Each hour of credit requires 40 hrs. of supervised experience. Not for graduate credit. May be taken for a max. of 9 sem. hrs. of credit. Supervised experience designed to integrate academic learning with professional practice.

4070 Entrepreneurship in Human Ecology (3) S Prereq.: MK 3401. Application of entrepreneurship skills to a new venture or company with an emphasis on home-based and/or microbusinesses; case studies of successful entrepreneurs.

4071 History of Dress 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 style of western civilization; how dress functions for individuals within culture and society; relationships of gender, environment, technology, economics, religion, and aesthetics to dress.

4078 Consumer Behavior in Fashion (3) Study of dress and appearance with emphasis on cultural, aesthetic, psychological, and marketing aspects. Meanings of dress and appearance, creation and diffusion of fashion and consumer culture, consumer characteristics, and fashion implications.

4232 CAD for Textiles and Apparel (3) Prereq.: HUEC 3230, 4 hrs. lab. Application of computer-aided design technology to the design and presentation of textile and apparel collections.

7031 Social And Psychological Theories of Dress, Appearance, and Fashion (3) S Examination and analysis of interdisciplinary and theoretical approaches to dress, appearance, and fashion; role of economic force.

7032 Comparative Studies in Dress and Culture (3) F Also offered as ANTH 7032. Relationship between people and dress; cross-cultural environmental, religion, ethnicity, gender, and aesthetics; impact of cultural change and western culture on world dress, ethnic, and fold traditions in dress.

7035 Textile Manufacturing (3) Prereq.: HUEC 4043; and one 7000-level statistics course. In depth study of mass production of textiles, with a detailed analysis of manufacturing technology, quality control methods, and end-use performance evaluation and application.

7036 Apparel Merchandising and Global Expansion (3) Internationalization of apparel merchandising; examination of theoretical foundations, principles, and applications within select international setting of international apparel merchandising strategies; assessment of global issues that affect apparel merchandising.

7037 Consumer Behavior in the Apparel Merchandising Environment (3) Examination of consumer behavior theories and their applications to apparel purchase and patronage decisions and merchandising research.

7040 Biochemical Constituents: Production and Utilization (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 Manufacture (3) S Prereq.: HUEC 4043; 6 hrs. lab. Characterization of natural and manufactured textile fibers, physical and chemical modifications to meet consumer needs; textile dyestuffs and finishes; methods of fiber identification and chemical testing of textiles.

7044 Global Textile and Apparel Economics (3) F Prereq.: HUEC 3030, ECON 2030. Application and analysis of economic concepts and principles associated with the textiles and apparel industry; overview of global economics and contemporary trade policy.

7045 Synthesis: Textiles, Apparel, and Product Processes (3) S Prereq.: HUEC 4037; 1 hr. lecture; 4 hrs. lab. Multi-functional team approach to creative problem solving; apparel product design, evaluation, and production using advanced pattern making techniques and technology.

7046 Advanced Topics in Apparel Merchandising (3) F Prereq.: HUEC 4043, 6 hrs. lab. Application of product development, buying and management of apparel merchandise; current industry issues and trends; emphasis on theory of merchandising and related strategies.

7047 Internship in Textiles, Apparel, and Merchandising (3) S or 60 hrs. Prereq.: 3000-level course plus 3.00 in GPA. One-semester internship in area of orientation workshop prior to enrollment. MKT 3401. Merchandising concentration: credit in HUEC 3043 and 3045. Apparel concentration: credit in MKT 3045, 3230, and 3232; textile science concentration: HUEC 4043.

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1000 Keyboarding (1) 2 hrs. lab. Presentation of the complete keyboard; keyboarding using the “touch” system; emphasis on correct keystroking using proper techniques; introduction to simple letters, paragraphs, manuscripts, and simple business forms.

1001 Industrial Engines: Maintenance and Repair (3) V 6 hrs. lab. Design, construction, operation, and maintenance procedures of industrial engines, including electrical, cooling, lubricating, and fuel systems.

2000 Document Production (3) Prereq.: HRE 1003 or equivalent. 2 hrs. lecture; 4 hrs. lab. Application of advanced word processing functions to the production of letters, documents, and reports; specialized documents and forms for legal, medical, technical; emphasis on production skills.

2001 Foundations of Human Resource Education (3) F 2 hrs. lecture; 2 hrs. lab. Training in the economic, sociological, and political influences on the historical development of workplace education; organization and delivery of workplace education and practices at the secondary and post-secondary levels.

2008 Individual Field Experience in Occupational Home Economics (1-3) Prereq.: consent of instructor. A max. of 6 hrs. of credit if topics vary. Supervised, field-based study in selected businesses and industries; emphasis on business practices, procedures, and regulations in a specific occupational home economics field.

2012 Woodworking Technology (3) V 6 hrs. lab. Advanced machine tool operations, job procedures, design and finishing.

2022 Advanced Metals (3) V 6 hrs. lab. Founding, forging, heat treatment, and machine tool work.

2030 General Electricity (3) V 6 hrs. lab. Fundamental principles of electricity; current and alternating current circuits.

2031 Basic Electronics (3) V 6 hrs. lab. Basic electronic principles and circuitry as applied to diodes, vacuum tubes, power transformers, inductors, capacitors, resistors, and rectifiers.

2040 Technical Drawing, Reading, Sketching, and Takoff (3) V 2 hrs. lecture; 6 hrs. lab. Basic reading of the mechanical and building trades; freehand sketching, materials takeoff, and estimating.

2045 Fundamentals of Air Conditioning and Refrigeration (3) V 1 hr. lecture; 4 hrs. laboratories. Principles, components, functions, and application of air conditioning and refrigeration systems; problems in equipment performance, operation, inspection, repair, and maintenence.

2053 Occupational Safety (3) S F Introduction to accident-producing conditions and practices in plant facilities, materials handling, machine safeguarding, hand tools, and occupational health.


2620 Practicum in Business and Office Education (2) S Prereq.: 2000-level course in subject. 1 hr. observation with instructor to discuss topics relative to student's job. Actual office experience of at least 10 hrs. per week providing on-the-job training in a clerical, secretarial, or bookkeeping field.

2621 Practicum in Distribution Education (2) One-hour weekly seminar with instructor to discuss topics relative to study in distribution. Students will observe work one week in a selling position in an approved retail establishment.

2723 Introduction to Leadership Development (3) F An honors course. HRE 2724 is available. Introduction to leadership development.
students understanding their personal traits, values, characteristics, and development tasks as a foundation for leadership development. For HRE 3603 and HRE 3605. This course strives to better prepare today’s teachers/trainees to deliver their goals of helping children grow who are living in a complex, independent world. Each of the various diversities addressed in this course mediate one another and issues that further complicates an educator’s task, but is nonetheless critical to an understanding of classroom interaction.

3605 Field Experience Resource Classroom Management (1) V Prereq.: concurrent registration in or credit for HRE 3603 and 3604. The purpose of this field experience is to expose the student to learning in the classroom, participating with the classroom teacher, and then reflecting on the experience. Motivation, classroom management, and teaching strategies are the focal areas of the experience. Prereq. for HRE 3724, is also available. Survey of leadership theory, concepts, and research; emphasis on understanding the foundational concepts of modern leadership.

3724 HONORS: Leadership Concepts and Principles (3) F Prereq.: Hons College students only. Same as HRE 3723 with special honors emphasis.

4001 History of Human Resource Education (3) V Events and organizations that contributed to the development of the profession.

4003 Independent Reading and Research in Human Economics Education (1-3) Prereq.: consent of instructor and director of major. 2 hrs. or credit. Students are responsible for registering with a faculty member with whom they will select the area of reading and research.


4101 Communications in Extension Education (3) F Synthesis and application of concepts and principles of communication in the extension educational program.


4200 Teaching: Manufacturing Industries (3) V An activity-oriented, conceptually based teacher education curriculum, incorporating methods and materials of The World of Manufacturing as developed by the Industrial Arts Curriculum Project. Prereq.: HRE 3723 and 3722. An honors course, HRE 4724, is also available.

4210 Teaching: Cooperative Education (3) V Organization and administration of cooperative education programs in public secondary education; historical foundations; relevant federal legislation.

4260 Teaching in Human Resource Education Content Areas (3) S Prereq.: HRE 2001, 3701, and 3702. Teaching human resource education in traditional classroom settings, with emphasis on content area, selection of materials, and planning instruction.

4376 Orientation to Human Resource Education Laboratory Experiences (3) V Prereq.: HRE 3001, 3701, and 3702. Preparation, organization, and evaluation of human resource education laboratory experiences.

4522 Instruction and Information Technology (3) V 2 hrs. lecture; 2 hrs. lab. Broad introduction to the vast array of information technologies as well as a survey of the global, ethical, political, cultural, social, and environmental issues raised by information technology; building skills in integrating information technologies into a workforce curriculum.

4528 Foundations of Distance Learning (3) V Prereq.: HRE 3101 or 3711. Overview of the theories, models, and systems of distance education. Focus on understanding the foundations of distance learning, the design and delivery methodologies, and the role of the instructor and learner.

4591 Advanced Distance Learning (3) S Prereq.: HRE 4281 or permission of instructor. Overview of the theories and practices surrounding online interaction environments. Focus on understanding the development and sustainability required for success online learning.

4594 Assessment, Career Development, and Productivity (3) F Assessing present and future needs of the human resource education student; procedures used to evaluate student preferences, career potential, and occupational placement.

4644 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 outside the formal school system.

4640 Youth Leadership Development (3) V Principles and practices in planning, organizing, and conducting youth organization activities.

4727 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 intervention in the workplace.

4753 Managing the Human Resource Development Function (3) Su Study of human resource development (HRD) within organizations with emphasis on practical application of principles for effective leadership, management, and administration of the HRD function.

4755 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.

4759 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.

4855 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 any specific area of consulting expertise.

4901 Workforce Education Learner Assessment (3) V Assessment of progress in the workforce education program. Focus on understanding the different processes for valid assessment.


4904 Teaching: Youth Leadership Development (3) S Prereq.: HRE 3723 and 3702. An honors course, HRE 4724, is also available. Focus on developing the leadership skills students need to effectively lead families, communities, and teams to achieve their vision and goals.
4724 HONORS: Advanced Leadership Development (3) F
Prereq.: HRE 2724 and 3724; Honors College students only. Same as HRS 4724. May not be taken for credit if student has 4124 or 4128.

4801 Teaching Internship: Professional (3) V Prereq.: concurrent enrollment in HRE 4801 and 4803. Permission of instructor. Professional responsibilities; teacher association work; teacher, parent, and student organization activities; school visits and certification. Not for graduate credit. Evaluation of the student's lesson preparation, demonstration ability; laboratory organization, participation in class activities, and evaluating teaching environment.

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

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

4804 Professional Development Internship (3-12) F,S
May be taken for a max. of 12 sem. hrs. of credit. Not for graduate credit. Permission of instructor. Students are mentored in the business community as they learn various skills that would make them highly employable.

4805 Making the Transition from College to Work (1) V Prereq.: concurrent enrollment 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 self-assessment, quickly learning and handling tasks on the job, the skills needed to win management's respect to quickly train and learn to be a top performing new employee and avoid typical mistakes college graduates make as new employees.

4806 Advanced Study of Adult Learning Theory and Research; 7024 Comparative Education (3) V Prereq.: concurrent enrollment in HRE 4801 and 4803. Permission of instructor. Not for graduate credit. Evaluation of the student's lesson preparation, demonstration ability; laboratory organization, participation in class activities, and evaluating teaching environment.

4807 Teaching Internship in Human Resource Education (6) V Prereq.: permission of instructor. 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 an activity, teacher/pupil/student organization activities; conducting school observational visits; completing teacher certification requirements.

4808 Advanced Problems in Human Resource Education (1-3) F,S,C
May be taken for a max. of 6 sem. hrs. credit. Not for graduate credit. Permission of instructor. Individual and group problems.

4819 Special Topics in Agricultural Education (1-3)
May be taken for a max. of 6 sem. hrs. of credit when topics vary. Focus on special and critical problems and materials; delivering instruction in classroom, laboratory, and field environments; developing instructional materials; participated in professional associations; planning and conducting a teacher/pupil/student organization activities; conducting school observational visits; completing teacher certification requirements.

4831 Special Topics in Industrial Education (1-3) V May be taken for a max. of 6 sem. hrs. of credit when topics vary. Focus on special and critical problems and materials; delivering instruction in classroom, laboratory, and field environments; developing instructional materials; participated in professional associations; planning and conducting a teacher/pupil/student organization activities; conducting school observational visits; completing teacher certification requirements.

4849 Special Topics in Educational Leadership (3-6) V May be taken for a max. of 6 sem. hrs. credit when topics vary. Focus on special and critical problems and materials; delivering instruction in classroom, laboratory, and field environments; developing instructional materials; participated in professional associations; planning and conducting a teacher/pupil/student organization activities; conducting school observational visits; completing teacher certification requirements.

7041 Foundations of Industrial Education (3) V History and philosophy of industrial arts/technology education and vocational education; expected practices in conducting the adult agricultural education program.

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

7110 Advanced Instructional/Curricular Design in Human Resource Education (3) V Prereq.: concurrent enrollment in the theory, principles, research, and practices of instructional systems design (IED) in human resource development (HRD) at the individual and group level.

7122 Program Development in Agricultural Education (3) V Development of curriculum; organization and use of committees; organization of facilities; utilization of the FFA in instruction.

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

7125 Program Development in Human Economics Education (3) V Principles and applied practices in developing programs in human and family life education for multicultural groups.

7171 Instructional Design for Human Resource Development (3) V Principles and applied practices in developing programs in human and family life education for multicultural groups.

6001 Teaching in General Business Education (3) F,S,Su May be taken for a max. of 3 sem. hrs. credit. Not for graduate credit. Permission of instructor. Individual and group problems.

7131 Instructional Design for Human Resource Development (3) V Principles and applied practices in developing programs in human and family life education for multicultural groups.

7201 Advanced Teaching Techniques in Human Resource Education (3) F,S,Su May be taken for a max. of 6 sem. hrs. credit. Not for graduate credit. Permission of instructor. 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 an activity, teacher/pupil/student organization activities; conducting school observational visits; completing teacher certification requirements.

7205 Teaching in Higher Education (3) V Methodology and skills for effective college classroom 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 and Practices of Extension Education (3) V Prereq.: HRE 7122 or equivalent. Learning and teaching concepts applied in the execution of an extension education program.

7242 Programmed Instruction (3) V Principles of programmed instruction; development of programmed instruction; concepts of discipline and development of a personal philosophy of discipline.

7275 Improvement of Instruction in Keyboards, Word Processing, and Home Economics Equipment (3) V Techniques and strategies related to the teaching of clerical skills.

7298 Improvement of Instruction in General Business, Accounting, and Bookkeeping (3) V Techniques and strategies related to the teaching of accounting and 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 skills for traditional classroom teaching, as well as informal work-based learning strategies.

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

7304 Human Resource Education for Special-Needs Students (3) Su 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 an independent study. Analysis of educational, occupational, and social information; occupational trends and surveys; use of occupational information by teachers; curruculum/course development.

7334 Vocational Counseling (3) V See ELRC 7334.

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

7395 Field Experiences in Vocational Counseling (3) V See ELRC 7395.

7401 Administration of Adult Human Resource Education Programs (3) V Role of adult education as a component of vocational education in contemporary society; preparation of the program plan, implementation, evaluation, development, financing, administration, and

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

7517 Performance and Needs Analysis in Human Resource Development (3) V Techniques and methodologies used in the analysis of performance problems in organizations; emphasis on the application of performance theory and use of tools and techniques for designing, developing, implementing, and individual level performance problems.

7573 Strategic Human Resource Development for Global Workforces (3) V The theory, principles, and methodologies used by human resource development to improve performance in work systems.

7575 Managing Change in Organizational Systems (3) V Introduction to the theory, methods, and practice of organizational change and development; emphasis on the role of the HRD practitioner as change agent and the emerging role of change and manage organization change.

7602 Program Evaluation Design (3) V Systematic application of social research procedures for evaluating the conceptualization, design, implementation, and utility of vocational educational programs.

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

7641 Selected Topics in Human Resource Development (3) V Principles and procedures for evaluating and improving home economics programs for diverse groups. May be taken for a max. of 12 sem. hrs. of credit. Not for graduate credit.

7705 Supervision in Human Resource Education (3) V Principles of supervision in workforce teaching at all levels.

7703 Supervision of Professional Field Experiences in Human Resource Education (3) V Philosophy, principles, and procedures in supervision of student teaching in human resource education.

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

7720 Leadership and Organization (3) V Application of relevant principles from leadership theory, group dynamics, social organization, and organizational administration to programs 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 through job experience, feedback intensive programs, and skill-building programs.

7741 Administration and Supervision of Vocational Education (3) V Principles, theoretical, and practical considerations in administering and supervising secondary and post-secondary vocational and technical education programs and staff.

7789 Practicum for the Human Resource Educator (3-9) F,S,Su May be taken for a max. of 9 sem. hrs. credit when topics vary. Faculty directed study of relevant topics in workforce education.

7805 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 in 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 Technology Change and Human Resource Education (3) V Scientific developments in agriculture; their impact on programs in agricultural education.

7818 Advanced Leadership Development (1) V Prereq.: HRE 7122 or equivalent. May be taken for a max. of 3 hrs. credit at master's level; minimum of 2 sem. hrs. required at the doctoral level for professional educational problems in vocational agriculture.

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

7823 Independent Study in Extension Education (3) V May be taken for a max. of 6 hrs. of credit. Permission of
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; interaction of applications with the Internet; analysis, design, and implementation of industrial and business networks.

4453 Quality Systems Engineering (3) Prereq.: grade of C or better in IE 3302. Principles and practice of quality assurance and control; theory of statistical sampling and control charts; design of experiments; statistical quality control; Six Sigma principles and practice.

4461 Human Factors Engineering (3) Prereq.: senior standing. Basic principles of human factors engineering such as human performance, air contamination, toning and nonionizing radiation, sound and vibration, and thermal stress; the foundation of application of the theory of occupational health hazards.

4465 Biomechanics for Engineers (3) See IE 4223.

4466 Human Computer Interaction (3) Prereq.: IE 2060 or equivalent. Systems approach to the identification, design, analysis, and development of human-operated information processing systems and control programs. Applications to industry, military, health systems, and education.

4700 Knowledge-Based Systems in Engineering (3) Prereq.: senior standing. Applications to expert systems and Artificial Intelligence. 2 hrs. lecture; 3 hrs. lab. Tools and techniques of knowledge-based expert systems as applied to engineering problems; evolution of expert systems building tools; state-of-the-art engineering expert systems.

4800 Manufacturing Automation (3) Prereq.: IE 3201 and ME 3635. 2 hrs. lecture and 3 hrs. lab. Application of computer-based control system techniques to manufacturing automation; programming of numerically controlled machine tools using Compact II and AP; robotics with multidegree of freedom linkages; NC programming using CAD/CAM; computer-automated part programming.

4845 Systems Approach to Manufacturing (3) Prereq.: IE 2060; ME 3635; 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 organization.

4900 Engineering Management (3) Prereq.: IE 1002, IE 3002, and credit or registration in IE 4425. Design, operation, and monitoring of a system to efficiently control manufacturing costs; maintenance organization and systems, preventive maintenance, maintenance planning and scheduling, maintenance work measurement, labor performance, safety programs, and parts purchasing.

5010 Plant and Shop Layout (3) Prereq.: IE 3201; grade of C or better in IE 3302. Clone 2141; and senior standing in College of Engineering. Machine loading, assembly line balancing techniques; layout of manufacturing systems, integrating materials-handling systems into the plant, design of plant service systems, site and plant location, and projects involving plant design using optimization techniques, ethics and professionalism.

5200 Supply Chain Logistics II (3) Prereq.: grade of C or better in IE 3520. Production logistics; forecasting, aggregate production, inventory systems, and materials requirement planning; lean supply system and supply chain management; warehousing and distribution systems; supply chain information technologies, and government policies/regulations.

5430 Lean Manufacturing Systems (3) Prereq.: IE 2060, 3320 and credit or registration in IE 4362. 2 hrs. lecture; 3 hrs. lab. Principles of Lean Manufacturing Systems; Queuing Theory and Analysis of Manufacturing Systems; Assessment-Industrial Process Mapping, Workflow Analysis; Improvement Activities Process and Operational 4V-Variances; Reducing Cost Work-in-Process Reduction, Waste Reduction, Zero Inventory and Just-in-time Production Systems; Design for Lean Manufacturing; Material and Shop Floor Control; Simulation Modeling and Analysis of Lean Systems.

5460 Reliability Engineering (3) Prereq.: IE 3302. Reliability concepts and methodology. Assesses the adequacy of design during pre-production development and testing; and special problems in maintenance, spare parts, and Markov processes.

5499 Industrial Engineering Seminar (3) Prereq.: IE 4425, 4453, 4516, 4520, 4530 and ME 3635; consent of department. Must be taken during the last semester of the undergraduate degree program. Must be taken in fall semester immediately prior to graduation; for spring or summer graduates, must be taken in the spring semester immediately prior to graduation. Study of current trends in industrial engineering. Applications of the course. Application of previous industrial engineering courses in a comprehensive design project; preparation for the industrial engineering board exam. Sections may be taken concurrently if topics vary. Topics in industrial engineering not sufficiently covered in other upper-division courses.

7201 Advanced Engineering Economy (3) Prereq.: IE 3201 or equivalent. Engineering economic analysis, multiple projects and constraints, capital and present worth, and economic analysis of capital projects with preference ordering theory, and capital equipment pricing theory.

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

7382 Probability Theory in Engineering (3) Prereq.: IE 4425 or equivalent. Random variables and their functions; transformation of random variables; sets of random variables and random sequences; expectation, special distributions, random processes, discrete and continuous Markov processes, birth and death processes, and waiting line theory.

7395 Systems Industrial Engineering Simulation (3) Prereq.: IE 4530 or equivalent. Design and analysis of simulation models for industrial systems including advanced techniques for random number generation, random variate generation, design and analysis of simulation experiments, and variance reduction techniques.

7422 Information Systems Engineering (3) Prereq.: IE 4425 or equivalent. 2 hrs. lecture; 3 hrs. lab. Advanced concepts of information systems engineering with emphasis on middleware architectures/technologies for integrating databases; design issues and methodology for developing and implementing distributed information systems. Design and implementation of data warehouses and online analytical processing (OLAP) systems.

7455 Lean Process Improvement (3) Philosophy and concepts of quality and process improvement, organization for quality, quality improvement (QI) tool techniques, advanced QI techniques, and quality improvement system development. Application of advanced Six Sigma and Lean tools and techniques to case studies related to the construction industry. Investigation, learning, and application of current research related to the course topics.

7461 Ergonomics in Work Design (3) Prereq.: IE 4461 or equivalent. 2 hrs. lecture; 3 hrs. lab. Introduction to anthropometry, functional anatomy and physiology, and their application in work design and task assessment.

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, radiation, and chemical, biological, and physical quality and contamination; design of ventilation systems.

7464 Work Physiology (3) Prereq.: IE 4463 or equivalent. Study of the relationship of the human body (pulmonary, muscular) to work applicable to task design and evaluation, employee selection and placement, and worker performance.

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 4465 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, e.g., text editing.

7467 Cognitive Ergonomics and Work Environments (3) Prereq.: IE 3302 and 4461, or equivalent. Topics in cognitive ergonomics and work environments, visual and auditory displays, and aspects of the work environment such as noise, socio-technical systems, and work stress factors. Applications to workplace settings including construction, healthcare, and the service sector.

7470 Artificial Intelligence Manufacturing Systems (3) Prereq.: IE 4425 or equivalent. An overview of the main artificial intelligence tools and techniques to computer integrated manufacturing systems including maintenance, product design, process planning, simulation, computer integrated manufacturing systems, and material requirement planning.