

psychology of folkways, mores, taboos and other cultural values; the foundations of personality and the socialization of the individual. Prerequisite: Psychology 221. (3+0)

**PSY 331. Psychology of Personality.** 3 Cr.

This course deals with various theories of personality and their application in understanding the individual. Emphasis is placed on the significance of biological, psychological, and sociological factors contributing to the development of the adult personality structure. Prerequisite: Psychology 221. (3+0)

**PSY 421. Psychology of Adolescence.** 4 Cr.

Comprehensive study of the problems which affect the beset young people in the years of transition from childhood to adulthood; Physiological changes; emotional, mental, and social development and adjustment; juvenile delinquency; educational and vocational guidance. Lectures largely supplemented by reports, outside reading, and class discussions. Prerequisite: Psychology 221. (4+0)

**PSY 422. Abnormal Psychology.** 4 Cr.

A course dealing with the abnormalities of certain types of personalities, their origin, symptoms, developments, and treatment, short of psychiatric competence. Main topics simple maladjustment; disturbances of emotional nature, of perception, attention, memory, judgment, thought; disorders of motility, speech, etc.; early symptoms of schizophrenia and description of its four stages of development. Special attention will be given to mental hygiene. For prospective teachers and students with special interest in psychology. Prerequisite: Psychology 221. (4+0)

**PSY 452. Special Studies in Psychology.** 1 to 4 Cr.

This course is designed to give students an opportunity for individual study or research in special topics which may be timely and related to their interest and program needs. The study is made under the direction of a cooperating department member. Prerequisite: Consent of instructor and department head. (1-4+0)

## Public Administration

**P-A 100. Principles of Administration.** 3 Cr.

An orientation course to give the student an overview of the field of administration and its principles. The course will involve field trips and lectures by various outside experts. (3+0)

**P-A 201. Applied Research 1.** 3 Cr.

Basic principles and techniques of inquiry and analysis. Special attention will be given to sources of information and applications to administrative problems. Interdisciplinary team teaching will be utilized. Prerequisite: Administration 100. (3+0)

**P-A 202. Applied Research 2.** 3 Cr.

Development and implementation of research techniques and skills as applied to specific administrative problems. A combined course with seminar concepts. Prerequisite: Administration 201. (3+0)

**P-A 211. Elementary Statistics.** 4 Cr.

Administrative applications of variance, elementary probability theory, measures of dispersion, measures of centrality, measures of association, levels of measurement and observation, scaling, and elementary non-parametric statistics. (4+0)

**P-A 250. Problems and Procedures in Administration.** 3 Cr.

A laboratory of workshop type capstone course designed to help the student relate all the various aspects of his core program in administration. Students will utilize skills in problem solving. Prerequisite: Consent of instructor. (3+0)

**P-A 270. Supervised Internship.** 8 Cr.

A college supervised work experience which permits the student to utilize administrative skills in an actual job setting. A requirement of the internship is the satisfactory completion of a project related to the students on the job experience. Prerequisite: Approval of the faculty coordinator.

**P-A 323. Statistical Inference.** 4 Cr.

Sampling methods as applied to general problems in administration. Prerequisite: Administration 211 or its equivalent. (4+0)

**P-A 332. Financial Administration.** 4 Cr.  
Financial structures of institutions with special emphasis upon the public sector. The course includes sources of funds, budgeting and financial problems associated with institutional administration. (4+0)

**P-A 350. Introduction to Public Planning.** 3 Cr.  
This course deals with the broad aspects of planning at all levels from the neighborhood to the interstate authority. Special emphasis is given to the political processes in zoning, framing and adoption of master plans and creation of intergovernmental planning authorities. It is especially designed to familiarize the student with the basic principles of effective land use, organization of growth patterns, and the social and cultural values involved in public planning. (3+0)

**P-A 351. Planning for the Metropolitan Area.** 3 Cr.  
This course deals primarily with the urban planning process. Special emphasis is placed on the study of urban renewal programs, social costs of inadequate housing and transportation, and public transportation systems. Consideration is also given to zoning, taxation and budgeting for most effective use of high density space in the urban area. The course is designed to enable the student to work closely with urban planning commissions, city and regional transportation authorities, zoning boards, and city governments. (3+0)

**P-A 441. Seminar in Problems of Administration.** 3 Cr.  
Interdisciplinary approach to a variety of problems in administration. Students utilize specific research skills, make periodic reports and prepare a substantial research project dealing with a particular administrative problem. Prerequisite: Senior standing. (3+0)

**P-A 452. Special Studies in Public Administration.** 1 to 4 Cr.  
This course will provide qualified students the opportunity for individual or small group study or research under the direction of one or more faculty members. Prerequisite: Consent of instructor and department head. (1-4+0)

**P-A 470. Administrative Internship.** 12 Cr.  
A directed program of internship or field study in which the student applies his skills

in a carefully selected occupational setting. In a cooperative project, the student provides valuable administrative assistance while learning from on the job experience. Prerequisite: Approval of coordinator.

**P-A 471. Internship Seminar.** 4 Cr.  
Must be taken concurrently with Administration 470. Course required regular conferences with faculty coordinator, and the successful completion of a substantial project related to the internship activities of the student. The project is undertaken with the approval of the students' internship supervisor and faculty coordinator. Prerequisite: Approval of coordinator.

## Radio-Television Service

**RTV 211. Basic Television.** 12 Cr.  
This course includes the fundamentals of the transmission of audio and video signals to the television receiver and the circuitry within the receiver and the study of transistorized TV circuits in modern receivers. Laboratory projects include basic manual and set-up adjustments, picture tube handling, testing and troubleshooting of FM, FM tuners, video and power supply circuits, and safety precautions involved in servicing. Prerequisite: EET 132. (5+18)

**RTV 221. Television Circuits.** 12 Cr.  
The theory aspect of this course includes the study of the following circuits: brightness control, d-c reinsertion, video detector, automatic gain control (AGC), synch separator and amplifier, deflection oscillator and amplifier, automatic frequency control (AFC), IF amplifiers, and RF tuners. Also studied is the use of sweep and marker generators in the alignment of the IF sections and VHF-UHF tuners. Laboratory practice involves analysis, testing and simple troubleshooting of the circuits studied. Visual alignment, adjustments of horizontal automatic frequency control and automatic gain control circuits are practiced. Prerequisite: RTV 211. (5+18)

**RTV 231. Color Television.** 12 Cr.  
A course on the NTSC color television system and the basic theory of color transmission, chrominance circuit design and localizing troubles in color receiver. Laboratory assignments are devoted to installation adjustments of color receivers, troubleshooting of chrominance circuits such as:

color sync circuits, chrominance band-pass amplifier stages, detector circuits and matrix network. Prerequisite: RTV 221. (5 + 18)

**RTV 241. Television Service.** 12 Cr.  
Emphasis is on troubleshooting the complete television receiver. Instructional units include: methods of fault location with the application of the vacuum tube voltmeter, oscilloscope, sweep and marker generator, signal analyst, color generator, curve tracer, isolation transformer and other items of test equipment. Also studied are receiver installation problems, picture interference analysis, VHF-UHF antenna, transmission line, distribution systems. Service problems are discussed. Laboratory work emphasizes performance checks, the diagnosis, and the repair of faulty receivers. Complete visual alignment procedures, including AFC and AGC adjustments, are performed. Prerequisite: RTV 231. (5 + 13)

## **Radiologic (X-Ray) Technology**

**R-T 100. Introduction to Radiologic Technology.** 1 Cr.  
A course designed to acquaint the student with the professional working environment of the radiologic technologist, their relationship with the other health-related professions and the professional and legal responsibility of the radiation worker, and the need for and basic means of radiation protection. (1+0)

**R-T 105. Elementary Radiographic Technics.** 4 Cr.  
This first course in the technical sequence provides the student with the basic knowledges in radiographic terminology, operation of radiographic equipment, technical factors and their relationship to film qualities and darkroom chemistry and film processing methods. Lecture and laboratory periods are coordinated to provide the basic knowledges and manipulative skills required to succeed in the following technical sequence courses. (3 + 2)

**R-T 106. Radiographic Positioning I.** 3 Cr.  
Basic positioning technics involving the upper and lower extremities are studied in the lecture periods and the application of these

technics are practiced in the laboratory using actual radiographic machines, phantoms, and film processing methods. Prerequisite: R-T 105 and BIO 105. (2+2)

**R-T 116. Radiographic Exposure Technics.** 2 Cr.  
An in-depth course covering the factors involved in radiographic exposure and its effect on film qualities. Lecture periods are coordinated with laboratory experiments to demonstrate these relationships. Prerequisite: R-T 105. (1 + 2)

**R-T 107. Radiographic Positioning II.** 3 Cr.  
The more technically difficult positioning of the spine, pelvis and organs of the thoracic and abdominal cavities is studied. Prerequisite: R-T 106. (2+2)

**R-T 117. Related Radiographic Procedures.** 3 Cr.  
Three inter-related units are studied in this course. Nursing procedures relating to radiology departments, the unique problems involving radiography of infants and children, and the uses of contrast media in patient examinations are explored in both lecture and laboratory periods. R-T 107 must be taken concurrently with this course. Prerequisite: R-T 116. (2+2)

**R-T 108. Radiographic Positioning III.** 3 Cr.  
The more complex aspects of radiography of the skull are combined with special radiographic procedures such as cerebral, abdominal and cardiac angiography and studied in detail in lecture and laboratory periods. Prerequisites: R-T 107 and 117. (2+2)

**R-T 118. Radiographic Physics.** 4 Cr.  
This course includes the study of physics as applied to radiography, the maintenance of radiographic equipment and accessories, and an extreme in-depth study of radiologic protection to patients and personnel. Prerequisite: Physics 180 — Radiation Physics. (3+2)

**Fifth Through Eighth Quarters Hospital Work Experience and a Seminar.** 63 Cr.  
Practical clinical experience supervised by adjunct clinical instructors at one of the program's affiliated hospitals, combined with an on-campus 40 hour seminar de-

signed to correlate the student's total learning-working experience and to relate them to their future working environments. (40+2000)

### Reading Development

#### RED 065. Developmental Reading I. 3 Cr.

A presentation of the basic vocabulary and comprehension skills with an emphasis on the study of vowel and consonant sounds and the word attack skills. An introduction to the study skills in the reading area is presented. (3+2)

#### RED 066. Developmental Reading II. 3 Cr.

A continuation of the study of word attack skills and a stressing of vocabulary and comprehension skill development. Also a continuation of the study skills in the reading area. (3+1)

#### RED 067. Developmental Reading III. 3 Cr.

The reading study skills, listening and note-taking skills, and skills involved in reading in the content fields are studied in addition to a continuation of an emphasis on vocabulary development and the various skills necessary to reading comprehension. (3+0)

#### RED 068. Developmental Reading IV. 3 Cr.

An individual laboratory situation for the student with unique problems in reading. This is also a continuation of the developmental reading program. An individualized program for each student will be prescribed on the basis of diagnostic procedures. (3+0 Hours to be arranged)

### Real Estate

#### R-E 210. Principles of Real Estate. 4 Cr.

This course acquaints the student with appraising real estate and granting real estate loans. The course includes appraising by estimating reproduction cost, estimating return on investment and estimating market value. A study is made of the source of real estate loan funds, the documentation of real estate loans including deeds, mortgages and land contracts. The course also includes loan delinquencies and foreclosure. Prerequisite: Law 325 recommended. (4+0)

#### R-E 230. Appraisal Principles and Procedures. 4 Cr.

The course is a survey of the basic principles and methods of appraising property. Its purpose is to lay a foundation for a sound development and further refinement of the specialized appraisal problems that may be encountered in business, finance, insurance, government, and legal spheres of activity. Prerequisite: R-E 210. (4+0)

#### R-E 240. Principles of Real Estate Management. 4 Cr.

The course is designed to provide an academic background and a working knowledge of the important fundamentals of property management, such as the merchandising, analysis, rental, public and tenant relations, and operations of residential, office, commercial, and industrial properties. Prerequisite: R-E 210. (4+0)

### Recreation

#### REC 101. Survey of Leisure Arts and Recreation Careers. 2 Cr.

A course designed to acquaint students with the various career opportunities in recreation and leisure.

Students will be introduced to the employment possibilities existing in both public and private recreational settings and to the degrees available in the leisure arts and recreation curriculums at Ferris State College. (2+0)

#### REC 120. Recreation Arts and Crafts. 3 Cr.

The course is designed to acquaint students with activities which stress a technical skill which produces objects that have functional value: leatherwork, carving, ceramics, weaving, etc. (3+0)

#### REC 220. Supervised Recreation Leadership. 1 to 4 Cr.

This course is a supervised recreational leadership experience which will take place in the college community or surrounding area. Prerequisite: Consent of Instructor.

#### REC 320. Recreation Facilities. 4 Cr.

A study of equipment and facilities in recreation. Concentration is primarily on placement construction, type, and maintenance of these facilities. (4+0)

**REC 430. Administration of Recreation.**

4 Cr.

A survey of the organization and administration of recreation on the federal, state, and local levels. Major emphasis is given to the administration at the local level including operation of playgrounds, community centers, pageants, and special events. (4 + 0)

**REC 435. Leadership and Programming.**

3 Cr.

This course is designed to acquaint the student with the various roles of leadership available to those interested in the profession of Recreation. Emphasis will also be given to the various types of programming found in the many facets of the recreation field. (3 + 0)

**REC 445. Camping.**

3 Cr.

A study of camps and camping, private, public, school, and family. An emphasis will be given to the necessary skills, equipment, facilities, and related problems concerning camping. (3 + 0)

**REC 455. Outdoor Recreation.**

3 Cr.

A study of outdoor education philosophy and practices, including the historical development of outdoor education. Emphasis will be focused on playgrounds, parks, state and national forests. (3 + 0)

**REC 475. Internship in Leisure Arts and Recreation.**

12 Cr.

A course in supervised and practical experience in some facet of leisure and recreation.

**Refrigeration, Heating and Air Conditioning****RHA 142. Duct Work.**

2 Cr.

Designed for Refrigeration, Heating and Air Conditioning students, it requires the use of all common sheet metal hand and machine tools. Problems relate to the layout and construction of various air handling components used in heating and air conditioning systems. (1 + 3)

**RHA 161. Basic Refrigeration.**

9 Cr.

The theory and application of the basic principles of refrigeration are studied in relation to the functioning and operating characteristics of the various components of the refrigeration system. Included are the operating characteristics of condensers, re-

ceivers, evaporators, refrigerant control, common refrigerants and the use of testing equipment, safety and protective devices. (5 + 15)

**RHA 162. Advanced Refrigeration.**

9 Cr.

A continuation of RHAC 161 in the theory, application, and operation of all types of refrigerant control devices. Various types of electric controls, including thermostats, pressure controls, defrost controls, relays and protective devices are included. System malfunction diagnosis and corrective procedures are presented and practiced. (5 + 15)

**RHA 163. Commercial Refrigeration.**

9 Cr.

Instruction in the design, layout, calculation and operation of complete commercial refrigeration systems. Various types of defrost mechanisms — basically electric and hot gas, with variations — are studied and analyzed for effectiveness. Heat load calculation both for high and low temperature requirements are studied. Time clock initiated control systems used in conjunction with pressure and temperature controls, magnetic starters, and other electrical control devices are covered. (5 + 15)

**RHA 165. Transportation Refrigeration and Air Conditioning.**

4 Cr.

A study of transport compressor construction, drive mechanisms, capacity control and other problems identified with mobile refrigeration, including types of safety devices, condensing problems, and equipment locations. Various types of eutectic plates and eutectic solutions for short haul and hold-over service are discussed. Problems concerning comfort air conditioning, as applied to trucks, bus, aircraft and marine applications are presented. (4 + 0)

**RHA 173. Applied Electricity.**

4 Cr.

The fundamentals of electricity with application to the area of refrigeration, heating and air conditioning. Includes study of electron theory, magnetism, DC and AC current, electrical producers, meters, motors, transformers, capacitors and relays. (4 + 0)

**RHA 181. Automotive Air Conditioning.**

4 Cr.

A course in the principles of diagnosis and repair of air-conditioning units in automobiles. Offered for students in the Automotive Service program. (4 + 0)

**RHA 261. Summer Air Conditioning.****9 Cr.**

A study of the basic principles, practices, and operation of air conditioning equipment for cooling. The sling psychrometer, anemometer, and other instruments are used in the study of the psychrometric chart, air, and steam tables. Laboratory work includes operating, testing and troubleshooting various types of air conditioning equipment. (5 + 15)

**RHA 262. Heating.****9 Cr.**

A study of the three basic heating systems warm air, hot water, and steam, including stokers, oil burners, filters, registers and heat transfer units, and problems in heat loss calculations for residential and commercial installations together with the selection and sizing of heating systems. Laboratory work includes the installation, operation, testing and trouble shooting of various types of heating equipment together with the associated electric and pneumatic controls. (5 + 15)

**RHA 263. Advanced Air Conditioning.****9 Cr.**

Calculations and problems coordinated with laboratory operations and tests, including the study of air distributions, duct design, fans, filters, diffusers, electric and pneumatic controls. Also included is a study of insulation materials; chimneys and flues. Laboratory work includes the use of pitot tubes, anemometers, manometers and draft gauges in checking duct systems for heating and cooling operations. Other laboratory problems consist of duct construction, applications of fan performance under various conditions, diagramming and testing various wiring requirements. (5 + 15)

**RHA 272. Air Movement and Ventilation.****4 Cr.**

The study of special problems in the areas of air handling for heating, air conditioning and ventilation, including specific problems in air duct design, psychrometric problems of design and installation of industrial ventilation. (4 + 0)

**RHA 273. Electrical Controls.****4 Cr.**

A course designed to provide a background in the theory of operation, application, and installation of electrical control circuits and control devices used in the refrigeration, air conditioning and heating industry. Basic

control circuits are combined in various ways to effect the control of motors, dampers and valves used with heating and air conditioning equipment. (4 + 0)

**RHA 297. Special Studies in Refrigeration, Heating, and Air Conditioning.****1 to 4 Cr.**

Individual or group projects in the area of the student's concentration and interest, involving significant effort in problem analysis, data collection, and the development of appropriate solutions and the organization of an oral and/or written report. Prerequisite: Consent of instructor and department head.

**Respiratory Therapy****RST 120. Respiratory Anatomy and Physiology.****4 Cr.**

Introductory course concentrating upon the inter-relationship of the cardiac and pulmonary systems. Course involves structure of the respiratory system, cardiovascular system, fetal lung development, regulation of respiration, mechanics of ventilation. For Respiratory Therapy majors only. (3 + 3)

**RST 125. Respiratory Therapy Fundamentals and Theories.****3 Cr.**

This course involves gas laws and application, gas transport in the blood, acid-base regulation in the body, basic cardiopulmonary pathology, and an introduction into the principles of mechanisms of drug interaction and drug administration. Prerequisite: RST 120. (3 + 0)

**RST 130. Respiratory Therapy Equipment and Procedures.****4 Cr.**

Course involves a continuation of pharmacology, humidity and aerosol therapy, oxygen administering devices, cylinders-regulators-flowmeters, medical gases, IPPB therapy, suctioning technique, intubation technique, and cardiopulmonary resuscitation. Prerequisite: RST 125. (3 + 3)

**RST 200. Hospital Relations.****2 Cr.**

Course offers insights into basic situation encountered by student and therapist in hospital setting. The therapists role and performance in emergency situations are examined. Adaptability to staff and patient is stressed. (2 + 0)

**RST 201. Clinical Therapy I.** 12 Cr.  
This course is offered in the clinical setting of the hospital. Practical application of theory and equipment is stressed. Prerequisite: RST 130. (0+36)

**RST 202. Clinical Therapy II** 12 Cr.  
This course is a continuation of application of theories and equipment in the clinical hospital setting. Patient care and management are stressed. Prerequisite: RST 201. (0+36)

**RST 203. Clinical Therapy III.** 12 Cr.  
This course is a continuation of applying theory and equipment skills in performing patient care and therapy in the clinical setting of the hospital. Leadership, supervision, department organization and patient management skills are stressed. Prerequisite: RST 202. (0+36)

**RST 210. Ventilator Mechanics.** 7 Cr.  
Course introduces modern day development and application of positive pressure, mechanical ventilators, characteristics of modern adult, pediatric, and neonate ventilators, clinical application, pulmonary care management, and monitoring. Prerequisite: RST 130. (6+3)

**RST 220. Pulmonary Function Testing.** 4 Cr.  
Introductory course dealing with the history of pulmonary function testing, lung volumes and capacities in both normal and abnormal states, simple screening and complete study testing, modern machine operation, testing technique, and test interpretation. Prerequisite: RST 130. (3+2)

**RST 231. Pulmonary Pathophysiology.** 4 Cr.  
Introduction to pathology and relation to cardiovascular problems with detailed emphasis on cardio-respiratory anatomy, physiology and pathology as applied to Respiratory Diseases, diagnosis, and treatment. Includes introduction to blood gases and acid-base problems. (4+0)

**RST 240. Pulmonary Diseases I.** 4 Cr.  
Introductory course first exploring basis and rationale behind diagnosis, testing, and treatment of respiratory diseases. Later etiology and management of obstructive and restrictive diseases are discussed. (4+0)

**RST 241. Pulmonary Diseases II.** 4 Cr.  
This is a continuation of the previous course examining the etiology and management of respiratory diseases. Diseases and conditions discussed include; fungal diseases, diffusion conditions, post operative and trauma conditions, neurologic and cancer conditions. (4+0)

### Social Science

**SSC 101. Man and Society 1.** 3 Cr.  
An introduction course in the social sciences which analyzes the problems that arise in American society and within the groups that make up the society. The scientific method as it applies to the social sciences is considered. NOTE: A student should complete this course not later than the end of his sophomore year. The course is not open for credit to a student who has credit in Sociology 221, or 222, or 231, or the equivalents. (3+0)

**SSC 102. Man and Society 2.** 3 Cr.  
A continuation of Social Science 101, including problems concerned with the satisfaction of human wants and the regulation of human behavior. NOTE: A student should complete this course not later than the end of his sophomore year. The course is not open for credit to a student who has completed Economics 221 or the equivalent. Prerequisite: Social Science 101 or consent of instructor. (3+0)

**SSC 114. Human Sexuality.** 2 Cr.  
This course provides a rational, contemporary and useful treatment of a broad range of subjects classified as "human sexuality," "heterosexual attraction," and "affectional responses." The physiological, psychological, sociological and ethical aspects of human sexuality will be discussed. (2+0)

### Social Service Technician

**SSV 101. The Field of the Helping Professions.** 4 Cr.  
A study of the role and functions of the helping professions in modern society. His-

tory, concepts, values, attitudes and philosophy of the helping professions will be covered. Description and analysis of the current status of the helping professions approach to helping people achieve effective relationships and cope with their problems. (4+0)

**SSV 102. Skills and Methods of the Helping Professions.** 3 Cr.  
Current fields of practice in the helping professions, their origins and changing focus are treated. The generic approach is followed in analyzing the current operation of social work in particular settings. Case records, materials and examples will be used from the helping professions. (2+2)

**SSV 103. Interviewing in the Helping Professions.** 4 Cr.  
The generic principles of interviewing will be analyzed including such aspects as how to observe and communicate effectively, the stages of the interview, etc. Case examples from various settings will be examined. Opportunity to interview and evaluate interviews will be offered. Some time will be spent to prepare the student for summer internship placement in a participating institution or agency. (3+2)

**SSV 114. Social Service Internship.** 6 Cr.  
Agency internship experience is designed to help each student understand and integrate his classroom and agency experience. A summer placement in a helping agency or institution is made to provide the student with first-hand knowledge of the operation of a specific agency in the area of his second year specialization or interest, i.e. Department of Social Services or Office of Youth Services county offices, corrections agencies, private agencies, youth serving agencies, Senior Citizen's services, state institutions, etc. Approval of Social Service Technician faculty required.

**SSV 200. Special Studies.**  
Variable credit, 1 to 3 Cr.  
Focus and scope of special projects, course of readings or study to be worked out by student and faculty concerned. Department head approval required.

**SSV 220. The Field of Aging.** 4 Cr.  
Consideration of the changing position of older people from pre-industrial to modern societies. The special roles and stages of life will be covered as follows: the family cycle, family relationships, aging and the socioeco-

omic structure, group behavior and the emerging culture of older people. Includes demographic analysis of older population, age and older people in value systems and cross-cultural comparisons. (3+2)

**SSV 221. Group Process and Treatment in the Helping Professions.** 4 Cr.  
An introduction to understanding of groups, group process and individual behavior in groups which will cover the role of the leader in groups of various types, ages and sizes as well as techniques of work with groups. Case examples from various settings will be examined. (3+2)

**SSV 222. Social Welfare as an Institution.** 3 Cr.  
A developmental analysis of American Social Welfare Institutions, policies and programs. Structure, financing, functions and major issues will be delineated, as will be the event and the people who created and influenced welfare institutions. (3+0)

**SSV 223. Planned Change in the Human Services.** 3 Cr.  
Obstacles to bringing about change in the social welfare system will be studied as well as various reform goals and models in the fields of public assistance, mental health, youth services and services to the aged. The different strategies and techniques for effecting change will be examined. (3+0)

**SSV 231. Group Process in Corrections.** 4 Cr.  
Emphasis in this course will be placed upon the needs and identities of the recipient of corrections services. The basic purpose of this course is to assist the student in gaining insights into, and developing sensitivity to the behaviors and motivations of the corrections client. (3+2)

**SSV 232. Corrections as an Institution.** 3 Cr.  
Emphasis will be placed upon the formal organization of the social welfare and corrections institutions in Michigan. The student will be expected to study the organization and disorganization of systems in which the corrections agent is involved. (3+0)

**SSV 233. Corrections and the Process of Law.** 3 Cr.  
An in-depth study of the roles of both the client and worker as structured and formalized by law. The student will be expected to study in detail that section of the Michigan

Probate Code as pertains to juveniles and the Juvenile Division. A cursory examination of the state statutes of Criminal Law will also be required as well as an examination of those aspects of the Supreme Court decisions relative to the field of corrections. (3+0)

## Sociology

### SOC 115. Planning for Marriage.

2 Cr.

A study of cultural patterns in dating, courtship, and engagement. Special emphasis is placed on factors involved in mate selection such as personality, family backgrounds, and socioeconomic influences. The subject of marriage and the family is considered, but major emphasis is placed on preparation for marriage. (2+0)

### SOC 221. Introductory Sociology.

4 Cr.

An introductory course in the study of man's behavior as it is affected by group situations and relationships. Included is a brief study of the scientific method, an examination of culture, an investigation into the nature of social groups and societal structures, and an introduction into the functioning of some social institutions. Throughout the course, principles which are basic for the understanding of society are stressed. Prerequisite: Social Science 101 or sophomore standing. (4+0)

### SOC 222. Social Problems.

4 Cr.

An analysis of representative social problems in contemporary America. Such societal problems as the following will be considered: delinquency, crime, alcoholism, drug addiction, prejudice, sex offenses, mental disease, immigration and others. Prerequisite: Sociology 221. (4+0)

### SOC 225. Marriage and the Family.

3 Cr.

A sociological study in depth of man's most basic institution. Biological foundations, cultural and historical backgrounds and American family patterns are investigated. Consideration is given to premarital behavior, mate selection, moral codes and marital interaction. Factors that lead to family disorganization and the means of conserving family values are discussed at length. Prerequisite: Social Science 101 or sophomore standing. (3+0)

### SOC 231. General Anthropology.

4 Cr.

Analyzes evidence tracing the evolution of man and the primates. Man's early cultural development as it parallels his physical change is considered as it may be inferred from the material cultural remains. Cross cultural comparisons are made of man's beliefs, feelings, and behavioral patterns as they are influenced by his social and physical environment. Prerequisite: Social Science 101 or sophomore standing. (4+0)

### SOC 240. Minority Groups in America.

4 Cr.

Minority-majority intergroup relations are examined. Particular emphasis is given to sources of stress and strain, the nature and roots of prejudice and discrimination, sub-cultural variations, and alternative means to achieve accommodation. Prerequisite: Sociology 221. (4+0)

### SOC 241. The Functioning Community.

4 Cr.

Community life is analyzed. The functional interdependence of groups, agencies and institutions for the maintenance of an organized community is emphasized. The development and implementation of programs to meet community needs is examined. Prerequisite: Sociology 221. (3+2)

### SOC 242. Sociology of Deviant Behavior.

4 Cr.

A study of the development of anti-social behavior. Consideration is given to normative structures and to the processes of socialization and social control. Sociological theories of deviant, delinquent and criminal behavior are presented. Application and limitations of these theories to selected problem areas are explored. Prerequisite: Sociology 221. (4+0)

### SOC 243. Culture of Rural and Urban Poverty.

4 Cr.

A comparison and contrast of life styles, attitudes, values, normative systems, formal and informal group relationships and their effect upon people engulfed in poverty within an affluent society are presented. Prerequisite: SOC 221. (4+0)

### SOC 244. Urban Sociology.

4 Cr.

The ecological and functional organization of urban life is examined. Special attention is devoted to the demographic structure,

spatial and temporal patterns of population changes, and sociological aspects of the problems of urban planning and redevelopment. Prerequisite: SOC 221. (4+0)

**SOC 261. Man and Leisure.** 4 Cr.  
A study of the social and cultural condition developing and affecting leisure, free-time, and recreation in America. Some consideration will be given to the wide variety of group and individual, commercial and non-commercial, forms of leisure arts and recreation. (4+0)

**SOC 350. Principles of Criminology.** 4 Cr.  
A study of the nature, origin and development of crime. Psychological and sociological factors leading to criminal behavior are examined. Current programs for treatment and prevention are considered. Prerequisite: SOC 221. (4+0)

**SOC 360. Dynamics of Contemporary Change.** 4 Cr.  
A survey of change theory; emphasis to be placed upon the acceleration of change experienced and being experienced in American society; effect upon contemporary social institutions; present trends and future predictions. Prerequisite: SOC 221. (4+0)

**SOC 452. Special Studies in Sociology.** 1 to 4 Cr.  
This course is designed to give students an opportunity for individual study or research in special topics which may be timely and related to their interest and program needs. The study is made under the direction of a cooperating department member. Prerequisite: Consent of instructor and department head. (1-4+0)

## Spanish

**SPA 101. Beginning Spanish 1.** 4 Cr.  
Emphasis on pronunciation, vocabulary, and basic grammar. Individual oral drill. Instruction in the cultural and historical development of Latin America. (4+0)

**SPA 102. Beginning Spanish 2.** 4 Cr.  
Continuation of Spanish 101. Emphasis on grammar and composition. Individual oral drill. Prerequisite: Spanish 101. (4+0)

**SPA 103. Beginning Spanish 3.** 4 Cr.  
Emphasis on reading, composition, and simple conversation. Individual oral drill. Prerequisite: Spanish 102. (4+0)

## Speech

**SPE 105. Fundamentals of Interpersonal Communication.** 4 Cr.  
A study of everyday communication and how it affects perceptions, self-image and interpersonal relations. Special attention is given to self-image, nonverbal communication and conflict resolution. (4+0)

**SPE 115. Parliamentary Procedure.** 2 Cr.  
The methods of presiding over and participating in business meetings are studied and applied. Each student helps to frame a constitution and participates in regular business meetings. (2+0)

**SPE 121. Fundamentals of Public Speaking.** 4 Cr.  
Training and experience in the preparation and delivery of short speeches with emphasis on the communication of ideas in a clear, logical, and concise manner. (4+0)

**SPE 131. Voice and Diction.** 2 Cr.  
Improving the speaking voice. Emphasis is placed upon developing clear articulation, pleasing vocal quality, adequate loudness and projection, a varied and expressive voice and correct habits of pronunciation. (2+0)

**SPE 151. Argumentation and Debate.** 4 Cr.  
A study of the techniques of investigation, reasoning, proof, and logical argument as preparation for debate. Each student conducts inquiry into the national intercollegiate debate proposition, prepares a brief, and enters into formal debate with his colleagues. Special attention is given to (1) analysis of the proposition, (2) research, (3) selection of issues, (4) kinds of argument, and (5) the structure of debate in American society. Prerequisite: Speech 105 or Speech 121 or consent of instructor. (4+0)

**SPE 152. Speech Activities.** 2 Cr.  
A laboratory course in which students prepare for and participate in speech activities such as: discussion, debate, individual speaking, and oral interpretation. Two hours of credit may be earned each quarter,

but not more than six hours of credit may be applied toward graduation. Prerequisite: Consent of department head and instructor. (0+4)

**SPE 221. Group Discussion Procedures.**

4 Cr.

This course trains the student in the method of thinking and problem-solving used in committees, industrial and civic groups, and similar organizations. Each student participates in, leads, and evaluates group discussions on topics of current interest and importance. Prerequisite: SPE 105, SPE 121 or consent of instructor. (4+0)

**SPE 231. Interpretative Reading.**

4 Cr.

Consideration of the fundamental principles of effective oral reading. Attention is given to the reading of both prose and poetry. Practice is provided in both individual and group reading. (4+0)

**SPE 232. Persuasion.**

4 Cr.

A study of the psychology and the techniques of persuasive speaking with special emphasis on the analysis of human behavior as it is expressed in audience reaction. Each student applies the techniques to the preparation and delivery of original persuasive speeches. Prerequisite: Speech 105 or Speech 121, or equivalent. (4+0)

**SPE 410. Communication Theory.**

4 Cr.

A review of contemporary theories of human communication in intrapersonal, interpersonal, small group, public, mass, and intercultural communications contexts. This course will cover the process and elements of both the verbal and nonverbal aspects of communication. Abstracting, language and meaning, and proxemics, are among the topics to be covered. (4+0)

**SPE 452. Special Studies in Speech.**

1 to 4 Cr.

Individual or small group study in areas of speech or drama that are not covered in detail in other courses. Written proposals of work to be done and written reports of results obtained are required. The topic and credit will be agreed upon before the student registers for the course. Prerequisite: Consent of instructor and department head. (1-4+0)

## Surveying

**SUR 101. Surveying 1.** 4 Cr.

Orientation and instruction in proper field surveying procedures, including the operation of surveying equipment and instruments, primarily leveling, measurement of lines, and angles, with emphasis on note keeping. Prerequisite: Concurrent enrolment or completion of Math 111. (2+6)

**SUR 102. Surveying 2.** 4 Cr.

A continuation of Surveying 101 with primary emphasis on transit-tape surveys, rigorous treatment of traverse techniques, and introduction to circular curves. Advanced leveling problems and basic instrument calibration and adjustment. Prerequisites: Concurrent enrolment, or completion of Math 124. (2+6)

**SUR 131. Theory of Land Surveying 1.**

3 Cr.

The study of the subdivision of public lands, theory of original survey, resurvey, subdivision survey, and methods of legal description. (3+0)

**SUR 141. Materials of Construction.**

3 Cr.

A study of the use and basic properties of construction materials, including concrete, bituminous concrete, steel, wood, non-ferrous metals, and plastics. The student is introduced to basic laboratory procedures in materials testing. (2+3)

**SUR 201. Surveying 3.** 4 Cr.

A continuation of Surveying 102. An engineering-surveying course which includes horizontal, vertical and easement curves, complete instrument adjustments, the problems of coordinates and the distribution of errors. Use of theodolites and electronic distance measuring equipment, solar and polaris observations. Prerequisites: Surveying 102 and Mathematics 124. (2+6)

**SUR 202. Surveying 4.** 4 Cr.

A topographical surveying course including mapping control, plane table surveys, instrument maintenance and repair, celestial observations and triangulations, with specialized problems used in coordination with Surveying 201. Prerequisite: Surveying 201. (2+6)

**SUR 221. Surveying Calculations.**

3 Cr.

An introduction to the techniques for making more advanced surveying calculations

including the reduction of field astronomy data for the determination of true meridian, elementary error analysis, coordinate systems and their application to survey problems. The use of programmable desk top computers is introduced in this course. Prerequisites: Surveying 102 and Mathematics 124. (3+0)

**SUR 231. Theory of Land Surveying 2.**  
3 Cr.

A continuation of Surveying 131 including the preparation of a plat, survey law, legal interpretations, and professional ethics. Prerequisite: Surveying 131. (3+0)

**SUR 241. Nature of Soils.** 3 Cr.

An introductory course for the technical student in the basic physical and geological aspects, characteristics, and engineering classifications of soils. Prerequisites: Completion of, or concurrent enrolment in Physics 211 and Surveying 141. (2+3)

**SUR 251. Introduction to Hydrology.**  
3 Cr.

The fundamental principles of the Hydrologic Cycle, run off collection system, and measurements of stream flow in the natural channels with emphasis leading towards basic culvert design. Prerequisites: Physics 211 or with special permission. (2+2)

**SUR 261. Topographical Drafting 1.**  
3 Cr.

Emphasis on laboratory practice involving the plotting and computations of profiles, cross-sections, traverses, contours, and deed descriptions. The course emphasizes drafting with ink and includes related problems from U.S.G.S. maps. Prerequisites: Surveying 201 and Engineering Graphics 122. (1+6)

**SUR 262. Topographical Drafting 2.**  
2 Cr.

A continuation of Surveying 261. Computation and the drawing of special problems are emphasized. A topographical map is compiled from data obtained in Surveying 202, and extensive use is made of mechanical lettering and plotting devices. Prerequisites: Surveying 261 and concurrent enrolment in Surveying 202, or with special permission. (1+3)

**SUR 297. Special Studies in Surveying.**  
1 to 4 Cr.

Individual or group projects in the area of the student's concentration and interest, involving significant effort in problem analy-

sis, data collection, and the development of appropriate solutions and the organization of an oral and/or written report. Prerequisite: Consent of instructor and department head.

**SUR 301. Environmental Engineering.**  
4 Cr.

This course is designed to acquaint the student with the study and use of soils information in the urban environment; with the problems of engineers in land development which would include the use of topography maps, drainage problems, the problems of cut and fill, the measuring of flows of liquid in closed and open systems; and in the use of surveying instruments to level and secure elementary topographic information, the reading of maps, and serial photographs in relation to land use. (3+3)

**SUR 302. Geodetic Surveying.** 4 Cr.

A study of methods employed in designing and executing large scale horizontal and vertical control survey systems and the special requirements for geodetic computation of length, azimuth, and elevation. The functions of the Coast and Geodetic Survey and the availability of Geodetic Control information through this agency is discussed. The computation and use of State Plane Coordinates is also introduced. Prerequisites: SUR 202; completion of, or concurrent enrolment in Math 232. (3+3)

**SUR 303. Engineering Cartography.**  
3 Cr.

Historical development, leading to contemporary map compilation systems. Methods and systems for the control and collection of cartographic data including tacheometry, aerial photography, and hydrographic surveying, electronic position location, and orbital satellite systems. The mathematics of map projection systems is introduced and the effect of scale error or linear distortion is discussed. Application or projection systems is demonstrated through the use of projection tables. Map accuracy, design editing, and reproduction; including orthophoto maps. The engineering use of cartographic data is emphasized. Prerequisites: SUR 262; completion of, or concurrent enrolment in Math 231. (3+0)

**SUR 332. Land Surveying.** 2 Cr.  
Case study of land surveying problems, riparian and littoral ownership, unwritten rights, mineral rights and reversion rights of property. Prerequisite: SUR 231. (2+0)

**SUR 341 Soil Mechanics.** 3 Cr.  
A continuation of soil analysis. Fundamental principles of soil compressibility and shear strength. Basic problems dealing with foundations, retaining walls, slope stability, and earth structures. Prerequisite: Math 231, Physics 211, and SUR 241. (3+0)

**SUR 351. Hydraulics.** 3 Cr.  
Introduction into fluid mechanics, static pressures, kinematics of fluid flow, energy and momentum. Open channel flow and pressure conduits leading to advanced drainage design and water supply systems. Prerequisites: SUR 251, Math 232. (2+2)

**SUR 401. Principles of Photogrammetry.** 3 Cr.  
Topics covered in this course include the history of photogrammetry, the geometry of single photos and stereopairs, stereoscopy, photogrammetric systems, field surveys related to photogrammetric systems, field surveys related to photogrammetry, relative and absolute orientation of the stereoplotter. Prerequisites: Junior status or permission of the Department. (2+3)

**SUR 402. Airphoto Interpretation and Application.** 3 Cr.  
The student is introduced to aerial mosaics and various types of photo maps. Characteristics of airphoto images are studied with reference to reconnaissance surveys, soil conditions, land form features, hydrologic data, and boundary evidence. A limited amount of time is spent on the stereoplotter in compiling a photogrammetric map. Prerequisite: SUR 401. (2+3)

**SUR 403. Advanced Surveying Problems.** 4 Cr.  
This course is intended to be a practical course for graduating students to perform a final and complete problem of their choice utilizing all available resources and previous course work. These problems are to be current and of practical nature and may be of use to the college or community as a service. Private land surveying will not be permitted. These problems will be presented by the students and be judged by the surveying faculty on a seminar basis. Prerequisite: To be taken only by senior students. (1+6)

**SUR 422. Surveying Data Adjustment.** 4 Cr.  
Theory and application of least squares. Adjustment of traverses, triangulation, trilateration, and level nets by approximate methods and least squares utilizing the digital computer. Also, evaluation of adjusted data. Prerequisite: SUR 302. (3+2)

**SUR 431. Subdivision Design.** 4 Cr.  
A study of basic design criteria and application of plat law and zoning ordinance as applied to residential lot layouts, trailer parks, industrial parks, and housing complexes. Prerequisite: Surveying 262. Should be taken only by senior surveying students. (2+4)

**SUR 432. Surveying Office Practice.** 2 Cr.  
A study of engineering office procedures and organization, engineering and surveying note and drawing record systems, equipment control, cost control, and professional conduct and ethics. (2+0)

**SUR 461. Urban Planning.** 3 Cr.  
A study of land use and transportation planning as it affects the subdivision, municipality and regional development. (3+0)

**SUR 497. Special Studies in Surveying.** 1 to 4 Cr.  
Individual or group projects in the area of the student's concentration and interest, involving significant effort in problem analysis, data collection, and the development of appropriate solutions and the organization of an oral and/or written report. Prerequisite: Junior standing and consent of instructor and department head.

## Technical Drafting and Tool Design

**T-D 110. General Industrial Drafting.** 3 Cr.  
This is a basic course utilizing laboratory experience and lectures as a means of developing understanding of industrial blueprints. A foundation of orthographic projection, delineation and dimensioning promotes the ability to convey and interpret manufacturing and engineering information. In learning the basic industrial language, the student will be able to develop an ability to comprehend the many complex blueprints of industry. Open to all students. (2+2)

**T-D 111. Drafting Techniques.** 5 Cr.  
Basic techniques of lettering, linework, geometric construction, orthographic projection and basic dimensioning are explored through discussion and laboratory assignments. A study of pictorial drawings and blueprint reading completes the preparation for technical drafting. (3+7)

**T-D 121. Technical Drafting 1.** 10 Cr.  
A lecture-laboratory course designed to develop the basic technical skills involved in general technical drafting. Product drafting procedures are used in teaching projection practices, dimensioning techniques, surface finish controls, geometric and positional tolerances, sections, symbols and conventions. Laboratory assignments cover detail, subassembly and assembly drawings. A.N.S.I. Standards are stressed throughout the course. Prerequisite: T-D 111. (5+15)

**T-D 131. Technical Drafting 2.** 10 Cr.  
Emphasis is placed on the solution of layout problems and the study of spatial relationships of lines, planes, and solids. Elements of descriptive geometry and principles of rotation are presented through discussion and assignments of typical industrial applications. Prerequisite: T-D 121. (5+15)

**T-D 142. Technical Drafting.** 2 Cr.  
An introductory course in drawing and blueprint reading for refrigeration, heating and air conditioning students, designed to develop the basic concepts of lettering, free-hand sketching, orthographic projection, the use of instruments, and blueprint reading. (1+3)

**T-D 174. Blueprint Reading.** 2 Cr.  
A practical mechanical drafting course for Welding program students, which includes simple blueprint reading. Special emphasis is placed on pipe and angle layout, and template making for these structures. (1+3)

**T-D 182. Sheet Metal Drafting.** 2 Cr.  
A basic sheet metal drafting course in layout for refrigeration, heating and air conditioning students. It includes the development of various cylindrical, square, and conical fittings and many types of transitional fittings used in the refrigeration and air conditioning fields. (1+3)

**T-D 191. Blueprint Fundamentals and Elementary Projection.** 2 Cr.  
This is a laboratory-lecture course which includes selected blueprint reading, drafting theory and drafting practice. This course is intended to survey the fundamental principles of drafting as applied to two-view and three-view drawings and the projection and dimensioning of cylindrical and complex shapes. (1+3)

**T-D 192. Industrial Drafting Standards.** 2 Cr.  
This is a laboratory-lecture course which includes drafting theory and drafting practice. Special consideration is given to the standard practices of dimensioning, tolerancing, and the notations of tooling components. Such as the proper practices of revolving out of position, line elimination, sectioning, etc., are studied as they apply to the drawing of castings, forgings and machine stock. Prerequisite: T-D 191. (1+3)

**T-D 193. Advanced Projection.** 2 Cr.  
This is a laboratory-lecture course which includes drafting theory and drafting practice. Advance projection is designed to further strengthen and enlarge upon the basic concepts of drafting. The course content includes casting, weldment, and tooling component drawings with special application to auxiliary views, double auxiliary views, and symmetrically opposite parts. Prerequisite: T-D 192. (1+3)

**T-D 194. Assembly Drawings and Tool Detailing.** 2 Cr.  
This is a laboratory-lecture course which includes drafting theory and drafting practice. The course content includes assembly drawings, tool detailing, and the reading of industrial tooling packages, plus a survey of the various types of pictorial drawings. Prerequisite: T-D 193. (1+3)

**T-D 195. Theory of Welding Fabrication Processes.** 2 Cr.  
Theory and practical demonstrations on types and processes of welding, joint design, welding symbols, and inspection and testing in a manner to provide the technical drafting student with an understanding of the field of welding as related to his field of study. (2+0)

**T-D 211. Technical Drafting 3.** 10 Cr.  
Jigs, fixtures, dies and molds and machines detailing.  
This is a laboratory-lecture course and in-

cludes 15 hours of drafting practice and 5 hours of drafting theory directly related to the laboratory work. It is designed to bring out the fundamentals of tools, jigs, fixtures, dies and molds. Standard parts such as clamps, washers, keys, locating pins, punches, etc. are given their proper perspective in relation to tools, jigs, fixtures, dies and their detailing. It also broadens the student's background with the use of actual drill jigs, milling fixtures and dies which are drawn as assemblies and detailed into working drawings. Practice is given in incorporating engineering changes in existing tool drawings. Prerequisite: T-D 131 (5+5)

**T-D 221. Tool Design 1.** 10 Cr.  
A theory-practice course in design related to production tooling devices for tool guiding and work holding. Laboratory assignments include jig, fixture, machine design problems. Current industrial designs, as well as vendors' catalogs, provide references and guidance for practical individual design solutions. Prerequisite: T-D 211. (5+15)

**T-D 231. Die Design 1.** 10 Cr.  
A theory-practice course in the design of production press-work dies, including typical cutting, forming, draw dies. Coupled variations include cam operated, combination and draw dies. Press accessories are studied as they apply to design problems. Prerequisite: T-D 221. (5+15)

**T-D 232. Mechanics and Strength of Materials 1.** 2 Cr.  
A study of forces, components, resultants and equilibrants — stress and strain in tension, compression and shear, modulus of elasticity, centroids and moments of inertia of areas. Prerequisite: Math 107 or equivalent. (1+3)

**T-D 283. Mechanics and Strength of Materials 2.** 2 Cr.  
A continuation of T-D 282. The following topics are covered: stresses in beams, shear diagrams, bending moments and diagrams, flexure formula, bending stresses combined with tension or compression, torsion of shafts, bending combined with torque, compression members and repeated stress. Prerequisite: T-D 282. (1+3)

**T-D 297. Special Studies in Technical Drafting.** 1 to 4 Cr.  
A course designed to allow qualified students the opportunity for independent study and/or research under the direction of one or more faculty members. Prerequisite: Consent of instructor and department head.

## Technical Illustration

**T-I 100. Industrial Sketching.** 2 Cr.  
This course will prepare the student to be competent in the principles and application of three-dimensional drawing. Upon completion of the course the learner will be capable of communication concepts and technical information by the media of pictorial sketching. (1+3)

**T-I 101. Technical Illustration 1.** 2 Cr.  
An introduction to the technical illustration field. The technical illustrators' tools, skills, responsibilities, standard of workmanship, and functions. Uses of technical illustrations and opportunities for the technical illustrator. Study of and practice in lettering. (1+3)

**T-I 102. Technical Illustration 2.** 7 Cr.  
Freehand Gothic Lettering and mechanical lettering devices. Charts and graphs. Orthographic and axonometric projections. Introduction to grids. (4+11)

**T-I 103. Technical Illustration 3.** 8 Cr.  
Enlarging and reducing drawings. Use of ellipse templates, proportional dividers, and other mechanical aids. Interpretation of blueprints from various industries. Shading with applied materials. (3+17)

**T-I 111. Basic Drawing.** 4 Cr.  
The development of sound fundamental approaches to drawing and of a thorough understanding of the principles of form and figure drawing. Special attention will be given to the technical aspects of drawing, including construction drawing, technical sketching, details, and textures. (2+6)

**T-I 201. Technical Illustration 4.**

8 Cr.

Individual assignment of practical projects. Special treatments, including phantom, cut-away, and exploded assemblies. Shading with applied materials. Emphasis on industrial standards. (3+17)

**T-I 202. Technical Illustration 5.**

6 Cr.

Group assignments for manual production. Emphasis on team work. (2+13)

**T-I 203. Technical Illustration 6.**

8 Cr.

Seminar and critique sessions. Development of student portfolio of Technical Illustrations. Keyline and paste-up. Industrial displays, posters and safety cartoons. (3+17)

**T-I 261. Industrial Materials and Processes 1.**

3 Cr.

Introduction to and study of basic industrial materials and processes. Designed to develop an understanding of industrial tools and materials; and an appreciation of engineering functions, product design, and production methods. (3+0)

**T-I 262. Industrial Materials and Processes 2.**

3 Cr.

Continuation of Technical Illustration 261. (3+0)

**T-I 263. Design, Materials and Reproduction.**

3 Cr.

Information on the study of layouts and make-up of industrial manuals, instruction sheets and other materials encountered by the technical illustrator. Keylining, color separation, and techniques used in industrial publication. Layout, paste-up, overlays, reverses, scaling, and screens. Study of reproduction processes. (2+2)

**T-I 297. Special Studies in Technical Illustration.**

1 to 4 Cr.

This course will provide qualified students with the opportunity for individual study or project development under faculty direction. Prerequisite: Consent of instructor and department head.

**Vocational-Business****V-B 112. Human Relations in Business.**

3 Cr.

This course deals with the area of human relations in business — the motivation of individuals, interpersonal relationships, and the morale of individuals and groups. (3+0)

**V-B 121. Elementary Typewriting.**

2 Cr.

This course is designed for students who have had no previous typewriting instruction. An introduction to the keyboard and an understanding of the operational parts of the typewriter are emphasized. The student is instructed on how to prepare communications relating to correspondence and tabulation. (5+0)

**V-B 122. Intermediate Typewriting.**

3 Cr.

This course is designed to develop further skills for job performance through typewritten communications. The production basis of instruction and evaluation is used through a series of projects. Prerequisite: One year of high school typewriting or successful completion of Vocational Business 121, or the equivalent. (5+0)

**V-B 123. Advanced Typewriting.**

3 Cr.

Proficiency in production typing is the major aim of this course. Emphasis is also placed on continued speed-building and accuracy. Instruction involves complex tabulations, rough drafts, legal documents, business letters, business forms, and composing. Simulated conditions of actual job situations are utilized. Prerequisite: Vocational Business 122, or the equivalent. (5+0)

**V-B 133. English for Business.**

4 Cr.

This course is designed to meet the practical English needs of students in the business field. It includes an intensive study of grammar, sentence structure, punctuation, paragraph construction, capitalization, dictionary usage, structure of words, word usage, word division, and spelling. Special attention will be given to phrases, clauses, and kinds of sentences to help students write with exactness and clarity for the business world. (4+0)

**V-B 134. Business Writing.**

4 Cr.

A course designed to teach the principles of business letter-writing, business reports, and annotations of business articles. A for-

mal business report based upon library research is required. Prerequisites: Vocational Business 122 and Vocational Business 133. (4 + 0)

**V-B 141. Mathematics for Business. 4 Cr.**

A review of fundamental arithmetical processes and their business applications. Problems solved in this course cover banking records, discounts, inventories, fractions, percentages, and interest. (4 + 0)

**V-B 143. Payroll Accounting. 3 Cr.**

A comprehensive study of the Social Security Act as it applied to FICA, FUTA, and state unemployment tax regulations and procedures. City, state, and Federal income taxes are also considered as they apply to payroll records, reports, and procedures. Prerequisite: Vocational Business 141. (3 + 0)

**V-B 144. Accounting 1. 4 Cr.**

A presentation of the basic principles of accounting pertaining to a personal service enterprise and a merchandise enterprise. The entire accounting cycle is covered at every opportunity to insure an understanding of overall accounting procedures. Prerequisite: Vocational Business 141. (4 + 0)

**V-B 145. Accounting 2. 4 Cr.**

This course is designed to give expanded consideration to the accounting for purchases, sales (including installment and consignment sales), inventory, prepaid expenses, and tangible long-lived assets. It also includes a study of the fundamental principles of accounting as applied to a partnership. Prerequisite: Vocational Business 144. (4 + 0)

**V-B 151. Office Machines I. 2 Cr.**

This course is designed for the student interested in acquiring competence on various types of calculating machines. It acquaints the student with the operational characteristics of the machines and promotes rapid acquisition of job-level skill. Additional consideration is given the technical and trades students with problems similar to those encountered in the specific technical and trades fields. Prerequisite: Vocational Business 141. (2 + 1)

**V-B 152. Office Machines 2. 2 Cr.**

Intensive practical training on posting and accounting machines as it applies primarily to accounts receivable; accounts payable,

and banking problems. This includes credit memorandums and discounts. Prerequisites: Vocational Business 141, Vocational Business 151. (2 + 1)

**V-B 162. Survey of Office Automation. 2 Cr.**

This course is designed to present the essential background and the current practices of automation in the office. Emphasis is placed on recording and processing data. Prerequisite: Vocational Business 141. (2 + 0)

**V-B 171. Dictation Machine Transcription. 2 Cr.**

This course is designed to develop job-level transcription machine skill with the aid of the electric typewriter. Emphasis is also given to the fundamentals of communication. Prerequisites: Vocational Business 133, Vocational Business 122. (2 + 1)

**V-B 192. Clerical Office Practice. 4 Cr.**

This course stresses the study of office duties and procedures. It is designed so that the student can apply acquired learning and skills to the practical problems that arise in the office. Prerequisite: To be taken in the final quarter of study. (4 + 0)

**V-B 193. Applied Clerical Office Procedures. 2 to 5 Cr.**

A work experience program designed to give the student practical experience in applying clerical office procedures in a selected administrative or faculty office. To qualify for admission to this course, the student should have (1) a cumulative honor-point average of 2.5 or more; (2) have the permission of the instructor. Prerequisite: Vocational Business 122.

**V-B 194. Clerical and Civil Service Training. 2 Cr.**

This course provides an intensive pre-employment review of the knowledge and basic skills that are necessary for clerical positions in business and government. It gives the student practice in taking tests of the type commonly used to screen prospective employees by the personnel offices of business and government. Particular attention is given to some of the special conditions and procedures for employment in civil service. Prerequisites: Vocational Business 122, Vocational Business 133, Vocational Business 141, Office Administration 250. (2 + 0)

## Welding

**WEL 111. Welding 1.** 8 Cr.  
This is the beginning course for students interested in either the certificate or associate degree program. Practical experience will be gained in the use of oxyacetylene and shielded metallic arc welding of ferrous metals in the flat position. Also an introduction is made to soldering and metal cutting procedures. (3 + 15)

**WEL 121. Welding 2.** 8 Cr.  
An expansion of Welding 111 where the techniques of out of position welding are emphasized. Laboratory projects will include oxyacetylene welding, cutting, soldering and shielded metallic arc welding in the vertical and overhead positions. Prerequisite: Welding 111. (3 + 15)

**WEL 131. Welding 3.** 12 Cr.  
This course in welding procedures and practices includes tungsten inert gas, gas shielded metal arc, and flux cored wire welding. Emphasis is placed on metal arc welding of pipe and oxyacetylene repair of aircraft structures. Prerequisite: Welding 121. (5 + 20)

**WEL 144. Template Layout and Construction.** 2 Cr.  
A course designed for students majoring in Welding, to give a working knowledge of template development. Emphasis is placed on design and making templates for the layouts of various pipe joints.

**WEL 183. Combined Welding.** 2 Cr.  
A combined course in gas and arc welding to provide the machinist or other tradesman with sufficient welding experience to make minor repairs and to fabricate simple assemblies. Emphasis is placed on the building up of worn parts and the repair of broken parts. The use of low temperature rods is included to make the repair of machine tools, such as milling cutters, possible. (1 + 3)

**WEL 191. Basic Metallurgy.** 3 Cr.  
The study of steel classifications, heat treatment procedures, properties of ferrous and non-ferrous metals, and non-destructive testing. This course is offered to Technical Drafting, Welding, and Machine Tool students. (3 + 0)

**WEL 192. Combined Welding.** 3 Cr.  
A combined welding course covering gas arc theory and practice, structured for students needing more than the offering of WEL 183, particularly those students enrolled in the Auto Body Repair program. (2 + 4)

**WEL 193. Welding Metallurgy.** 3 Cr.  
A lecture-demonstration course designed to give welding students a better understanding of effects of alloying elements on welds. The course utilizes the metallurgy laboratory and deals with the inspection and testing of welds, etching, grain structure changes made by welding, and slags and gasses for welding shielding. (3 + 0)

**WEL 211. Welding 4.** 10 Cr.  
This final course in the certificate program is designed to give the student extensive work on non-ferrous and ferrous alloys. Objectives also include repair welding, fabrication and operator qualification testing. Prerequisite: Welding 131. (4 + 16)

**WEL 221. Welding 5.** 8 Cr.  
A course designed to broaden the student's knowledge in production welding processes, especially in the semi-automatic and resistance welding fields. Theory and application of special welding processes, such as submerged arc, electron beam, plasma arc and spray welding will also be covered. Prerequisite: Welding 211. (3 + 15)

**WEL 231. Welding 6.** 8 Cr.  
This course will include the design of welded structures and the use and construction of jigs and fixtures. Special emphasis is placed on non-destructive testing of student weldments for certification purposes, using non-destructive testing processes such as radiography, ultrasonic, penetrant and magnetic particle inspection. Prerequisite: Welding 221. (3 + 15)

**WEL 297. Special Studies in Welding.** 1 to 4 Cr.  
A course designed to allow qualified students the opportunity for independent study and/or research under the direction of one or more faculty members. Prerequisite: Consent of instructor and department head.

## INDEX

- A.W.S. . . . . . 122  
 Absence from Class . . . . . 128  
 Academic Advisers . . . . . 98  
 Academic Calendar . . . . . 6  
 Academic Credit for Activity  
   Courses . . . . . 126  
 Academic Deans . . . . . 97  
 Academic Information, General . . . . . 128-130  
 Academic Programs . . . . . 132-273  
 Academic Standards . . . . . 128  
 Accountancy, Courses in . . . . . 296-298  
 Accountancy, Department of . . . . . 165  
 Accounting, Higher Curriculum . . . . . 193  
 Accounting Major, Academic Major  
   Requirements . . . . . 165  
 Accounting Major, Program  
   Requirements . . . . . 165-166  
 Accreditation and Approval . . . . . 172  
 Activities, Student . . . . . 122-126  
 Activity Card, Student . . . . . 122  
 Activity Courses, Academic  
   Credit for . . . . . 126  
 Administration and Faculty . . . . . 10-41  
 Administrative Affairs . . . . . 40  
 Administrative Assistant, Public  
   and Industrial Administrative  
   Assistant . . . . . 235  
 Administrative Assistant  
   Curriculum, Associate of  
   Arts Degree . . . . . 235  
 Administrative Officers . . . . . 10-13  
 Admission, Registration  
   and Orientation . . . . . 80-86  
 Admission Requirements  
   by Schools . . . . . 80-81  
 Admission to Ferris State College . . . . . 80  
 Admission with Advanced  
   Standing . . . . . 82-85  
 Admissions, Records and Registration,  
   Division of . . . . . 40  
 Adult Education Program,  
   Community . . . . . 256  
 Advertising, Courses in . . . . . 298-300  
 Advertising, Curriculum . . . . . 176, 184  
 Advertising Major . . . . . 176  
 Advertising Major, Transfers with  
   Junior Standing . . . . . 183  
 Advisory Committees . . . . . 43  
 Allied Health, Courses in . . . . . 300  
 Allied Health, School of . . . . . 132-16  
 Allied Health, School of, Admission  
   Requirements . . . . . 132  
 Allied Health, School of,  
   Career Fields . . . . . 133, 134  
 Allied Health, School of, Faculty . . . . . 13-16  
 Allied Health, School of, History . . . . . 132  
 Allied Health, School of, Philosophy  
   and Goals . . . . . 132  
 Allied Health, School of,  
   Requirements for the Bachelor of  
   Sciences Degree . . . . . 133  
 Allied Health, School of,  
   Requirements for the Associate in  
   Applied Science Degree . . . . . 133  
 Allied Health Education  
   Curriculum . . . . . 211-212  
 Alumni Building . . . . . 74  
 Alumni Office . . . . . 41  
 Apartment Facilities . . . . . 76  
 Application for Loans . . . . . 100-107  
 Applied Biology . . . . . 231  
 Architectural Drafting,  
   Courses in . . . . . 300-303  
 Architectural Drafting  
   Curriculum . . . . . 270-271  
 Art, Courses in . . . . . 303-304  
 Art, Commercial, Courses in . . . . . 317-319  
 Art, Commercial Curriculum . . . . . 275-276  
 Associate Degree Programs, Technical and  
   Applied Arts . . . . . 270-292  
 Associate in Applied Science Degree in  
   Business, Requirements . . . . . 191-192  
 Associate in Arts Degree in General  
   Education, Requirements . . . . . 230  
 Associated Women Students . . . . . 122  
 Astronomy, Courses in . . . . . 304, 392  
 Athletic Facilities . . . . . 75  
 Athletics, Intercollegiate . . . . . 125  
 Athletics, Intramural . . . . . 125  
 Auditing Courses, Reviewing or . . . . . 89  
 Automobiles, Student . . . . . 73  
 Automotive and Heavy Equipment  
   Technology, Bachelor of  
   Science Degree Curriculum . . . . . 266-267  
 Automotive and Heavy Equipment  
   Technology, Courses in . . . . . 304-305  
 Automotive Body, Courses in . . . . . 304  
 Automotive Body Curriculum . . . . . 271-272  
 Automotive Machine, Courses in . . . . . 305  
 Automotive Machine Curriculum . . . . . 292-293  
 Automotive Painting, Courses in . . . . . 306  
 Automotive Painting Curriculum . . . . . 272  
 Automotive Service, Courses in . . . . . 306-308  
 Automotive Service Curriculum . . . . . 272-273  
 Aviation, Courses in . . . . . 308-309  
 Avionics, Courses in . . . . . 309  
 Awards . . . . . 113-119  
 Bachelor of Science in Business . . . . . 163  
 Band . . . . . 126  
 Biological Science, Courses in . . . . . 310  
 Biology, Courses in . . . . . 310-312  
 Biology Minor . . . . . 221, 223  
 Board of Control . . . . . 10  
 Bookstore . . . . . 74  
 Broadcast Electronics Technology,  
   Courses in . . . . . 312  
 Broadcast Electronic Technology  
   Curriculum . . . . . 267-268  
 Building Construction Technology,  
   Courses in . . . . . 313-314  
 Building Construction Technology  
   Curriculum . . . . . 274-275  
 Buildings, Description of . . . . . 73-75  
 Business, Courses in . . . . . 314-315

Business, School of	162-206	Councils	42-43
Business, School of, Admission Requirements	80	Commencement	130
Business, School of, Baccalaureate Programs	163-191	Commercial Art, Courses in	317-319
Business, School of, Bachelor of Science Degree	163	Commercial Art Curriculum	275-276
Business, School of, Cooperative Education	162	Committees, Faculty	42-43
Business, School of, Degree Programs	163	Community Adult Education Program	256
Business, School of, Faculty	16-20	Community Studies, Courses in	319-320
Business, School of, General Education Core Requirements	163	Continuing Education	256
Business, School of, History	162	Convocations, General Education	130
Business, School of, Purpose and Program	162	Cooperative Education, School of Business	162
Business Administration Major	168-170	Core Courses, Business	164
Business Administration Major, Management	168-170	Core Requirements, Business	164
Business Building	75	Cosmetology, Courses in	320-321
Business Communications Option	202-203	Cosmetology Curriculum	276-277
Business Education	212-218	Counseling, Summer Program	85-86
Business Core Courses	164	Counseling Services	97-98
Business Core Requirements	164	Courses, Description of	296-417
Business Curriculum, Terminal	191-206	Court and Conference Reporting, Courses in	321-323
Business Education Curriculum	212-218	Court and Conference Reporting Curriculum	203-204
Business Education Majors	215-218	Credit Designation	128
Business Education Minor	215-218	Criminal Justice, Law Enforcement, Courses in	359-360
Business Office Assistant Program, Certificate	204	Criminal Justice, Law Enforcement Curriculum	233-234
Business Operations	41	Data Processing, Courses in	323-325
Calendar	2	Data Processing, Courses in (Restricted to Qualified Majors)	324-325
Calendar, Academic	6	Data Processing, Department of	166-167
Campus, Description and Location of	72	Data Processing Major	166-167
Career Fields, School of Allied Health	133-134	Debating	126
Career Fields, School of Business	163	Degree Programs in Business	163
Career Fields, School of Education	208	Dental Assistant, Courses in	325-326
Career Fields, School of General Education	231	Dental Assistant Curriculum	144-145
Career Fields, School of Technical and Applied Arts	265	Dental Hygiene, Courses in	326-327
Certificate Programs, School of Technical and Applied Arts	292-293	Dental Hygiene Curriculum	145-146
Chemistry, Courses in	315-316	Dental Laboratory Technology, Courses in	327-328
Chemistry Minor	221-222	Dental Laboratory Technology Curriculum	146-147
Child Care, Courses in	316-317	Department of College Relations	40
Chorus	126	Deposit Procedures	81-82
Clinic, Seminars, Short Courses, Workshops	256	Deposit Refund Policy	93
Clubs, Interest	124	Description of Courses	296-417
Coaching Minor	223	Description of the Campus	72
College Apartments	76	Developmental Services	97, 256-257
College of Optometry	259	Directed or Internship Teacher Requirements	209
College Personnel	10-41	Distributive Education Major	213
College Relations, Department of	40	Division of Admissions, Records and Registration	80-86
College-Wide Committees and Councils	42-43	Division of Student Affairs	38-40
Commencement	130	Drafting, Architectural, Courses in	300-303
Commercial Art, Courses in	317-319	Drafting, Architectural Curriculum	270-271
Commercial Art Curriculum	275-276	Drafting, Technical, Courses in	412-414
Committees, Faculty	42-43	Drafting, Technical, Curriculum	290-291
Community Adult Education Program	256	Drama, Courses in	328-329
Community Studies, Courses in	319-320	Dramatics	126
Continuing Education	256	Dual Degree Programs	179
Convocations, General Education	130		
Cooperative Education, School of Business	162		
Core Courses, Business	164		
Core Requirements, Business	164		
Cosmetology, Courses in	320-321		
Cosmetology Curriculum	276-277		
Counseling, Summer Program	85-86		
Counseling Services	97-98		
Courses, Description of	296-417		
Court and Conference Reporting, Courses in	321-323		
Court and Conference Reporting Curriculum	203-204		
Credit Designation	128		
Criminal Justice, Law Enforcement, Courses in	359-360		
Criminal Justice, Law Enforcement Curriculum	233-234		
Data Processing, Courses in	323-325		
Data Processing, Courses in (Restricted to Qualified Majors)	324-325		
Data Processing, Department of	166-167		
Data Processing Major	166-167		
Debating	126		
Degree Programs in Business	163		
Dental Assistant, Courses in	325-326		
Dental Assistant Curriculum	144-145		
Dental Hygiene, Courses in	326-327		
Dental Hygiene Curriculum	145-146		
Dental Laboratory Technology, Courses in	327-328		
Dental Laboratory Technology Curriculum	146-147		
Department of College Relations	40		
Deposit Procedures	81-82		
Deposit Refund Policy	93		
Description of Courses	296-417		
Description of the Campus	72		
Developmental Services	97, 256-257		
Directed or Internship Teacher Requirements	209		
Distributive Education Major	213		
Division of Admissions, Records and Registration	80-86		
Division of Student Affairs	38-40		
Drafting, Architectural, Courses in	300-303		
Drafting, Architectural Curriculum	270-271		
Drafting, Technical, Courses in	412-414		
Drafting, Technical, Curriculum	290-291		
Drama, Courses in	328-329		
Dramatics	126		
Dual Degree Programs	179		

East Building .....	74	Courses in .....	342-344
Economics, Courses in .....	329-330	Food Service Management	
Education Building .....	75	Curriculum .....	149-150
Education, Minors .....	223-227	Forensics .....	126
Education and Learning Resources,		French, Courses in .....	344
School of .....	207-228	General Academic Information .....	128-130
Education and Learning Resources,		General Business Program .....	163
School of Admission		General Clerical, Certificate .....	205-206
Requirements .....	208-209	General Education, School of .....	229-258
Education and Learning Resources,		General Education, School of,	
School of, Directed or Internship		Admission Requirement .....	230-231
Teacher Requirements .....	209	General Education, School of,	
Education and Learning Resources,		Associate in Arts Degree	
School of, Faculty .....	20-21	Requirements .....	230
Education and Learning Resources,		General Education, School of,	
School of, History .....	207	Associate in Applied Science	
Education and Learning Resources,		Degree Requirements .....	230
School of, Requirements for		General Education, School of,	
Acceptance as a Candidate for		Bachelor of Science	
Teacher Certification .....	209-210	Degree Requirements .....	231
Education and Learning Resources,		General Education, School of,	
School of, Requirements		Career Fields .....	231
for Graduation .....	209	General Education, School of,	
Education, Courses in .....	330-334	Faculty .....	21-30
Education Grants and		General Education, School of,	
Scholarships .....	107	History .....	229
Electrical Power Technology,		General Education, School of,	
Courses in .....	336-337	Philosophy and Goals .....	229
Electrical Power Technology		General Education Convocations .....	130
Curriculum .....	277-278	General Education Core	
Emeriti .....	37-38	Requirements .....	163, 211, 212
Employment, Student, Part-time .....	98	General Information .....	72-77
Engineering Graphics, Courses in .....	337	General Printing Curriculum .....	286-287
English, Courses in .....	337-338	General Science Minors .....	224-225
English Minor .....	224	General Studies Curriculum .....	250-253
Enrollment .....	85	General Studies (Science) .....	253-254
Enrollment, Late .....	86	Geography, Courses in .....	344-345
Enrollment Deposit .....	81	Geology, Courses in .....	345, 392
Enrollment Fee Summary .....	88	Government, Student .....	122
Environmental Health,		Grading System .....	128
Courses in .....	338-341	Graduation .....	130
Environmental Health,		Graduation, Residence Requirements	
Curriculum .....	134-139	for .....	129
Environmental Sanitarian Assisting,		Graduation Requirements, School of	
Courses in .....	338-341	Allied Health .....	133
Environmental Sanitarian Assisting		Graduation Requirements, School of	
Curriculum .....	147-149	Business .....	163
Equal Opportunity .....	73	Graduation Requirements, School of	
Evening College .....	86, 254-256	Education and Learning	
Executive Secretarial Curriculum		Resources .....	209
(Legal Option) .....	200-201	Graduation Requirements, School of	
Executive Secretarial Curriculum		General Education .....	230-231
(Medical Option) .....	201-202	Graduation Requirements, School of	
Extended Degree Option .....	176-179	Pharmacy .....	262
Faculty .....	13-41	Graduation Requirements,	
Faculty, Committees .....	42-43	School of Technical and	
Fees, Other General .....	92	Applied Arts .....	266
Fees and Expenses .....	88-93	Graduation with Honors .....	86
Ferris Story .....	68-70	Graphic Reproduction,	
Finance, Courses in .....	341-342	Courses in .....	345-346
Finance Major .....	170-172	Graphic Reproduction	
Financial Aids for Students .....	98-113	Curriculum .....	293
Food Service Facilities .....	96	Health Center, Student .....	76, 119-120
Food Service Management,		Health Education, Courses in .....	346
Courses in .....	342-344	Health Optics, Curriculum .....	151-152

Health and Physical Education Building	75	Library Technology Curriculum	277-278
Health and Physical Education Requirements	129-130	Literature, Courses in	361-362
Health Service, Student	76, 119-120	Loans, Application for	100-107
Health Services Management, Courses in	346-347	Loans, General Policies	100-101
Health Services Management, Curriculum	139-140	Loan Funds	101-107
Heavy Equipment Service, Courses in	347-348	Location of Ferris State College	72
Heavy Equipment Service Curriculum	278-279	Machine Tool, Courses in	362-363
Higher Accounting Curriculum	193	Machine Tool Curriculum	282
High School Department	257-258	Majors, Business Education Curriculum	212-218
Highway Technology, Courses in	349	Management, Courses in	363-365
Highway Technology Curriculum	279-280	Management, Department of	170-175
History, Courses in	349-351	Management Major, Transfers with Junior Standing	184-185
Honor Societies	123	Marketing, Associate in Applied Science Degree	197-199
Honors, Graduation with	86	Marketing, Bachelor of Science Degree	175-176
Housing for Students	96-97	Marketing, Courses in	365-368
Housing Rates	88, 96	Marketing, Department of	175-76, 182-84, 197-99
Humanities, Courses in	351	Marketing Major	175-176
Human Services, Courses in	352-353	Marketing, Major, Transfers with Junior Standing	182-183
Human Services Curriculum	232	Marking System	128
Identification Card, Student	122	Married Students Housing	76
Industrial Chemistry Technology, Courses in	353	Mathematic, Courses in	368-371
Industrial Chemistry Technology Curriculum	280-281	Mathematics Education, Major	219-220
Industrial Electronics Technology, Courses in	353	Mathematics Education Curriculum	219-220
Industrial Electronics Technology Curriculum	281-282	Mathematics Minor	219-220
Industrial Production Technology, Courses in	354-355	Maximum Load	128
Instructional Buildings	74-75	Mechanical Engineering Technology, Courses in	371-372
Instructionally Related Organizations	124	Mechanical Engineering Technology Curriculum	283-284
Insurance, Associate in Applied Science Degree, Curriculum	186-187	Media Technology Program	228
Insurance, Bachelor of Science Degree, Curriculum	172-173	Medical Assistant, Courses in	372-373
Insurance, Courses in	355-356	Medical Assistant Curriculum	152-153
Insurance Major	172-173	Medical Laboratory Technician, Courses in	373
Intercollegiate Athletics	125	Medical Laboratory Technician Curriculum	153-154
Interest Clubs	124	Medical Record Administration	140-142
Interfraternity Council	123	Medical Record Technician, Courses in	373-375
International Business Courses in	356-357	Medical Record Technician Curriculum	154-155
Intramural Sports	125	Medical Technology, Courses in	375-376
Journalism	232-233	Medical Technology Curriculum	143-144
Journalism, Courses in	357-358	Music	126
Late Enrollment	86	Music, Courses in	376-377
Law, Courses in	358-359	Music Activities Center	75
Law Enforcement & Criminal Justice, Courses in	359-360	Nuclear Medicine Technology	155-156, 377-378
Law Enforcement & Criminal Justice Curriculum	233-234	Nursing, Courses in	378-379
Learning Resources Careers	208, 227-228	Nursing Curriculum	156-157
Legal Assistant Curriculum	195-196	Occupational Safety and Health, Courses in	379-380
Library	73-74	Occupational Safety and Health Curriculum	284-285
Library Technology, Courses in	360-361	Off Campus Housing	96-97
		Office Administration, Courses in	380-384

Office Administration, Department of .....	176-79, 188-89, 199-204
Office Administration Major (Executive Office Option) .....	176-177
Office Administration Major (Executive Office Option) Transfers with Junior Standing .....	189-190
Office Administration, Executive Secretarial .....	199-200
Office Administration Major (Office Management Option) .....	178-179
Office Administration Major (Office Management Option) Transfers with Associate Degree .....	189-190
Office Education — Accounting Major .....	214
Office Education — General Business Major .....	214
Office Education — Office Administration Major .....	214-215
On Campus Housing, Single Students .....	96-97
Ophthalmic Dispenser Curriculum .....	151-152
Ophthalmic Laboratory Technician Curriculum .....	151-152
Ophthalmic Science, Courses in .....	384-385
Optometric Technician Curriculum .....	157-158
Optometry, College of .....	259
Optometry, College of Admission Requirements .....	259
Organizations and Student Activities .....	122-126
Orientation, Courses in .....	385
Orientation, Registration and Admission .....	80-86
Orientation Course, the College .....	385
Ornamental Horticulture Technology, Courses in .....	386
Ornamental Horticulture Technology, Curriculum .....	236-237
Panhellenic Council .....	122
Part-Time Student Employment .....	98
Payment of Tuition and Fees .....	88-89
Pesticide Technology, Courses in .....	386
Pesticide Technology Curriculum .....	158-159
Pharmaceutical Chemistry, Courses in .....	386-387
Pharmacist, Registration as .....	260-261
Pharmacognosy, Courses in .....	388-389
Pharmacology, Courses in .....	389
Pharmacy Building .....	75
Pharmacy, Courses in .....	387-388
Pharmacy, School of .....	260-263
Pharmacy, School of, Admission Requirements .....	261-262
Pharmacy, School of, Application of Transfer Credit .....	262
Pharmacy, School of, Faculty .....	30-31
Pharmacy, School of, History and Aims .....	260
Pharmacy, School of, Requirements for Graduation .....	262
Pharmacy, School of, Scholastic Regulations and Personal Qualifications .....	260
Pharmacy, School of, Standards .....	260
Pharmacy Administration, Courses in .....	388
Physical Education, Courses in .....	389-392
Physical Science, Courses in .....	392-393
Physics, Courses in .....	393-394
Physics Minor .....	223
Placement and Career Information Center .....	98
Plastics Technology, Courses in .....	394-395
Plastic Technology Curriculum .....	
Political Science, Courses in .....	395-396
Pre-Arts Curriculum .....	241
Pre-Dentistry, Curriculum .....	243-244
Pre-Engineering Curriculum .....	241-242
Pre-Law Curriculum .....	242-243
Pre-Medicine Curriculum .....	243-244
Pre-Mortuary Science .....	244
Pre-Optometry Curriculum .....	245
Pre-Pharmacy Curriculum .....	245-246
Pre-Science Curriculum .....	246
Pre-Teaching, Elementary Curriculum .....	247-248
Pre-Teaching, Secondary Curriculum (Non-commerce and Non-Science) .....	248-24
Pre-Veterinary Curriculum .....	249-250
President's Office .....	41
Printing, Courses in .....	396-399
Printing Curriculums .....	286-287
Printing Management .....	268-269
Production Management Major .....	173-175
Professional Fraternities and Recognition Groups .....	123
Programs, School of Technical and Applied Arts .....	
Psychology, Courses in .....	399-400
Public Administration Assistant .....	235
Public Administration, Courses in .....	400-401
Publications, Students .....	125
Quarter-Hour Credit Courses, Description of .....	296-417
Radio-Television Service, Courses in .....	401-402
Radio-Television Service Curriculum .....	287-288
Radiologic (X-Ray) Technology, Courses in .....	402-403
Radiologic (X-Ray) Technology Curriculum .....	159-160
Rankin Center .....	76
Reading Development, Courses in .....	403
Real Estate, Courses in .....	403
Receptionist-Typist, Certificate .....	205
Recognition Groups and Professional Fraternities .....	123
Recreational Facilities .....	76-77
Refrigeration, Heating and Air Conditioning, Courses in .....	404-405
Refrigeration, Heating and Air Conditioning Curriculum .....	288-289
Refund Policy .....	92

Refund Policy, Deposit .....	93	Program .....	97, 256-257
Registration, Orientation and Admission .....	80-86	Student Employment, Part-Time .....	98
Religious Organizations for Students .....	125	Student Government .....	122
Residence Facilities .....	75-76	Student Health Center .....	76, 119-120
Residence Halls Association .....	122	Student Health Service .....	76, 119-120
Residence Hall Counseling .....	97	Student Housing .....	75-76
Residence Regulations .....	96	Student I.D. Card .....	122
Residence Requirements for Graduation .....	129	Student Loan Funds .....	101-107
Respiratory Therapy, Courses in .....	405-406	Student Publications .....	125
Respiratory Therapy Curriculum .....	160-161	Student Services .....	96-120
Retail Advertising Option .....	198-199	Summer Counseling Program .....	85-86
Retail Fashion Merchandising Option .....	198	Surveying, Courses in .....	410-412
Reviewing or Auditing Courses .....	89	Surveying Curriculum .....	269-270, 289-290
Schedule of Charges .....	88	Swan Technical Arts Building .....	75
Scholarships and Educational Grants .....	107	Table of Contents .....	3-15
School of Allied Health .....	132-161	Teacher Certification Requirements for Acceptance as a Candidate .....	209-210
School of Business .....	162-206	Teaching Certificates, Requirements for .....	209-210
School of Education and Learning Resources .....	207-228	Technical and Applied Arts, School of .....	264-293
School of General Education .....	229-258	Technical and Applied Arts, School of, Admission Requirements .....	265-266
School of Pharmacy .....	260-263	Technical and Applied Arts, School of, Faculty .....	31-37
School of Technical and Applied Arts .....	264-293	Technical and Applied Arts, School of, Graduation Requirements .....	266
Science Education, Biology Major .....	221	Technical and Applied Arts, School of, History .....	264
Science Education, Chemistry Major .....	221-222	Technical and Applied Arts, School of, Objectives for Programs .....	264
Science Education, Majors .....	221-222	Technical and Applied Arts, School of, Programs .....	265
Science Education Curriculum .....	220-222	Technical Drafting and Tool Design, Courses in .....	412-414
Science Hall .....	74	Technical Drafting and Tool Design Curriculum .....	290-291
Secretary, Executive, Curriculum .....	199	Technical Illustration, Courses in .....	414-415
Seminars, Clinics and Workshops, Description of .....	256	Technical Illustration Curriculum .....	291
Service Organizations .....	124	Television-Radio Service, Courses in .....	401-402
Social Fraternities .....	123	Television-Radio Service Curriculum .....	287-288
Social Science, Courses in .....	406	Trade and Industrial Annex .....	75
Social Service Technician Curriculum .....	237-240	Trade and Industrial Center .....	75
Social Service Technician Program .....	237-238	Trade-Technical Education Curriculum .....	222-227
Social Service Technician Program Courses in .....	406-408	Transcripts .....	129
Social Sororities .....	123	Transfer Programs, School of Business .....	179, 180
Social Studies Minor .....	226	Tuition and Fees .....	88
Sociology, Courses in .....	408-409	Tuition and Fees, Payment of .....	88-89
Sources of Students .....	72	Veterans, Education of .....	130
Spanish, Courses in .....	409	Vocational-Business, Courses in .....	415-416
Special Services to Students .....	96-98	Vocational-Business Curriculum .....	204-206
Special Transfer Programs, School of Business .....	179, 180	Welding, Courses in .....	417
Speech, Courses in .....	409-410	Welding Curriculum .....	292
Speech and Hearing Clinic .....	97	Welding Technology .....	292
Sports, Intramural .....	125	West Building .....	74
Starr Educational Center .....	74	Work-Study .....	113
Student Activities .....	122-126		
Student Activities and Organizations .....	122-126		
Student Activity Card .....	122		
Student Automobiles .....	73		
Student Center Board .....	122		
Student Conduct .....	73		
Student Development			