

INDUSTRIAL ENGINEERING (ENGI)

ENGI 220 Engineering Economy 3 Credit Hour(s)

Resident Prerequisite: MATH 131 or MATH 126 or ENGR 131

Online Prerequisite: MATH 126 or MATH 131 or ENGR 131

Introduction to the principles of time value of money, analysis of investments, break-even concepts, risk analysis, alternatives analysis, tax implications, certainty and uncertainty.

Offered: Resident and Online

ENGI 230 Production Systems 3 Credit Hour(s)

Prerequisite: ENGR 110 and CSIS 111

Introduction to manufacturing and production processes. Topics include production process as a human/machine system, planning, organizing, designing, and operating production systems.

Offered: Resident and Online

ENGI 299 Internship 0 Credit Hour(s)

Placement in a manufacturing plant, hospital, library, police department, or similar location, or related organization for a controlled learning experience within the student's career specialization area. Application procedures processed through the Career Center. Must apply semester prior to internship.

Registration Restrictions: Sophomore status, 2.00 GPA, two courses in major, declared major, not more than one CSER behind

Offered: Resident

ENGI 300 Enterprise Forecasting 3 Credit Hour(s)

Prerequisite: ENGR 210 and First Year Engineering Gate with a score of 5
Advanced forecasting and data modeling methods and techniques.

Note: First Year Engineering Gate courses consistent of: MATH 131, MATH 132, PHYS 231, and ENGR 110 (or ENGR 115) with a grade of 'C' or higher

Offered: Resident

ENGI 305 Data Analysis Methods and Modeling 3 Credit Hour(s)

Prerequisite: ENGR 210

Revealing business and economic patterns and information hidden in data by transforming data using algebraic and statistical methods.

Offered: Resident

ENGI 307 Data Analysis and Machine Learning 3 Credit Hour(s)

Online Prerequisite: ENGR 210

Revealing business and economic patterns and information hidden in data by transforming data using algebraic and statistical methods. Enabling computers to learn to predict and categorize events by using data.

Offered: Online

ENGI 310 Operations and Research Logistics 3 Credit Hour(s)

Online Prerequisite: ENGR 210

Introduction to basic principles and application of deterministic analytical methods. Topics include linear programming, dynamic programming, nonlinear optimization, and genetic algorithms.

Offered: Online

ENGI 330 Facilities Design 3 Credit Hour(s)

Prerequisite: ENGI 230

Introduction to the design, analysis and selection of manufacturing facilities and material handling equipment. Topics include integration of computer systems, material flow and storage, and economic implications.

Offered: Resident and Online

ENGI 340 Introduction to Operations Research: Deterministic Models 3 Credit Hour(s)

Prerequisite: MATH 321 (may be taken concurrently) or MATH 221 (may be taken concurrently)

Introduction to basic principles and application of deterministic analytical methods. Topics include linear programming, integer programming, dynamic programming and nonlinear optimization.

Offered: Resident

ENGI 350 Introduction to Operations Research: Probabilistic Models 3 Credit Hour(s)

Prerequisite: ENGI 340 and ENGR 210 and CSIS 111

Introduction to decision-making modeling and analysis subject to randomness, uncertainty, and risk. Topics include stochastic dynamic programming, Markov chains, and queuing theory.

Offered: Resident

ENGI 360 Engineering Information Systems 3 Credit Hour(s)

Prerequisite: First Year Engineering Gate with a score of 5

Introduction to information systems used in the analysis, design, and management of complex engineering projects. Topics include identifying potential data anomalies and methods for ameliorating these problems.

Note: First Year Engineering Gate courses consistent of: MATH 131, MATH 132, PHYS 231, and ENGR 110 (or ENGR 115) with a grade of 'C' or higher

Offered: Resident

ENGI 371 Six Sigma, Lean and Kaizen 3 Credit Hour(s)

Online Prerequisite: ENGR 210

Six Sigma is a process improvement methodology that is important for quality management/improvement across a wide range of industries. It is a method that provides organizations tools and methods to improve the capability of their business processes by reducing variation while improving performance and profitability. Six Sigma places a strong emphasis on statistics and rigorous data analysis and the implementation process (DMAIC). Lean methods of process improvement are closely related to Six Sigma, and are often combined as "Lean Six Sigma." These methodologies rely on statistics-driven approaches to quality management, lean approaches focus on eliminating waste and non-value added processes, while traditional Six Sigma emphasis on reducing variation and improving control. In practice, these techniques are often interrelated and complement each other, as both work towards the goal of delivering the highest level of quality at the lowest cost.

Offered: Online

ENGI 420 Advanced Data Analysis and Machine Learning 3 Credit Hour(s)

Prerequisite: (ENGR 210 or MATH 211) and (MATH 221 or MATH 321) and (ENGR 133 or MATH 133)

Machine learning introduces the methods that are used to provide computers the ability to perform various levels of artificial intelligence (AI) with the ability to learn without being explicitly programmed. Machine learning focuses on the development of computer programs and algorithms as well as the underlying data requirements that can enable computers to teach themselves, self-organize objects, and to grow or change when exposed to new data or sensory information.

Offered: Resident

ENGI 428 CNC and Programming Logic Chips 3 Credit Hour(s)

Online Prerequisite: ENGE 205 or ENGE 211

This course introduces the fundamentals of Computer Numerical Control (CNC) for machining and Programmable Logic Chips (PLC) for factory control. Specifically, the course teaches the basic elements and tools of PLC necessary to create a complete program using ladder logic common to most platforms. The CNC aspects of the course focus on setup and programming of CNC machining and turning centers to include programming these tools on a variety of brands and machines.

Offered: Online

ENGI 430 Decision Analysis 3 Credit Hour(s)

Prerequisite: ENGI 220 and ENGI 350 (may be taken concurrently)

A first course in decision analysis that extends the domain of decision-making problems from those considered in traditional statistical hypothesis testing scenarios: modeling decisions, where the emphasis is on structuring decision problems using techniques such as influence diagrams and decision trees, modeling uncertainty, which covers subjective probability assessment, use of classical probability models, Bayesian analysis, and value of information, and modeling preferences, which introduces concepts of risk preference, expected utility, and multi-attribute value and utility models.

Offered: Resident

ENGI 450 Human Factors and Ergonomics 3 Credit Hour(s)

Prerequisite: ENGI 330

Human biological and psychological capabilities and limitations in the industrial setting. Topics include techniques and methods for applying the principles of human factors engineering and ergonomics to systems design.

Offered: Resident and Online

ENGI 460 Digital Simulation 3 Credit Hour(s)

Prerequisite: MATH 334

Introduction to the structure, logic and methodologies of systems simulation. Topics include the generation of random numbers, simulation languages, and simulation models and analysis.

Offered: Resident

ENGI 461 Engineering Technology Capstone I 3 Credit Hour(s)

Capstone (part 1) emphasizes the planning and project management process, from inception to completion. In addition to technical design, factors such as safety, economics and ethical and societal implications are considered.

Registration Restrictions: Must be taken in the last semester of enrollment

Offered: Online

ENGI 462 Engineering Technology Capstone II 3 Credit Hour(s)

Online Prerequisite: ENGI 461

Capstone (part 2) emphasizes the execution and implementation of the project process for an approved project. Students put into motion an approved project plan.

Note: Can be taken in the same semester as ENGI 461

Offered: Online

ENGI 497 Special Topics in Industrial and Systems Engineering 1-4 Credit Hour(s)

Selected topics in various areas of Industrial and Systems Engineering. May be repeated for credit when topic varies.

Offered: Resident

ENGI 499 ISE Internship 1-6 Credit Hour(s)

Placement in a manufacturing plant, hospital, library, police department, or similar location or related organization for a controlled learning experience within the student's career specialization area. Applications are processed through the department Faculty Intern Advisor. Applicants must apply the semester prior to starting the internship.

Registration Restrictions: Junior or Senior status

Offered: Resident