simple, compound and transition curves; grades and vertical curves; earthwork and haul quantities. Credit cannot be given for this course and CIVL 185. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

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

DATA PROCESSING TECHNOLOGY

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

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

DECORATING

DECO 011-012-013 BASIC INTERIOR DECORATING I, II, III (3 cr.) (3 cr.) (3 cr.)—This course covers the fundamental principles involved in good interior decorating. Lectures 3 hours per week.

DENTAL ASSISTANT

DENT 100 INTRODUCTION TO DENTAL ASSISTING (2 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. Lectures 2 hours per week.

DENT 101 DENTAL SCIENCE I (4 cr.)—Bactriology, anatomy and physiology, micro-biology, and oral and dental anatomy as related to dental science and the practice of dental assisting. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

DENT 102 DENTAL SCIENCE II (4 cr.)—Prerequisite DENT 101. Oral pathology, pharmacology, nutrition, and common dental emergencies as related to the role of the dental assistant. Lectures 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. Lectures 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 specialities such as endodontics, periodontics, orthodontics, prosthetics, and oral surgery. Lectures 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 all 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. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

DENT 190 SUPERVISED CLINICAL EXPERIENCE (5 cr.)—Supervised, in-service dental assisting experience. Lecture 1 hour, Laboratory 12 hours, Total 13 hours per week.

DENT 199 DENTAL ASSISTANT SEMINAR (2 cr.)—Study of personal responsibilities as a practitioner, including employee-employer relations, opportunities for continued development as a person and a health worker, and importance of organization membership; review for dental certification. Lectures 2 hours per week.

DRAFTING AND DESIGN

DRFT 066-067 BASIC ELECTRICAL AND ELECTRONICS DRAWING (3 cr.) (3 cr.)—A course for electronics' students only. Training will include care and use of drawing instruments, alphabet of lines, lettering, types of electrical and electronic symbols, sketching, and basic electrical and electronics blueprint reading. Laboratory 9 hours per week.

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

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

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

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

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

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

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

ECONOMICS

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

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

ECON 226 INDUSTRIAL ECONOMICS (3 cr.)—The growth and development of industry and technology; industrial relationships; some current problems, to include those posed by automation and computers. Lectures 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. Further developments in the theory of money and income. Application of theory to analysis of policy questions, including government finance and debt management. Covers both macro and microeconomics. Lectures 3 hours per week.

ECON 246 MONEY AND BANKING (3 cr.)—Fundamental principles of money, credit, and banking and their exemplification in modern currency and banking history, particularly that of the United States. Special attention is given to present day conditions and problems. Lectures 3 hours per week.

ELECTRONICS AND ELECTRICAL (ENGINEERING) TECHNOLOGY

ELEC 111 ELECTRICAL CIRCUITS I (5 cr.)—Corequisite MATH 122. The study of resistance, magnetism, inductance, capacitance, and the transient state. An introduction to circuit theorems as applied to direct current circuits. Lectures 4 hours, Laboratory 3 hours, Total 7 hours per week.

ELEC 112 ELECTRICAL CIRCUITS II (4 cr.)—Prerequisite ELEC 111 and Corequisite MATH 123. An advanced course in electrical circuits employing complex algebra, equivalent circuit theorems and modern techniques for the solution of complex circuit problems. Lectures 3 hours, Laboratory 4 hours, Total 7 hours per week.

ELEC 118-119 ELECTRICAL SHOP I-II (1 cr.) (1 cr.)—A course designed to familiarize the student with the use of hand tools commonly found in the electrical and electronics industry. A variety of projects requiring fabrication of electrical-mechanical equipment are performed. Laboratory 3 hours per week.

ELEC 201 ELECTRICAL ENGINEERING TECHNOLOGY I (6 cr.)—Prerequisite ELEC 112. An integrated course covering the basic concepts of electron and solid-state physics. Consideration is given to the application of vacuum, gas, and semiconductor diodes and triodes to basic electronic circuits. Lectures 5 hours, Laboratory 3 hours, total 8 hours per week.

ELEC 202 ELECTRICAL 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 are studied. Laboratory experiments demonstrate the application of vacuum tubes and transistors to various circuits. Lectures 5 hours, Laboratory 6 hours, Total 11 hours per week.

ELEC 203 ELECTRICAL ENGINEERING TECHNOLOGY III (7 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. Lectures 5 hours, Laboratory 6 hours, Total 11 hours per week.

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

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

ELEC 213 INDUSTRIAL CONTROLS (4 cr.)—Prerequisite ELEC 212. The object of this course is to present a survey of principles and "building blocks" of industrial controls. This is done by analyzing involved control circuits, presenting the principles of operation and application of special electromagnetic and electronic devices; as well as feedback circuits, and introducing static controls, devices, logic symbols, and boolean algebra. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 214 ELECTRICITY I (4 cr.)—Prerequisites MATH 123 and PHYS 123. An introductory course for non-electrical students covering direct and alternating current theory with some introduction to electrical machines. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 241 COMMUNICATIONS I (4 cr.)—Prerequisite ELEC 112. An introduction to modulation and power in modulated waves. Topics included are sinusoidal oscillations and oscillators, RF amplifiers and detectors, and AM receivers. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

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

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

ELEC 248 MICROWAVE TECHNIQUES (3 cr.)—Prerequisite ELEC 202. This brief course in microwave techniques serves to introduce the student to some of the special requirements when using very high frequency equipment such as klystrons, cavity resonators, slotted lines and waveguide type transmission devices. Lectures 3 hours per week.

ELEC 258 ELECTRONIC DATA PROCESSING (3 cr.)—Prerequisite MATH 123. A course designed to familiarize the student with computer organization and basic programming techniques. Lectures 3 hours per week.

ELEC 277 ELECTRICAL MEASUREMENTS (4 cr.)—Prerequisite ELEC 112. A course in basic electrical measuring devices. Beginning with the development of standards and then introducing the common meters as AC and DC voltmeters, ammeters and wattmeters. The calibration of meters and the determination of instrumentation for simple measurements is also presented. Laboratory work emphasizes principles of operation of such devices as VTVM'S, oscilloscopes, precision, potentiometers, Q meters, AC bridges, counters, and other special equipment. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

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

ENGINEERING TECHNOLOGY

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

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

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

ENGR 103 CONCEPTUAL DESIGN AND ANALYSIS (2 cr.)—Prerequisite ENGR 122, corequisite ENGR 123. Engineering fundamentals and concepts involved in designing for production, prototype and laboratory models, automation, tape programming and verification, design problems, class reports, and departmental visits at nearby four year college. Lectures 1 hour, Laboratory 2 hours, Total 3 hours per week.

ENGR 121 ENGINEERING GRAPHICS I (2 cr.)—Prerequisite high school plane solid geometry. A basic course in 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, MATH 141. Graphical methods used in engineering design, layout and calculation. Properties and types of graphs for engineering and scientific purposes. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

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

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

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

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

ENGR 201 MECHANICS OF PARTICLES (5 cr.)—Corequisite MATH 241. Vector treatment, using index notation, of concepts of force, mass, space, time; gravitational systems of measurements; equilibrium of discrete force systems; centrouds; 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. Lectures 5 hours, Total 5 hours per week.

ENGR 202 MECHANICS OF DEFORMABLE SOLIDS (4 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. Lectures 4 hours, Total 4 hours per week.

ENGR 203 DYNAMICS OF RIGID BODIES (3 cr.)—Corequisite MATH 243. Vector treatment; using index notation of planar and three-dimensional kinematics and kinetics of rigid bodies; mass moments in inertia; Newton's Laws, work and energy, impulse and momentum, vibration applied to rigid bodies. Lectures 3 hours, Total 3 hours per week.

ENGLISH

ENGL 011 VERBAL EXPRESSION I (3 cr.)—A course designed as one of a series 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. Lecture 3 hours per week.

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

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

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

ENGL 041-042 READING IMPROVEMENT I-II (3 cr.) (3 cr.)—Designed to improve speed and comprehensive capacity of the student in reading. Where special reading problems are discovered, an opportunity for special work will be offered. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

ENGL 046 DEVELOPMENTAL READING (5 cr.)—A basic course for the development of good reading habits and skills with emphasis on improved reading comprehension. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

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

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

ENGL 111-112-113 ENGLISH COMPOSITION I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite successful completion of 4 units of high school English andaa satisfactory score on the English usage portion of the American College Test or equivalent. Expository writing, ranging from single paragraphs to essays of somea length and complexity. Study of the logical, rhetorical, and linguistic structures

of expository prose; the methods and conventions of preparing research papers; and the practical criticism of major literary types. Lectures, 3 hours per week.

ENGL 121-122-123 JOURNALISM I-II-III (2 cr.) (2 cr.) (2 cr.)—Instruction and classroom practice in gathering, evaluating, and writing news. Techniques of page layout, newspaper make-up, rewriting, and editing. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

ENGL 127 TECHNICAL REPORT WRITING (2 cr.)—A course designed to provide skill training in the preparation of reports, memoranda, articles, and correspondence related to technical occupations through the use of specialized materials related to the students' occupational goals. Lectures 2 hours per week.

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

ENGL 221 JOURNALISM IV—NEWS WRITING (3 cr.)—Prerequisite ENGL 121 or instructor's permission. Intensive practice in reporting and news writing for local newspapers or the college newspaper under supervision of professional journalists and the journalism faculty. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

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

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

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

ENGL 250 SURVEY OF AMERICAN LITERATURE (3 cr.)—Prerequisite ENGL 113 or equivalent. This is a survey course comprising the study of such authors and their works from Colonial Times to the present as best interpret American life and ideals. It requires an adequate amount of parallel reading, especially the novel and drama. Lectures 3 hours per week.

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

ENGL 280 BUSINESS ENGLISH (3 cr.)—Prerequisites ENGL 101, 102 and 136. An intensive study of the qualities and techniques required in the preparation of business correspondence, reports, articles, and memoranda. A practical course in the reading and writing of business-related materials with emphasis on compre-

hension, analysis, and organization of ideas in a logical pattern. Lectures 3 hours per week.

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

FRENCH

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

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

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. Lectures 3 hours per week.

GENERAL

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

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

GERMAN

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

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 schoole German. Advanced training in the speaking, understanding, reading, and writinge of German. German is used in the classroom. Lectures 3 hours, Laboratory ande drill 2 hours, Total 5 hours per week.e

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. Lectures 3 hours per week.

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. Lectures 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. Lectures 3 hours per week.

GOVT 296 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. Purpose is to develop the ability to analyze and critically evaluate present problems as they relate to the functioning of the United States. Lectures and Seminars 2 hours per week.

HEALTH

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

HLTH 110 PERSONAL AND COMMUNITY HEALTH (2 cr.)—An introductory course in personal hygiene with emphasis upon social principles. Lecturese 2 hours per week.e

HISTORY

HIST 101-102-103 HISTORY OF WESTERN CIVILIZATION I-IIeIII (3 cr.)e (3 cr.) (3 cr.)—The development of western civilization from ancient times to thee

present. The last two quarters deal with a survey of the period since the close ofs the Reformation. Lectures 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. Lectures 3 hours per week.

HIST 221-222 AMERICAN ECONOMIC HISTORY I-II (3 cr.) (3 cr.)—First quarter deals with the economic history of the 19th and early 20th centuries in the United States. The second quarter deals with the remainder of the 20th century with special emphasis on the 1920s and 1930's. Lectures 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 in Europe from 1500 to the present. Lectures 3 hours per week.

HUMANITIES

HUMN 204-205 SURVEY OF WESTERN CULTURE I-II (5 cr.) (4 cr.) -A survey of the Western world which correlates the art, music and literature of the following periods: Greek and Roman, Middle Ages, Renaissance, Elizabethan, Neo-Classical, and Modern. Lectures 5 hours per week for HUMN 204 and 4 hours per week for HUMN 205.

INDUSTRIAL TECHNOLOGY

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

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

INDT 143 METHODS OF MANUFACTURE III (3 cr.)—Continuation of a study of manufacturing processes. During this quarter emphasis will he on foundry processes. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

INDT 270 INDUSTRIAL MANAGEMENT (3 cr.)—Detailed study of organizational structure; operational, financial, accounting and marketing activities,s management responsibilities, planning, control, personnel, safety, labor relationships,s and factors essential to effective management. Lectures 3 hours per week.s

INDT 276 TIME AND MOTION STUDY (3 cr.)—Principles and applications of motion analysis, process study, operations study, micromotion study. Methods improvment, work simplification, standardization, rating, allowance, analysis of time data. Lectures 3 hours per week.

MATHEMATICS

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

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

MATH 031 032 BASIC ALGEBRA I-II (5 cr.) (5 cr)--Fundamentals of algebraic calculations for students who need a survey of the basic principles of algebra and MATH 032 surveys the second year of high school algebra. Lectures 5 hours per week.

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

MATH 037 BASIC PLANE GEOMETRY AND TRIGONOMETRY (5 cr.)—Fundamentals of plane geometry and an introduction to trigonometry for students who need a review or survey of the basic principles in plane geometry and elementary trigonometry. Lectures 5 hours per week.

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

MATH 039 BASIC SOLID GEOMETRY (5 cr.)—Prerequisite MATH 001-002-003 or equivalent. Trigonometric functions, graphic representations, logarithms, laws of sine and cosines, trigonometric equations, inverse functions, complex numbers. Lectures 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 and a satisfactory mathematics score on the ACT test or MATH 036 and MATH 039 or equivalent. Algebra, trigonometry, and introduction to calculus. The course sequence includes solutions of linear and quadratic equations, trigonometric functions, trigonometric curve sketching, logarithms, ratio, proportion and variation, vectors, complex numbers and binomial theorem. Lectures 5 hours per week.

MATH 141-142-143 INTRODUCTORY MATHEMATICAL ANALYSIS I-II-III (5 cr.) (5 cr.) (5 cr.)—Prerequisite satisfactory mathematics score on the ACT test and four units of high school mathematics including two units of algebra, one unit of geometry, and one-half unit of trigonometry, or MATH 036 and MATH 039 or equivalent. A modern unified course in algebra, trigonometry, analytic geometry, and calculus designed primarily for engineering and science students. Lectures 5 hours per week.

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

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

MATH 180 INTRODUCTORY STATISTICS (5 cr.)—Introduction to the fundamental ideas of statistics, including a brief treatment of descriptive statistics, problems of sampling, estimation, testing or hypotheses, regression, and correlation. Lectures 5 hours per week.

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

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

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

MECHANICAL ENGINEERING TECHNOLOGY

MECH 020 MACHINE SHOP PRACTICE (2 cr.)—An introductory exploration of machine shop operations with practice on the various basic machines. Labortary 6 hours per week.

MECH 214-215 MECHANICAL DESIGN I-II (4 cr.) (4 cr.)—Prerequisites MATH 123, ENGR 152. Application of the principles, practices, tools, and commercial standards of jig and fixture design. Through lectures, visual aids, and individual project and design work, the student becomes well acquainted with the many types of jigs and fixtures and their design. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

MECH 248 PHYSICAL METALLURGY (4 cr.)—The fundamentals of physical metallurgy, of ferrous and nonferrous alloys, including crystal structures, phase diagrams, cooling curves, solid solutions, eutectic diagrams, grain characteristics, and the application of these to heat treating alloying metals. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 264 THERMODYNAMICS I (4 cr.)—Prerequisite PHYS 123, MATH 123. Basic thermodynamics; characteristics of gases; applied study of steam cycles and combustion processes. Laboratory includes application of principles covered in lecture. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

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

MECH 267 FLUID MECHANICS (4 cr.)—Prerequisites PHYS 123 and MATH 123. Properties of fluids and fluid flow, Bernoulli's Theorem, measuring devices, viscosity and dimensional analysis. Laboratory emphasis on pumps, piping and fluid motors. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

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

MUSIC

MUSC 104 MUSIC APPRECIATION I (5 cr.)—This course aims to increase the variety and depth of the student's interest in music and related cultural activities. It seeks to stress the relation of music as an art to our daily lives and music's place in society, to promote an understanding of the spirit of the art which will lead to the emotional and aesthetic development of the individual, and to enable him to enjoy intelligent listening. Lecture 3 hours, Laboratory 4 hours, Total 7 hours per week.

MUSC 105 MUSIC APPRECIATION II (4 cr.)—This course aims to increase the variety and depth of the student's interest in music and related cultural activities. It seeks to stress the relation of music as an art to our daily lives and music's place in society, to promote an understanding of the spirit of the art which will lead to the emotional and aesthetic development of the individual, and to enable him to enjoy intelligent listening. Lecture 3 hours, Laboratory 2 hours, Total 5 hours per week.

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

MUSC 131-132-133 HISTORY OF MUSIC I-II-III (3 cr.) (3 cr.) (3 cr.)—A chronological survey of the history of music from antiquity—the twentieth century. Relationship of historical development of music to parallel movements in art and drama. Development of technique for listening analytically and critically to music. I Music to 1600, II Music to 1826, III Music to present. Lectures 3 hours per week.

MUSC 141-142-143 COLLEGE CHORUS I-II-III (1 cr.) (1cr.) (1 cr.)—A study of vocal techniques and choral interpretation. Ensemble singing including the performance of works from standard choral repertory. Voice range audition is required of all students. Attendance at rehearsals and concert performances is expected. Open to all students. Meets three hours per week for one credit. Laboratory 3 hours per week.

MUSIC 211-212-213 INTRODUCTION TO MUSICAL THEORY I-II-III (3 cr.) (3 cr.) (3 cr.)—(No previous training in music is required). The materials of music, rhythm, melody, timbre and harmony. The elements of musical composition with an emphasis on analysis and individual exercises. The harmonic vocabulary; a study of chords and their application in musical design. Lectures 3 hours per week.

MUSC 241-242-243 COLLEGE CHORUS I-II-III (1 cr.) (1 cr.) (1 cr.)—A study of vocal techniques and choral interpretation. Ensemble singing including the performance of works from standard choral repertory. Voice range audition

is required of all students. Attendance at rehearsals and concert performances is expected. Open to all students. Meets three hours per week for one credit. Laboratory 3 hours per week.

NATURAL SCIENCE

NASC 021-022-023 SURVEY OF SCIENCE I-II-III (3 cr.) (3 cr.) (3 cr.)—A general survey course designed to familiarize the student with the basic principles of Chemistry, Physics, and Biology. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

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

PHILOSOPHY AND RELIGION

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

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

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

PHYSICAL EDUCATION

PHED 101-102-103 PHYSICAL EDUCATION I-II-III (1 cr.) (1 cr.) (1 cr.)—An introductory study of recreational and physical education activities that will have value for the individual in adult life in developing physical skills for more effective use of leisure time. The development of skills and methods in archery, bowling, general conditioning, golf, gymnastics, horseback riding, ice skating, jogging, swimming, tennis and volleyball are stressed. Lecture 1 hour, Clinic 1 hour, Total 2 hours per week.

PHYSICS

PHYS 014-015 BASIC APPLIED PHYSICS I-II (3 cr.) (3 cr.)—Designed for all students in diploma programs. Presents the fundamentals of classical physics along with applications. Physics I deals with the properties of matter and mechanics. Physics II includes the study of heat, light, optics, and sound. Lectures 3 hours per week.

PHYS 121-122-123 GENERAL PHYSICS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite or corequisite MATH 181 or equivalent general freshman mathematics. Fundamentals and principles of physics including mechanics, heat, sound, electricity, and light. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

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

PHYS 226 ENGINEERING PHYSICS I (4 cr.)—Electromagnetism and Ray optics. Topics to be covered include gravitation; gravitation field and gravita-

tional potential; electric charge and matter; electric field; Gauss's Law; electric potential and electric field; capacitors; dielectrics and their properties; electric current and resistance; electromotive force and single-loop circuits; multiple-loop and R-C circuits; magnetic field, force and torque; devices involving magnetic fields; Ampere's Law; Biot-Savart Law; Faraday's Law; inductance; L-R circuits; electromagnetic oscillations; Maxwell's Equations; nature and propagation of light; speed of light and Doppler Effect; reflection and refraction at plane surfaces; reflection surfaces; thin lenses and optical instruments. Lectures 3 hours, Recitation-laboratory two 1½ hour periods, Total 6 hours per week.

PHYS 227 ENGINEERING PHYSICS II (4 cr.)—Wave optics and wave mechanics. Topics to be covered include electromagnetic waves and radiation; traveling waves; interference and coherence of light; interference from thin films; single and double slit diffraction; diffraction grating; X-ray diffraction; polarization; scattering; quantum theory; Maxwell-Blotzmann Distribution Law; application of M-B statistics; statistical meaning of heat and entropy; Schrodinger's Wave Equation; potential step and particle in a box; harmonic oscillator and wave functions; potential barrier penetration; Time Dependent Schrodinger Equation; principles of quantum mechanics; the hydrogen atom; one-electron wave functions; electron spin; spin orbit interaction; the Helium Atom; and the electronic structure of atoms. Lectures 3 hours, Recitation-laboratory two 1½ hour periods, Total 6 hours per week.

POLICE SCIENCE

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

PLCE 110 PATROL ADMINISTRATION (3 cr.)—The theories, history, and development of police patrol. Examines the methods and techniques of the various types of patrol and their importance to the overall police function. Focuses on the responsibilities of patrol officers and supervisors in identifying police hazards, preventing crime, providing police services, and establishing sound public relations. Practical exercises are included. Lectures 3 hours per week.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

PSYCHOLOGY

PSYC 110 PRINCIPLES OF APPLIED PSYCHOLOGY (3 cr.)—The general principles of perception, learning, and conscious and unconscious motivation which

are operative in all practical applications of psychology to life and work. Credit cannot be received for both this course and PSYC 128. Lectures 3 hours per week.

PSYC 116 THE PSYCHOLOGY OF PERSONAL ADJUSTMENT (3 cr.)—Prerequisite PSYC 110. Characteristics of mental health. Psychological principles applied to the development of a mature personality and to the problems of everyday life. Effective methods in study and work. Credit cannot be received for both this course and PSYC 128. Lectures 3 hours per week.

PSYC 128 HUMAN RELATIONS (3 cr.)—Introduction to 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. Lectures 3 hours per week.

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

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

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

PSYC 246 EDUCATIONAL PSYCHOLOGY (5 cr.)—Prerequisite PSYC 202 or equivalent. Human behavior and learning treated in the context of educational processes. The nature of various mental characteristics (intelligence, interest, knowledge, etc.) is examined, with special consideration given to their measurement and appraisal and their significance for educational goals. Lectures 5 hours per week.

PSYC 257 LAW ENFORCEMENT PSYCHOLOGY (3 cr.)—Prerequisite PSYC 128 or PSYC 110 and 116. Intergroup relations and police work. Some facts about racial, religious and national differences. Prejudice, suggestion, emotion, frustration and aggression in interpersonal and intergroup situations. Types of abnormal behavior likely to be encountered in police work. Lectures 3 hours per week.

RADIO AND TELEVISION

RDTV 111-112-113 INTRODUCTION TO TELEVISION I-II-III (4 cr.) (4 cr.) (4 cr.)—A survey of the organization and principles of telecasting operations, including positions and responsibilities, camera techniques, lighting, sound film, control room, settings, scenery, properties, floor directing, floor organization, scripting, television art, and on-camera performance. Lectures, reading assignments, and special projects in addition to laboratory work provide the student with an understanding of the TV industry: its history and development and its fundamental principles of operation, from both the commercial and the non-commercial point of view. This is a general background course designed to familiarize the student with the skills and techniques in the listed area through observation, study, and participation. Lectures 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. These assignments include such positions as 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. Introductory training is provided in discharging the responsibilities and duties of the television producer that are involved in organizing, planning, and producing television programs. These relate to program formats, production techniques, program costs, 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. They gain practical experience as cameramen, microphone boom operators, announcers, floor directors, continuity writers, technical directors, lighting technicians, property directors, studio managers, talent, and floor crew. They learn also the responsibilities of each crew position and of the performer under actual working conditions. Student productions are kinescope recorded for analysis and evaluation. Lectures 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. Students learn to prepare newscasts, using wire service copy, local news sources, interviews, still photos, and newsreels. Practical experience is gained on the production of newscasts and interviews through laboratory assignments in the studios at the local ETV station. Lectures 3 hours per week.

RDTV 231-232-233 TECHNICAL PROBLEMS OF TELEVISION I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite RDTV 113. Training is given in the design, construction, and handling of television scenery, special effects devices, visual materials, and sound effects. Special lighting problems are considered, using standard and rear projection scenery. A study is made of the uses of motion picture film in television, with training in cinematography as applied to television, in editing of film, in the care and handling of silent and sound film, and in the technical aspects of motion picture film projection and slide projection equipment. Practice is provided in the operation of the television camera. Observation and practice in the laboratory provide opportunity to experiment and learn more advanced directing techniques. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

RDTV 281-282-283 TELEVISION WORKSHOP IV-V-VI (2 cr.) (2 cr.) (2 cr.)—Prerequisite RDTV 183 or equivalent. Advanced practical studio experience is provided so that each student has an opportunity for "on the air" experience in all phases of television work within the educational station. Laboratory 6 hours per week.

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

SECRETARIAL SCIENCE

SECR 009 STENOGRAPHIC REVIEW (3 cr.)—A refresher and upgrading

course for secretaries, particularly for those returning to work after some absence. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

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

SECR 111 TYPEWRITING I (3 cr.)—Introduction to keyboard with emphasis on good technique and machine mastery, letter format and styles; tabulation and centering; manuscript typing. Electric typewriters are used for training. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

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

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

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

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

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

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

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

SECR 217 TYPEWRITER SKILL BUILDING (2 cr.)—Prerequisite SECR 113. Further development of speed and accuracy on production typing with emphasis on employment standards. Preparation for employers' secretarial placement examinations. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

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

SECR 222 SHORTHAND TRANSCRIPTION II (3 cr.)—Prerequisite SECR 221 or placement test. Continuation of speed building with emphasis on particular areas of general business, developing special vocabularies, phrases, and shortcuts. Emphasis on spelling, grammar, and other transcription skills. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

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

SECR 241 SECRETARIAL PROCEDURES I (3 cr.)—Corequisite SECR 216. Development of skills in operation of stencil and spirit duplicating machines. Preparation of copy for reproduction by offset, stencil, and spirit process. Criteria for selecting a duplicating process. In-depth study of type styles, paper, typewriter ribbons, and carbon paper. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

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

SECR 243 SECRETARIAL PROCEDURES III (3 cr.)—Prerequisite SECR 242. Continued emphasis on the secretary's office responsibilities, including handling of banking transactions, maintaining of office layouts, and personnel policies. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

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

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

SOCIAL SCIENCE

SOSC 161-162-163 AMERICAN CIVILIZATION I-II-III (3 cr.) (3 cr.) (3 cr.) —An analysis of the factors involved in the development of the American Society and American Culture. Course materials will be presented in an integrated pattern to develop an understanding of American history, American government, American economics, and man's role in society. Lectures 3 hours per week.

SOCIOLOGY

SOCI 101-102-103 INTRODUCTORY SOCIOLOGY I-II-III (3 cr.) (3 cr.) (3 cr.)—The fndamental concepts and the general principles of sociology; social institutions, population study, human ecology and community study, culture, human nature and personality, social interaction and startification, and social problems. Lectures 3 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: I: including delinquency and crime, mental illness, drug addiction, alcoholism, and sexual behavior; II: including population crisis, race relations, family and community disorganization, poverty, automation, war and disarmament. Lectures 3 hours per week.

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

SPANISH

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

SPAN 201-202-203 INTERMEDIATE SPANISH I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite Spanish 103 or successful completion of two years of high school Spanish. Training in the speaking, understanding, reading, and writing of Spanish. Spanish is used in the classroom. Lectures 3 hours, Laboratory and drill 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 the background of Spanish life and culture and to the outstanding contributions of Spain to world civilization from medieval times to the present. Readings in the original Spanish. Spanish is used in the classroom. Lectures 3 hours per week.

SPEECH-DRAMA

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

SPDR 118 DIRECTING AND ACTING (3 cr.)—A course designed to encompass principles and methods of directing and acting in the theatre. An attempt is made to expose the student to historical dimensions of directing and acting as well as present principles and procedures. Lectures 3 hours per week.

SPDR 119 THEARTES, ARTISTS, TECHNICIANS (3 cr.)—A course designed to present the technical aspects of theatrical production. Lectures 3 hours per week.

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

SPDR 137 PUBLIC SPEAKING (3 cr.)—Development of skill in speech-making, 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. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

SPDR 138 PERSUASIVE SPEAKING (3 cr.)—Prerequisite SPDR 137. A continuation of SPDR 137 with emphasis upon 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. Continued practice in speaking before the class. Lectures 3 hours per week.

SPDR 139 ORAL COMMUNICATION (3 cr.)—The principles and techniques of oral communication in the light of classical and modern rhetorical theory. Analysis of a variety of prose and poetry types for comprehension of the author's content and attitude. Special attention to improvement of meaning in a variety of live audience situations. Lectures 3 hours per week.

WELDING

WELD 026 BASIC ARC WELDING (3 cr.)—Basic welding procedures and practice using arc welding equipment. The student will gain experience in the use of the tools and techniques as these apply to the machinist in the repair of tools and equipment. Lectures 1 hour, Laboratory 6 hours, Total 7 hours per week.

ADDENDUM TO COURSES IN AUTOMOTIVE MECHANICS, BUSINESS ADMINISTRATION, CHEMISTRY, AND GOVERNMENT

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

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

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

BUAD 148 PRINCIPLES OF SECURITIES INVESTMENT (3 cr.)—This course is designed to aid the student in developing a broad perspective in the area of stocks and bonds. Studies are made of the mechanics of the stock exchange, types of securities, types of orders, and related subject matter. Emphasis is placed on specific investment objectives. Lectures 3 hours per week.

BUAD 160 SURVEY OF INSURANCE (3 cr.)—A course in insurance principles and practices. Includes an examination of risks and applications in the principal fields of insurance, including life, accident, and health, fire, liability, surety, and property. Lectures 3 hours per week.

BUAD 161 PRINCIPALS 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. Lectures 3 hours per week.

BUAD 162 PRINCIPLES OF REAL ESTATE II (3 cr.)—Prerequisite BUAD 161. Continuation of Real Estate I with more detailed examination of the fundamentals already exposed in the first course. Particular attention is given to the techniques required for the proper selection, analysis and listing of real properties. How to determine needed data, how to analyze forms and records for recording and presenting data. Lectures 3 hours per week.

BUAD 188 PUBLIC RELATIONS AND MANAGEMENT (3 cr.)—A survey of Public Relations as a management responsibility includes a brief study of philosophy and techniques of Public Relations, followed by application to employee relations, customer relations, stockholder relations and relations with general public. Course includes lecture, demonstrations and problem cases for practical application by individual student. Lectures 3 hours per week.

BUAD 221-222-223 COST ACCOUNTING I-II-III (3 cr.) (3 cr.) (3 cr.)—Covers both procedures and principles of cost accounting. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

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

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

CHEM 131 QUALITATIVE ANALYSIS (4 cr.)—Review and practice in balancing chemical equations, stoichiometric calculations, and equilibrium calculations, laboratory work emphasizes techniques and allows practice in chemical reactions and identifying unknowns. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

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

CHEM 267 INSTRUMENTAL ANALYSIS FOR CHEMISTRY (3 cr.)—The use of various instruments in chemical analysis, including calibration, representative titrimetric, gravimetric and calorimetric determinations; the pH meter absorption spectrometers; electroanalyzer; polagraph; gas fractometer; and geiger counter. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

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

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

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