visual merchandising; special events strategies; public relations; Internet promotions.
3230 Pattern 2: 2 hrs. lab. Use of computer. Application (4) Prereq.: HUEC 3027. 2 hr. lecture; 4 hrs. lab. Application of two-dimensional pattern making principles to the design and analysis of original garment designs; introduction to proprietary computer software.
3322 Apparel Design Studio (3) Prereq.: HUEC 2032, 2037, ART 1847 or 1848. 1 hr. lecture. Fashion illustration techniques; adaptation of inspirational ideas to designs for women; project per semester; use of CADD in design development; use of an industry-specific CAD system.
4034 Textile and Apparel Production Evaluation (3) F Prereq.: HUEC 3032, 3035, 3232 or 3235. Interpretation of work, classification of defects, and rating toyard and in final appearance with emphasis on cultural, aesthetic, religious, and aesthetic to dress.
4079 Fashion Research (3) Prereq.: HUEC 3032. Case studies of successful entrepreneurs. Focus on personal traits, values, and methods of correlating with factors that affect apparel merchandising.
4071 History of Dress and Adornment Prior to 1700 (3) Prereq.: HUEC 2032, 2041. Development and use of clothing systems; analysis of theoretical foundations, principles, and applications within modern, historic, and archaeological specimens.
4044 Global Textile and Apparel Economics (3) Prereq.: HUEC 3032, ECON 2030. Economic concepts and principles associated with the textiles industry; overview of global economics and contemporary business practices.
4045 Synthesis: Textile and Apparel Product Processes (3) S Prereq.: HUEC 4057. 1 hr. lecture; 4 hrs. lab. Multi-functional team approach to creative problem solving: apparel product design, development, evaluation, and presentation using advanced pattern making techniques and technology.
4046 Advanced Topics in Apparel Merchandising (3) F Prereq.: HUEC 3032 and 3043. Application of principles of product development management to apparel analysis and price; current industry issues and trends; emphasis on theory and policy related strategies.
4047 Internship in Textiles, Apparel, and Merchandising (3 or 6) S or Su Prereq.: GPA of at least 2.30 on all HUEC classes taken at LSU and permission of department; participation in orientation workshop prior to enrollment. Internship will allow student to integrate academic learning with professional practice.
4070 Entrepreneurship in Human Ecology (3) S Prereq.: MKT 3401. Study of two or more entrepreneurs with an emphasis on home-based and/or microbusinesses; case studies of successful entrepreneurs.
4071 History of Art and Design. Prior to 1700 (3) Emphasis on styles of western civilization; how dress functions for individuals within culture and society; relationships of gender, environment, technology, economics, religion, and aesthetics to dress.
4072 History of Dress and Adornment After 1700 (3) Emphasis on styles of western civilization; how dress functions for individuals within culture and society; relationships of gender, environment, technology, economics, religion, and aesthetics to dress.
4073 Comparative Studies in Dress and Culture (3) F Also offered as ANTH 7032. Relationship between people and dress; cross-cultural analysis of occupations, environment, religion, ethnicity, gender, and aesthetics; impact of cultural change and western culture on world dress, ethnic, and folk traditions in dress.
4075 Textile Manufacturing (3) Prereq.: HUEC 4045; and one 7000-level statistics course. In-depth study of mass production textile technologies; development of manufacturing technology, quality control methods, and end-use performance evaluation and application.
4136 Apparel and Global Expansion (3) Internationalization of apparel merchandising; examination of theoretical foundations, principles, and applications within modern, historic, and archaeological specimens.
4137 Consumer Behavior in the Apparel Merchandising Environment (3) Examination of consumer behavior theories and their applications to apparel purchase and consumer subtopics, such as purchasing research.
7040 Bio-based Components: Production and Evaluation (3) Bio-based material products and applications, with case studies to illustrate end-use evaluation of related agricultural materials.
7041 Introduction to Research in Textiles, Apparel Design, and Merchandising (3) F Introduction to research and methods in textiles and apparel design; research issues.
7042 Research in Textiles (3) 1 hr. lecture; 4 hrs. lab. Research methods applied to fabric analysis and testing; trends and recent developments.
7043 Seminar: Textiles, Apparel Design, and Merchandising (1) ‘SU’ grading. May be taken for a max. of 3 hrs. of credit if student earns an A in the seminar and completes a literature review and discussion of selected research and creative topics.
7046 Microscopy of Fibers and Polymers (3) Analysis and characterization of fibers and polymers using microscopic techniques; emphasis on textile fibers and fabrics, including modern, historic, and archaeological specimens.
7047 Modern Fiber Science and Technology (2) 2 hrs. lecture; 2 hrs. lab. New techniques for obtaining fiber and fiber components; introduction to analytical techniques, such as yje cellulose, and plant derived polymers; examination of polymeric materials used for the development of high performance fibers for space and other industrial applications.
7048 Thermal Characterization of Fibers and Polymers (3) 2 hrs. lecture; 2 hrs. lab. Analysis and characterization of fibers and polymers using thermal, thermo-electro-mechanical techniques; examination of textile fibers and fabrics including bio-derived materials and classical specimens.
7049 Advanced Individual Field Experience In Textiles, Apparel Design, and Merchandising (3) Prereq.: Cons. of instructor. May be taken for a max. of 6 hrs. of credit when topics vary. Analysis and discussion of selected research and creative topics.
7054 Seminar in American and European Design (3) See also HTHR 7518. May be taken for a max. of 6 hrs. of credit. Advanced, individual, supervised, field-based study in selected areas of textiles, apparel design, and merchandising; use of research data and contemporary practices within selected businesses, industries, agencies and museums.
7518 Studies in American and European Dress (3) See also HTHR 7518. May be taken for a max. of 6 hrs. of credit. Advanced, individual, supervised, field-based study in selected areas of textiles, apparel design, and merchandising; use of research data and contemporary practices within selected businesses, industries, agencies and museums.
7519 Seminar in American Dress: 16th Century to 1880 (3) See also HTHR 7519. May be taken for a max. of 6 hrs. of credit. Advanced, individual, supervised, field-based study in selected areas of textiles, apparel design, and merchandising; use of research data and contemporary practices within selected businesses, industries, agencies and museums.
7520 Seminar in American Dress: 1880 to the Present (3) See also HTHR 7520.
teamwork and production in business and industry.

3665 Industrial Safety Management (3) V Prereq.: HRE 2053 or equivalent. An overview of industrial safety and health, accident prevention and control; analysis of loss prevention programs; certification, professional ethics; functions of the safety professional.


3101 Instructional/ Curriculum Design for Human Resource Education (3) V Curriculum, course unit, and lesson plan development in human resource; selection and evaluation of course materials.

3171 Instructional Design for Training (3) S Prereq.: HRE 3071. Principles and practices of instructional design for effective training; course, unit, and lesson development.

3200 Records Management (3) Principles of records creation, retention, transfer, and disposal; organization and management of stored records; coding, microfilming, and retrieval of information; manual, mechanical, and computer means of storing and retrieving information.

3201 Presentation Methods in Human Resource Education (3) The components of effective presentation for instructional and individual training.

3271 Leading Learning in Human Resource Development (3) S, V Emphasis on the principles and practices of instructional delivery strategies to facilitate learning in training and development; methods for leading learners in the new learning environment; the field of adult learning; and the role of small group learning; and individual learning.

3331 Strategic Career Development/Planning (3) Prereq.: Sophomore standing or consent of instructor. Career development and planning through career decision-making, networking and linking personal competencies to organizations. Applying skills required for a successful job search and making the transition from college to work.

3400 Office Management (3) Facilitating office work through management of environment, organization, communication, personnel, systems, productivity, and cost factors.

3500 Administrative Assistant Procedures (3) Prereq.: HRE 2000 or equivalent. Responsibilities of administrative support personnel; skills needed for supervision, decision making, and human relations; planning, organizing, and disseminating information.


3603 Classroom Management in Human Resource Education (3) Prereq.: concurrent enrollment in HRE 3604 and HRE 3605. Managing the human resource education classroom; emphasis on student behavior; techniques for preventing, diagnosing, and handling student discipline problems.

3604 Human Diversity in Learning in Human Resource Education (3) Prereq.: concurrent enrollment in HRE 3603 and HRE 3605. This course strives to better prepare today’s teachers/trainers to achieve their goals of delivering an effective education to diverse students who are living in a complex, interdependent world. Each of the various diversities addressed in this course mediate one another and do not act in isolation, which further complicates an educator’s task, but is nonetheless critical to an understanding of classroom interaction.

3605 Field Experiences in Human Resource Classroom Management (1) V Prereq.: concurrent registration or in credit for HRE 3603 and 3604. The purpose of this field experience is to provide direct experiences to increase understanding of the classroom process and apply skills for facilitating the process. The course provides detailed guidelines for observing the dynamics of the classroom and community, participating as a classroom teacher, and then reflecting on the experience. Motivation, classroom management, and teaching strategies are the focus areas of the experience.

3723 HONORS: Leadership Concepts and Principles (3) F Prereq.: HRE 2000 and instructor consent. An honors level overview of the field of leadership and its role in leading organizations.


4225 Instruction and Information Technology (3) V 2 hrs. lecture; 3 hrs. lab. Concepts and applications of information technology as well as a survey of the global, ethical, political, cultural, social, and environmental issues presented by emerging educational technology. Title: teaching skills in integrating information technologies into a workspace curriculum.

4281 Foundations of Distance Learning (3) V Prereq.: HRE 3101 or 3171. Overview of the theories, models, and systems of distance learning; focus on understanding the foundations of distance learning, the design and delivery methodologies, and the role of the learner.

4283 Advanced Distance Learning Strategies (3) V Prereq.: HRE 4281 or permission of instructor. Overview of the theories and practices of interaction environments; focus on understanding the community development and sustainability required for success online learning.

4301 Assessment, Career Development, and Productivity (3) F Assessing present and future needs of the human resource professional; methods for assessing career development; evaluation of student preferences, career potential, and occupational placement.

4302 Adult and Nonformal Home Economics Education (3) 2 hrs. lecture; 2 hrs. lab. Working with adults and youth in community agencies and other programs with clientele similar to those served by the formal school system.

4504 Youth Leadership Development (3) V Principles and practices in planning, organizing, and conducting youth organizations.

4571 Technology in Human Resource Development (3) V Survey of the use of computer, information and telecommunication technology in human resource development; emphasis on the analysis, design, development, implementation, evaluation, and management of human resource development technology integration in the workplace.

4573 Managing the Human Resource Development Function (3) S Prereq. of Study of human resource development (HRD) in business and industry. Practical application of principles for effective leadership, management, and administration of the HRD function.

4576 Ethical and Legal Issues in Human Resource Education (3) V Ethical and legal issues and problems faced by human resource development professionals practicing in public and private organizations.

4579 Training in Global Organizations (3) F Introduction to the problems, practices, and models of cross-cultural competence and cross-cultural training; focus on the nature, content, and function of cross-cultural training in organizations.

4585 Consulting in Organizations (3) V Practical look at the skills to be an effective internal or external consultant in organizations; emphasis on consulting process rather than specific area of practice.

4601 Workforce Education Learner Assessment (3) Assessment of progress of workforce education students in psychomotor, cognitive, and affective skills.


4704 Time Management Techniques in Human Resource Education (3) S Methods of planning and procedures for using time efficiently in conducting the human resource education program.

4705 Education, Business, and Entrepreneurship (3) Prereq.: concurrent strategies in business and operating small businesses; emphasis on resources available to aid the educator in bridging the gap between business and entrepreneurship.

4723 Advanced Leadership Development (3) S Prereq.: HRE 2723 and 3723. An honors course, HRE 4724, is also available. Credit will not be given for both courses.

4724 HONORS: Advanced Leadership Development (3) F Prereq.: HRE 2724 and 3724; Hones College students only. Same as HRE 4723 with special honors emphasis. Credit will not be given for both courses.

4801 Teaching Internship: Professional (3) V Prereq.: concurrent enrollment in HRE 4802 and 4803. Permission of instructor. Not for graduate credit. Professional responsibilities; teacher association work; teacher, parent, and student organization activities; school visits and public speaking.

4802 Internship: Preparation (3) V Prereq.: concurrent enrollment in HRE 4801 and 4803. Permission of instructor. Not for graduate credit; preparation of the student's lesson preparation, demonstration ability; laboratory organization, participation in class activities, and evaluation.

4804 Professional Development Internship (3-12) F,S,Su May be taken for a max. of 12 sem. hrs. of credit. Not for graduate credit; credit for hours in professional development courses. Students are mentored in the business community as they learn
human resource education

7828 Various skills that would make them highly employable.
4805 Making the Transition from College to Work (1)
Course is for students with an internship, practicum, or other work experience. Introduction to the skills needed to successfully make the transition from college to career life; emphasis on quickly learning how to be a top performer new employee and avoid typical mistakes college graduates make as new employees.

4806 Study in Teaching in Human Resource Education (9)
V Prereq.: Permission of instructor. Not for graduate credit. Professional responsibilities including developing instructional materials; delivering instruction in classroom, laboratory, and field environments; organizing and operating instructional laboratories; participating in professional associations; planning and conducting teacher/staff/student organization activities; conducting school observational visits; completing teacher certification requirements.

4807 Teaching Internship in Human Resource Education (6) V Prereq.: Permission of instructor. Professional responsibilities including developing instructional plans and materials; delivering instruction in classroom, laboratory, and field environments; organizing and operating instructional laboratories; participating in professional associations; planning and conducting teacher/staff/student organization activities; conducting school observational visits; completing teacher certification requirements.

4809 Advanced Practicum in Human Resource Education (1-3) F,S,Su May be taken for a max. of 6 sem. hrs. credit. Permission of instructor. Individual and group projects.

4819 Special Topics in Human Resource Education (1-3) V Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. of credit when topics vary. Individual and group study of selected topics under the direction of a faculty member.

4849 Special Topics in Business Education (1-3) V Prereq.: may be taken for a max. of 6 sem. hrs. credit. Prerequisite: permission of instructor. Individual and group study of selected topics under the direction of a faculty member.

4869 Special Topics in Home Economics Education (1-3) Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. Prerequisite: permission of instructor. Individual and group study of selected topics under the direction of a faculty member.

7001 Principles of Human Resource Education (3) V Principles of workforce education and development programs conducted by business, industry, government, and educational institutions at all levels; relationships to adult education, career/technical education, human resource development, career development, general education, and society.

7003 Philosophy of Human Resource Education (3) F Major philosophies that have influenced human resource education; philosophical approaches to problems in human resource education. Comparative analysis of systems and practices in conducting the adult agricultural education program.

7016 Foundations of Agricultural Education (3) V Events and organizations that contributed to the development of agricultural education programs.

7024 Comparative Extension Education (3) S Prereq.: HRE 7122 or equivalent. Comparative analysis of systems of extension education in industrial and trade education programs.

7025 Advanced Adult Learning Theory and Practice (3) Advanced study of the theory and research in adult learning with implications for adult learning practice.

7041 Foundations of Industrial Education (3) V History and philosophy of industrial/technology education and vocational trade and industrial education.

7056 Foundations of Business Education (3) V Historical foundations; relevant state and federal legislation; organization and administration of business education in public secondary education.

7101 Advanced Curricular/Curriculum Design in Human Resource Education (3) V Introduction to the theory, principle, research, and practices that contribute to the knowledge base of curriculum development and instructional design in business education.

7112 Program Development in Agricultural Education (3) V Development of curriculum, organization and use of committees; order problems in business education; utilization of the FFA in instruction.

7122 Program Development (3) F Concepts relating to the formulation, implementation, and evaluation of educational programs in business education.

7124 Program Development in Industrial Education (3) V Program research and development.

7162 Program Development in Home Economics Education (3) V Principles and applied practices in developing programs in home and family life education for multicultural groups.

7171 Instructional Design for Human Resource Development (3) V Theories, principles, research, and practices of instructional systems design (ISD) in human resource education (HRD) and training.

7201 Advanced Teaching Techniques in Human Resource Education (3) F,Su-O Principles underlying the human resource development (HRD) and training process; teaching, learning, and administration; development of skills needed for effective workforce leadership education.

7205 Teaching in Higher Education (3) F,S Methodology for effective college teaching; student motivation; planning for instruction, delivery, and evaluation.

7213 Pedagogical Advances in Agricultural Education (3) V Developments in education; their impact on agricultural education.

7218 Teacher Education (3) V Development and functions of the comprehensive agricultural teacher education program.

7222 Principles of Practices of Extension Education (3) S Prereq.: HRE 7122 or equivalent. Learning and teaching concepts applied in the execution of an extension educational program.

7242 Programmed Instruction (3) V Principles of programmed instruction; emphasis on methods and application of instruction.

7255 Improvement of Instruction in Keyboarding, Word Processing, Shorthand, and Clerical Practices (3) V Techniques and strategies related to the teaching of clerical skills.

7256 Improvement of Instruction in General Business, Accounting, and Bookkeeping (3) V Techniques and strategies related to the teaching of general business.

7271 Leading Learning in Human Resource Development (3) V Principles, research, and practices of facilitating learning in human resource development (HRD) including facilitation of training for individuals in workplace learning, as well as informal workplace-based learning strategies.

7301 Orientation to the World of Work (3) V See ERC 7301.

7304 Human Resource Education for Special-Needs Students (3) V Regulations, issues, assessment, instruction, and special problems in human resource education for learners with special needs.

7332 Educational and Occupational Information (3) V Also offered as ERC 7332. Classification and analysis of educational, occupational, and social information; occupational trends and surveys; use of occupational information for making vocational and educational decisions.

7334 Vocational Counseling (3) V See ERC 7334.

7392 Advanced Vocational Counseling (3) V See ERC 7392.

7398 Field Experiences in Vocational Counseling (3) V See ERC 7398.

7401 Adapting Techniques of Adult Human Resource Education Programs (3) V Role of adult education as a component of vocational education in contemporary society; program conceptualization, needs assessment, program initiation, development, financing, administration, and evaluation.

7414 Androgyny in Agricultural Education (3) V Principles and practices in conducting the adult agricultural education program.

7571 Performance and Needs Analysis in Human Resources Development (3) F Theory and principles used in the analysis of performance problems in organizations; emphasis on the application of performance theory and use of tools and techniques for analyzing organizational, process, and individual level performance problems.

7573 Strategic Human Resources Development for Global Organizations (3) V Implications of globalization and its impact on the problems, practices, programs, theories, and methodologies used by human resource development to improve organizational effectiveness.

7575 Managing Change in Organizational Systems (3) S Introduction to the theory, methods, and practice of organizational change, and social change with emphasis on the role of the HRD practitioner as change agent and the interventions used to lead and manage organization change.

7602 Program Administration (3) V Systematic application of social research procedures for evaluating the conceptualization, design, implementation, and utility of organizational development programs.

7622 Evaluation Methods (3) F Concepts and principles of evaluation applied to programs in extension education.

7662 Program Improvement in Home Economics Education (3) V Principles and practices of evaluating and improving home economics programs for diverse groups.

7701 Organization and Administration of Workforce Education (3) V Principles, research, and practice of organization and administration; development of skills needed for effective workforce leadership education.

7705 Supervision in Human Resource Education (3) Su-E Principles of supervision in workforce teaching at local and state levels.

7716 Organization, Administration, and Supervision of Agricultural Education (3) V Theory, principles, and practices of organization and supervision of vocational teaching.

7723 Leadership and Organization (3) V Application of relevant principles from leadership theory, group dynamics, social organization, and organizational administration to problems of organizing extension education programs.

7725 Leadership Development Strategies in Organizations (3) V Introduction to the major strategies used for developing leaders in organizations; emphasis on learning theories for leadership development, formal training strategies, development opportunities, feedback intensive programs, and skill-building programs.

7741 Administration and Supervision of Vocational Technical Education (3) V Administrative and theoretical, and operational considerations in administering and supervising secondary and post-secondary vocational educational programs.

7766 Home Economics in Higher Education (3) V Goals and objectives of home economics; program development; roles and responsibilities of faculty.


7803 Independent Study in Human Resource Education (1-3) F,S,Su Prereq.: permission of instructor. Independent study under the guidance of a faculty member.

7804 Seminar in Human Resource Education (1-6) F,S,Su May be taken for a max. of 6 sem. hrs. credit when topics vary. Selected topics of interest to human resource education.

7809 Practicum for the Human Resource Educator (3-9) F,S,Su Prereq.: permission of instructor. Practical experience under the guidance of practicing vocational educators in various educational settings.

7812 Technological Advances in Agricultural Education (3) V Scientific developments in agriculture; their impact on programs in agricultural education.

7816 Advanced Agricultural Education Seminar (1) V May be taken for a max. of 1 sem. hr. credit. A minimum of 1 sem. hr. required at master's level; minimum of 2 sem. hrs. required at the doctoral level. Current professional educational problems in vocational education.

7822 Advanced Extension Education (3) S Integration of relevant concepts, principles, and research findings in program development, leadership and organization, learning and teaching, and evaluation.

7824 Independent Study in Extension Education (3) V May be taken for a max. of 6 hrs. of credit. Permission of instructor. Independent study under the guidance of the graduate faculty.

7826 Seminar in Extension Education (1) V May be taken for a max. of 2 hrs. of credit. Pass-fail grading. Student-faculty exchange of ideas on research and issues.

7848 Special Topics in Industrial Education (3) V May be taken for a max. of 6 sem. hrs. of credit. Research reporting and topics of current interest.

7871 Research and Theory in Human Resource Development (3) V Research, research, and research in human resource development practice and research, theory-building methodologies, and key foundational principles of research in human resource development.


7901 Scientific Methods in Human Resource Education (3) V Principles and procedures involved in formulating educational problems, hypotheses, research strategies; historical,
4461 Industrial Engineering • IE

1002 Industrial Engineering Fundamentals (3)
Introduction to industrial engineering design process and concepts.

2060 Introduction to the Use of Computers (3) Prereq.: eligibility to take MATH 1550 or equivalent; and credit or registration in IE 1002.
2 hrs. lecture; 3 hrs. lab. Principles of digital computer systems, introduction to software, and programming of electronic computers to typical engineering problems; OS operation, Microsoft Office, and Groupware.

2400 Industrial Management Systems (3) Prereq.: Credit or registration in IE 1002.
2 hrs. lecture; 3 hrs. lab. System and work design concepts; time studies; performance rating systems; control and pre-determined times; work methods improvement; design of manual work, equipment and tools, and work environments; line balancing; manpower determinations; job analysis; and incentives; business systems analysis, lean and value analysis.

3201 Principles of Engineering Economy (3) Planning, economy studies for decision making, including consideration of rate of return, cost and yield studies, depreciation and tax relationships, increment costs, replacement, and introduction to multivariate alternative studies.

3302 Engineers Statistics (3) Prereq.: Grade of C or better required in MATH 1532 and PHYS 2102 or CSC 2259.
Probability, discrete and continuous distributions, functions of random variables, sampling theory, tests of hypotheses including goodness-of-fit and independence.

3520 Supply Chain Logistics I (3) Prereq.: IE 2400.
MATH 1550 or equivalent; and credit in IE 3302 and introduction to resources and systems; Logistics resource optimization: linear programming; Logistics network and flow problems: transport, facilities location, shortest path and vector routing, maximum flow problems; Project and resources management, and operations sequencing and resource scheduling.

3462 Advanced Engineering Statistics (3) Prereq.: Grade of C or better in IE 3302.
Linear regression and correlation, curvilinear regression, analysis of variance, and factorial experiments.

4425 Information Systems Engineering (3) Prereq.: Credit or registration in IE 2400. 2 hrs. lecture; 3 hrs. lab. Analysis and design of information systems; projects relating comprehensive computer systems to typical industrial and service applications; ethics and professionalism.

4426 Distributed Information Systems Engineering (3) Prereq.: IE 4425 or equivalent.
2 hrs. lecture; 3 hrs. lab. Interfacing programs to databases; analysis and development of client-server applications in industrial and business settings; interfacing databases and industrial applications to the Internet; analysis, design, and implementation of industrial and business networks.

4453 Quality Control & Six Sigma (3) Prereq.: Grade of C or better in IE 3302.
Principles and practices of quality assurance and control; theory of statistical sampling and control and related economic analysis; Quality Systems; Six Sigma concepts and methodologies.

4461 Human Factors Engineering (3) Prereq.: Credit or registration in IE 2400.
2 hrs. lecture; 3 hrs. lab. Human performance systems, including information processing, display and control design, workplace design, and environmental effects on worker performance.

4462 Safety Engineering (3) Occupational safety and health accident prevention management; design and implementation of safety programs; control of hazardous physical and environmental conditions.

4463 Fundamentals of Industrial Hygiene Engineering (3) Prereq.: IE 2400 or equivalent. Detailed techniques and scientific principles related to the control of occupational safety hazards.

4465 Biomechanics for Engineers (3) See BE 4323.
Human body mechanics; motion study of the human body; structural and mechanical properties of the human body; mechanics applied to human movement; applications to work relevant to task design and evaluation, employee selection and placement, and work-scheduling programs.

4466 Lean Manufacturing Systems (3) Prereq.: IE 2060 or 2400 or equivalent.
Principles of lean manufacturing; techniques to manufacture automation; programming of numerically controlled machine tools using Compact II and APT; robotics with multidegree of freedom linkages; NC programming using CAD/CAM, computer-automated part programming.

4501 System Integration in Manufacturing (3) Prereq.: IE 2060; IE 2950. 2 hrs. lecture; 3 hrs. lab. Principles and application of information technologies to monitoring, control, and integration of manufacturing operations at all levels within the facility.

4490 Engineering Management Maintenance (3) Prereq.: IE 1002, 3302, and credit or registration in IE 4425.
Design, operation, and maintenance cost-effectively controlled maintenance; maintenance costs; maintenance organization and systems, preventive maintenance, maintenance planning and scheduling, measurement, labor performance measures, and spare parts.

4516 Plant and Systems Design (3) Prereq.: IE 3201, grade of C or better in IE 2950 or equivalent.
Planning and engineering of industrial projects from schematic to online condition.

4551 Queuing Theory (3) Prereq.: IE 3520 or equivalent.
Analysis of rate of return, cost and yield studies, economy studies for decision making, including consideration of rate of return, cost and yield studies, depreciation and tax relationships, increment costs, replacement, and introduction to multivariate alternative studies.

4553 Lean Manufacturing Systems (3) Prereq.: IE 2060 or 2400 or equivalent.
Principles of lean manufacturing; techniques to manufacture automation; programming of numerically controlled machine tools using Compact II and APT; robotics with multidegree of freedom linkages; NC programming using CAD/CAM, computer-automated part programming.

4530 Lean Manufacturing Systems (3) Prereq.: IE 2060.
and credit or registration in IE 3520 and 4362.

4540 Reliability Engineering (3) Prereq.: IE 3302.
Reliability engineering and the design, assessment, and planning for the development of production systems: pre-production development and testing; and special problems in maintenance, spare parts, and Markov processes.

4599 Industrial Engineering Senior Design Project (3)
IE 4425, 4435, 4516, 4520, 4530; ME 3633; consent of department. Must be taken during the last semester of the undergraduate program. For December graduates, must be taken in full semester immediately prior to graduation. Students not meeting this requirement will be dropped from the course.

Application of previous industrial engineering courses in a comprehensive design project.

4785 Special Topics in Industrial Engineering (1-3) Prereq.: senior standing and consent of department. May be taken for a max. of 6 hrs. of credit when topics vary. Two sections may be taken concurrently on topics of vary. Topics in industrial engineering not sufficiently covered in other undergraduate courses.

7211 Project Engineering (3) Prereq.: IE 3201 or equivalent. Large-scale engineering construction or development projects from schematic to online condition.

7421 Advanced Programming (3) Prereq.: IE 4362 or equivalent. 3 hrs. lecture; 3 hrs. lab. Advanced concepts of information systems engineering with an emphasis on development and implementation techniques for integrating databases; design issues and methodology for developing and implementing distributed information systems; and development methodologies and development environments and online analytical processing (OLAP) systems.

7455 Lean Process Improvement (3) Philosophy and concepts of quality and process improvement. Application of advanced Six Sigma and Lean tools and techniques to case studies from healthcare, military, education, and manufacturing industry. Investigation, learning, and application of current research related to the course topics.

7463 Industrial Hygiene Engineering (3) Prereq.: IE 4463 or equivalent or consent of instructor. Evaluation and control of industrial environments; noise and vibration, industrial illumination, radon, radiation, air quality and containment; design of ventilation systems.

7464 Work Physiology (3) Prereq.: IE 4461 or equivalent. Study of the physiological functions (e.g., cardiovascular, pulmonary, muscular) to work applicable to task design and evaluation, employee selection and placement, and work scheduling programs.

7465 Occupational Biomechanics (3) Prereq.: IE 4461 or equivalent. 2 hrs. lecture; 3 hrs. lab. Principles of biomechanics applied to human movement; applications to work systems such as manual materials handling and tool design.

7466 Human Interaction with Computers (3) Prereq.: IE 4461 or IE 4466 or equivalent. Ergonomics of the use of interactive computer systems: general characteristics and requirements of people-oriented computer systems from the perspective of different disciplines and tasks, etc. test environments.

7467 Cognitive Ergonomics and Work Environments (3) Prereq.: IE 3302 and 4421 or equivalent. Topics in cognitive ergonomics applied to efficiently control hazardous conditions, visual and auditory displays, and aspects of the work environment such as noise, socio-technical systems, and non-ergonomic factors. Application settings including construction, healthcare, and the service sector.

7470 Artificial Intelligence Manufacturing Systems (3) Prereq.: IE 3520 or equivalent.
Principles of artificial intelligence tools and techniques to computer integrated manufacturing systems including maintenance, product design, process planning, factory scheduling and control, robotics, and intelligent warehouse systems.

7540 Advanced Reliability Engineering (3) Prereq.: IE 4360 or equivalent. Analysis of complex and distributed systems; optimization of performance; and availability of large production facilities; applications to a variety of manufacturing environments.

7451 Linear Programming and Related Algorithms (3) Prereq.: IE 3520 or equivalent.
Optimization of linear objective functions subject to linear constraints; vector spaces, convex analysis, polyhedral sets, matrix descriptions of simplex, revised simplex, bounded variables; duality theory and primal-dual simplex algorithms; postrational and parametric analysis; decomposition, and cutting plane algorithms.

7551 Queuing Theory (3) Prereq.: IE 3302 or equivalent.
Fundamentals of queuing processes, transient and limiting behavior, measures of effectiveness; birth and death processes, single and multi-server queues, priorities, balkings, renegings, and blocking; analysis of certain traffic patterns, including construction, healthcare, and the service sector.

7561 Programming Methods in Operations Research (3) Prereq.: IE 3520 or equivalent. Aspects of advanced programming methods for unconstrained and constrained optimization problems; applications to a variety of optimization problems.

7641 Logistics & Distribution Systems (3) Prereq.: IE 3520 or equivalent.
Logic of computing systems, simulation and large-scale queueing systems; applications, statistical inference, design and control of queueing systems.

76516 Logistics & Distribution Systems (3) Prereq.: IE 3520 or equivalent. Aspects of advanced programming methods for unconstrained and constrained optimization problems; applications to a variety of optimization problems.

7664 Logistics & Distribution Systems (3) Prereq.: IE 3520 and IE 4520, or equivalent.
Concept of logistics and distribution, large scale operational logistics, materials replenishing logistics, warehousing logistics, designing logistics network and distribution systems, convoy movements, long- and short-haul freight transportation, and Industrial practices.

7565 Metaheuristics (3) Prereq.: IE 3520 or equivalent.
Introduction of the principles, algorithms, and real world applications of metaheuristic algorithms including evolutionary algorithms, swarm-based methods, scheduling, tabu search, variable neighborhood search, guided local search, iterated local search, and population based methods such as particle swarm optimization, differential evolution, and colony optimization, genetic algorithm, and evolutionary programming.

7724 Special Topics in Industrial Engineering (3) May be taken for a max. of 12 sem. hrs. when topics vary.
Special topics in specialized areas such as design and analysis of complex systems, including programming methods for unconstrained and constrained optimization problems; applications to a variety of optimization problems.

7724 Independent Study in Industrial Engineering (1-3) Prereq.: Consent of department. May be taken for a max. of 6 sem. hrs. of credit.
Independent study in specialized areas such as design and analysis of complex process systems,