Industrial Engineering (IEEN)

IEEN 2310 Appl. Meth. in Engr. Stat. I **3 SCH (3-0)**
An introduction to basic concepts, methods, techniques and major statistical software packages in applied statistics and data analysis. Topics include descriptive and basic inferential statistics: sampling, probability distributions, estimation, hypothesis testing, and analysis of variance. Prerequisite: MATH 2413.

IEEN 3310 Appl. Meth. in Engr. Stat. II **3 SCH (3-0)**
Basic experimental designs, tests of hypothesis, analysis of variance, correlation and regression, and factorial design. Prerequisite: IEEN 2310 and MATH 2414.

IEEN 3314 Engr. Meth. In Qual Assurance **3 SCH (2-3)**
Quality control with statistical principles applied to problems in various production systems, control chart concepts, process capability analysis and sampling inspection plans; laboratory exercise for exposure to basic metrology and applied statistics for quality control applications in discrete-item manufacturing systems. Prerequisite: IEEN 2310.

IEEN 3315 Comp. Based Prod. & Inv. Con. **3 SCH (3-0)**
Modeling, design, and optimization of systems for production and inventory control, forecasting and market analysis, time series analysis, fixed order size systems, batch type production systems, discrete demand systems, MRP and JIT. Prerequisite: MATH 3320.

IEEN 3321 Op. Research Meth. in Engr. I **3 SCH (3)**
Development and application of fundamental deterministic analytical methods including linear programming, integer programming,transportation problems, assignment problems. Prerequisite: MATH 2414.

IEEN 3325 Engr Economic Analysis I **3 SCH (3-0)**
Basic concepts of time value of money and economic equivalence, correlation between engineering design and the economic issues, fundamental engineering project incorporates simple and compound interest, present and future worth, equal payment series, depreciation, rate of return calculation, replacement analysis, capital budget, and cost comparisons. Prerequisite: junior standing.

IEEN 3341 Human Factors and Ergonomics **3 SCH (3-0)**
Human capacity and limitation within a system that covers human information processing, biomechanical functioning, and workstation and job design. Human factor and ergonomic principles in engineering design and analysis. Prerequisite: Junior Standing.

IEEN 4163 Senior Design Project I **1 SCH (1-0)**
Capstone design course emphasizing quantitative analysis including statistical methods, operations research, and simulation as applied to the design process. Prerequisite: IEEN 3310 and senior standing in Industrial Engineering.

IEEN 4264 Senior Design Project II (WI) **2 SCH (1-3)**
Capstone design emphasizing analysis and design of manufacturing systems, cellular design, flexible manufacturing systems, and manufacturing integration. Integrates knowledge gained from all required industrial engineering courses in a system design project. Prerequisite: IEEN 4163 and senior standing in Industrial Engineering.

IEEN 4312 Supply Chain Management **3 SCH (3-0)**
This course applies operations research techniques to optimize the design, planning and operation of supply chain systems. Facility location, capacity allocation, transportation, inventory, and risk management. Prerequisite: IEEN 3321 or approval of instructor.

IEEN 4313 Standards in Supply Chain **3 SCH (3-0)**
An introduction to basic concepts and knowledge of standards of cybersecurity in supply chain and their applications. An introduction to assessment and mitigation of cybersecurity risks in supply chain. Prerequisite: senior standing.

IEEN 4316 Facility Design & Plant Layout **3 SCH (2-3)**
Modern plant layout and materials handling practices, stressing the importance of interrelationships with management planning, product and process engineering, and production control. Prerequisite: IEEN 2310 and senior standing.

IEEN 4321 Op. Research Meth. in Engr. II **3 SCH (3)**
Development and application of probabilistic analytical methods including decision making, Markov chains, queuing systems and Game theory. Prerequisite: MATH 3415.

IEEN 4325 Engr. Economic Analysis II **3 SCH (3-0)**
Advanced topics in economics analysis and control of industrial enterprises. Cash flow estimating, measuring costs in industry, economic budgeting, planning, decision making, taxes, and financial analysis for engineering design and manufacturing of products/systems. Prerequisite: IEEN 3325.

IEEN 4328 Appl. of Computer Simulation **3 SCH (2-3)**
Basic simulation modeling, advanced simulation including discrete events, queuing systems, inventory systems, and manufacturing systems, and analysis of computer simulation models using simulation language. Prerequisite: IEEN 3310.

IEEN 4332 Prin of Engr Proj Management **3 SCH (3-0)**
Techniques relating to managing engineering activities, engineer's transition into management, financial decision making, engineering managerial functions, motivation of individual and group behavior, productivity assessment/improvement, management of the quality function and communications. Prerequisite: senior standing or approval of instructor.

IEEN 4334 Lean Manufacturing **3 SCH (3-0)**
Lean terminology and philosophy, Just-in-Time, six sigma, and continuous improvement. Lean manufacturing approaches to help increase the efficiency of materials handling and flow, reduce manufacturing costs, reduce or eliminate waste, and increase profit margins. Prerequisites: MATH 2413, senior standing or approval of instructor.

IEEN 4335 Special Problems **1-3 SCH (0-0-1-3)**
Individual solution of selected problems in Industrial Engineering conducted under the direct supervision of a faculty member. May be repeated up to 6 hours. Prerequisite: Senior Standing.

IEEN 4336 Selected Topics **1-3 SCH (0-0-1-3)**
Advanced topics in Industrial Engineering related to new technology or cutting-edge research. May be repeated when topic changes. Prerequisite: Senior Standing.

IEEN 4351 Reliability & Adv. Top. in QC **3 SCH (3-0)**
Reliability measures, reliability and hazard functions, failure density functions and system failure models, important distribution function models, reliability estimations, sequential life testing, total quality control including business quality management, and application of total QC in the company. Prerequisite: IEEN 3314.

IEEN 4354 System Safety Engineering **3 SCH (3-0)**
System safety analytical techniques, product safety program, risk assessment, human factors, automations, working environments and product liability applications relative to the design of systems for government, military and general industry. Prerequisite: senior standing or approval of instructor.

IEEN 4360 Comp. Int. Manuf. Sys. **3 SCH (3-0)**
System concept of computer integrated manufacturing system, definition of manufacturing and its various levels, planning and control of product movement through the production system, successful use of automation, robotics, just-in-time manufacturing, and knowledge-based systems. Prerequisite: IEEN 3315.