

COURSE DESCRIPTIONS--

Categories:

10	.....Art
15	.....Business
20	.....Education
25	.....Engineering
30	.....English
35	.....Foreign Languages
40	.....Math
50	.....Music
60	.....Physical Education
70	.....Natural Sciences
80	.....Social Sciences
85	.....Speech & Theatre
89	.....Experiential Learning, Electives, EMT, Nurse Aide, Study Abroad, and Enrich Program
90-99	.....Career and Technical

* Special Problems credit cannot be used to fulfill general education core requirements of degree.

The pair of numbers in parentheses at the end of each course description refers to lecture hours and lab hours respectively. All courses are graded on a quality point basis unless designated as pass/no pass.

10 Art

10:100 Encounters in Humanities (2 s.h.) This course is designed to introduce students to the world of humanities; describe the humanities genres and disciplines; provide a systematic method of assessing humanities artifacts; present opportunities to assess humanities artifacts; define methods of participating in the humanities. Four humanities genres are represented with their respective disciplines. (15-30)

10:101 Essentials of Art (3 s.h.) An introductory course designed to give a better understanding of art as an important force in present-day living. Aims to develop an appreciation of art and creative thinking through lectures, readings, and visual aids. Experimentation with a variety of tools, techniques, and materials is a meaningful part of the course. Recommended for nonart majors. Entry-level course. (45-0)

10:102 Art History I (3 s.h.) The study of the development of the visual arts of western civilization including painting, sculpture, architecture, and crafts from prehistoric origins through Gothic. (45-0)

10:103 Art History II (3 s.h.) The study of the development of the visual arts of western civilization including painting, sculpture, architecture, crafts, and photography from the Renaissance through the twentieth century. (45-0)

10:112 Art in the Elementary School (3 s.h.) Prerequisite: 10:101, Essentials of Art, or permission of instructor to remove prerequisite. This course is designed for elementary education majors or those who are planning to work with children pre-K to grade 6. Focuses on instructional planning for art studio and response activities with emphasis on interdisciplinary and multicultural approaches.

Components are artistic development of children, peer teaching, field observation, and foundations of art education. (45-0)

10:120 Drawing (3 s.h.) The development of visual perception in objective and subjective representation. Study of line, form, texture, and value in a variety of media stressing an individual's creative development. Entry-level course. (20-50)

10:130 Ceramics (3 s.h.) Prerequisite: 10:201, Two-Dimensional Design; 10:120, Drawing; or 10:101, Essentials of Art. An introductory course involving hand-building, wheel-throwing, glazing, and firing. Slides, lectures, and demonstrations. Ceramics facilities are located in the MacNider Museum, Mason City. (20-50)

10:150 Creative Photography (3 s.h.) An investigation into the relationship of basic photographic techniques to design, perception, and aesthetics. Each student is encouraged to cultivate his or her own visual vocabulary while working on photographic projects. (20-50)

10:151 Intermediate Photography (3 s.h.) Prerequisite: 10:150, Creative Photography. Emphasis on exploring photographic materials in the development of a personal vision. Technical subject covered: lighting, advanced printing, and camera techniques. Only offered spring semesters. (20-50)

10:201 Two-Dimensional Design (3 s.h.) Students/ artists explore the process of visual problem solving through participation in class critiques of individual projects. Perception and structure: exploring visual order emphasizing two-dimensional concepts. (20-50)

10:202 Graphic Design (3 s.h.) Prerequisite: 10:201, Two-Dimensional Design. Creative problem solving through the exploration of aesthetic and technical aspects of graphic design using computer-aided design software. (20-50)

10:210 Painting I (3 s.h.) Prerequisite: 10:201, Two-Dimensional Design; 10:120, Drawing; or 10:101, Essentials of Art. Beginning course planned to familiarize the student with the basic materials and tools of painting, the elements of pictorial organization, and the individual's creative development. Each student is encouraged to cultivate his or her own visual vocabulary. (45-0)

10:211 Painting II (3 s.h.) Prerequisite/Corequisite: 10:210, Painting I. Continuation of 10:210. Independent research, reading, and personal exploration of media and techniques. (45-0)

10:220 Digital Illustration (3 s.h.) Prerequisite: 10:201, Two-Dimensional Design. Recommended: 10:150, Creative Photography, or 10:202, Graphic Design. Creation and manipulation of digital imagery is explored in the context of creative expression. User interactivity, animation, full-color printing, and computer art theories are covered. The student completes visual projects with instructor guidance. (30-30)

10:299A Special Problems in Art (1 s.h.) A course designed jointly by the student and the instructor to investigate a problem in art. Disciplined, advanced art students can select an area for research. With the instructor's approval and the consent of the Division Chair

15:136 Advanced Document Processing (3 s.h.) Prerequisites: 15:134, Computer Applications, and 15:211, Word Processing. Students will learn intermediate to advanced functions of Microsoft Word including customizing templates, recording macros, creating on-screen forms, managing long documents, creating hyperlinks, and publishing on the World Wide Web. Upon completion of the course, the students may be prepared to take the Microsoft Office Specialist expert exam. (30-30)

15:140 Introduction to Computers and Information Systems (3 s.h.) Emphasis on computer literacy and business applications of computer software. Students do business problems using electronic spreadsheets, word processing software, database management software, and presentation software. Students also are exposed to web use, file management, and simple web page development. (45-0)

15:141 Management Information Systems I (3 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems, or permission of the Instructor. The primary goal of MIS I is to prepare students to be productive participants in an information society. The course is designed to develop a broad understanding of business information systems, various ways to discern information from an information system, and look at ways to distribute this information. The student will also learn the basic principles and techniques for developing simple computer-based information systems for managerial decision support systems through an extensive group project component of the course. (45-0)

15:142 Principles of Management (3 s.h.) 15:101, Introduction to Business, is recommended. Provides students with a general introductory management learning experience. Role of management in today's business environment; management's influence on employee productivity, employee satisfaction and organizational effectiveness; major control devices of management. (45-0)

15:144 Principles of Supervision (3 s.h.) This course is designed for individuals who hold, or who will hold, supervisory positions. The course involves the study of the major managerial functions (planning, organizing, staffing, directing, and controlling) and is augmented by other pervasive areas of supervision such as communication, motivation, decision making, and human relations. (45-0)

15:149 Managing Human Resources (3 s.h.) Course describes the transition from personnel management to human resources management. The focus is on the systematic process of recruitment, selection, developing, and appraising employees. (45-0)

15:150 Accounting Principles I (3 s.h.) An introductory accounting course: analyzing transactions, matching principle, adjusting and closing entries, financial statements, receivables, inventories, fixed assets and intangible assets, current liabilities, corporations (capital stock transactions, dividends, income and taxes, stockholder's equity, investment in stocks), bonds payable, investment in bonds. (45-0)

15:151 Accounting Principles II (3 s.h.) Prerequisite: 15:150, Accounting Principles I, or equivalent. Course covers Statement of Cash Flows, financial statement analysis, job order and process

cost systems, cost behavior, budgeting, standard costing, differential analysis and product pricing, capital investment analysis, activity-based costing, and just-in-time manufacturing. Emphasis is on management's use of accounting information. (45-0)

15:155 Payroll Accounting (3 s.h.) Prerequisite: 15:109 Introduction to Accounting or 15:150 Accounting Principles I with a grade of "C" or above. A study of basic business taxes. Emphasis on payroll taxes including social security taxes, income taxes, and unemployment taxes; completion of quarterly and annual reports and a payroll simulation project. (45-0)

15:156 Networking I (4 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems, or permission of the instructor. This course provides an overview of networking, including such topics as networking advantages, OSI layers, addressing and routing protocols, and LAN design, topologies, and cabling. (60-0)

15:157 Networking II (4 s.h.) Prerequisite: 15:156, Networking I, or permission of the instructor. A continuation of Networking I. Provides overview of Ethernet, token ring, ATM, and FDDI; examines routing and addressing issues; studies router setup and configuration; examines LAN designing, testing, and switching; and studies TCP/IP protocol and addressing. (45-30)

15:158 Networking III (4 s.h.) Prerequisite: 15:157, Networking II, or permission of the instructor. A continuation of Networking II. Addresses such topics such as advanced router configurations, LAN switching, networking management, advanced network design, access control list, Virtual LANS, and Novell IPX. (45-30)

15:159 Networking IV (4 s.h.) Prerequisite: 15:158, Networking III, or permission of the instructor. A continuation of Networking III. Using primarily hands-on, project-based learning, this course includes advanced network design projects and advanced network management projects. Wide Area Networks are discussed. (45-30)

15:160 Computer Accounting (3 s.h.) Prerequisite: 15:109 Introduction to Accounting or 15:150 Accounting Principles I with a grade of "C" or above. Designed to provide students with realistic experience with automated accounting consisting of five systems: general ledger, accounts payable, accounts receivable, depreciation, and payroll. Students will find themselves as having taken an accounting position in a company already using a computerized accounting system. Students will be working in an individualized instruction environment. (45-0)

15:161 Operating Systems I (3 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems, or permission of the instructor. Operating Systems I provides for core skills and understanding needed to successfully complete NIACC's IST program. Students gain knowledge and understanding for operating systems such as MS-DOS, Microsoft Windows 95, Microsoft Windows 98, and Windows NT. Students will also be introduced to other operating systems such as Linux, Apple MacOS, Microsoft Windows 2000 Professional, and Microsoft Windows XP Professional. This course addresses operating system interfaces and controls, resource management, file management, application management, and network client connectivity. (30-30)

15:163 Network Operating Systems (4 s.h.) Prerequisite: 15:177, Operating Systems II, or permission of the instructor. This course goes into detail on topics of network operating system such as design, planning, installation, configuration, security, performance, administration, troubleshooting, fault tolerance, and disaster recovery. Client setup, file and print sharing, directory services, remote access, along with other network services will be explored. (30-60)

15:164 Groupware Applications I (4 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems; 15:156, Networking I; and 15:161, Operating Systems or permission of the instructor. This course provides an introduction to such applications as electronic mail, shared calendars, document sharing, and applications within a networked environment. The course will also include an examination of groupware application features, groupware configuration and management, the relation of desktop applications to group products, a comparison of specific groupware products, and implementation issues related to groupware applications. (60-0)

15:166 Inter/Intranet Application Management (4 s.h.) Prerequisite: 15:163, Network Operating Systems, and 15:177, Operating Systems II, or permission of the instructor. This course enables students to design, set up, configure, and manage Internet and Intranet services such as Web, e-mail, DNS, security, and FTP along with gaining knowledge and insight into management of emerging Internet and Intranet technologies. Students will gain hands-on experiences in the installation, configuration, and management of applications such as Microsoft Internet Information Services (IIS), Apache Web Server, Microsoft Exchange Server, and Lotus Domino. (30-60)

15:167 Network Security (3 s.h.) Prerequisite: 15:156, Networking I, or permission of the instructor. This course will provide an overview of issues related to security in a networked environment, including such topics as security and disaster recovery, security within information services, security within an organization, virus protection, and Internet security/firewalls. (30-30)

15:168 Introduction to Programming (4 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems, or permission of the instructor. This course provides students exposure to computer program design, structure, development, and troubleshooting through an examination of such topics as logic concepts, variables, input/output, interactive constructs, conditional flow, modular design, create and manage databases, debugging, cgi scripting, object-oriented programming, and the comparison of programming languages. (45-30)

15:169 Media Experience (3 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems, or permission of the instructor. This course covers comprehensively the latest version of HTML. Students will learn good coding practices and be introduced to web development tools and FTP programs. Students will also be introduced to CSS (Cascading Style Sheets), image management, and basic JavaScript. (30-30)

15:170 Principles of Banking (3 s.h.) Fundamental bank functions presented in a descriptive fashion so that the beginning banker may

view the chosen profession in broad (and operational) perspective. (45-0)

15:171 Introduction to Entrepreneurship (3 s.h.) The course provides students with an opportunity to investigate, understand, and apply the process of founding a successful start-up company. Students will evaluate entrepreneurial characteristics, learn skills to identify new venture opportunities, and develop skills to create a business plan to maximize the chance of success for the new venture. (45-0)

15:172 Managing the Entrepreneurial Venture (3 s.h.) Prerequisite: 15:171, Introduction to Entrepreneurship, or permission of the instructor. The course provides students with an introduction to entrepreneurship and new venture creation. Students will examine the characteristics of successful entrepreneurs and develop insight on developing and enhancing creativity and innovation. Students will also learn the process of assessing new venture proposals and understanding the components of a business/feasibility plan. (45-0)

15:173 Seminar in Entrepreneurship (3 s.h.) Prerequisite: 15:171, Introduction to Entrepreneurship, and 15:172, Managing the Entrepreneurial Venture. Course will combine group discussions with an actual case project at a local entrepreneurial firm. Students will have an opportunity to apply business skills learned throughout their NIACC program as they complete a project for a local entrepreneurial venture. Students also will discover key entrepreneurial success characteristics. (15-38)

15:174 Database Management (3 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems, or permission of the instructor. This course introduces students to database concepts, with topics such as database structure and design, planning, modeling, database software and servers, SQL, reports, fault tolerance, and administration being covered. Exposure to current and popular database systems will be provided. (30-30)

15:175 Electronic Spreadsheets (3 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems, or 15:134, Computer Applications. Learn the fundamentals of spreadsheets, databases, and business graphics using appropriate software. (30-30)

15:176 Advanced Desktop Applications (3 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems. Advanced topics in desktop computer applications will be studied in this course. Students will also examine integrated software packages such as Microsoft Office Professional in this class. They will utilize integrated software to solve several business problems presented to them allowing them to gain an understanding of integrated software, as well as other desktop applications, through hands-on experience. The course will be project-based, providing the student with a collaborative environment. (30-15)

15:177 Operating Systems II (3 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems, and 15:161, Operating Systems I, or permission of the instructor. This course is a continuation of Operating Systems I. It addresses advanced topics such as file management, shell programming, security, network

and service administration, fault tolerance, recovery, troubleshooting, and operating system structure. This will be accomplished by studying the Unix or Linux operating systems. (30-30)

15:178 Hardware Service and Support (4 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems, 15:161, Operating Systems I, or permission of instructor. This course prepares the student to properly install, configure, upgrade, troubleshoot and repair microcomputer hardware. This includes basic knowledge of desktop and portable systems, basic networking concepts, and printers. The student must also demonstrate knowledge of safety and common preventive maintenance procedures. Topics include advanced DOS and Windows concepts such as batch files and memory management, installing and uninstalling software, basic hardware installation, and troubleshooting. (30-30)

15:182 Microsoft Windows Professional (4 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems; 15:161, Operating Systems I, or permission of the instructor. This course prepares the student to properly install, configure, upgrade, troubleshoot, and repair personal computer operating systems such as Microsoft Windows 2000 Professional and Microsoft Windows XP Professional. This course also addresses operating system interface controls; file system management; application management; network client configuration; and, operating system security. (30-60)

15:184 Windows 2000 Network Management (4 s.h.) Prerequisite: 15:163, Network Operating Systems, or permission of the instructor. This course applies the students' knowledge of computer networking, client operating systems, and server operating systems to the management of a complete Microsoft Windows network environment. Students will learn to manage client and server computers, storage resources, NTFS permissions, shared drives and printers, server performance and security, Active Directory objects, group policies, the Active Directory service, TCP/IP, name resolution protocols, applications, IIS, remote access, disaster recovery, and security. Concepts learned in this course lead toward the Microsoft Certified Professional Exam #70-218 Managing a Microsoft Windows 2000 Network Environment. (30-60)

15:186 Internet Programming I (3 s.h.) Prerequisite: 15:169, Media Experience, and 15:196, Structure and Design, or permission of the instructor. This course will teach the fundamentals of client-side web scripting with JavaScript. Students will learn about browser-related object models and their associated properties, events, and methods. Students will work with these models to create documents on the fly, create pop-up documents, manage images, manage framesets, create roll-overs, enable and validate form elements, manage cookies, create and maintain basic databases, define and enable custom objects, and create various web-related tools. (30-30)

15:190 General Insurance (3 s.h.) Principles of insurance and risk, including personal and business viewpoints in regard to life, health, property, and liability risks. (45-0)

15:191 Introduction to E-Commerce (3 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems, or permission of the instructor. This course provides students with foundational skills and general information about electronic business

solutions on the World Wide Web. Topics will include features of Internet marketing, sales, computer graphics, and network security. Students will also be introduced to Internet-related programming concepts and tools used to create web-based solutions. (30-30)

15:193 Computer User Support (3 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems; 15:178, Hardware Service and Support, or instructor approval. Introduces the concept of supporting personal computers as a career. Designed to help students target their customers and develop appropriate service skills. This course provides an introduction to end-user computing, computer user support, customer service skills, skills required for troubleshooting computer problems, common support problems, help desk operation, user support management, product evaluation strategies and standards, user needs analysis and assessment, installing end-user computer systems, training computer users, technical writing skills, and computer facilities management. (30-30)

15:194 E-Commerce Cases (4 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems, or permission of the instructor. Investigate current E-Commerce basics and real life scenarios regarding electronic business practices. This capstone course will tie together previous E-Commerce courses to real life applications. (30-60)

15:195 Property and Casualty Insurance (3 s.h.) Prerequisite/Corequisite: 15:190, General Insurance. This course is designed to provide instruction that will provide a high level of understanding of property and casualty insurance. Topics covered include fire, homeowners, dwelling, auto, business and professional liability, crime and fidelity, worker's compensation, and applications from a personal and commercial perspective. (45-0)

15:196 Structure and Design (3 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems, or permission of the instructor. A fundamental requirement for people in the Information Technology field is the ability to organize a solution to a problem. This, in and of itself, is a difficult task. Often, however, this skill takes a backseat to learning code or is lost in the complexity of the task. Structure and Design concentrates on the process of developing a logical algorithmic solution to a problem. (45-0)

15:197 Internet Law (3 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems, or permission of the instructor. An overview of the legal issues which have arisen in response to internet usage, particularly those legal issues which impact web-based commerce. Specific issues studied include jurisdiction, copyright, trademarks, contract, taxation, securities, offerings, privacy, obscenity, defamation, security, and computer crime. (45-0)

15:199 Web Development Cases (3 s.h.) Prerequisite: 15:174, Database Management, or permission of the instructor. This course will build on the student's prior Internet Programming knowledge and give them an overview of various web application development resources, tools, languages, and technologies. Students will be introduced to various current tools and technologies available to a Web Developer for development and begin to understand the situations each works best in. Emphasis will be on compare and contrast techniques, proper planning, relating the syntax and

elements to other tools and languages, knowledge transfer, how interaction takes place, design, and developing an understanding and use of programming resources. (30-30)

15:200 Life, Health, and Disability Insurance (3 s.h.) Prerequisite/Corequisite: 15:190, General Insurance. This course is designed to provide instruction in a variety of areas giving the student a good understanding of life insurance, health insurance, and the role and application of both within the industry. (45-0)

15:201 Visual Communication (3 s.h.) Prerequisite: 15:140, Introduction to Computers and Information Systems, 15:169, Media Experience, or permission of the instructor. This course is an introduction to visual problem solving and communication through the World Wide Web. This course will cover basic technical terminology, an overview of software and equipment for web graphic design and an introduction into digital imagery. Studio assignments will be digitized and sent electronically for evaluation and critique. The goal is to expand student competency in basic visual and technical skills, developing and understanding of how perception relates to communication, and expose students to current issues related to web graphic design. (30-30)

15:202 Web Design (3 s.h.) Prerequisite: 15:201, Visual Communications or permission of the instructor. This course is an expansion of graphic design concepts merging traditional page design, typography, and digital imagery into the concepts and practices of web design. This studio course will cover the preparation of digital images, compositional dynamics, and sequencing of images into a complete working web design. Students will work with current graphic and digital imaging software and web authoring software. (30-30)

15:203 Server Side Scripting (4 s.h.) Prerequisite: 15:168, Introduction to Programming, and 15:174, Database Management, or permission of the instructor. Students will learn to develop and implement web applications using server side scripting with emphasis on a single language. Additional server side scripting languages and technologies will be discussed. Much of the languages object model and methods will be covered with focus on how to work with these objects and procedures. Students will gain hands-on experience while writing real world-based web applications from the ground up. Database basics will also be learned along with SQL. Simple databases will be created for use with web application backends. Students will learn to access and modify their databases by building front-ends for them using server side scripting and embedded SQL. Sufficient time will be spent building solutions that require using ASP, HTML, JavaScript, and various other server side scripting technologies together. (30-60)

15:204 Java (4 s.h.) Prerequisite: 15:168, Introduction to Programming, or permission of the instructor. This course introduces students to doing purely object-oriented programming using the Java syntax. Emphasis is placed on using Java for web development. Students learn how to create their own objects and employ these objects as solutions to common real world-based web problems using applications and applets. Students will learn to create interactive elements and simple GUI elements. Use of the java.awt components, event-handling model, containers, and layout managers will also be emphasized. File handling techniques and

multithreading will be presented, along with JavaBeans. Applications and applets will be built from button up to facilitate in deeper understanding of the concepts used in OOP. (30-60)

15:206 Web Animation (3 s.h.) Prerequisite: 15:201, Visual Communications. Animation can be an important part of information transfer from a Web site to the viewer. Topics will include when animation is an appropriate tool to use, when animation should be avoided, what tools are the current standard for Web animation, and how animation can be used to present information. The class will be project-based, with the student solving animation-related problems based on real business situations. Students will be expected to animate their solutions using current software. Animations will be judged on their completeness, correctness, and professionalism. (30-30)

15:207 60-Hour Real Estate Prelicense (3 s.h.) This pre-licensure course is required by the Iowa Real Estate Commission prior to examination for an Iowa Real Estate Salesperson License. Upon completion of this curriculum, participants will be exposed to principles of real estate, terminology, mathematical calculations, procedures and ethics necessary to enable them to understand the real estate profession. This course prepares them to take the Real Estate Salesperson Examination, and to function as a well informed real estate salesperson. (30-30)

15:208 PC Technician Internship (3 s.h.) Prerequisite: 15:178, Hardware Service and Support; Prerequisite/Corequisite: 15:193, Computer User Support; or permission of the instructor. Students will improve their proficiency in providing personal computer support by troubleshooting real-life scenarios including specification/ management considerations, and customer service skills. This course will provide students with the opportunity at local businesses or non-profit organizations to install and upgrade operating systems and software; install and upgrade computer system hardware; and, troubleshoot and repair hardware and/or software issues. (15-60)

15:209 Advanced Computer System Support (4 s.h.) Prerequisite: 15:178, Hardware Service and Support, or permission of instructor. This course expands on concepts and skills learned in 15:178, Hardware Service and Support, and provides the knowledge, skills, and abilities essential for a successful computer service technician at the advanced level. Students are provided theoretical information and hands-on experiences in advanced topics of computer troubleshooting and repair. Students will be presented with opportunities to identify and diagnose hardware and software problems; implement and test solution(s); and prepare appropriate documentation. (30-60)

15:210 Business Statistics (3 s.h.) Prerequisite: 40:125, Quantitative Methods; 40:140, Intro to Statistics; 40:161, Precalculus; or approval of instructor. The use of statistical methods as an analytical tool in business situations. Data collection, tabular and graphical presentations, frequency distributions, probability, sampling, data analysis, hypothesis testing and regression and correlation analysis. The use of calculators and statistical software is incorporated into the course. (45-0)

15:211 Word Processing (2 s.h.) This course is designed to introduce students to computers and the fundamentals of word processing. The students will progress from basic through intermediate features of word processing software. Also Open Entry. (20-20)

15:212 Business Communication (3 s.h.) This course will help the student become an effective communicator in the business world. Basic written communication will be emphasized through practice in grammar structure, vocabulary building, and organization of thoughts. These skills will then be implemented when the student plans and writes business letters and interoffice memorandums. A secondary emphasis will be placed on oral communication, listening skills, and nonverbal communication. (45-0)

15:218 Professional Office Procedures (4 s.h.) Prerequisite: 15:211, Word Processing; and 15:212, Business Communication. Office procedures and techniques necessary to perform general office duties. Includes using a word processor, developing transcription skills, using the Internet to access information, filing, handling telephone services, discussing professionalism, applying grammar rules, and taking care of general office administration. Students are expected to spend time outside of class working in the computer lab. (20-80)

15:221 Principles of Marketing (3 s.h.) A study of the role of marketing in society as well as a study of target market (customer) determination and selection, product strategy, channels of distribution, pricing concepts, and promotional activities that are used in business today. (45-0)

15:222 Principles of Advertising (3 s.h.) The study of advertising process and its place in business and society. The course involves learning about the planning, creating and placement of advertising. The course also covers the topic of integrated promotion. (45-0)

15:223 Principles of Selling (3 s.h.) This course is centered around the study of concepts and practices used by professional salespeople in today's market-driven economy. The course also includes a study of selling as a promotional strategy used by marketers. (45-0)

15:225 Microsoft Access (1 s.h.) This course is designed to take students through the core competencies for Microsoft Access in preparation for the Microsoft Office Specialist certification test. (5-20)

15:226 Microsoft PowerPoint (1 s.h.) This course is designed to take students through the core competencies for Microsoft PowerPoint in preparation for the Microsoft Office Specialist certification test. (5-20)

15:227 Microsoft Outlook (2 s.h.) The course is designed to take students through the core competencies for Microsoft Outlook in preparation for the Microsoft Office Specialist certification test. (15-30)

15:230 Money and Banking (3 s.h.) Prerequisite: 80:133, Macroeconomics. An examination of money, banks, and financial markets and their effects on the U.S. economy in a global setting. The focus is on the nature and functions of money, the supply and demand for money, financial markets and interest rates, the Federal

Reserve Banking System, bank safety and regulation, the money supply, and the level of national income and monetary policy. (45-0)

15:231 Advanced Professional Leadership Development (1 s.h.) This course is designed for the experienced business manager and supervisor or the employee that is on the management fast track. This course involves the study of the major management functions of building and leading teams, communications, financial management, coaching and mentoring, presentation skills, business writing, organizational design, managing change, strategic planning, quality management, creative thinking, and negotiation skills. Course is repeatable for credit to a maximum of 3 credit hours. (15-0)

15:241 Human Relations (3 s.h.) The study of how people satisfy both personal growth needs and organizational goals. Human Relations looks at what can be done to anticipate problems, resolve them, or prevent them from happening. Emphasis is on practical knowledge which can be applied at work or at home. Significant developments in recent years have increased the importance of interpersonal skills in almost every type of setting; these trends provide support for the necessity of acquiring competence in human relations. (45-0)

15:249 Medical Transcription I (3 s.h.) This course is designed to simulate medical transcription practices used in a healthcare environment. The main objective is to provide the student with knowledge of the content and formats of medical documents and reports typically dictated in physicians' offices, hospital clinics, and hospital ancillary and support facilities. (15-60)

15:250 Basic Medical Insurance and Coding (2 s.h.) Prerequisite: 15:251, Medical Terminology I and 94:104, Body Structure and Function. This course will provide the students with an overview of medical health insurance claims submission guidelines and basic coding procedures. In addition, the student will work through a number of relevant case studies. (30-0)

15:251 Medical Terminology I (3 s.h.) A study of medical terminology which should be taken concurrently with 70:250, Anatomy and Physiology, or 94:104, Body Structure and Function, as a part of the Medical Secretary and Medical Assistant curriculum. Introduction of basic medical terminology utilizing a programmed, word-building system to learn word parts to construct and analyze new terms. Emphasis is placed on spelling, definition, usage, and pronunciation. (45-0)

15:252 Medical Terminology II (3 s.h.) Prerequisite: None. However, 15:251, Medical Terminology I is highly desirable. A continuation of 15:251. To be taken concurrently with 70:251, Anatomy & Physiology, by those in the Medical Secretary curriculum. A brief review of basic medical terminology followed by a systems approach to learning terms associated with the anatomical, physiological, and pathological aspects of the body. (45-0)

15:256 Medical Transcription II (3 s.h.) Prerequisite 15:249, Medical Transcription I. This course is designed to introduce students to hospital dictation. The students will progress through various levels of dictation including some advanced documents. (15-60)

15:259 Medical Office Procedures (3 s.h.) Prerequisite: 15:211, Word Processing, and 15:212, Business Communication. Management of a medical office that includes preparing correspondence and patient records, using the Internet to access information, filing, handling telephone services, making and keeping appointments, developing transcription skills, composing letters, discussing professionalism, applying grammar rules, and taking care of general office duties. Also includes medical ethics and etiquette, medical law, and use of a computer for word processing. Students are expected to spend time outside of class working in the computer lab. (45-0)

15:265 Medical Transcription III (3 s.h.) Prerequisites: 15:249, Medical Transcription I. This course is designed to introduce students to live medical dictation from the clinical and radiology settings. The students will also be applying the issues of confidentiality and using medical reference books. (15-60)

15:277 Network Routing (5 s.h.) Prerequisite: 15:159, Networking IV, or permission of the instructor. This course focuses on advanced routing using Cisco routers connected in local-area networks (LANs) and wide-area networks (WANs) typically found at medium to large network sites. Upon completion of this training course, the student will be able to select and implement the appropriate Cisco IOS services required to build a scalable routed network. (45-60)

15:278 Network Remote Access (5 s.h.) Prerequisite: 15:277, Network Routing, or permission of the instructor. Remote Access focuses on advanced WAN configurations, building remote access networks. The course teaches students how to build a remote access network to interconnect central sites to branch offices and home offices for telecommuters. The course further teaches students how to control access to the central site and how to maximize bandwidth utilization over the remote links. (45-60)

15:280 On-the-Job Training (1-3 s.h.) On-the-Job Training is designed to provide a student an opportunity to apply his/her skills in a job setting. The On-the-Job experience is coordinated with an identified school coordinator and on-site sponsor. This is repeatable credit for a maximum of 6 hours. (0-60 to 180)

15:285 Multi-Layer Switching (5 s.h.) Prerequisite: 15:277, Network Routing, or permission of the instructor. This course leads to the CCNP or CCDP. In this course, network administrators learn how to build campus networks using multilayer switching technologies over high speed Ethernet. This course includes both routing and switching concepts, covering both Layer 2 and Layer 3 technologies. (45-60)

15:286 Network Support (5 s.h.) Prerequisite: 15:277, Network Routing; 15:278, Network Remote Access; and, 15:185, Multi-Layer Switching, or permission of the instructor. This course leads to the CCNP. This course teaches students how to baseline and troubleshoot an environment using Cisco routers and switches for multi-protocol client hosts and servers connected with the following: Ethernet and Fast Ethernet LANS, Serial, Frame Relay, and ISDN BRI WANs. The course provides students with methodical practice using specific Cisco IOS software and Catalyst software tools to diagnose and correct problems on widely installed Cisco products. (45-60)

15:287 Emerging Remote Access Technologies (3 s.h.) Prerequisite: 15:159, Networking IV, or permission of the instructor. Introduces end-to-end Digital Subscriber Line (DSL) and cable modem technologies with focus on hands-on lab training for technicians on installing, configuring and troubleshooting DSL CPE equipment and infrastructure in a small business environment. Also touches upon Wireless and other emerging technologies communications. (30-30)

15:288 Network Design I (3 s.h.) Prerequisite: 15:158, Networking III, or permission of the instructor. This course leads to the CCDA certification. The CCDA certification (Cisco Certified Design Associate) indicates a foundation or apprentice knowledge of network design for the small office/home office (SOHO) market. CCDA certified professionals can design routed and switched networks involving LAN, WAN, and dial access services for businesses and organizations with networks of fewer than 100 nodes. (45-0)

15:289 Network Design II (4 s.h.) Prerequisite: 15:288, Network Design I; 15:277, Network Routing; 15:278, Network Remote Access; and 15:285, Multi-Layered Switching; or permission of the instructor. This course leads to the CCDP certification. The CCDP certification (Cisco Certified Design Professional) indicates advanced or journeyman knowledge of network design. With a CCDP, a network professional can design routed and switched networks involving LAN, WAN, and dial access services for businesses and organizations with 100 to more than 500 nodes. (60-0)

15:290 Fundamentals of Project Management (4 s.h.) Prerequisites: 15:156, Networking I, 15:161, Operating Systems I, or by written permission of the instructor. Fundamentals of Project Management defines a project and the role of projects in business. Students identify and demonstrate the basic knowledge areas of Project Management and the Project Management Framework. These knowledge areas focus on managing project components including: Integration, Scope, Time (scheduling), Cost, Quality, Human Resource, Communications, Risk, and Procurement. Fundamentals of Project Management clarifies the relationship between Project Management and other management disciplines including general management knowledge and practice, and application-area knowledge and practice. Students learn to apply the breakdown of project phases and processes and construct project plans that employ project phasing and knowledge areas. Students also learn to identify the aspects of project-based organizational systems and classify business organizations by type and project characteristics. Critical Path Method (CPM) project scheduling is learned and utilized to coordinate project planning, execution and analysis throughout a project life cycle. (60-0)

15:299A Special Problems in Business* (1 s.h.) Students may submit a proposal for a special project to the instructor. With the instructor's approval and the consent of the Division Chair and Vice President for Academic Affairs, credit may be given upon satisfactory completion of the project. Course can be repeated for credit. (15-0)

15:299B Special Problems in Business* (2 s.h.) Same as 15:299A. (30-0)

15:299C Special Problems in Business* (3 s.h.) Same as 15:299A. (45-0)

20 Education

20:101 Introduction to Teaching (3 s.h.) An introductory course in teacher education. The place of the school in the community, the basic philosophy, the organization and administration, and the nature of the curriculum. Purposeful observations provide practical experience. (30-30)

20:110 Educational Measurement and Evaluation (2 s.h.) Prerequisite: 20:101, Introduction to Teaching. This introductory course in educational measurement and evaluation will provide a survey of the following topics: assessment instruments, test preparation, and use of standardized measures. (30-0)

20:120 Including Exceptional Students (3 s.h.) Prerequisite: 20:101, Introduction to Teaching. An introductory discussion of issues and practices regarding the inclusion of diverse student populations in general education settings. Topics include integration, mainstreaming, and inclusion. Emphasis is placed on addressing the needs of all students, i.e. general education, special education, gifted, at risk, and multicultural. Formal and informal projects explore adaptive strategies for the curriculum, classroom, and social skill development. (45-0)

20:195 Educational Media and Classroom Computing Techniques (3 s.h.) The production and use of instructional media/computer technology and their relationship to educational strategies. (30-30)

25 Engineering

25:110 Orientation to Engineering (0 s.h.) Designed to help freshmen better understand engineering and assist them in choosing their area of specialization. Presentations by guest engineers from industry who discuss their areas of the profession. Four field trips to a selected engineering department of North Iowa industrial firms. (Class meets one hour per week.) This course has been designated as a pass/no pass course. (10-8)

25:111 Engineering Problems with FORTRAN (3 s.h.) Corequisite: 40:151, College Algebra and Trigonometry I; or 40:161, Precalculus. Development of skills, standards, and orderly methods of solving engineering problems. SI and English measurement and unit conversion. Estimation and calculation with approximate numbers. Significant figures. Graphing and curve-fitting of technical data. Using logarithmic and trigonometric functions. Introduction to engineering economics and statistics. Solution of engineering problems using the FORTRAN language. (30-30)

25:112 Engineering Graphics and Design (3 s.h.) Prerequisite: 25:111, Engineering Problems with FORTRAN, with a grade of "C" or higher, or consent of instructor. The integration of fundamental engineering graphics, computer-aided design (CAD), and engineering design. The use and manipulation of drawing instruments; free-hand lettering and sketching; machine and CAD drawing of orthographic views and isometric pictorials; and basic dimensioning. Techniques for visualizing, analyzing and communicating 3-D geometries. Application through creative design projects with written and oral reports. (15-75)

25:231 Statics of Engineering (3 s.h.) Prerequisite: 40:251 Analytic Geometry and Calculus I, with a grade of "C" or higher. Corequisite: 40:252 Analytic Geometry and Calculus II, and 70:282 College Physics I. Scalar and vector quantities, forces, moments of forces, couples, and force systems; equilibrium, centroids and centers of gravity; analysis of structures; internal forces, shear and bending moments; friction; moments of inertia of areas. (45-0)

25:241 Dynamics (3 s.h.) Prerequisite: 40: 253, Analytic Geometry and Calculus III and 25:231, Statics of Engineering. Particle and rigid body kinematics, Newton's laws of motion, kinetics of plane motion, rigid body problems using work-energy, linear, and angular impulse-momentum principles, vibrations. (45-0)

25:251 Mechanics of Materials (3 s.h.) Prerequisite: 25:231, Statics of Engineering. Plane stress, plane strain, stress-strain relationships, and elements of material behavior. Application of stress and deformation analysis to members subject to centric, torsional, flexural, and combined loadings. Elementary considerations of theories of failure, buckling. (45-0)

30 English

30:090 Basic Writing (4 s.h.) A developmental writing course designed for students referred by orientation assessment or by instructors. Emphasis is on writing; students will learn strategies for recognizing and compensating for individual writing problems. Students complete the course by meeting the minimum entrance requirements for Communication Skills I. Credit earned will not satisfy the requirements for an Associate Degree and will not be used in calculating the cumulative grade point average for graduation. This course has been designated as a pass/no pass course. (60-0)

30:095 Basic Reading (4 s.h.) A developmental reading course designed for students who test at less than a ninth grade reading ability on standardized tests. Emphasis is on practice in improving concentration, vocabulary, and study skills. Credit earned will not satisfy the requirements for an Associate Degree and will not be used in calculating the cumulative grade point average for graduation. This course has been designated as a pass/no pass course. (60-0)

30:101 Communication Skills I (4 s.h.) Improvement of skills in reading, writing, speaking, and listening, with an emphasis on expository methods of development and personal experience as supporting material. Students may be requested to use word processors and the Writer's Workbench analyses programs, the Writer's Workbench STEPS programs, and the structuring sentences video series. Students must meet minimum competency requirements in writing and speaking to receive a grade of "C" or higher. (60-0)

30:101C Communication Skills I (3 s.h.) Improvement of skills in reading and writing with an emphasis on expository methods of development and personal experience as supporting material. Students may be requested to use word processors and the Writer's Workbench analyses programs, the Writer's Workbench STEPS programs, and the structuring sentences video series. Students must meet minimum competency requirements in writing to receive a grade of "C" or higher. (45-0)

30:102 Communication Skills II (4 s.h.) Prerequisite: 30:101, Communication Skills I. Students must have earned a "C" or higher grade in Communication Skills I before enrolling in Communication Skills II. A continuation of 30:101, Communication Skills I, with an emphasis on argumentative and persuasive writing and speaking, on research methods, and on language. Students may be requested to use word processors, Writer's Workbench analyses, Writer's Workbench STEPS, and sentence structuring videos. Students must meet minimum competency requirements in writing and speaking to receive a grade of "C" or higher. (60-0)

30:102C Communication Skills II (3 s.h.) Prerequisite: 30:101C, Communication Skills I. Students must have earned a "C" or higher grade in Communication Skills I before enrolling in Communication Skills II. A continuation of 30:101C, Communication Skills I, with an emphasis on argumentative and persuasive writing, on research methods, and on language. Students may be requested to use word processors, Writer's Workbench analyses, Writer's Workbench STEPS, and sentence structuring videos. Students must meet minimum competency requirements in writing to receive a grade of "C" or higher. (45-0)

30:110 Oral Interpretation of Literature (3 s.h.) Meets either Communications or Humanities requirement. Analyzing prose, poetry, and drama selections for their logical and emotional content, and learning platform techniques to present this material to an audience. (45-0)

30:111 Introduction to Poetry/Drama (3 s.h.) A study of selected works of poetry and drama as forms of literature. Discussion and writing emphasizing interpretation, critical analysis, and judgment/evaluation. (45-0)

30:112 Introduction to Short Story/Novel (3 s.h.) A study of selected works of fiction in the short story and novels as forms of literature. Discussion and writing emphasizing interpretation, critical analysis, and judgment/evaluation. (45-0)

30:113 LOGOS (1 s.h.) Students may contribute to the student news publication, LOGOS, for 1-4 credits during their enrollment at NIACC. Credit may be earned through practical experience in reporting, photography, advertising, and other production-oriented work. Staff members are required to attend weekly staff meetings and meet a minimum number of contributions for a passing grade. (0-30)

30:120 College Reading Skills (3 s.h.) Designed to help students become more efficient and effective in reading college textbooks, required materials, leisure articles, and books. Course adapts to the style and needs of each individual to improve vocabulary, comprehension, rate, and study skills. (45-0)

30:121 Introduction to Journalism (3 s.h.) Introduction to Journalism is designed to help the student understand the role of the media in a democracy and how that role is accomplished. The student will also improve communication skills because the course stresses the fundamentals of news gathering, news writing, editing, and publication design. Students will have the opportunity to gain practical experience in news writing and interviewing. The course will stress print media. (45-0)

30:122 News Writing and Reporting (3 s.h.) Prerequisite: 30:121, Introduction to Journalism, and ability to type. News Writing and Reporting serves as a class designed to help the student improve his or her news gathering and reporting skills. Students will be expected to cover a regular news beat and write stories for publication in LOGOS, the student news publication. Students will be expected to conduct interviews and utilize the computer programs used by the paper. (45-0)

30:201 World Literature I (3 s.h.) Readings are drawn from several of the world's great civilizations up to the 18th Century. This course emphasizes prose and poetry from the religious and secular traditions of the Far East, South Asia, the Ancient Mediterranean, Northern Europe, and Ancient and Medieval I Near East. (45-0)

30:202 World Literature II (3 s.h.) Readings are taken from works of short story, poetry, novel, and drama from around the world. The course will primarily focus upon literature written from the early 18th Century to Present. World Literature I is not required. (45-0)

30:203 Minority Literature: African American (3 s.h.) Prerequisite: 30:101, Communication Skills I. A study of the writings of major African Americans from pre-Civil War to contemporary times. Slave narratives, autobiographies, letters, short stories, poetry, and novels will be studied as works of literature. Discussion and writing will focus on the critical analysis of the works. (45-0)

30:204 Minority Literature: American Indian (3 s.h.) Prerequisite: Communication Skills I. A study of the writings of major American Indians from precontact with Europeans to contemporary times. Legends, autobiographies, letters, speeches, poetry, novels and short stories will be studied as works of literature. Discussion and writing will focus on the critical analysis of the works. (45-0)

30:205 Creative Writing (3 s.h.) Prerequisite: A strong interest in writing and a background in literature is stressed. A practical workshop in writing and rewriting manuscripts in preparation for submitting for publication. Emphasis on nonfiction articles and short stories but also covers poetry, plays, and screenplays. (45-0)

30:210 Children's Literature (3 s.h.) Prerequisite: It is recommended that students have some writing background from 30:101 and 30:102, Communication Skills I and II, and 30:120, College Reading Skills. A study of Children's Literature by genre. An emphasis on teaching literature in the classroom will be a major component of the course. Purposeful school visitations will provide practical experience. This course meets some education program requirements. (45-0)

30:299A Special Problems in Communications* (1 s.h.) Student may submit a proposal for special project. If instructor approves, and with the consent of the Division Chairperson and the Vice President for Academic Affairs, credit may be given upon satisfactory completion of the project. Course may be repeated for credit. (15-0)

30:299B Special Problems in Communications* (2 s.h.) Same as 30:299A. (30-0)

30:299C Special Problems in Communications* (3 s.h.) Same as 30:299A. (45-0)

35 Foreign Languages

35:110 Beginning Spanish I (4 s.h.) Designed for students with little or no previous study of Spanish. Focus is on acquainting the student with fundamentals, including pronunciation, basic grammar needed to express activities in the present and near future. Basic vocabulary will be learned to enhance speaking, listening, writing, and reading skills. Increase global awareness by video shorts and short readings. (45-30)

35:111 Beginning Spanish II (4 s.h.) Prerequisite: 35:110, Beginning Spanish I or minimum of one year of high school Spanish. Designed as a continuation of Beginning Spanish I. Focus is on reinforcing students' knowledge in fundamentals, including pronunciation, basic grammar needed to express activities in the present and near future. Basic vocabulary will be learned to enhance speaking, listening, writing, and reading skills. New grammar includes being able to communicate in the past tenses, and giving commands for common verbs. Students are expected to use as much Spanish as possible with classmates and the instructor. (45-30)

35:211 Intermediate Spanish I (4 s.h.) Prerequisite: 35:111, Beginning Spanish II or minimum of two years of high school Spanish. Designed as a comprehensive grammar review, composition, and speaking course. Builds on aural-oral skills, increased vocabulary, and reading short pedagogical (using vocabulary and grammar students are familiar with) stories and authentic language literature. (45-30)

35:212 Intermediate Spanish II (4 s.h.) Prerequisite: 35:211, Intermediate Spanish I or minimum of three years of high school Spanish with instructor approval. Designed as a comprehensive grammar review, composition, and speaking course. Builds on aural-oral skills, increased vocabulary, and reading short pedagogical (vocabulary and grammar suited to student abilities) stories and authentic language literature. (45-30)

35:260 Advanced Spanish I (3 s.h.) Prerequisite: 35:212, Intermediate Spanish II; or four years of high school Spanish with instructor approval. Students will become more comfortable speaking by Q & A, impromptu speaking. Reading skills will be enhanced by reading original short stories and cultural and historical selections from the text. Use of visual aids, video shorts, speaking, and reading will increase vocabulary competency. Grammar study and activities will increase language accuracy and expression. Use of exams will be limited; students will be graded on in-class discussion and homework completion. Students will at times use the Internet to find and interpret articles from Hispanic newspapers. A final oral (optional) and written evaluation will determine the student's progress in the above-mentioned areas. (30-30)

35:261 Advanced Spanish II (3 s.h.) Prerequisite: 35:260, Advanced Spanish I, or four satisfactory years of high school Spanish with instructor approval. Students are expected to maximize their use of Spanish in the classroom. Guided dialogs as well

as extemporaneous speaking will increase fluency. Original texts from various Hispanic countries will be used to gain cultural understanding, vocabulary, and provide topics for classroom discussion. By end of semester, students should be able to express themselves in speech and writing using all verb tenses. Short creative writings will be done. Articles from Hispanic countries will be used to expose students to a wide range of events and cultural differences. The use of contemporary music and videos will enhance student listening comprehension. Limited use of tests will be used along with in-class participation and out-of-class work to evaluate student progress. This semester's reading will include one drama, "En la ardiente oscuridad" and/or "Fuenteovejuna," and excerpts from one novel (Como agua para chocolate). As segments of the latter are read, the movie will be watched in segments also. Projects may include transcription of a song or video segment, or researching a topic of a current event in a Hispanic country. Every student should demonstrate improvement in all four skills—reading, writing, listening, and speaking. (30-30)

35:299A Special Problems in Foreign Languages - Spanish* (1 s.h.) Student may submit a proposal for a special project. With the instructor's approval and the consent of the Division Chair and Vice President for Academic Affairs, credit may be given upon satisfactory completion of the project. Course may be repeated for credit. (15-0)

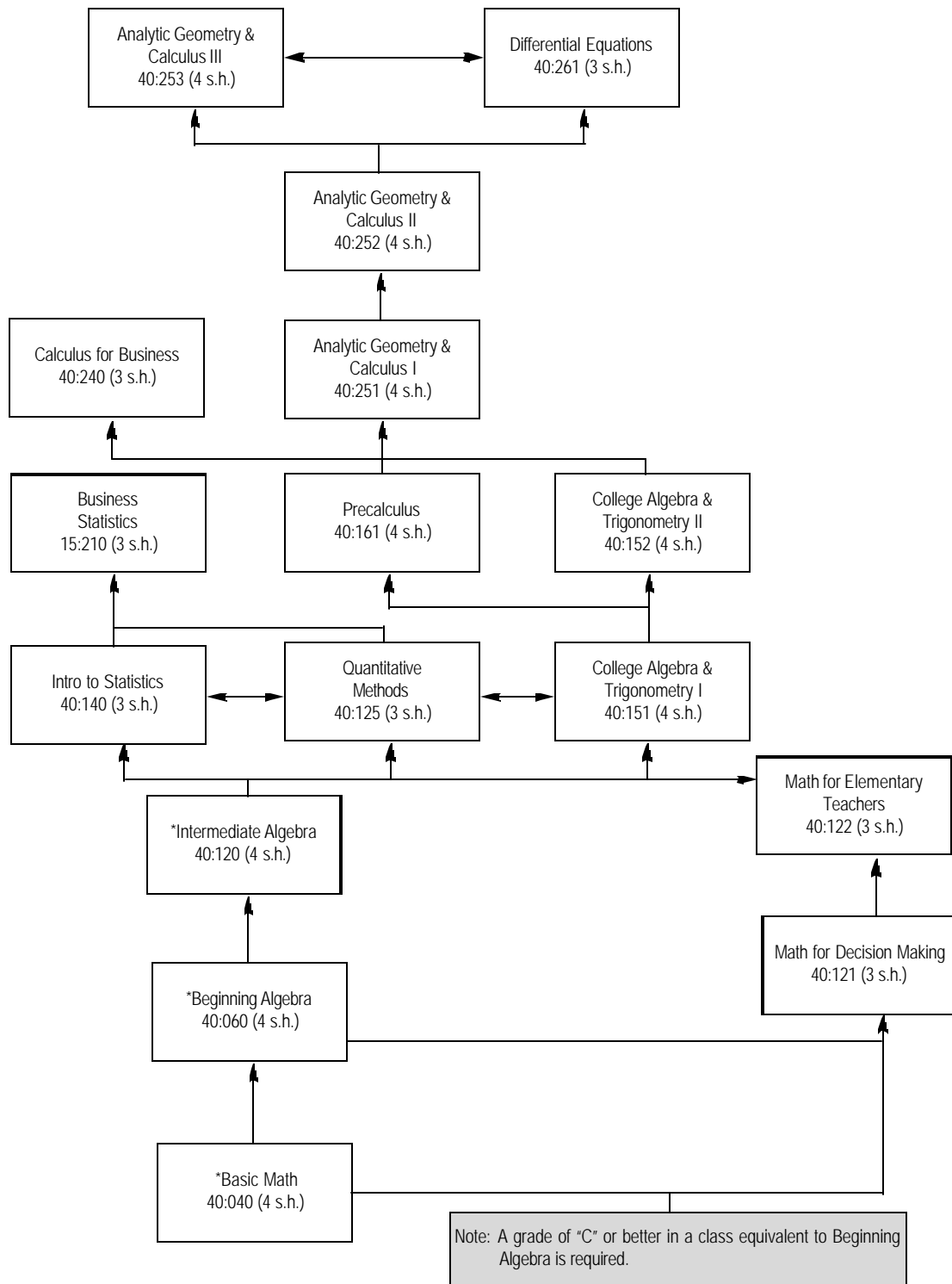
35:299B Special Problems in Foreign Languages - Spanish* (2 s.h.) Same as 35:299A. (30-0)

35:299C Special Problems in Foreign Languages - Spanish* (3 s.h.) Same as 35:299A. (45-0)

40 Mathematics

40:040 Basic Mathematics (4 s.h.) Prerequisite: A score of 15 or higher on the Basic Mathematics Pretest. This is a basic mathematics course that will prepare students to compete in an entry-level math course and to use numbers effectively in other situations. Upon completion, students will be able to perform basic computational skills with whole numbers, fractions, decimals, percentages, and integers. (40:040 is a developmental course. Credit earned will not satisfy the requirements for an Associate degree and will not be used in calculating the cumulative grade point average for graduation.) Students will be allowed to register in Basic Mathematics upon referral from the instructor and/or appropriate diagnosis. (60-0)

40:060 Beginning Algebra (4 s.h.) Prerequisite: Basic arithmetic skills as shown by one of the following: 1) a score of 49-100 on the COMPASS Pre-Algebra Test, a score of 1-51 on the COMPASS Algebra Test or a score of 16 or higher on the ACT math test; 2) successful completion © or higher) of 40:040, Basic Mathematics. This course is intended for students who have had no previous experience in algebra. Topics include: the real number system, linear and quadratic equations, exponents, factoring, rational expressions, graphing, systems of equations, radicals, the quadratic formula, square root manipulation, and application of concepts. Credit earned will not satisfy the requirements for an Associate degree and will not be used in calculating the cumulative grade point average for graduation. (60-0)



* These courses do not satisfy the core requirements.

40:120 Intermediate Algebra (4 s.h.) Prerequisite: Basic algebra skills as shown by one of the following: 1) a score of 51 or higher on COMPASS Algebra test or 20 on the ACT Math Test and one year of high school algebra with a "C" or higher; or 2) successful completion (C or better) of Beginning Algebra (40:060). This course should prepare the student for college algebra and trigonometry or other course work that requires the same level of sophistication. Topics include properties of real numbers, linear and quadratic equations, graphs of linear and quadratic equations, systems of equations, polynomials and rational expressions, inequalities, integral and rational exponents, radicals, and complex numbers. This course may not be used to satisfy core requirements. (60-0)

40:121 Mathematics for Decision Making (3 s.h.) Prerequisite: Basic Arithmetic and Algebra skills as shown by one of the following: 1. A score of 16 or higher on the ACT Math Test, or a score of 49 or higher on the Pre-Algebra part of the COMPASS Test AND a grade of "C" or better in 40:060, Beginning Algebra (at NIACC) or equivalent; 2. A score of 20 or higher on the ACT Math Test or 51-75 on the Algebra section of the COMPASS test. Mathematics for Decision Making provides a survey of mathematics topics that includes sets, logic, probability, statistics, sets of numbers, algebra, geometry, and consumer math. This course will fulfill 3 hours of Natural Sciences requirement for the A.A. Degree. (45-0)

40:122 Mathematics for Elementary Teachers (3 s.h.) Prerequisite: 40:121, Math for Decision Making with a "C" or higher grade, or instructor approval. The course is specifically designed for elementary education majors. Topics include problem-solving strategies, sets, numeration systems, algebra, geometry, calculators and computers, elementary probability and statistics. These topics are presented with a focus on their developmental theory. (30-30)

40:125 Quantitative Methods (3 s.h.) Prerequisite: Two years of high school algebra with a "C" or higher or 40:120, Intermediate Algebra, with a "C" or better. This course provides a sampling of applied mathematics topics from various disciplines. Some topics covered include elementary functions, linear systems, matrices, linear programming, set theory, probability, and Markov chains. (45-0)

40:140 Introduction to Statistics (3 s.h.) Prerequisite: Two years of high school algebra with a "C" or higher or 40:120, Intermediate Algebra, with a "C" or higher. This course is intended to introduce students to basic statistical concepts. It covers descriptive and inferential statistical methods, hypothesis testing on the mean and proportion, Chi-square test for independence, and linear regression. Students are also introduced to technology as it applies to introductory statistical methods. (45-0)

40:151 College Algebra and Trigonometry I (4 s.h.) Prerequisite: Two years of high school algebra with a "C" or higher or 40:120, Intermediate Algebra, with a "C" or higher. This course is intended for students majoring in business, social science, biological sciences, liberal arts, and those mathematics students with insufficient background to begin the study of calculus. The course is a study of various classes of functions, their graphs, and applications. The functions studied include linear, polynomial, rational, root, inverse, exponential, logarithmic, and trigonometric. A graphing calculator is required. (60-0)

40:152 College Algebra and Trigonometry II (4 s.h.) Prerequisite: 40:151, College Algebra & Trigonometry I with a "C" or higher. This course is a continuation of 40:151. Topics include the further study of trigonometric functions including their applications and inverses, study of vectors, complex numbers, DeMoivre's Theorem, systems of equations and inequalities, matrices, conic sections, parametric and polar equations, probability, sequences and series, and the Binomial Theorem. (60-0)

40:161 Precalculus (4 s.h.) Prerequisite: Two years of high school algebra with a "C" or higher and one year of geometry with a "C" or higher. This course is intended to provide students with a summary of mathematics topics needed to study analytic geometry and calculus. The functional approach is emphasized. Topics covered include fundamentals of algebra, polynomial, rational, exponential, logarithmic, and trigonometric functions, analytic trigonometry, systems of equations, and analytic geometry of conics. (60-0)

40:240 Calculus for Business (3 s.h.) Prerequisite: 40:161, Precalculus with a grade of C or better, or equivalent; or 40:151 and 40:152, College Algebra and Trigonometry I and II; or 91:107, and 91:08, Technical Mathematics I and II. This course uses calculus techniques applicable to business, social and life sciences, and also to career programs such as Mechanical Design. The course includes discussions of both algebraic and transcendental functions, including exponential, logarithmic and trigonometric functions. Topics include limits, derivatives and their uses, and integrals and their applications. A graphing calculator is required. (45-0)

40:251 Analytic Geometry and Calculus I (4 s.h.) Prerequisite: Precalculus (40:161) with a "C" or higher, or both semesters of College Algebra and Trigonometry (40:151 and 40:152) with a "C" or higher, or two years of high school algebra with a "C" or higher and one year of high school geometry with a "C" or higher and at least one semester of precalculus or trigonometry with a "C" or higher. Topics include analysis of functions, limits, derivatives and integrals of algebraic, logarithmic, exponential, and trigonometric functions, and applications of differentiation. (60-0)

40:252 Analytic Geometry and Calculus II (4 s.h.) Prerequisite: 40:251, Analytic Geometry & Calculus I. This course is a continuation of 40:251. Topics include applications of the definite integral; principles of integration evaluation; improper integrals; modeling with differential equations; and infinite sequences and series. The availability of a graphical calculator is highly recommended. (60-0)

40:253 Analytic Geometry and Calculus III (4 s.h.) Prerequisite: 40:252, Analytic Geometry & Calculus II. This course is a continuation of 40:252. Topics include graphs and analysis of the conic sections, polar coordinates and parametric equations, three dimensional space, vectors and vector-valued functions, partial derivatives, multiple integrals, topics in vector calculus. (60-0)

40:261 Differential Equations (3 s.h.) Prerequisite: 40:252, Analytic Geometry and Calculus II. Topics include analytic methods for solving first and second order ordinary differential equations, higher order linear differential equations (including Laplace Transforms) and systems of differential equations, numerical methods for approximating solutions of differential equations, and applications using differential equations. (45-0)

40:299A Special Problems in Mathematics* (1 s.h.) Students may submit a proposal for a special project to an instructor. With the instructor's approval and the consent of the Division Chair and the Vice President for Academic Affairs, credit may be given upon satisfactory completion of the project. Course may be repeated for credit. (15-0)

40:299B Special Problems in Mathematics* (2 s.h.) Same as 40:299A. (30-0)

40:299C Special Problems in Mathematics* (3 s.h.) Same as 40:299A. (45-0)

50 Music

50:113 Exploring Music (3 s.h.) Exploring Music is concerned with the development of Western Classical Music that encompasses nearly 2500 years of history beginning in 400 BC and culminating in the 1990s. This course provides the student knowledge of six commonly recognized historical eras through lectures, recordings, videotapes, digital media, and possible guest speakers. (45-0)

50:120 Introduction to Music Theory (2 s.h.) Prerequisite: previous instrumental or vocal music experience. Introduction to Music Theory is designed as a precourse to any Music Theory sequence. The course work will emphasize the circle of fifths, major scales, all forms of the minor scales, parallel and relative scale relationships, and music vocabulary. This course will also introduce the aural skills of scale identification, rhythmic dictation, and interval identification. (22.5-15)

50:121 Music Theory I (4 s.h.) Prerequisite: Previous instrumental or vocal experience. Theory I examines all the basic materials of music which include notation, scales, intervals, chords, melody, harmony, rhythm and texture. Other areas of analysis take in cadence types, chordal inversions, figured bass harmonization and principles of part writing based on 18th century models. This course introduces fundamentals of the aural skills, ear training and sight singing. (45-60)

50:122 Music Theory II (4 s.h.) Prerequisite: Final grade of "C" or better in 50:121, Music Theory I, or instructor consent. A continuation of 50:121, Theory II will examine in more detail the harmonic element of music. Discussions will include the harmonic progression, modulation and specific types of seventh chords as they relate to 18th century counterpoint. Continued development of ear training and sight singing skills. (45-60)

50:123 Music Theory III (4 s.h.) Prerequisite: Final grade of "C" or better in 50:122, Music Theory II, or instructor consent. Students will develop analytical, written, aural, and sight-singing skills in music covering the Renaissance through the early Classical period. (45-30)

50:124 Music Theory IV (4 s.h.) Prerequisite: Final grade of "C" or better in 50:123, Music Theory III, or instructor consent. Students will develop analytical, written, aural, and sight-singing skills in music covering the late Classical through the 20th Century. (45-30)

50:150 Concert Chorus (1 s.h.) Concert Choir is open to all students interested in vocal music. The group performs one formal concert on campus each semester, as well as community performances, area high school assemblies, and community meetings. Course may be repeated for credit. (45-90)

50:151 Voice Ensemble - NIACC Singers (1 s.h.) NIACC Singers is an auditioned group for students with a high level of competency in vocal music. Auditions may be completed individually by contacting the professor. The group performs one formal concert on campus each semester, as well as community performances, area high school assemblies, and community meetings. Course may be repeated for credit. (0-60)

50:152 Concert Band (1 s.h.) The North Iowa Concert Band, sponsored by North Iowa Area Community College, rehearses one night each week in preparation for concerts and programs. Open to all interested NIACC students and adults in the North Iowa area. Course is repeatable for credit to a maximum of 4 credit hours. (20-0)

50:153 Orchestra (1 s.h.) The North Iowa Symphony Orchestra, sponsored by North Iowa Area Community College rehearses one night each week in preparation for concerts and programs. Open to all interested NIACC students and adults in the North Iowa area. Some sections of the orchestra require an audition. Course is repeatable for credit to a maximum of 4 credit hours. (20-0)

50:154 NIACC Jazz Ensemble (1 s.h.) The NIACC Jazz Ensemble rehearses two and a half hours each week in preparation for concerts on campus, for area high school assemblies, festivals, and community events. Concentration on jazz repertoire from 1930 to the present. Open to all interested NIACC students by audition. Course is repeatable for credit to a maximum of 4 credit hours. (30-0)

50:155 Chamber Ensemble (1 s.h.) Course is designed to provide an opportunity to study and perform chamber literature of the last three centuries. Groups may vary in size from duets to sextets for brass, woodwind, string, or percussion instrumentalists. Also includes jazz combos. Time arranged. Course is repeatable for credit to a maximum of 4 credit hours. (15-0)

Applied Music (1-2 s.h.) Prerequisite for 50:157, Piano: 1 credit hour of 50:195 or equivalent. Individualized instruction in vocal or instrumental performance through the development of strong technical foundation and well-rounded musicianship. Instructional materials include a repertoire of traditional and contemporary literature. Students may register for 1 credit hour (30-minute lesson per week) or 2 credit hours (60-minute lesson per week) each semester. Each course is repeatable for credit to a maximum of 8. Must have instructor consent for 2 credit hours. (7.5-15) or (15-30)

Applied Music courses include:

50:156	Voice
50:157	Piano
50:158	Flute
50:159	Oboe
50:160	Clarinet
50:161	Bassoon
50:162	Saxophone
50:163	Trumpet

50:164	French Horn
50:165	Trombone
50:166	Euphonium
50:167	Tuba
50:168	Percussion
50:169	Drum Set
50:170	Guitar

50:195 Beginning Piano (1 s.h.) Individualized instruction in piano performance for students that are beginners. Instructional materials include a repertoire of basic piano literature. Students register for 1 credit hour (one 30-minute lesson per week) which is repeatable to a maximum of 4 credit hours. (7.5-15)

50:299A Special Problems in Music* (1 s.h.) Students may submit a proposal for a special project to an instructor. With the instructor's approval and the consent of the Division Chair and the Vice President for Academic Affairs, credit may be given upon satisfactory completion of the project. Course may be repeated for credit. (15-0)

50:299B Special Problems in Music* (2 s.h.) Same as 50:299A. (30-0)

50:299C Special Problems in Music* (3 s.h.) Same as 50:299A. (45-0)

60 Physical Education

60:102 Weight Training (1 s.h.) A lab course designed to increase the student's awareness and appreciation of weight training and its effect on physical well being. The course provides a structured environment for the student to learn proper lifting techniques and an awareness of the benefits associated with different types of lifts. The course is repeatable for up to four semester hours credit. (0-30)

60:107 Bowling (1 s.h.) A 1-hour lab class designed to teach the basic skills and knowledge of bowling through participation in a two hour per week bowling class. Student will be instructed on basic bowling techniques and scoring. Student will participate in various bowling activities such as a class bowling league and other group and individual competition. Class will meet at Lee's Lanes in Mason City. Student is required to pay a one-time bowling fee of \$45. The course is repeatable for up to four credits. (2-28)

60:108 Aerobics/Tae-Bo (1 s.h.) A 1-hour lab class designed to increase the students' level of physical fitness and confidence through participating in three levels of Tae-Bo. Tae-Bo is an aerobic form of exercise using basic self-defense techniques of punching and kicking to develop cardiovascular strength, flexibility, and muscular endurance. The class is set up to be progressive with three levels of Tae-Bo included. The three levels are: a basic level, an intermediate level, and an advanced level of Tae-Bo. Class activity will follow the "Billy Blanks Instructional Tae-Bo" videotapes. Class will meet twice each week for one hour. The course is repeatable for up to four credits. (2-28)

60:112 Scuba Diving (1 s.h.) Development of skills, knowledge, and safety leading to international certification in sport diving. Will involve additional fees for equipment rental, book, certification, pool rent, and purchase of specialized scuba gear. (15-0)

60:113 Physical Fitness (1 s.h.) A lecture course designed to teach the student about the importance of being physically fit. The course material will provide insight into various methods of testing physical fitness as well as identifying what good physical fitness is. The student will be able to assess his/her own level of physical fitness. (15-0)

60:114 Physical Fitness Lab (1 s.h.) A lab course designed to increase a person's interest of his/her own level of physical fitness. The course provides activities with which the student can improve his/her level of physical fitness in the areas of strength, flexibility, and endurance. The student will be required to participate in class activities twice a week. (0-30)

60:115 Games and Officiating I (2 s.h.) Guiding principles and standards: rules, mechanics, and procedures for competitive sports officiating. Students will work toward becoming a registered official in the Iowa Athletic Associations. Emphasis will be on football officiating, volleyball officiating, and boys' and girls' basketball officiating. Each student will gain actual officiating experience. (28-4)

60:116 Games and Officiating II (2 s.h.) Prerequisite: 60:115, Games and Officiating I. This course is a continuation of 60:115. Attention directed toward the study of wrestling, track, baseball, and softball. (28-4)

60:117 Introduction to Physical Education (Co-ed) (2 s.h.) Designed to provide career information concerning opportunities in physical education, coaching, and recreational activities. (30-0)

60:118 Care and Prevention of Athletic Injuries (2 s.h.) Recommended: one semester course in anatomy and physiology. Introductory preparation in athletic training, injury, treatment techniques, taping, wrapping, etc. Preventative measures to reduce athletic injuries. Course may be used to fulfill partial requirement for Iowa Coaching Certification. (30-0)

60:120 Baseball (1 s.h.) Course may be repeated for credit. (40-160)

60:121 Basketball (1 s.h.) Course may be repeated for credit. (40-160)

60:122 Football (1 s.h.) Course may be repeated for credit. (40-160)

60:123 Golf (1 s.h.) Course may be repeated for credit. (10-60)

60:127 Softball (1 s.h.) Course may be repeated for credit. (40-160)

60:128 Volleyball (1 s.h.) Course may be repeated for credit. (40-100)

60:129 Soccer (1 s.h.) Course may be repeated for credit. (40-100)

60:150 Theory, Ethics, and Professional Responsibilities of Coaching Interscholastic Athletics (1 s.h.) Guiding principles and techniques of coaching interscholastic athletics. Discussion of

theory, ethics, and professional responsibilities as they relate to coaching interscholastic athletes. (20-0)

60:152 Introduction to Anatomy and Physiology for Coaching (1 s.h.) An introduction to anatomy and physiology with stress on the relationship to athletic actions. This course is designed as an introductory course for prospective coaches with little or no background in anatomy and physiology. (15-0)

60:153 Human Development in Sports (1 s.h.) A one-semester course with emphasis on human growth and development and relationship to physical activity, with special attention to children and adolescents. (15-0)

60:175 Rape Education and Self Defense (2 s.h.) Rape Education and Self Defense is a course of study designed to introduce the participant to basic self-defense concepts and techniques, to heighten the participant's level of awareness and alertness in her environment, to provide participant with information about violent contexts, and to provide the participant with basic physical methods of self-defense. In general, this course cannot offer absolutes; however, the theory behind such a course rests in the concept that those armed with information and a few operational options stand a better chance of avoiding and, when avoidance fails, surviving violence. (30-0)

60:232 First Aid and Personal Safety (1 s.h.) Lecture-type course designed to give the layperson adequate first aid knowledge and skills with emphasis on accident prevention and recognition and treatment of common medical emergencies. (15-0)

60:299A Special Problems in Physical Education* (1 s.h.) Students may submit a proposal for a special project to an instructor. With the instructor's approval and the consent of the Division Chair and the Vice President for Academic Affairs, credit may be given upon satisfactory completion of the project. Course may be repeatable for credit. (15-0)

60:299B Special Problems in Physical Education* (2 s.h.) Same as 60:299A. (30-0)

60:299C Special Problems in Physical Education* (3 s.h.) Same as 60:299A. (45-0)

70 Natural Sciences

70:100 Intro to Lab Science (2 s.h.) Prerequisite: 30:101, Communication Skills I; 80:110, Sociology OR 80:101, General Psychology; 70:140, Intro to Chemistry; 70:250, Anatomy and Physiology I. This course familiarizes the student with the Medical Laboratory Technician program and the field of laboratory medicine. The organization and role of the clinical laboratory are explored, as well as medical ethics and conduct, employment opportunities, and professional opportunities. (30-0)

70:101 Biological Principles (3 s.h.) A biology course for non-science majors that covers cellular structure and function, reproduction, inheritance, evolution, and organ system structure and function in animals and plants. (45-0)

70:102L Biological Principles Laboratory (1 s.h.) Prerequisite: Credit for 70:101 or current enrollment in 70:101. Concurrent enrollment is recommended as course supplements and supports lecture. (0-30)

70:104 Environmental Science and Lab (3 s.h.) The study of ecological principles and the interrelationships among populations, resources, and pollution in developing a sustainable society. Topics include: population, ecology, soil, water, land, air, and energy resources, plus air, water, soil, and waste management. Environmental decision-making strategies to resolve current and future environmental issues are stressed. (30-30)

70:105 Biology I (4 s.h.) Prerequisite/Corequisite: concurrent enrollment in 70:135, General Chemistry I, or 70:137, Chemistry Principles I, is strongly encouraged. Detailed study of the fundamental principles of biology. Includes study of cell structure and function, energy transfer, inheritance, and ecology. Course is intended for students majoring in biology or pursuing careers in the premedical or related fields which require an emphasis in biology. (45-30)

70:108 Biology II (4 s.h.) Prerequisite: 70:105, Biology I or permission of instructor. The evolution and diversity of life. Characteristics, structures, and functions of the major groups of living organisms will be examined. Intended for biology majors. (45-30)

70:109 Microbiology (4 s.h.) Morphology, physiology, taxonomy, and relationship of microorganisms to disease. In-depth laboratory study and suitable lecture material with applications to agriculture, industry, and medicine. (45-30)

70:110 Health and Nutrition (3 s.h.) The science of health and its application to the individual, home, community, and school. Elementary physiology, nutrition, dependency, and current health problems of national concern. (45-0)

70:111 Human Biology (4 s.h.) Course provides overview of human biology for nonscience majors. Includes study of cells, tissues, organs, and systems with emphasis on interrelatedness. Coverage also includes genetics, and aspects of various human diseases. (45-30)

70:112 Animal Science I (3 s.h.) This course is designed to provide students with a general overview of the livestock industry. It identifies the ways in which domestic animals serve the basic needs of humans for food, fiber, shelter, protection, fuel and emotional well-being. Students will develop an understanding of and be able to apply the basic principles of animal selection, breeding, genetics, feeding, health, and husbandry practices. As a student, you will become familiar with the economic and social issues that confront the livestock industry. (45-0)

70:113 Fire Behavior and Investigation (4 s.h.) This course is designed to assist in training firefighters and fire officers to properly determine the origin and cause of fire. (45-35)

70:114 Intro to Physical Science (4 s.h.) Prerequisite: High school Algebra or equivalent. An introductory college level, one-semester course intended to meet general education and elementary education certification requirements. Uses the Powerful Ideas in Physical Science curriculum and includes the units on Light & Color, Electricity, and Heat & Conservation of Energy. (45-30)

70:115 Fire Protection Technology (4 s.h.) This course will familiarize the student with the different types of building construction as they relate to fire protection. Also covered will be: private fire protection systems, municipal water systems, state and local codes. (65-15)

70:116 Hazardous Material Technician (3 s.h.) This course will be oriented toward preparing emergency response team members to perform advanced control, containment, and/or confinement operations; understand hazard and risk assessment techniques; know how to identify materials using field response plan; understand the various roles within the incident command system; properly identify, select, and use specialized chemical protective clothing; and perform decontamination activities on personnel equipment. (30-30)

70:117 Incident Command System (1 s.h.) This course is designed to meet the needs of fire officers and managers with responsibilities to use, deploy, implement, and/or function within an incident command system. This program addresses the need for incident management systems, an overview of the structure and expandable nature of ICS, and understanding of the command skills needed by department officers to effectively use ICS guidelines, and scenario practice. (15-0)

70:119 Fire Instructor I (2 s.h.) This course develops the participants' attitudes, knowledge, skills, and abilities to effectively implement and manage tactical operations. Develop a basic understanding of fire fighting strategies and tactics. (24-24)

70:122 Principles of Physics (4 s.h.) Prerequisite: 40:120, Intermediate Algebra, or equivalent. An introductory level, one-term course. Major topics are measurement, matter in motion, heat, wave motion, electricity, and magnetism. (45-30)

70:135 General Chemistry I (5 s.h.) Prerequisite: 40:060, Beginning Algebra, or equivalent. First semester of a two-semester sequence intended for nonscience majors. Introduction to the basic concepts and facts of chemistry. Topics include atomic structure, formation of ionic and covalent compounds, molecular structure, chemical equations including mass relations, solutions, and gases. Laboratory work is an important part of this course. (45-60)

70:136 General Chemistry II (5 s.h.) Prerequisite: 70:135, General Chemistry I, or the equivalent. Continuation of 70:135, General Chemistry I. Topics include types of chemical reactions and chemical reactivity, equilibrium concepts, reaction rates, electrochemical cells, introductions to organic chemistry and biochemistry. Laboratory work is an important part of this course. Intended for nonscience majors. (45-60)

70:137 Chemistry Principles I (5 s.h.) Prerequisite: satisfactory completion of one year of high school chemistry; 40:120, Intermediate Algebra, or the equivalent. Atomic structure, stoichiometry, thermochemistry, solutions, reactions in aqueous solution, chemical bonding and molecular structure, structure-property relationships. (45-60)

ometry, thermochemistry, solutions, reactions in aqueous solution, chemical bonding and molecular structure, structure-property relationships. (45-60)

70:138 Chemistry Principles II (5 s.h.) Prerequisite: 70:137, Chemistry Principles I, or equivalent. Physical properties (gases, liquids, solids), chemical equilibrium and kinetics, acid-base chemistry, chemical thermodynamics, electrochemistry, introduction to organic chemistry and polymers. (45-60)

70:140 Introductory Chemistry (4 s.h.) Prerequisite: 40:060, Beginning Algebra, or equivalent. A one-semester college chemistry course which surveys important concepts and topics of chemistry. Among these are systems of measurement, matter and energy, atomic theory, energy levels and atomic structure, the periodic table, ionic and covalent bonding, chemical equations, acids and bases, states of matter, and solutions. Laboratory work is an important part of this course. (45-30)

70:149 Kinesiology (3 s.h.) Prerequisite: 70:250, Anatomy and Physiology I; and 70:251, Anatomy and Physiology II. Provides a basic understanding of normal human body movement as related to skeletal, articular, neurological, and muscular systems. Levers, torques, center of gravity, base of support, and their relationship to balance, posture, and movement will be addressed. The student will learn anatomical palpations and the basics of human gait. (30-30)

70:161 Genetics (4 s.h.) Prerequisite: One term of biology or consent of instructor. The course is an introduction to basic modern genetics. It includes: the nature of the genetic material and how it is transmitted between generations; gene regulation and interactions; human genetics; genetic engineering, and its implications. (45-30)

70:182 Astronomy (3 s.h.) An introductory level, one-semester course for the nonscience major. Topics include a brief history of astronomy, the physics behind astronomy, the solar system, stars, and galaxies. Computer-based and hands-on activities complement material in the text. (45-0)

70:200 Nutrition (3 s.h.) Prerequisite: three credit hours of inorganic chemistry. Physiology very helpful, but not essential. Introduces the scope of the science of nutrition and its application to the nurse's role in promoting good nutrition throughout the life span. Principles of diet modification are presented as they relate to specific health problems. Nursing assessment, the patient's nutritional needs, and dietary planning are included. (45-0)

70:204 Field Studies in Biology (1-4 s.h.) Prerequisite: permission of the instructor. Field-based exploration of fundamental concepts of ecology and biology through active investigation. Use of nature centers, field professionals, parks, and the environment itself for learning and interpretation. Past trips include Belize, tropical ecology; Washington state, temperate rainforest and tidepool ecology; northern Minnesota, boreal forest ecology. (0 to 30-30 to 120)

70:212 Animal Science II (3 s.h.) This course applies advanced principles of livestock production and management. Areas of emphasis include: a review of animal husbandry practices, which

result in greater performance and profit; livestock facilities requirements; production trends, animal health, and nutritional requirements for livestock produced in the Midwest; emphasis on swine and beef cattle production. (45-0)

70:249 Urinalysis I (3 s.h.) Prerequisite: 70:100, Intro to Lab Science. This course includes the study of urine formation and the methodology determining the physical, chemical, and microscopic properties of urine in normal and abnormal states. (30-30)

70:250 Anatomy and Physiology I (4 s.h.) Prerequisite: Human biology or biological principles highly recommended, but not required. A study of the human body emphasizing the complementary nature of structure and function, molecular and cellular interactions, homeostasis, and metabolic processes. Includes a study of cells, tissues, membranes, skeletal, muscular, and reproductive systems. (45-30)

70:251 Anatomy and Physiology II (4 s.h.) Prerequisite: Successful completion of 70:250, Anatomy and Physiology I, highly recommended, but not required as a prerequisite. A continuation of 70:250, Anatomy and Physiology I. Includes a study of the circulatory, respiratory, digestive, endocrine, urinary, and nervous systems. Cat kidney, brain, and eye dissections are performed in the laboratory. (45-30)

70:260 Quantitative Analysis (4 s.h.) Prerequisite: 70:137 and 70:138, Chemistry Principles; or 70:135 and 70:136, General Chemistry. Theory and practice of general gravimetric, volumetric, and instrumental methods of chemical analysis; laboratory work involving quantitative reactions, measurements, and calculations. (45-30)

70:272 Fundamentals of Organic Chemistry (3 s.h.) Prerequisite: 70:135, General Chemistry; 70:137, Chemistry Principles I; or 70:140, Introductory Chemistry. Introductory survey of organic chemistry covering nomenclature, molecular structure and reactions. The chemistry of carbohydrates, amino acids, proteins, lipids, nucleosides, nucleotides, and nucleic acids. Intended for nonscience majors. (45-0)

70:273 Organic Chemistry (4 s.h.) Prerequisite: 70:140, Introductory Chemistry; 70:135, General Chemistry; or 70:137, Chemistry Principles I. This course provides instruction in the preparation and reactions of the basic classes of carbon compounds. Among these include hydrocarbons, alcohols, esters, carboxylic acids and their derivatives, aldehydes, ketones, amides, and amines. Laboratory procedures and techniques dealing with nonaqueous solvents are developed. (45-30)

70:274 Organic Chemistry I (5 s.h.) Prerequisite: 70:136, General Chemistry II, or 70:138, Chemistry Principles II. Survey of the major classes of organic compounds emphasizing molecular structure, stereochemistry, reaction mechanisms and synthesis. Laboratory work includes procedures of distillation, solvent extraction, chromatography, polarimetry and the use of both macroscale and microscale laboratory glassware. (45-65)

70:275 Organic Chemistry II (5 s.h.) Prerequisite: 70:274, Organic Chemistry I. Continuation of 70:274 including spectroscop-

ic methods for molecular structure determination. Laboratory work involving the procedures introduced in 70:274 and the use of infrared spectroscopy and gas chromatography for compound identification. (45-65)

70:280 General Physics I (4 s.h.) Prerequisite: 40:151, College Algebra and Trigonometry, or equivalent. Mechanics, simple harmonic motion, waves, and fluids. Designed for students in pharmacy, medicine, dentistry, and professional fields other than engineering. Liberal arts students with an interest in science may elect this course. (45-30)

70:281 General Physics II (4 s.h.) Prerequisite: 40:151, College Algebra and Trigonometry or equivalent, and 70:280, General Physics I; or equivalent algebra-based first semester physics course as approved by the instructor. A continuation of 70:280, thermodynamics, electricity and magnetism, DC and AC circuits, optics and atomic physics. (45-30)

70:282 College Physics I (5 s.h.) Prerequisite: 40:251, Calculus I or equivalent with a "C" or higher, concurrent enrollment in or completion of 40:252, Calculus II or equivalent. Calculus-based course intended for engineers or physics majors. Kinematics, dynamics, static equilibrium, conservation laws, rotational motion, simple harmonic motion, waves, and fluids. (60-30)

70:283 College Physics II (5 s.h.) Prerequisite: 70:282, College Physics I or equivalent; 40:252, Calculus II or equivalent. Second of two-course sequence for engineers or physics majors. Thermodynamics, electricity and magnetism, electric circuits, and optics. (60-30)

70:297A Special Problems in Biology* (1 s.h.) Students may submit a proposal for a special project to an instructor. With the instructor's approval and the consent of the Division Chair and the Vice President for Academic Affairs, credit may be given upon satisfactory completion of the project. Course may be repeatable for credit. (15-0)

70:297B Special Problems in Biology* (2 s.h.) Same as 70:297A. (30-0)

70:297C Special Problems in Biology* (3 s.h.) Same as 70:297A. (45-0)

70:298A Special Problems in Chemistry* (1 s.h.) Students may submit a proposal for a special project to an instructor. With the instructor's approval and the consent of the Division Chair and the Vice President for Academic Affairs, credit may be given upon satisfactory completion of the project. Course may be repeatable for credit. (15-0)

70:298B Special Problems in Chemistry* (2 s.h.) Same as 70:298A. (30-0)

70:298C Special Problems in Chemistry* (3 s.h.) Same as 70:298A. (45-0)

70:299A Special Problems in Physics* (1 s.h.) Students may submit a proposal for a special project to an instructor. With the

instructor's approval and the consent of the Division Chair and the Vice President for Academic Affairs, credit may be given upon satisfactory completion of the project. Course may be repeatable for credit. (15-0)

70:299B Special Problems in Physics* (2 s.h.) Same as 70:299A. (30-0)

70:299C Special Problems in Physics* (3 s.h.) Same as 70:299A. (45-0)

80 Social Sciences

Note: All courses in this category do not meet the Social Science distribution requirement. See pages 116-117 for courses which specifically meet this requirement.

80:101 General Psychology (3 s.h.) Corequisite: New students with entering ACT or COMPASS reading scores below college level will be required to co-enroll in 30:120, College Reading Skills. Introduction to the scientific study of behavior: a brief history of psychology as a science; influences of heredity and environment, motivation, frustration and conflict, the learning process, intelligence, perception, and mental health. (45-0)

80:103 Educational Psychology (3 s.h.) Prerequisite: 20:101, Intro to Teaching, is highly recommended, but not required prior to taking Ed Psychology. Study of teaching and learning process. Mental hygiene, evaluation, individual differences, motivation, and teaching methods are introduced as they apply to the teaching and learning environment. (45-0)

80:104 Child Psychology (3 s.h.) Prerequisite: 80:101, General Psychology, and/or 80:230, Human Growth and Development. Course covers information relevant to the development of humans from the prenatal stages through adolescence. Topics covered include the developing fetus, as well as physical, social, and psychological development in infancy, toddlerhood, childhood, and adolescence. (45-0)

80:110 Sociology (3 s.h.) An introductory survey course, sociology is the scientific study of society. Inquires into what holds societies together, what causes societies to change, and how social forces affect our daily lives. Topics covered include: culture and society, socialization, social research, groups, organizations, institutions, deviance, gender, race and ethnicity. An emphasis is placed on cultural diversity. (45-0)

80:111 Social Problems (3 s.h.) Prerequisite: 80:110, Sociology, is strongly recommended. Introduction to the study of contemporary social problems. The course examines how social problems are identified, explores underlying conditions and causes of social problems, and considers possible solutions and policy implications. Emphasis is on sociological and critical thinking frameworks. Topics of exploration include: mental illness, substance abuse, crime, prejudice and discrimination, prostitution, poverty, and more. (45-0)

80:112 Marriage and Family (3 s.h.) A survey of the family as a social unit in the modern American culture. A study is made regarding the creation of the American family from various cultures as well as the problems the family is subjected to such as sex relations, social roles, communication, finance, and divorce. (45-0)

80:114 Introduction to Human Services (3 s.h.) This course is designed to familiarize the student with the human services arena. Various employment opportunities are explored, as well as ethical, legal, political, and economic forces. (45-0)

80:120 Introduction to American Government (3 s.h.) A survey of the American federal system of government including a description and analysis of the Constitution, the legislative, executive, and judicial branches of government, and the American political process. (45-0)

80:121 American State and Local Government (3 s.h.) A survey of state and local governments in the United States including an analysis of federal-state relations, state constitutions, state and local legislative, executive, and judicial systems, and major issues in state and local politics. (45-0)

80:122 International Relations (3 s.h.) An introductory course in international relations which offers an analysis of the structure and processes of world politics. Topics covered include the study of foreign policies, a survey of major problems in contemporary world affairs, and an examination of selected global issues. (45-0)

80:125 Student Senate (1 s.h.) Students learn organizational and leadership skills through participation in the NIACC Student Senate, student and college committees, and student activity programming. Each student will identify and carry out a project to demonstrate leadership skills including needs assessment, planning, budgeting, motivating volunteers, and evaluation. Course may be repeatable for credit. (0-30)

80:127 Leadership Development Seminar (2 s.h.) This course will help students develop the necessary skills to be an effective leader. Topics covered include developing a leadership philosophy, articulating a vision, decision making, time management, team building, empowering and delegating, initiating change, managing conflict, and ethics. Class time will primarily consist of discussion and small-group activities. (15-30)

80:133 Macroeconomics (3 s.h.) An introductory study of how people use scarce resources to satisfy unlimited wants. After an introduction to economics, the emphasis is on the determination of national income, output, employment, and the general price level in the national economy including an examination of the money and banking system. (45-0)

80:134 Microeconomics (3 s.h.) Prerequisite: 80:133, Macroeconomics. An introductory study of how people use scarce resources to satisfy unlimited wants. The emphasis is on the behavior and decisionmaking by individual consumers, entrepreneurs, workers, and other resource owners in the product and resource markets and the resulting effects on the efficiency with which resources are used. (45-0)

80:135 Personal Finance (3 s.h.) Introduction to financial planning, using financial services and your income wisely, protecting your assets, increasing your income through savings and investment, and planning for retirement. (45-0)

80:140 American History to 1877 (3 s.h.) A survey course covering the social, political, and economic history of American civilization from the Age of Discovery through Reconstruction. (45-0)

80:141 American History 1877 to Present (3 s.h.) A survey course covering the social, political, and economic history of the United States since 1877. (45-0)

80:144 American Indian History: Prehistory to Mid-20th Century (3 s.h.) Ethnographic and historical survey of the social, cultural, and political systems developed by Native Americans north of Mexico, and the developing relationship of these systems with those of the European-Americans. Native religion and world view, agricultural and hunting practices, material culture, trade, diplomacy and political structures are examined, as are the mutual impact on both societies resulting from contact with and interaction between native North Americans and Europeans and their descendants. (45-0)

80:150 Introduction to Physical Geography (3 s.h.) An introductory systems course in geography that acquaints the student with spatial relationships that exist in the physical environment. Topics include: geographic tools, weather and climate, land forms, soils, water resources, plants, and animals. Lab experience included. (45-0)

80:151 Regional Geography of the Developed World (3 s.h.) A regional study of the physical and cultural spatial patterns of Europe, Australia, Russia, and Anglo-American. (45-0)

80:152 Regional Geography of the NonWestern World (3 s.h.) A regional study of the physical and cultural spatial patterns of Middle America, South America, North Africa/Southwest Asia, South Asia, East Asia, Southeast Asia and the Pacific World. (45-0)

80:160 Cultural Anthropology (3 s.h.) Prerequisite: Three of the following: Sociology, Psychology, Marriage and Family, Biology, Literature, or Genetics. This course embraces cultures from all continents; highlights major human subsistence patterns; and illustrates human adaptation to the environment, from the beginning of human history to the present. Individual studies enable students to experience cultures in-depth. The student's goal is to understand one's own culture from a historical perspective and to analyze the forces of today in terms of how those forces may affect the future of earth and mankind. (26-38)

80:190 Criminal Law I (3 s.h.) The philosophy and basis for law; the historical development of criminal law and procedures; the structure, definitions, and criminal laws of Iowa. Required course for Criminal Justice curriculum. (45-0)

80:191 Criminal Law II (3 s.h.) Required course for Criminal Justice curriculum. Covers the law of arrest, search, and seizure. A continuation of 80:190. (45-0)

80:192 Patrol Procedures (3 s.h.) Responsibilities, techniques, and methods of police patrol. Methods of traffic law enforcement, regulation and control; and fundamentals of traffic accident investigations. (45-0)

80:201 Western Civilization to 1648 (4 s.h.) A study of the major social, political, economic, cultural, and philosophical movements in the Western World from the beginning of civilization to 1648. (60-0)

80:202 Western Civilization 1648 to the Present (4 s.h.) A study of the major social, political, economic, and philosophical movements in the Western World from 1648 to the present. (60-0)

80:210 Introduction to Philosophy (3 s.h.) Introduces the student to the study of philosophy and teaches skills of critical thinking. The course examines the meaning and value of philosophy; human nature and the self, axiology—ethics and d values (In search of the Good Life); social philosophy; freedom; individualism; philosophy and art; epistemology—the nature of knowledge; truth; philosophy and religion; the meaning of suffering and death; examination of decision making and self-discovery. (45-0)

80:212 Ethics (3 s.h.) This course is designed to develop objective thinking skills. The goal is to create a balance between moral principles when considering a variety of ethical issues. The emphasis will be on developing a moral stance that is workable in today's society. Issues include poverty, environment, animal rights, business, preferences in hiring, war, death penalty, abortion, euthanasia, parent-child relationships, sex, love, and marriage. (45-0)

80:230 Human Growth and Development (3 s.h.) A study of the physical, mental, emotional, and social growth of the person from conception through later adulthood. Class lecture and discussion will reflect on such issues as attachment, play behavior, parenting styles and discipline, education, mate selection, midlife events, and later adulthood experiences. (45-0)

80:290 Criminal Evidence (3 s.h.) The kinds and degrees of evidence and the rules governing the admissibility of evidence in court. Required course for Criminal Justice curriculum. (45-0)

80:291 Administration of Justice (3 s.h.) Arrest, search and seizure; review of court systems; procedures from incident to final disposition; principles of constitutional, federal, state, and civil laws as they apply to and affect law enforcement. Required course for Criminal Justice curriculum. (45-0)

80:292 Criminal Investigation (3 s.h.) Fundamentals of investigation, crime scene search and recording, collection and preservation of physical evidence, scientific aids, modus operandi, sources of information, interviews and interrogation, follow-up, and case preparation. (45-0)

80:299A Special Problems in Social Sciences* (1 s.h.) Students may submit a proposal for a special project to an instructor. With the instructor's approval and the consent of the Division Chair and the Vice President for Academic Affairs, credit may be given upon satisfactory completion of the project. (15-0)

80:299B Special Problems in Social Sciences* (2 s.h.) Same as 80:299A. (30-0)

80:299C Special Problems in Social Sciences* (3 s.h.) Same as 80:299A. (45-0)

85 Speech & Theatre

85:101 Public Speaking (2 s.h.) Public speaking as an intellectual tool for use in argumentation and persuasion in a democratic society. (Offered each term.) (30-0)

85:105 Group Discussion (2 s.h.) Principles and techniques of group discussion methods and procedures based on parliamentary methods. (30-0)

85:150 Introduction to Theatre TV and Film (3 s.h.) A survey of dramatic theatre, television, and film. (45-0)

85:160 Stagecraft (3 s.h.) An introduction to the construction, painting, and shifting of stage scenery, including scene shop methods and maintenance. (45-40)

85:170 Introduction to Acting (3 s.h.) Basic principles of stage acting. Work in song, dance, monologue, and play cuttings to develop techniques of voice, gesture, movement, and characterization. (45-0)

85:299A Special Problems in Speech/Theatre* (1 s.h.) Student may submit a proposal for a special project to an instructor. With the instructor's approval and the consent of the Division Chair and the Vice President for Academic Affairs, credit may be given upon satisfactory completion of the project. Course may be repeatable for credit. (15-0)

85:299B Special Problems in Speech/Theatre* (2 s.h.) Same as 85:299A. (30-0)

85:299C Special Problems in Speech/Theatre* (3 s.h.) Same as 85:299A. (45-0)

89 Experiential Learning, Electives, EMT and Nurse Aide

89:100 A-B-C-D-E Cooperative Work Experience (1-5 s.h.) Practical training on the job under the cooperative supervision of the college and work supervisor. Designed primarily for the college transfer students to provide an experience that: (1) is directly related to their college program and career objectives; or (2) will help them test out career interest and/or discover new career possibilities. Credit is determined on the basis of one semester of credit for each 60 hours of approved employment to be completed in a term. Appropriateness of learning objectives is an essential factor in the approval process. 1-5 credits per semester, 12 credits maximum. (0-60 to 300)

89:120 Individualized Educational Planning & Assessment (1 s.h.) Prerequisite: Students must have the consent of the instructor. The introductory and required beginning course for the Individualized Competency Based Education Program (ICBE). It is designed to teach educational assessment and evaluation, career development and goal setting, degree pact writing and individualized educational planning. (15-0)

89:140 Orientation to College (0 s.h.) Prerequisite: First-time, full-time college students [transfer students with less than 12 hours credit]. Areas included in this course are campus involvement, services available to students, alcohol awareness, career awareness, and personality types/study behaviors. (5-0)

89:150 Employment Strategies (1 s.h.) Develop skills necessary to enter the job market and experience long-term career growth. Students learn basic job seeking techniques, job keeping skills, and strategies for continued growth. (15-0)

89:151 Academic Success Seminar (2 s.h.) Designed primarily for freshmen. The focus is assisting in the development of effective study techniques and comprehensive skills necessary for independent learning and academic success. (30-0)

89:152 Career Decision Making (2 s.h.) Introduction to a structured career decision-making process, including self-awareness, career and educational information, economic information, and related activities/projects. (30-0)

89:153 ACE-Action for College Education (1 s.h.) Prerequisite/Corequisite: For participants in the Student Support Services Project. ACE (Action for College Education) is a motivational behavioral modification program. The course cultivates a positive attitude and gives students the motivation to help themselves in a college setting. The goal is to instill confidence, eagerness, and enthusiasm toward obtaining a college degree. (15-0)

89:155 Financial Management/Insurance Internship (3 s.h.) The internship will provide practical application for each student. The activities will be in the actual insurance industry environment where each student will be afforded the opportunity to turn theory into application. (15-150)

89:159 Introduction to Health Professions (2 s.h.) This course provides a brief historical view of health care in addition to an overview of today's health care delivery system and related health care issues. Ethical/legal issues and desirable professional skills and behaviors associated with health care workers are also addressed in this course. Direct observation and research of specific health careers in health care agencies is also a requirement. Specific immunizations and health history information may be required for the observational experience and should be discussed with your counselor prior to the course. This course has been designated as a Pass/No Pass course. (30-0)

89:164 Nurse Aide Theory (2 s.h.) Corequisite: 89:165, Nurse Aide Clinical. This 75-hour nurse aide course has been designed to meet the training requirements of The Omnibus Budget Reconciliation Act of 1987 (OBRA) for aides working in nursing facilities (NF) and skilled nursing facilities (SNF). Emphasis in the course is on students achiev-

ing a basic level of knowledge and demonstrating skills to provide safe, effective resident care. The course has been developed in six units of study. The theory portion includes 30 hours of classroom time and 15 hours of laboratory practice. (30-0)

89:165 Nurse Aide Clinical (1 s.h.) Corequisite: 89:164, Nurse Aide Theory. The clinical experience includes 30 hours in a nursing facility. (0-45)

89:168 Introduction to Health Care and Health Care Skills I (2 s.h.) Corequisite: 80:101, General Psychology; 30:101, Communication Skills I; 15:251, Medical Terminology; 94:104A, Body Structure and Function or articulated high school Anatomy and Physiology. A brief, historical view of health care in addition to an overview of today's health care delivery system and related health care issues. Orientation to nursing and the role of the practical nurse in the health community, history of nursing, and principles of planning nursing care. Theory and basic nursing skills including asepsis, communication, body mechanics, and hygiene. Practice and demonstration of nursing skills in college laboratory. (15-30)

89:169 Introduction to Health Care and Health Care Skills II (3 s.h.) Prerequisite: 80:101, General Psychology; 30:101, Communication Skills I; 89:168, Introduction to Health Care and Health Care Skills I. Corequisite: 80:230, Human Growth and Development; 30:102, Communication Skills II; 94:104A, Body Structure and Function or articulate high school Anatomy and Physiology. A continuation of orientation to the role of the practical nurse in the health community. An introduction to nursing care for client's with nutrition, fluid balance and elimination needs. Legal and ethical principles related to nursing practice. Practice of nursing skills in college laboratory. A two-week clinical experience with skilled nursing and acute care. Upon completion of this course, the nursing student is eligible for the Nurse Aide written and skill demonstration tests. Passing these tests with 70 percent is required to be placed on the Department of Inspection and Appeals Nurse Aide Registry. (30-20-30)

89:170 First Responder (2 s.h.) Prerequisite: At least 17 years of age at the time of enrollment. Proficient in writing, reading, and speaking English. Hold or eligible to obtain a driver's license. Physically and emotionally capable of performing basic emergency care skills. Current certification at the Basic Cardiac Life Support Health Care Provider Module with the American Heart Association or permission obtained by the instructor. A 45-hour emergency care course which emphasizes life-threatening emergencies, wounds, fractures, medical and environmental emergencies, and other emergency situations as outlined by the U.S. DOT. (23-17)

89:171 EMT-P: Part I (6 s.h.) Prerequisite: EMT-B and EMT-I State of Iowa Certification, or 89:189, EMT-I: Part I. This course provides the student with advanced prehospital training. It includes roles and responsibilities, overview of human systems, emergency pharmacology, airway management, patient assessment, and trauma management (including PHTLS). (60-60)

89:172 EMT-P: Part II (7 s.h.) Prerequisite 89:171, EMT-P: Part I. This course is a continuation of 89:171, EMT-P: Part I. It includes respiratory, cardiac, diabetic, neurological, toxicological, abdominal, gynecological, behavioral, pediatric, geriatric and obstetrical emergencies. (71-69)

89:173 EMT-P: Part III (3 s.h.) Prerequisite 89:171, EMT-P: Part I; 89:172, EMT-P: Part II. This course includes 68 hours of hospital clinical experience and 67 hours of field experience. (0-0-90-45)

89:174 EMT-P: Part IV (3 s.h.) Prerequisite 89:171, EMT-P: Part I; 89:172, EMT-P: Part II; 89:173, EMT-P: Part III. This course includes 67 hours of hospital clinical experience and 68 hours of field experience. (0-0-45-90)

89:175 EMT-I (4 s.h.) Prerequisite: EMT-B State of Iowa Certification. This class provides the student with advanced skills to provide emergency care and transport. It includes roles and responsibilities, legal aspects, EMS system and communications, patient assessment, advanced airway management, shock management, including intravenous therapy and defibrillation. It also includes 45 hours of clinical/field experience. (30-30-45)

89:195 Emergency Medical Technician - Basic Part I (4 s.h.) Prerequisite/Corequisite: Be at least 17 years of age at the time of enrollment. Be proficient in writing, reading, and speaking English. Hold or be eligible to obtain a current driver's license. Be physically and emotionally capable of performing basic emergency care skills. Current certification at the Basic Cardiac Life Support Health Care Providers Course with the American Heart Association. Physical examination required prior to beginning hospital clinicals with immunizations and hepatitis B vaccine or waiver. This class provides the student with the necessary knowledge and skill to perform basic emergency care and transport. It includes an introduction/preparation module, airway management module, patient assessment module, medical/behavioral emergencies module, and obstetrical/gynecological emergencies module. Six hours of clinical in the hospital and nursing home is also included. (47-24-6)

89:196 Emergency Medical Technician - Basic Part II (2 s.h.) Prerequisite/Corequisite: Be at least 17 years of age at the time of enrollment. Be proficient in writing, reading, and speaking English. Hold or be eligible to obtain a current driver's license. Be physically and emotionally capable of performing basic emergency care skills. Current certification at the Basic Cardiac Life Support Health Care Providers Course with the American Heart Association. Physical examination required prior to beginning hospital clinicals with immunizations and hepatitis B vaccine or waiver. Must have completed EMT-Basic Part I (89:195). This class is a continuation of EMT-B Part I. It includes a trauma module, infants and children module, and operations module. Twelve hours of clinical in the hospital is also included. (20-14-12)

Study Abroad

Through NIACC's participation in the Iowa Community College Study Abroad Consortium, students have the opportunity for foreign study while remaining full-time NIACC students. Currently, the program is offered in London during the fall semester. On this program, students have the opportunity to earn 12 or more credit hours. Except for a mandatory Humanities offering, British Life and Culture (89:157 - 3 s.h.), course offerings are determined by the expertise of the instructor accompanying the students in any given semester.

Enrich Program

This program is recommended to students who do not meet the prerequisites for developmental courses. It is intended to lead to a one year General Studies diploma. Credit earned will not satisfy the requirements for an Associate degree and will not be used in calculating the cumulative grade point average for graduation. All courses in the program have been designed as pass/no pass.

30:048 Communication Through Reading and Writing, Enrich (4 s.h.) Prerequisite: Consent of instructor. This Enrich course will focus on strategies that enable adult students to understand and apply reading skills to printed material, and to express ideas clearly and correctly in writing. Applications will be in daily life, at work, and in leisure activities. (60-0)

30:049 Communication Through Reading and Writing II (4 s.h.) Prerequisite: Consent of instructor. This Enrich course will focus on strategies that enable adult students to understand and apply reading skills and to express ideas clearly and correctly in writing. Applications will be in daily life, at work, and in leisure activities. Emphasis will be on decoding, vocabulary building, and writing. This course is designed to follow Communication Through Reading and Writing I, Enrich (30:048) but may be taken without that prerequisite. (60-0)

40:038 Enrich Math I (2 s.h.) Prerequisite: Consent of instructor. This Enrich course will focus on strategies that enable adult students to understand and apply mathematics in their daily lives, at work, and in their leisure hours. (30-0)

40:039 Enrich Math II (2 s.h.) Prerequisite: Consent of instructor. This Enrich course will focus on strategies that enable adult students to understand and apply mathematics in their daily lives, at work, and in their leisure hours. Focus will be on decimals, fractions, and percents. The course is designed to follow Enrich Math I, but may be taken without that prerequisite. (30-0)

89:020 Civic Responsibility (3 s.h.) Prerequisite: Consent of instructor. This Enrich class is designed to teach the economic philosophy and structural construction of the American government. Stress will be placed on the citizen's role within that government. Economics and the individual consumer will be considered. (45-0)

89:030 Personal Management (3 s.h.) Prerequisite: Consent of instructor. This Enrich course will examine concerns faced by students as members of modern society. It is designed to assist students in making sound decisions concerning physical, mental, and financial health, and to use nonworking hours in a creative way. Critical thinking skills will be emphasized as students analyze written documents, including those financial, legal, and medical. (45-0)

89:040 Skills for Job Seekers (3 s.h.) Prerequisite: Consent of instructor. This Enrich course is designed to assist the student in structuring a job search. Written materials will include applications, resumes, and cover letters. Interviewing skills will be developed. Job-keeping skills will be emphasized. (45-0)

89:041 Career Decisions (3 s.h.) Prerequisite: Consent of instructor. This Enrich course is designed to assist students in determining realistic career objectives and assessing personal strengths. Curriculum focuses on self-management skills, time, and organizational concepts. The class stresses both written and verbal communication skills. (45-0)

90-99 Career and Technical

90:106 Introduction to Nursing (1 s.h.) An introduction to the philosophy and conceptual framework of the NIACC Associate Degree Nursing program. The course includes basic concepts related to legal and ethical aspects of nursing, nursing roles, and current trends in health care. The student is introduced to wellness-illness theory, the therapeutic nurse-patient relationship and effective communication techniques. An introduction to caring concepts is also included. This course has been designated as a pass/no pass course. (15-0)

90:108 Nursing I (7 s.h.) Prerequisite: 90:106, Introduction to Nursing; 70:250, Anatomy and Physiology I; 70:251, Anatomy and Physiology II; 70:109, Microbiology; and 30:101C, Communication Skills I. Nursing I utilizes the nursing process with emphasis on assessment and nursing diagnosis in meeting client needs resulting from impairments relating to safety and comfort throughout the life span. Pharmacological concepts, diet modification, psychosocial concepts, and health maintenance are integral considerations in the progressive development of the student's knowledge and skills. Clinical experiences include opportunities to apply nursing roles and the nursing process in long-term care, medical-surgical, and community settings. (60-105)

90:111 Nursing II (10 s.h.) Prerequisite: 90:108, Nursing I; 80:230, Human Growth and Development; and 80:101, General Psychology. Nursing II utilizes the nursing process with emphasis on planning in meeting client needs resulting from impairments relating to self-esteem and mobility throughout the life span. Pharmacological concepts, diet modification, psychosocial concepts, and health maintenance are integral considerations in the progressive development of the student's knowledge and skills. Clinical experiences include opportunities to apply nursing roles and the nursing process in maternal-newborn, pediatrics, medical-surgical, and community settings. (105-135)

90:113 Nursing IIA (1 s.h.) Prerequisite: Graduate of approved practical nursing program; hold current, unencumbered practical nurse license, plus successful completion of all freshman nonnursing courses. Provides introduction to program, differentiates roles of LPN and RN, reviews nursing process, presents specific communication techniques, and reviews content in laboratory setting. Students must obtain a passing grade in this course to continue into Nursing, 90:210. If a passing grade is not attained, the student will be required to register for Nursing, 90:111. This course has been designated as a pass/no pass course. (14-2)

90:121 Introduction to Drafting (3 s.h.) Fundamentals of AutoCAD: layers, icons, pull-down menu, drawing and editing commands, object snaps, screen menu, filters, text, sketch, basic construction of 2D mechanical drawings. Use of board equipment and

instruments, lettering, basic geometric construction, and sketching fundamentals. (30-90)

90:122 Drafting I (3 s.h.) Prerequisite: 90:121, Intro to Drafting. A continuation of AutoCAD and drafting fundamentals; multi view projections, rays, construction lines, auxiliaries, isometric drawings, theory of orthographic projection: points, lines, planes, and auxiliaries. (30-90)

90:123 Retail Field Experience (5 s.h.) The on-the-job training component of the Retail Management Program. (15-225)

90:125 Retailing (3 s.h.) The study of the selling of goods and services to ultimate consumers, involving distribution, inventory control, site selection, pricing, and other topics pertinent to successful retail business operations. (45-0)

90:126 Retail Field Experience (5 s.h.) Prerequisite: 90:123, Retail Field Experience. The on-the-job training component of the Retail Management Program. (15-225)

90:128 Introduction to CAD (2 s.h.) A class in Auto CAD 2000 commands. A thorough introduction of two-dimensional drafting commands and command options. The sessions are hands-on using a variety of application drawing exercises that are modified or created. (15-30)

90:129 CAD II (2 s.h.) Prerequisite/Corequisite: 90:128, Introduction to CAD, or equivalent experience. This course is designed to build on the skills acquired in introduction to CAD. This course will review multi view drawings, layers, linetypes, colors, basic and advanced dimensioning, blocks and attributes, sectional views, three-dimensional drawing techniques, plotting, and printing with AutoCAD 2000. (15-30)

90:131 Drafting II (7 s.h.) Prerequisite: 90:121, Intro to Drafting; and 90:122, Drafting. AutoCAD fundamentals; array dimensioning (basic, intermediate, and advanced), Tolerancing, sections, threads and fasteners, isometric drawing, editing using grips, display options, editing polylines and splines, blocks, viewports, attributes, bill of materials, and assemblies. (60-195)

90:134 Basic Pharmacology (2 s.h.) Provides a basic foundation of the study of drugs including general concepts, biological factors affecting the action of drugs, and effects of medications on body systems. Includes allergy overview, the medication order, and discussion of legal and ethical issues related to pharmacology. (30-0)

90:136 Introduction to the Clinic (1 s.h.) Prerequisite: 90:149, Introduction to PTA; and 90:144, Fundamentals for the PTA. Forty-hour clinical occurs one week prior to start of second term. Skills, knowledge, and attitudes learned will be applied to direct patient care in selected clinical settings. Includes application/integration of PTA course work with the goal of student providing quality care with uncomplicated patients and a high degree of supervision and guidance. This course has been designated as a pass/no pass course. (0-40)

90:137 PTA Clinic I (2 s.h.) Prerequisite: 90:149, Introduction to PTA; and 90:144, Fundamentals for the PTA; 70:149, Kinesiology; 90:146, Developmental Processes; and 90:159, PTA Modalities. Eighty-hour clinical occurs two weeks beyond the end of the second term. Skills, knowledge, and attitudes learned in Developmental Processes, Kinesiology, and PTA Modalities will be applied to direct patient care in selected clinical settings. Includes application/integration of all PTA course work with the goal of student providing quality care with uncomplicated to complex patients and a degree of supervision and guidance that will vary with the complexity of the patient or the environment. This course has been designated as a pass/no pass course. (0-80)

90:138 PTA Clinic II (2 s.h.) Prerequisite: 15:251, Medical Terminology or 90:145, PTA Terminology; 90:149, Introduction to PTA; and 90:144, Fundamentals for the PTA; 70:149, Kinesiology; 90:146, Developmental Processes; 90:159, PTA Modalities; 90:147, Pathophysiology; and 90:150, PTA Assessment Procedures. Eighty-hour clinical occurs in the final week of the third term and extends one week after the term ends. Skills, knowledge, and attitudes learned in Pathophysiology and PTA Assessment Procedures will be applied to direct patient care in selected clinical settings. Includes application/integration of all PTA course work, with the goal of the student providing quality care with uncomplicated to complex patients and a degree of supervision/guidance that will vary with the complexity of the patient or environment. This course has been designated as a pass/no pass course. (0-80)

90:140 Laboratory Tests (2 s.h.) To familiarize the student with clinical laboratory tests and their normal ranges in the areas of hematology, urology, and microbiology. The student will also learn basic surgical position terminology, instruments, and special organ studies. (30-0)

90:141 Clinical Procedures I (4 s.h.) Assist physician with examinations and treatments, prepare patients for examinations and diagnostic procedures, administer first aid and CPR, maintain and use aseptic techniques, obtain and record patient data. Perform routine tests, autoclave instruments, and prepare sterile setups. If taking curriculum beyond a one-year period, this course should be taken during the final year of the curriculum, (45-30)

90:142 Clinical Procedures II (4 s.h.) Prerequisite: 90:141, Clinical Procedures I. A continuation of Clinical Procedures I with emphasis on pharmacology, administration of medications, electrocardiography and the circulatory system. Principles of radiography and nutrition. Collection and testing of laboratory specimens, including phlebotomy. If taking curriculum beyond a one-year period, this course should be taken during the final year of the curriculum, (45-30)

90:144 Fundamentals for PTA (3 s.h.) Prerequisite: None. This course provides a foundation in physical therapy interventions by covering basic assessment and measurement techniques that the PTA can utilize to monitor patients as well as basic treatment interventions such as range of motion and transfers. Purposes of all skills, proper techniques, and safety considerations will be addressed. Students will have lab time to apply, practice, and demonstrate skills they are taught. (30-30)

90:145 PTA Terminology (1 s.h.) Prerequisite: None. Includes an orientation to the vocabulary of medicine with emphasis on terminology related to rehabilitation. (15-0)

90:146 Developmental Processes (3 s.h.) Presents normal physical, cognitive, social, and emotional developmental processes which affect an individual throughout the life span. Emphasis on integration of all aspects of human development and additional focus on application of physical processes to the field of physical therapy. (45-0)

90:147 Pathophysiology (3 s.h.) Prerequisite: 15:251, Medical Terminology or 90:145, PTA Terminology; 70:250, Anatomy & Physiology I; and 70:251, Anatomy & Physiology II. Presents clinical disorders and diseases commonly treated in physical therapy. Pathology, etiology, diagnosis, signs, symptoms, prognosis and implications for rehabilitation will be covered. (45-0)

90:149 Introduction to PTA (2 s.h.) Prerequisite: None. This course provides an overview of the physical therapy profession and the role of the physical therapist assistant, including legal and ethical aspects of practice. Students will be introduced to the patient care process, be instructed in documentation, and given much opportunity to work on their communication skills. Includes an introduction to the Clinical Education component of the program. (30-0)

90:150 PTA Assessment Procedures (3 s.h.) Prerequisites: 90:149, Introduction to the PTA; 90:144, Fundamentals for PTA; and 70:149, Kinesiology. This course provides an in-depth look at various assessment skills performed and utilized by the PTA. Special emphasis will be on theory, application procedures, and documentation of findings when utilizing goniometry and manual muscle testing in the clinic setting. Students will have an opportunity in the lab portion to apply, practice, and demonstrate techniques they are taught. (30-30)

90:159 PTA Modalities (4 s.h.) Prerequisite: 90:144, Fundamentals for PTA. Prepares the student for safe and effective application of modalities for patient treatment. Mechanisms of action, indications, contraindications and treatment procedures will be covered for the following: heat, electromagnetic radiation, cold, massage, biofeedback, external compression, whirlpool, wound care, traction, and electrical stimulation. Pain and skin assessment will be included. Students will practice applications in lab. (37.5-45)

90:160 Crop Science I (3 s.h.) Topics covered include: plant anatomy and physiology; plant classification and ID; pest classification and ID; and pesticides, pest management, application equipment, calibration, laws/regulations. Students will take the Iowa Core Manual examination as a requirement for this course. (38-15)

90:161 Crop Science II (3 s.h.) Basic concepts and principles of plant-soil-climate relationships. Management principles necessary for successful crop production with major emphasis on corn, soybeans, small grains, and legume crops common to North Iowa agriculture. (38-15)

90:168 Ag Math (2 s.h.) This course is designed for students seeking an Associate of Applied Science Degree in Agriculture. Ag Math is a developmental course in the fundamentals of arithmetic and elementary equation solving. (30-0)

90:169 Swine Production (2 s.h.) This course applies advanced principles of swine production and management. Areas of emphasis include: a review of swine husbandry practices, which result in greater performance and profit; livestock facilities requirements and maintenance, animal health, reproduction, and nutritional requirements. Students will have the opportunity to apply skills learned in the classroom to the swine operation at the NIACC Farm Lab. (30-0)

90:170 Introduction to Agricultural Business (3 s.h.) Basic economic concepts, principles, and practices reflected in agriculture. An overview of the major components of an agricultural business organization and the economic fundamentals involved in organizing, operating, and managing an agricultural business. (45-0)

90:171 Animal Nutrition (2 s.h.) Fundamentals of nutrition that deal with monogastric and ruminant animals. Materials covered will enable students to identify sources, composition and functions of various feedstuffs. Students will learn to evaluate and formulate livestock rations and will be able to make feeding recommendations based upon varying livestock, environment and management conditions. (30-0)

90:182 Computer Applications for Agriculture (3 s.h.) This course is designed for students seeking an Associate of Applied Science Degree in Agriculture or for students transferring on to a four-year institution pursuing a degree in agriculture. Students will be involved in techniques that make the personal computer a more productive tool in agriculture. Students will also have the opportunity to see how computers enable better management decision-making and improved economic efficiency of agricultural operations. Major topic area of instruction is the Microsoft Office 2000 package. (30-30)

90:183 Agricultural Economics (3 s.h.) This course is designed for students seeking an Associate of Applied Science Degree in Agriculture. Students will study the role of agriculture in the American economy. Basic economic concepts, the composition and pricing of agricultural products, government and monetary policy will be discussed. A study of this country's agricultural economic policies with a look at how other countries' agricultural economic policies affect us. The economic decision-making process will be taught built upon the management function of planning, organizing, directing, and controlling. (45-0)

90:185 Commodity Marketing (2 s.h.) Elements of producer marketing of major Midwest crops with emphasis on formulating marketing goals and plans. Marketing tools, futures and option markets, speculation, hedging, and risk management. (30-0)

90:186 Soil Science (3 s.h.) Introduction to the physical, chemical, and biological properties of soils with an emphasis on the functions of the soil as a medium to support plant life. A review of the sources and functions of major and minor plant elements, fertilizers and their properties, soil acidity, liming materials, and soil conservation. (38-15)

90:189 Salesmanship/Advertising and Retailing (2 s.h.) This course is designed for students seeking an Associate of Applied Science Degree in Agriculture. Sales presentations and advertising setups of agricultural goods and services will serve as a basis of

discussion in this course. Students will study techniques of selling and advertising of agricultural goods and services, and have a first hand chance to sell products to student/consumers during the course of the semester. (30-0)

90:208 Medical Assistant Externship (6 s.h.) An eight-week term of practical experience in selected physicians' offices, clinics, or laboratories. It offers the students an opportunity to perform various clinical and office procedures under the supervision of the physician or assistant and the instructor/coordinator. This course has been designated as a pass/no pass course. (0-270)

90:210 Nursing III (12 s.h.) Prerequisite: 90:111, Nursing II; or 90:113, Nursing IIA, or consent of Associate Degree Nursing faculty, plus all freshman year nonnursing courses. Nursing III utilizes the nursing process with emphasis on implementation in meeting client needs resulting from impairments relating to interpersonal interaction, oxygenation, and nutrition throughout the life span. Pharmacological concepts, diet modification, psychosocial concepts, and health maintenance are integral considerations in the progressive development of the student's knowledge and skills. Clinical experiences will include opportunities to apply nursing roles and the nursing process in a variety of care settings. (105-225)

90:211 Nursing IV (12 s.h.) Prerequisite: 90:210, Nursing III, or consent of Associate Degree Nursing faculty, plus 80:110, Sociology. Nursing IV utilizes the nursing process with emphasis on evaluation in meeting client needs resulting from impairments relating to nutrition, elimination, and sensory stimulation throughout the life span. Pharmacological concepts, diet modification, psychosocial concepts, and health maintenance are integral considerations in the progressive development of the student's knowledge and skills to meet the diverse needs of the client. Concepts of management, legal, and ethical aspects of the nursing profession and issues related to current trends are presented. Clinical experiences will focus on clients with complex needs. The management experience is the culmination of the student's academic and clinical education in which the student will have an opportunity to care for a group of clients and apply basic skills in leadership and conflict management. Clinical experiences will include opportunities to apply nursing roles and the nursing process in a variety of care settings. (105-225)

90:212 Therapeutic Exercise (3 s.h.) Prerequisite: 90:144, Fundamentals for PTA, and 90:149, Kinesiology. This course studies the physiological effects of exercise on the musculoskeletal, cardiovascular, and pulmonary systems. Physical therapy treatment techniques to improve strength, flexibility, cardiovascular and pulmonary functions are presented. Treatment programs for specific diagnoses such as diabetes, pregnancy, and amputation are addressed. Students will practice techniques in lab. (30-30)

90:213 Orthopedics (3 s.h.) Prerequisite: 70:250 and 70:251, Anatomy and Physiology I and II, and 90:149, Kinesiology. Principles of fracture and soft tissue healing are applied to musculoskeletal injuries and disorders. Injuries, disorders, and function specific to each joint are covered. Physical therapy treatment for specific joint injuries are presented. Students will practice techniques in lab. (30-30)

90:214 Neurology for the PTA (4 s.h.) Prerequisites: 70:250, Human Anatomy and Physiology I; 70:251, Human Anatomy and Physiology II; 90:147, Pathophysiology; 90:146, Developmental Processes. This course will provide information, discussion, and treatment considerations with neurologically based diagnoses. Emphasis will be on exploring clinical manifestations and treatment considerations with all the disorders with special emphasis on cardiovascular accidents. Typical treatment techniques, exercise programs, and treatment progression will be applied to lab scenarios with a variety of neurological diagnoses. Students will have an opportunity in the lab portion to apply, practice, and demonstrate techniques they are taught. (45-30)

90:215 PTA Management (2 s.h.) Prerequisite: All previous PTA technical courses. Includes the basic principles of management including levels of authority and responsibility, supervisory process, performance appraisals, and policies and procedures. The process of quality assurance and chart audits are discussed. Varieties of reimbursement systems and their impact on health care delivery are discussed. Resume writing, interviewing, and employability skills will be covered. Ethical and legal issues in the practice of physical therapy will also be examined. (30-0)

90:217 PTA Seminar (1 s.h.) Prerequisite: All PTA courses. This course will focus on the role of the PTA in helping patients achieve optimal mobility and become as independent as possible with functional activities. Lecture and discussions will incorporate students' experiences from PTA Clinic III and PTA Clinic IV so that each student has time to process and consider these learning experiences. All aspects of patient care will be addressed and case study presentations will be included to assist with problem-solving skills. (15-0)

90:218 PTA Clinic III (7 s.h.) Prerequisite: All PTA courses except 90:217, PTA Seminar. Eight-week, full-time clinical experience. Skills, knowledge, and attitudes will be applied to direct patient care in selected clinical settings. Includes application and integration of all PTA course work with the goal of the student consistently and efficiently providing quality care with uncomplicated to complex patients and a moderate to low degree of supervision/guidance except when addressing new and highly complex situations. This course has been designated as a pass/no pass course. (0-320)

90:219 PTA Clinic IV (5 s.h.) Prerequisite: All PTA courses except 90:217, PTA Seminar. Six-week, full-time clinical experience. Skills, knowledge, and attitudes learned in all PTA course work will be applied to direct patient care in selected clinical settings. Includes application and integration of all PTA course work with the goal of the student consistently and efficiently providing quality care with uncomplicated to complex patients. The student usually needs no further guidance or supervision except when addressing new and highly complex situations. This course has been designated as a pass/no pass course. (0-240)

90:231 Machine Element Design (9 s.h.) Prerequisite: 91:150, Statics; 91:226, Fundamentals of Unigraphics; and 91:227, Fundamentals of ProEngineer; Corequisite: 91:212, Design Research Laboratory. Combines basic graphical and mathematical analysis of linkages, gears, and cams; design optimization utilizing spreadsheets as mathematical models to simulate geometric and kinematic relationships; construction of 3D parametric models

including assembly implementation to create a set of working drawings including details, parts lists, and specifications; usage of handbooks and suppliers' catalogs. (60-210)

90:233 Retail Field Experience (5 s.h.) Prerequisite: 90:123 and 90:126, Retail Field Experience. The on-the-job training component of the Retail Management Program. (15-225)

90:234 Retail Buying (3 s.h.) Buying duties and policies, how to buy, how much to buy, buying methods, source selection, price lines, and sales records. Product knowledge and analysis relative to the buying function and value analysis of products. (30-30)

90:237 Retail Field Experience (5 s.h.) Prerequisite: 90:123, 90:126, and 90:233, Retail Field Experience. The on-the-job training component of the Retail Management Program. (15-225)

90:264 Introduction to Farm Operation (3 s.h.) Introduction to Farm Operation is a unique study experience with hands-on activities in the learning lab at NIACC. Students enrolled in this three-credit course participate in the management and operation of the NIACC Teaching Farm Lab. The primary objective of this course is to provide experience in the planning, purchasing, production, construction, maintenance, marketing, and investment decisions associated with a diversified Iowa farm operation. (10-90)

90:267 Precision Ag Technology Systems (2 s.h.) Prerequisite: Intro to Computers or Ag Computer Applications or demonstrated proficiency with computers. Microcomputer technology applications in agriculture with global positioning systems, geological information systems, mapping systems, graphics interface, field sensing, and equipment control related to site specific farming applications. Electronics/computers applied to practical problems in modern agricultural systems to sense, monitor, and control various processes in agronomic and animal environments. Utilization of GPS and GIS systems to analyze, manipulate, and manage Ag resources and related problems. Evaluating and using information systems and electronic communications for business profit. (15-30)

90:282 Soil and Crop Management (2 s.h.) Prerequisite: 90:186, Soil Science, or its equivalent. The use of advanced technology for crop production. (30-0)

90:285 Agricultural Finance Management (2 s.h.) Prerequisite: 92:151, Ag Business Accounting. Principles of farm management. Emphasis is given to decision making, implementation, and control in farm operations using economic principles, farm records, enterprise analysis, financial reports, and investment analysis procedures. (30-0)

90:293 Beef Cattle Production (2 s.h.) This course is designed to help students identify the primary biological principles that contribute to raising productive beef cattle, to integrate biological and economic principles that comprise effective management decisions needed to produce profitable cattle, and to enhance the understanding and communication between all segments of the beef industry. The course material identifies the primary management principles and practices needed by commercial and seed stock producers to raise productive and profitable cattle that can meet the specifications needed by the beef industry. (30-0)

90:299A Special Problems in Career Programs (1 s.h.) Students may submit a proposal for a special project to the instructor. With the instructor's approval and the consent of the Division Chair and Vice President for Academic Affairs, credit may be given upon satisfactory completion of the project. Course may be repeated for credit. (15-0)

90:299B Special Problems in Career Programs (2 s.h.) Students may submit a proposal for a special project to the instructor. With the instructor's approval and the consent of the Division Chair and Vice President for Academic Affairs, credit may be given upon satisfactory completion of the project. Course may be repeated for credit. (30-0)

90:299C Special Problems in Career Programs (3 s.h.) Students may submit a proposal for a special project to the instructor. With the instructor's approval and the consent of the Division Chair and Vice President for Academic Affairs, credit may be given upon satisfactory completion of the project. Course may be repeated for credit. (45-0)

91:101 Career Math I (4 s.h.) Prerequisite: A score of 15 or higher on the Basic Mathematics Pretest. This is a basic mathematics course that will prepare students for 91:122, Occupational Math, and to use numbers effectively in other situations. Upon completion, students will be able to perform basic computational skills with whole numbers, fractions, decimals, percentages, and integers. Credit earned will not satisfy the requirements for an Associate degree and will not be used in calculating the cumulative grade point average for graduation. Students will be allowed to register in Career Math upon referral from the instructor and/or appropriate diagnosis. (60-0)

91:104 Introduction to Technical Computing and Computer-Aided Drafting (3 s.h.) Prerequisite/ Corequisite: Ability to key-enter the equivalent of 25 words/minute at a computer keyboard. Introduction to Technical Computing and CAD is designed to familiarize the student with microcomputer basics relating to occupations in the industrial/technical area. Topics include computer hardware, operating systems, commands and tasks, disk organization and access, word processing, spreadsheets, and two-dimensional computer-aided drafting (CAD). Multiple entry/multiple exit enrollment. See Electromechanical Systems Technology Multiple Entry/Multiple Exit Course Enrollment rules on page 78. (15-60)

91:105 Industrial Control Systems (3 s.h.) Prerequisite: 91:175, DC/AC Theory. Introduction to industrial electrical motor and control circuitry. Emphasis placed on AC single- and three-phase circuit and transformer theory and industrial applications. Applications include various types of control elements. Study of the National Electrical Code as it pertains to manufacturing/industrial environment. Fundamental skills in electrical wiring and raceway techniques are learned through lab and/or project exercises. Multiple entry/multiple exit enrollment. See Electromechanical Systems Technology Multiple Entry/Multiple Exit Course Enrollment rules on page 78. (15-69)

91:110 Electromechanical Internship (2 s.h.) Prerequisite: sophomore status in the Electromechanical Systems Technology Program and permission of internship coordinator. Supervised work experience in a business or industry. Work must be related to the

major field of study; i.e., electricity/electronics, industrial maintenance, installation or service of control systems, etc. (0-160)

91:120 Manufacturing Processes I (2 s.h.) Knowledge and skills in manufacturing materials and the procedures used to produce products in today's modern industry. Introduction to measurement and quality assurance with an emphasis on tolerances, measurement, and calibration. Final project, create a product using manual metal cutting processes. (15-30)

91:121 Manufacturing Processes II (2 s.h.) Prerequisite: 91:120, Manufacturing Processes I. Automation methods using (CNC) Computer Numerical Control, (CAD) Computer-Aided Design, (CAM) Computer-Aided Manufacturing and the integration of these technologies, (CIM) Computer Integrated Manufacturing, and (FMS) Flexible Manufacturing Systems. Final project, create a product using CAD, CAM, and CNC. (15-30)

91:122 Occupational Math I (2 s.h.) Prerequisite: Compass Pre-Algebra Score greater than or equal to 49 or a score greater than or equal to 16 on the math portion of the ACT exam or completion of Basic Math with a C or better or completion of Career Math I with a C or better. This course covers essential topics in algebra, including ratio and proportion, and basic statistics. This course is offered during the first eight weeks of the fall semester and the first eight weeks of the spring semester. (30-0)

91:123 Occupational Math II (2 s.h.) Prerequisite: Completion of 91:122, Occupational Math I, with a C or better. This course covers essential topics in geometry and trigonometry. This course is offered during the second eight weeks of the fall semester and the second eight weeks of the spring semester. (30-0)

91:124 Technical Graphics (2 s.h.) Corequisite: 96:140, Metal Fabrication, and 96:230, Commercial Heating Systems. A development of the skills of interpreting machine/system drawings, including mechanical, hydraulic, pneumatic layouts. Electronic circuit drawing, terms, symbols, and standards. Use of templates with printed circuits, schematic diagrams, and sketching. (30-0)

91:129 Industrial Electricity I (2 s.h.) Prerequisite/Corequisite: 91:128, Basic Electricity. This course provides an understanding of the theory, operation, installation, and maintenance of motor controllers. Labs stress development and troubleshooting of basic motor control circuits. (15-30)

91:150 Statics (2 s.h.) Prerequisite/Corequisite: 91:108, Technical Mathematics II. Provides the theory and practical background for analysis of the forces acting upon an object in equilibrium. The following are stressed: resultant and equilibrium of forces, moments, concurrent and nonconcurrent coplanar forces. (30-0)

91:151 Fundamentals of Carpentry I (3 s.h.) (15-60)

91:152 Fundamentals of Carpentry II (3 s.h.) (15-60)

General skills instruction covers safety; basic hand tools; basic power tools; job site safety; print reading; construction materials and systems; construction fasteners and processes; residential construction practices; and commercial construction practices.

91:153 Carpentry I (4 s.h.) (60-0)

91:154 Carpentry I Lab (4 s.h.) (0-210)

General skills instruction covers safety; hand tools; power tools; print reading; builders level, transit, and laser; scaffolding; rigging; arc welding, cutting, and burning. Residential skills instruction covers site work; building layout; form work; floor and sill framing; wall and ceiling framing; roof framing; stair construction; exterior walls, soffits, and cornice construction; roof coverings; window and door installation; cabinet fabrication; and running trims and hardware installations. 91:153 (lecture) and 91:154 (lab) must be taken concurrently.

91:156 Carpentry II (4 s.h.) (60-0)

91:157 Carpentry II Lab (4 s.h.) (0-210)

General skills instruction covers safety; hand tools; power tools; print reading; builders level, transit, and laser; scaffolding; rigging; arc welding, cutting, and burning. Commercial skills instruction covers site work; building layout; footing, wall, stair, column, beam, and deck form constructions; wood and steel stud framing; exterior walls and canopy constructions; cabinet fabrication; wood and steel jamb, window, door, millwork, and hardware installations; office partition, and acoustical ceiling installations. 91:156 (lecture) and 91:157 (lab) must be taken concurrently.

91:158 Building Trades Math (3 s.h.) The course covers adding, subtracting, multiplying, and dividing whole numbers, fractions, and decimals. The English system and the metric system are used in measuring linear lines, surface areas, and volume shapes. Exercises include applying math skills and measuring skills to lay out geometric shapes from construction drawings. (45-0)

91:159 Intro to the PC (1 s.h.) This course provides an introduction to the desktop PC, its parts and basic operation. The student learns how to operate the computer, work within the windows environment, and manipulate files. Course exercises will include using the MS Office Suite, including Word, Excel, Access, and Outlook to process documents, lay out spreadsheets, compile databases, and send E-mail. Students also learn to explore the Internet to research information. (10-20)

91:161 Construction Safety (2 s.h.) This course covers Safety and Health Standards for the Construction Industry (29 CFR Part 1926). Safety in the construction industry is as essential to securing the well being of the company as it is to protecting the welfare of the worker. Changes in the labor market, insurance costs, and OSHA compliance requirements make it imperative that supervisors and workers receive adequate safety training to develop, practice, and maintain safe working conditions at construction work sites. (30-0)

91:173 Architectural Drawing (1 s.h.) Students will learn about the fundamentals of drawing using manual and computer-aided drafting skills. Architectural Drawing is designed to give students the skills necessary to produce a set of working drawings. Students will learn to draw plans, sections, elevations, details, and schedules. (0-30)

91:174 Building Codes and Standards (2 s.h.) This course covers construction-related building codes and standards. Presentations illustrate which of the various codes and standards

affect specific types of construction. Students learn how competent construction workers bear responsibility for knowing, understanding, and complying with codes and standards during all phases of the construction process. (30-0)

91:175 DC/AC Theory (3 s.h.) Prerequisite/ Corequisite: 91:122, Occupational Math I, and 91:123, Occupational Math II. Study of the nature of electricity involving both direct and alternating current. DC circuit analysis utilizing more advanced techniques such as: superposition, Thevenin's and Norton's theorems. AC circuit analysis involving RL, RC, and RLC circuits, inductive and capacitive reactances, resonance, and transformer fundamentals. Computer circuit simulation of both DC and AC circuits is stressed along with an application of electronic test equipment: oscilloscopes, meters, and power supplies. Multiple entry/multiple exit enrollment. See Electromechanical Systems Technology Multiple Entry/Multiple Exit Course Enrollment rules on page 78. (15-60)

91:179 Analog Devices and Circuits (4 s.h.) Prerequisite: 91:175, DC/AC Theory. Study of diodes, bipolar transistors and field effect transistors (JFETs and MOSFETs) as they are used in both AC and DC electronic circuits. Applications such as power supplies, switching circuits and amplifier circuits are covered. Advanced topics in electronic devices including operational amplifiers (op amps), active filters, thyristors, and voltage regulation are covered. Computer simulation of the devices under study is covered. Both circuit analysis and measurement techniques using meters and oscilloscopes are stressed. Multiple entry/multiple exit enrollment. See Electromechanical Systems Technology Multiple Entry/Multiple Exit Course Enrollment rules on page 78. (15-91)

91:198 Blueprint Reading and Estimating (3 s.h.) Residential and commercial blueprint reading and materials estimating covers understanding drawings, the language of construction. Students learn how to gather and use information from prints and drawings to estimate quantities of materials and perform construction work processes. (45-0)

91:204 Advanced Industrial Control Systems (7 s.h.) Prerequisite: Level 3 Electromechanical Systems Technology Core. Introduction to programmable logic controllers (PLC's) using the Allen Bradley SLC500 and RSLogix 500 programming software, elementary ladder logic and external contact instructions, counters timers, program development techniques, and troubleshooting. Advanced topics in programmable logic controllers including program control instructions, math operations, analog I/O, sequencers, and data manipulation. Field wiring of PLCs to control devices using standardized practices. Motor control circuitry utilizing advanced control techniques, application of variable frequency drives for AC motors. DeviceNET programming and integration using RSNetworkx. PanelVIEW programming and integration using the Allen Bradley Panel 500. Projects involving practical field devices and program development. Multiple Entry/Multiple Exit enrollment. See Electromechanical Systems Technology Multiple Entry/Multiple Exit Course Enrollment Rules on page 78. (30-164)

91:206 Computer Automated Manufacturing (3 s.h.) Prerequisite/Corequisite: 92:118, Fluid Power; 91:204, Advanced Control Systems; and, 92:227, Automated Manufacturing

Processes. Introduction to robotic fundamentals including the integration of robots, computers, and programmable logic controllers in the operation of a flexible manufacturing line (FML). Group dynamics, project structure, and troubleshooting techniques. (15-65)

91:207 Industrial Instrumentation (4 s.h.) Prerequisite/ Corequisite: Level 4 Electromechanical Systems Technology Core. Modern instrumentation techniques as they apply to the manufacturing environment. Industrial sensors, transducers, and related components. Instrumentation programming using RS Logix500, DeviceNet, and Panel Builder. Use of the PLC and personal computer for instrumentation and control purposes. Industrial process control theory, telemetry, and data communication. Multiple Entry/ Multiple Exit enrollment. See Electromechanical Systems Technology Multiple Entry/Multiple Exit Course Enrollment Rules on page 78. (15-90)

91:212 Design Research Laboratory (2 s.h.) Prerequisite: 91:150, Statics, 91:240, Fluid Mechanics, and 70:122, Principles of Physics. Corequisite: 91:251, Strength of Materials and 90:231, Machine Element Design. Course includes instruction and laboratory techniques in Statistical Process Control, including Deming's 14 points, project selection, data gathering, variable and attribute charts, interpretations and capabilities; rapid prototyping using stereolithography equipment; and geometric dimensioning and tolerancing including functional part relationships of features, manufacturing, inspection, and economics using ANSI Y14.5M-1994. (15-30)

91:214 Digital Electronics (3 s.h.) Prerequisite/ Corequisite: 91:175, DC/AC Theory. Study of number systems related to digital circuits, Boolean Algebra/Karnaugh Maps. Combinational logic including AND, OR, NAND, NOR, NOT, and XOR. Combinational circuits decoders. Basic sequential elements including SR, D, JK, and Master-Slave flipflops. Sequential circuits including registers and counters. Memory circuits and applications. Analog to digital (A/D) and digital to analog (D/A) conversion, and elementary interfacing. Design, analysis, and computer simulation. Multiple entry/multiple exit enrollment. See Electromechanical Systems Technology Multiple Entry/Multiple Exit Course Enrollment rules on page 78. (15-63)

91:226 Fundamentals of Unigraphics (4 s.h.) Prerequisite: 90:231 Drafting II. Solid modeling fundamentals using Unigraphics CAD software. Layers, creating lines, arcs and circles, fillets and chamfers, trimming, extruding, sweeping along a guide, sketch a datum plane, blends, hollow solid, tapers, holes, slot, groove, pocket, boss, threads, and instance array. Adding orthographic views, dimensioning, creating text, sectioning, GD&T symbols, surface finish symbols, move/copy and align views and detailed views. (30-112)

91:227 Fundamentals of ProEngineer (4 s.h.) Prerequisite: 90:122, Drafting I; 90:131, Drafting II; 91:108, Technical Mathematics II. Solid modeling fundamentals using ProEngineer CAD software. Sketcher mode part creation and sketcher constraints; holes, cuts, shafts, rounds, chamfers, slots, revolved features, patterns, sweeps, blends, and shell. Fundamental knowledge of model trees, parent-child relations, datum planes and feature relations. Assembly fundamentals including components, constraints and sub-assemblies. Drawing creation with part and assembly associativity, view types, notes, and dimensioning. (30-112)

91:240 Fluid Mechanics (3 s.h.) Prerequisite/ Corequisite: 91:108, Technical Mathematics II. A basic principles course using mathematical analysis dealing with confined noncompressible fluids and applications of fluid power systems. Primary emphasis is on the topics of fluid statics, flow of fluid in pipes, and flow measurement. (45-0)

91:251 Strength of Materials (3 s.h.) Prerequisite/ Corequisite: 40:240, Calculus for Business, and 91:150, Statics, or 25:231, Statics of Engineering. Course includes simple stresses and properties, moment of inertia, torsional properties, columns, beams including shear, moment and deflection diagrams and formulas, flexure formula, and combined stresses. (45-0)

91:299A-D Special Problems in Career Programs (1-4 s.h.) Students may submit a proposal for a special project to an instructor. With the instructor's approval and the consent of the Division Chair and the Vice President for Academic Affairs, credit may be given upon satisfactory completion of the project.

92:118 Fluid Power (3 s.h.) Prerequisite/Corequisite: 91:122, Occupational Math I, and 91:123, Occupational Math II. Fluid Power gives students a solid foundation in, and hands-on experience with, hydraulic and pneumatic components and circuits; the transmission of force through fluids; conversion of force to pressure; the control of power; and systematic methods of troubleshooting and testing hydraulic and pneumatic systems. Multiple Entry/Multiple Exit enrollment. Please see Electromechanical Systems Technology Multiple Entry/Multiple Exit Course Enrollment rules on page 78. (15-65)

92:151 Ag Business Accounting I (3 s.h.) Principles of debit, credit, the recording of data in various types of journals, posting of the ledgers, the worksheet, financial statements and their interpretation, analysis, adjusting, and closing the books at the end of the fiscal period. (45-0)

92:166 Animal Health (2 s.h.) This course provides a basic overview of animal health principles and practices that enable students to identify the major diseases of livestock, prescribe treatment and properly administer treatment. The course includes a review of animal insects, parasites, and reproductive management. The course allows students to develop strategies aimed at disease prevention, disease treatment and improved animal performance while providing concern for the animal's well being. (30-0)

92:168 A or B Crop Production & Lab (1 or 2 s.h.) (0-30) or (0-60) Problem-solving approach to crop management. Principles and practices of agricultural science are used in the discussion of management problems and operations related to crop production at the NIACC Farm Lab. Students will participate in the management and operations of the NIACC Farm Lab. Field trips and guest speakers. (0-30) or (0-60)

92:176 Welding (2 s.h.) An introductory course teaching basic skills in the areas of shielded metal arc welding, gas metal arc welding, and oxyacetylene welding, cutting and brazing. The basic fundamentals of each process are covered. Safe welding practices are taught. The course provides skill application in all positions, on mild steel with single and multi-pass welds with backing strips. (15-30)

92:189 Ag Real Estate Evaluation (2 s.h.) Concepts of appraisal and pricing of real estate, along with development, growth, and value of real estate. Methods of acquiring and financing real estate and estate planning. (30-0)

92:260 Advanced Computer Applications (2 s.h.) Prerequisite: 90:182, Computer Applications for Agriculture; 90:186, Soil Science; and 70:112, Animal Science I; or with instructor approval. An advanced course that allows the student to apply the fundamentals of computers, accounting, crops, and livestock. Intended to enhance the foundations of early knowledge, in each area, with the ability to make more efficient, effective decisions. (30-0)

92:261 Site-Specific Crop Management (2 s.h.) Prerequisite: 90:186, Soil Science, or its equivalent. The use of advanced technologies for crop production. (30-0)

92:262 Swine A.I. Center Management (1-3 s.h.) Students will be responsible for the operation and management of the Swine A.I. Center. During the period of instruction students will develop skills associated with the artificial insemination of swine. This hands-on experience utilizes the NIACC's industry-leading swine lab facility which includes housing of gilts, sows and boars; bright and easily accessible training areas, a fully equipped laboratory for semen processing, evaluation, extension, packaging, and storage. The course emphasizes boar management, training, reproductive physiology, semen collection, handling and processing; sow reproductive physiology, semen evaluation and packaging, artificial insemination techniques, semen marketing, and business management. (15-30, 30-60, or 45-90)

92:263 Agriculture Futures and Futures Options (2 s.h.) Prerequisite/Corequisite: Commodity Marketing. Advanced commodity marketing concepts, principles, and terminology. (30-0)

92:264 Horse Essentials/Equine Essentials/Horse Care and Management (2 s.h.) General concepts of breed type and identification; the selection process; nutrition requirements; the reproduction cycle; the importance of genetics; general health; and management requirements will build a strong background for those interested in owning a horse of their own or pursuing a career in equine management. (30-0)

92:270 Livestock Production Lab I (1 or 2 s.h.) Students will develop livestock husbandry skills associated with profitable beef and swine production. This hands-on experience emphasizes production practices that increase reproductive efficiency, insure herd health, increase pounds of market production, provide proper nutrition, and assure high market value. Students will assist in the selection, breeding, parturition, processing, feeding, fitting, and marketing of hogs and cattle. Students will evaluate, modify, and manage livestock facilities for maximum production efficiency. (0-30 or 60)

92:271 Livestock Production Lab II (1 or 2 s.h.) Students will develop livestock husbandry skills associated with profitable beef and swine production. This hands-on experience emphasizes production practices that increase reproductive efficiency, insure herd health, increase pounds of market production, provide proper nutrition, and assure high market value. Students will assist in the

selection, breeding, parturition, processing, feeding, fitting, and marketing of hogs and cattle. Students will evaluate, modify, and manage livestock facilities for maximum production efficiency. (0-30 or 60)

92:272 Employment Relations and Business Decisions (2 s.h.)

This course is designed for students seeking an Associate of Applied Science Degree in Agriculture. Provides students with a management and supervisory learning experience. The course emphasizes the role of management in today's agribusiness environment. Principles of managerial control, coordination, communication, motivation, and organization are discussed. The role of management supervision and its influence on employee productivity, satisfaction, and organizational effectiveness is a major part of the course. (30-0)

92:273 Equipment Maintenance and Management (2 s.h.)

Maintenance and management of agricultural machinery and power units. (23-45)

94:101 Practical Nursing Arts I (4 s.h.) Prerequisite/Corequisite:

94:104, Body Structure and Function, 30:10C Communication Skills I. Orientation to nursing and the role of the practical nurse in the health community, history of nursing, ethical principles, legal nursing assessment, basic nursing skills, and practice of nursing skills in college laboratory. (45-30)

94:102 Practical Nursing Arts II (8 s.h.) Prerequisite: 94:101,

Practical Nursing Arts I; 94:104, Body Structure and Function; and 30:101C, Communication Skills I. Prerequisite/Corequisite: 80:101, General Psychology. A continuation of 94:101. Continued development of basic skills, nursing assessment, creating and maintaining the physical environment, physical and psychological supportive measures, basic scientific principles of therapeutic nursing interventions and documentation, introduction to pharmacology and the administration of medications, normal nutrition, and therapeutic diets. Supervised practice in a college laboratory, long-term care nursing facilities, and medical-surgical settings. (75-120)

94:103 Practical Nursing: Maternal, Infant, and Child Care (5 s.h.) Prerequisite: 94:101, Practical Nursing Arts I; 30:101,

Communication Skills I; 94:104A, Body Structure and Function. Prerequisite/Corequisite: 80:101, General Psychology. Offers the student basic knowledge about the family from the prenatal experience through labor and delivery to nursing care of the postpartum family and newborn. Includes an orientation to the nursing care of children in relation to normal growth and development through adolescence, as well as the effect of illness and hospitalizations on the child and family. Supervised clinical experience is provided in a birth center, a pediatric unit, and selected community agencies. (60-45)

94:104 Body Structure and Function (4 s.h.) A basic study of the

anatomy and physiology of the human body. Study progresses from the cell to tissues, organs, and systems with emphasis on their interrelatedness. Discussion includes some of the alterations that occur in illness. Usage of applicable medical terminology is stressed. (45-30)

94:110 Practical Nursing in Physical-Mental Illness of Adults (13 s.h.) Prerequisite: 94:101, Practical Nursing Arts I; 94:102,

Practical Nursing Arts II; 94:103, Practical Nursing: Maternal, Infant and Child Care; 94:104A, Body Structure and Function; and 80:101, General Psychology. Prerequisite/Corequisite: 80:230, Human Growth and Development. Utilization of the nursing process to develop basic skills in providing nursing care for patients with common health problems associated with each body system. Continuation of pharmacology and nutrition, beginning management skills and responsibilities of a licensed practical nurse, trends in nursing, preparation for licensure, and employment. Supervised clinical experience in medical/surgical areas, and surgical patient follow-through, mental health, home care and nursing facilities. (105-270)

95:130 Communications I (3 s.h.) Study designed to assist stu-

dents in improving and/or refining skills in the areas of reading, writing, listening, and speaking to help meet communication needs in college and for success and advancement in a career. (45-0)

95:131 Communications II (3 s.h.) Further study designed to

assist students in improving and/or refining skills in the areas of reading, writing, listening, and speaking to help meet communication needs in college and for success and advancement in a career. (45-0)

96:128 Residential Heating Systems (4 s.h.) Corequisite: 96:132,

Electrical Concepts, or instructor's permission. The purpose of this course is to introduce the student to the various types of residential heating systems. Areas and concepts covered include combustion theory, basic air distribution, furnace construction, filters, humidifiers, installation techniques, and maintenance procedures. (30-105)

96:129 Troubleshooting Heating Systems (3 s.h.) Prerequisite:

96:132, Electrical Concepts, or instructor's permission. The purpose of this course is to introduce the student to the fundamentals of troubleshooting by utilizing a practical and systematic approach to locate and repair heating system malfunctions. The student will also have the opportunity to study, in detail, the motors and controls used in today's heating systems. Topics to be covered include basic electric circuits, electrical test meters, motors and controls, diagnosis of electrical and mechanical malfunctions, and special emphasis on writing diagrams. (15-90)

96:132 Electrical Concepts (3 s.h.) Electrical Concepts is an intro-

ductory survey of electricity and electronics suitable for students interested in pursuing a career in such technical fields as electronics, automotive, HVAC, and other fields that require knowledge of basic electrical/electronic concepts. Topics include safety, shop and lab practices, motors and controls, direct and alternating current, and semiconductor and digital electronics. Course work consists of problem solving, computer-assisted instruction, computer simulation, and hands-on exercises with industrial grade equipment. (30-30)

96:134 Air-Conditioning Principles (2 s.h.) A study of the theory of

air-conditioning. Includes psychometrics, heat gain/loss problems, and equipment sizing. (15-45)

96:138 Residential Air-Conditioning Systems (4 s.h.)

Prerequisite: 96:132, Electrical Concepts, or instructor's permission. The purpose of this course is to introduce the student to the various types of residential air-conditioning and heat pump systems. Areas and concepts covered include refrigeration, air-conditioning, heat pump theory, heat pump construction, installation techniques, and maintenance procedures. (30-105)

96:139 Troubleshooting Air-Conditioning Systems (3 s.h.)

Prerequisite: 96:132, Electrical Concepts, or instructor's permission. The purpose of this course is to introduce the student to the fundamentals of troubleshooting by utilizing a practical and systematic approach to locate and repair air-conditioning and heat pump system malfunctions. The student will also have the opportunity to study, in detail, the motors and controls used in today's air-conditioning and heat pump systems. Topics to be covered include basic electric circuits, electrical test meters, motors and controls, diagnosis of electrical and mechanical malfunctions, and special emphasis on wiring diagrams. (15-90)

96:140 Metal Fabrication (2 s.h.) Corequisite: 91:124, Tech Graphics, and 96:230, Commercial Heating Systems. The student performs basic sheet metal fabrication, gas piping, plastic piping, copper piping and venting pertaining to climate control devices. Working safely and neatly performing field tasks in a laboratory atmosphere enhances the student "job readiness." (15-45)

96:150 Career Physics (4 s.h.) Prerequisite/ Corequisite: 91:101, Career Math I, or 91:122, Occupational Math I, and 91:123, Occupational Math II. An introduction to basic operating principles of gears, levers, pulleys, simple machines, and the effects of heat on solids, liquids, and gases. (45-30)

96:155 Facilities Maintenance (5 s.h.) Prerequisite: 91:105, Motors, Controls, and Industrial Wiring. Overview of topics specific to maintenance of facilities. Topics include project estimating issues including installation, cost, and time. Practice reading building schematics and blueprints. Fundamentals of HVAC with lab exercises. Construction issues including sprinkler, electrical, and plumbing systems. General overview of facilities systems. (30-90)

96:156 Maintenance Shop Operations (3 s.h.) Introduction to shop equipment generally found in the industrial maintenance environment. Instruction and practice with metal saws, drills, grinders, elementary welding and cutting, thread repair, anchors and fasteners. Study of mechanical prints to identify parts in assembly and repair situations. Use of catalogs to find and order repair parts, study of bearings and seals, applications, and failure analysis. (15-61)

96:157 Servos and Drives (2 s.h.) Prerequisite: 91:105, Industrial Control Systems. Study of direct and alternating current variable speed drives, closed loop control systems, and servo systems. Hands-on exercises provide experience with typical components and interconnections needed to implement various control systems. Concepts of system stability, frequency response, feedback, damping, position and speed control, and many others are covered. Multiple Entry/Multiple Exit enrollment. See Electromechanical Systems Technology Multiple Entry/Multiple Exit Course Enrollment Rules on page 78. (15-31)

96:162 Computer Orientation (1 s.h.) Introduction to basic computer hardware and software functions. Emphasis on using the computer as a tool to create personal and business documents. Introductory windows, word processing, spreadsheet, presentation, and Internet units give students an opportunity to view software capabilities and use some of the features. (15-15)

96:163 Blueprint Reading I (1 s.h.) An introduction to the importance of prints in industry. Covers isometric drawings, orthographic projection, auxiliary views, detail and assembly drawing, dimensions and tolerances, and sectional views. Integrates the alphabet of lines and principles of sketching. Other information covered includes title blocks, drawing change systems, drawing notes, and material lists. (0-30)

96:164 Blueprint Reading II (1 s.h.) Prerequisite/ Corequisite: 96:163, Blueprint Reading I. Continues Blueprint Reading I with emphasis on geometric dimensioning and tolerancing and the interpretation of more advanced prints used in the construction of tool and die and mold building. (0-30)

96:165 Machine Tool Practices I (9 s.h.)

Prerequisite/Corequisite: 91:122, Occupational Math I; and 96:163, Blueprint Reading I. Covers theory and lab use of basic measuring and machining tools, layout inspection tools, as well as bench work. Safety is taught and enforced as it applies to each machine process. Proper terminology of the machinist trade is emphasized as well as following blueprints and holding tolerances through the use of a variety of machining processes to produce a product. (60-225)

96:166 Machine Tool Practices II (7 s.h.)

Prerequisite/Corequisite: 96:165, Machine Tool Practices I; 91:123, Occupational Math II; and 96:164, Blueprint Reading II. Continues Machine Tool Practices I. Covers more advanced principles in setup and operation of mills, lathes, and grinders, with an introduction to carbide tooling along with a continued emphasis on shop safety, communication, and cooperation. Stresses the interrelationship of manufactured mating parts. (45-195)

96:167 Fundamentals of CNC (3 s.h.)

Prerequisite/ Corequisite: 96:166, Machine Tool Practices II. Students must obtain a grade of "C" or better in 96:165, Machine Tool Practices I. Covers computer numerical control (CNC) as it relates to milling machines, turning lathes, microcomputers, and related software. Emphasis on input language, codes, machine set-up and operation, inspection of parts, and communication of peripherals. (30-30)

96:169 Welding (2 s.h.)

This is a basic arc/oxy-fuel welding and cutting course. The students will perform introductory skills in SMAW, GTAW, and GMAW welding, oxy-acetylene welding, and oxy-fuel cutting. The students learn safety procedures relating to welding subjects and general shop safety. (15-30)

96:170 Statistical Process Control (SPC) (1 s.h.)

Covers the current transformation methods of industry and business toward a complete quality control system. Management theory on quality, productivity, and controlled charting techniques are included. (15-0)

96:171 Tool and Die Making I (5 s.h.) Prerequisite/ Corequisite: Students must obtain a grade of "C" or better in 96:167, Fundamentals of CNC, and 96:166, Machine Tool Practices II. This course is an introduction to the design of industrial tools and machining characteristics of tool components. The student is introduced to additional machining skills that will be encountered in typical machine shops in the building of molds, dies, jigs, fixtures, and precision machine parts. (30-160)

96:172 Fundamentals of EDM (2 s.h.) Prerequisite/ Corequisite: 96:171, Tool and Die Making I. Students must obtain a grade of "C" or better in 96:167, Fundamentals of CNC. The students are introduced to the electrical discharge machines, both wire and ram-type. Emphasis on how these tools are used in the manufacturing of punch and die components and injection mold cores and cavities. (15-45)

96:173 3-D Modeling (2 s.h.) Prerequisite: 96:270, Computer-Aided Drafting. Students are introduced to solid modeling as an essential tool, utilizing and enhancing designing skills. This is accomplished through the generation of 3-D drawings created in the CAD environment. Operating systems commands, cursor manipulation, file storage and retrieval, entity manipulation, such as rotation, mirroring, editing, dimensioning, sections, sheet metal parts, and assemblies capabilities will be covered. (15-30)

96:180 Survey of Machine Tool Practices I (4 s.h.) The student safely uses basic measuring tools, machine tools, and layout/inspection tools. Emphasis is on turning machines, drills, and hand tools. Safety is taught and enforced as it applies to each machine process. Proper terminology of the machinist trade is emphasized. The student follows blueprints to produce products within tolerances specified. (15-90)

96:181 Survey of Machine Tool Practices II (4 s.h.) Continues Survey of Machine Tool Practices I. The student safely uses basic measuring tools, machine tools, and layout/inspection tools. Emphasis on basic milling machines. Safety is taught and enforced as it applies to each machine process. Proper terminology of the machinist trade is emphasized. The student follows blueprints to produce products within tolerances specified. (15-90)

96:182 Survey of Machine Tool Practices III (4 s.h.) Prerequisite: 96:180, Survey of Machine Tool Practices I; 96:181, Survey of Machine Tool Practices II. The student safely performs cylindrical grinder and surface grinder operations. Using the grinders, the student makes round and flat surfaces to conform to the specified tolerances. Emphasis is placed on safety, proper use of tools, and using correct terminology of the machinist trade. (15-90)

96:193 Capstone Manufacturing Project (4 s.h.) Prerequisite: 96:180, Survey of Machine Tool Practices I - Pass with a "C" or better; 96:181, Survey of Machine Tool Practices II - Pass with a "C" or better; 96:182, Survey of Machine Tool Practices III - Pass with a "C" or better; 96:167, Fundamentals of CNC - Pass with a "C" or better. The goal is for the learner to build an approved multiple-part project using machine tools and communicate the successes and difficulties encountered in the project-building process. (15-90)

96:230 Commercial Heating Systems (5 s.h.) Prerequisite: 96:128, Residential Heating Systems, or instructor's permission. This course covers large heating systems used in commercial, institutional, and industrial applications. Types of equipment include hot water and low-pressure steam boilers and rooftop heating units. (30-135)

96:231 Advanced Control Systems (4 s.h.) Prerequisite: 96:129, Troubleshooting Heating Systems; and 96:139, Troubleshooting Air-Conditioning Systems, or instructor's permission. Major emphasis is on four basic types of control systems: pneumatic, electronic, electro mechanical, and digital as applied to large heating and air-conditioning applications. (30-120)

96:232 Air Distribution (3 s.h.) Prerequisite: 96:134, Air-Conditioning Principles, or instructor's permission. A study of the construction and design of duct work and related duct fittings. Includes correct layout and sizing of ducts, return and supply grills, and use of airflow measuring instruments. (30-60)

96:234 Commercial Air-Conditioning Systems (5 s.h.) Prerequisite: 96:138, Residential Air-Conditioning Systems, or instructor's permission. This course covers large cooling systems used in commercial, institutional, and industrial applications. Types of equipment include water chillers, multistage reciprocating units, and an introduction to absorption systems. (30-135)

96:235 Energy Management (3 s.h.) Prerequisite/ Corequisite: 96:231, Advanced Control Systems, or instructor's permission. This course is designed to examine the consumption of energy in commercial and industrial buildings and how energy usage may be reduced. Topics include building design, load management, improving equipment efficiency, improved lighting systems, utility rate structures, and energy management control systems. (30-60)

96:270 Computer-Aided Drafting (CAD) (2 s.h.) Prerequisite/Corequisite: 96:164, Blueprint Reading II. Students are introduced to computer-aided drafting and design as an essential tool utilizing and enhancing the student's existing drafting skills. This is accomplished through the generation of two- and three-dimensional orthographic drawings as well as pictorial techniques in the CAD environment. Operating systems commands, cursor manipulation, direct display interaction, geometry creation and manipulation, file storage and retrieval, entity manipulation such as rotation and mirroring, and the use of printers are just a few of the hardware and software capabilities to be covered. (15-30)

96:271 Tool and Die Making II (8 s.h.) Prerequisite/Corequisite: 96:171, Tool and Die Making I. This course is a continuation of Tool and Die Making I with instruction and practice in building a progressive or compound die. Emphasis is placed on the tool building procedures learned in Tool and Die I and toward fabricating dies. Instruction is given on the considerations involved in developing die components, such as calculation of die clearances, bend allowance, cutting forces, press tonnage requirements, and practice in building a complete functional die. (45-225)

96:272 Computer-Aided Manufacturing (CAM) (3 s.h.) Prerequisite/Corequisite: 96:171, Tool & Die Making I, and 96:172, Fundamentals of EDM. Students must obtain a grade of "C" or better

in 96:167, Fundamentals of CNC. This program provides an introduction to (Process Modeling) utilizing the CNC graphics programming system. Using engineering drawings, students program various parts for CNC mills, CNC lathes, and CNC EDM. Related topics include job planning, tool selection, construction of a process model, tool path verification, simulation, quality control, CAD, CAM data transfer, and CNC code generation. (15-60)

96:273 Plastic Materials and Methods (1 s.h.) This is a survey course designed to introduce the student to the field of plastics. This overview includes thermoplastics and thermoset materials along with the major processing methods being utilized by industry today. (15-0)

96:274 Mold Making I (9 s.h.) Prerequisite/ Corequisite: 96:271, Tool and Die Making II; 96:273, Plastics Materials and Methods. The student is introduced to the field of mold making for plastic injection molds, blow molds, compression and transfer molds, zinc and aluminum die casting molds. Focus is placed on mold theory, mold repair, identification and correction of mold problems, standardization of mold components, mold blueprint reading, and the machine shop skills necessary for mold making, as related to thermoplastic injection molds. In addition the student develops necessary basic skills for gating, venting, heating, cooling, stoning and polishing as well as other hands-on experiences necessary to manufacture mold plates, cores, cavities, and ejection systems. The student builds a prototype injection mold. (45-285)

96:275 Advanced CNC & EDM (2 s.h.) Prerequisite/Corequisite: 96:274, Mold Making I. A continuation of CNC and EDM fundamentals as well as mold making with additional instruction and practice in the use of CAD, wire, and ram electrical discharge machines in the construction of die and mold components. (15-45)

98:110 Welding Symbols and Blueprint Reading (2 s.h.) Prerequisite: None. This course provides instruction in the fundamentals of reading and interpreting blueprints. A student learns to interpret and apply welding symbols along with identifying proper assembly procedures. (30-0)

98:133 Heating & Air-Conditioning (3 s.h.) Prerequisite/ Corequisite: 96:132, Electrical Concepts, or instructor's permission. Instruction in heat transfer principles applied in testing, repairing, and/or replacing heating and air-conditioning system components. Laboratory procedures for servicing and maintaining air-conditioning systems utilizing refrigerant recovery and recycling equipment. (30-60)

98:135 Welding Symbols and Blueprint Reading II (2 s.h.) Prerequisite: 98:110, Welding Symbols and Blueprint Reading. This course provides instruction in the reading and interpreting of blueprints. The course covers the applications of welding symbols, dimensions, and assembly procedures. (15-30)

98:144 Introduction to Automotive Technology (3 s.h.) Prerequisite/Corequisite: strong mechanical aptitude. Instruction in fundamental shop safety, service procedures, precision measurement and engine operation, use of service manuals and service equipment. Laboratory procedures in performing vehicle lubrication and fluid changes, and general maintenance and service of engine exhaust, and cooling systems. (30-60)

98:145 Brake Systems (3 s.h.) Prerequisite/ Corequisite: 98:144, Introduction to Automotive Technology. Instruction in the theory and operating principles of drum, disc, hydraulic and anti-lock brake systems (ABS). Laboratory procedures for inspecting, testing, diagnosing, repairing and/or replacing conventional, power, and ABS brake system components. (15-90)

98:146 Suspension and Steering (3 s.h.) Prerequisite/ Corequisite: 98:144, Introduction to Automotive Technology. Instruction/laboratory service procedures for inspection, adjustments, alignment, repair and/or replacement of suspension and steering components. (15-90)

98:147 Electrical Systems I (3 s.h.) Prerequisite/ Corequisite: 98:144, Introduction to Automotive Technology and 96:132, Electrical Concepts. Instruction in the electrical and electronic principles and testing procedures as applied to automotive circuits and microprocessors. Laboratory procedures to include the utilization of wiring schematics and test equipment for diagnosing and repairing instrumentation, electrical accessory, and lighting systems. (30-60)

98:148 Engine Repair (3 s.h.) Prerequisite/ Corequisite: 98:144, Introduction to Automotive Technology. Instruction/laboratory procedures for engine repair diagnosis, removal, disassembly, inspection, overhaul and reassembly of automotive and/or light truck engines according to manufacturer's specifications. (15-90)

98:149 Manual Drive Train & Axles (3 s.h.) Prerequisite/ Corequisite: 98:144, Introduction to Automotive Technology. Instruction/laboratory procedures for servicing, diagnosing, and repairing/replacing standard transmissions and clutches, transaxles, and differentials. (15-90)

98:161 Metal Processing and Metallurgy (2 s.h.) The student uses basic hand tools, drills, measuring tools, lathes, grinders, and welding equipment to build parts with practical applications in automotive service. (15-30)

98:179 Automatic Transmissions & Transaxles (5 s.h.) Prerequisite/Corequisite: 96:132, Electrical Concepts, or instructor's permission. Instruction in diagnosis, maintenance, and overhaul of major automatic transmissions and transaxles in various makes of automobiles. (45-90)

98:180 Computerized Controls (2 s.h.) Prerequisite/ Corequisite: 96:132, Electrical Concepts, or instructor's permission. Instruction in theory, application, and diagnostics of automotive computers, sensors, and control devices. (15-45)

98:190 Oxyacetylene Welding and Cutting; Gas Tungsten Arc Welding (3 s.h.) Fusion joining of mild steel and cutting processes. The basic principles of gas tungsten arc welding including AC and DC applications. Selection of proper torch tip sizes, filler rods, angles, and travel speeds for OAW processes. The set-up and adjustment of gas tungsten arc welding equipment, along with practical experience using both ferrous and nonferrous metals. (15-90)

98:191 Shielded Metal Arc and Gas Metal Arc (3 s.h.) Flat and horizontal shielded arc, vertical, and overhead shielded arc welding. The operation of AC and DC transformer arc welders and motor-driven DC welders. The effects of amperage, polarity, and

characteristics of various electrodes. Butt, fillet, corner, and lap welds are made in various positions. Application of techniques required for equipment repair. (15-90)

98:208 Fuel Delivery Systems (3 s.h.) Prerequisite/ Corequisite: 96:132, Electrical Concepts, or instructor's permission; and strong mechanical aptitude. Instruction in the fundamentals of operation and service of complete fuel systems, including storage, delivery, and metering. (30-60)

98:209 Electrical Systems II (5 s.h.) Prerequisite/ Corequisite: 98:147, Electrical Systems I, or instructor's permission. Strong mechanical aptitude. Instruction in operation, service, and troubleshooting of automotive electronic/electrical circuits and systems; to include starting, charging, and ignition systems. (45-90)

98:211 Engine Performance Testing (5 s.h.) Prerequisite/ Corequisite: 98:180, Computerized Controls, or instructor's permission. Strong mechanical aptitude. Instruction in the theory, operation, and analysis of computer control distributorless ignition and emission systems, with emphasis placed on diagnosis/repair of problems using manufacturer flow charts, oscilloscopes, DVOMs, and scan tools. (45-90)

98:212 Advanced Engine Performance (7 s.h.) Prerequisite/Corequisite: 98:180, Computerized Controls, or instructor's permission. Strong mechanical aptitude. Instruction in the theory, operation, and testing of computerized engine control systems and other advanced electronic systems on the automobile, with emphasis placed on diagnosis/repair of problems using manufacturer flow charts, oscilloscopes, DVOMs, and scan tools. (75-105)

Quotable Quote:

Success is a ladder that cannot be climbed with your hands in your pockets.

-American Proverb