INDUSTRIAL & SYSTEMS ENGR (ISYE)

ISYE 1XXX. Industrial & Systems Engineering Elective. 1-21 Credit Hours.

ISYE 2027. Probability with Applications. 3 Credit Hours.
Topics include conditional probability, density and distribution functions from engineering, expectation, conditional expectation, laws of large numbers, central limit theorem, and introduction to Poisson Processes.

ISYE 2028. Basic Statistical Methods. 3 Credit Hours.
Point and interval estimation of systems parameters, statistical decision making about differences in system parameters, analysis and modeling of relationships between variables.

ISYE 2127. Honors Probability. 3 Credit Hours.
Topics parallel those in ISYE 2027 with an intended treatment that is more innovative and challenging. Credit not allowed for both ISYE 2127 and 2027.

ISYE 2128. Honors Statistics. 3 Credit Hours.
Topics parallel to those in ISYE 2028 with an intended treatment that is more innovative and challenging. Credit not given for both ISYE 2028 and 2128.

ISYE 2698. Undergraduate Research Assistantship. 1-12 Credit Hours.
Independent research conducted under the guidance of a faculty member.

ISYE 2699. Undergraduate Research. 1-12 Credit Hours.
Independent research conducted under the guidance of a faculty member.

ISYE 2801. Special Topics. 1 Credit Hour.
Courses in special topics of timely interest to the profession, conducted by resident or visiting faculty.

ISYE 2803. Special Topics. 3 Credit Hours.
Courses in special topics of timely interest to the profession, conducted by resident or visiting faculty.

ISYE 2XXX. Industrial & Systems Engineering Elective. 1-21 Credit Hours.

ISYE 3025. Essentials of Engineering Economy. 1 Credit Hour.
Introduction to engineering economic decision making, economic decision criteria, discounted cash flow, replacement and timing decisions, risk, depreciation, and income tax.

ISYE 3030. Basic Statistical Methods. 3 Credit Hours.
Point and interval estimation of systems parameters, statistical decision making about differences in system parameters, analysis and modeling of relationships between variables.

ISYE 3039. Methods of Quality Improvement. 3 Credit Hours.
Topics include quality system requirements, designed experiments, process capability analysis, measurement capability, statistical process control, and acceptance sampling plans. Credit will not be awarded for both ISYE 3039 and ISYE 6382.

ISYE 3044. Simulation Analysis and Design. 3 Credit Hours.
Discrete event simulation methodology emphasizing the statistical basis for simulation modeling and analysis. Overview of computer languages and simulation design applied to various industrial situations.

ISYE 3103. Introduction to Supply Chain Modeling: Logistics. 3 Credit Hours.
Course focuses on engineering design concepts and optimization models for logistics decision making in three modules: supply chain design, planning and execution, and transportation.

ISYE 3104. Introduction to Supply Chain Modeling: Manufacturing and Warehousing. 3 Credit Hours.
Design and operation of manufacturing and warehousing facilities.

ISYE 3106. Cornerstone Design for Industrial Engineers. 3 Credit Hours.
Structure a complex problem through information gathering, data analysis, industrial engineering and design principles application, project management, while working in and leading diverse teams.

ISYE 3133. Engineering Optimization. 3 Credit Hours.
Topics include modeling with networks and graphs; linear, nonlinear, and integer programming, construction of models employing modern modeling languages; and general solution strategies.

ISYE 3232. Stochastic Manufacturing and Service Systems. 3 Credit Hours.
Methods for describing stochastic movements of material in manufacturing facilities, supply chain, and equipment maintenance networks. Includes analysis of congestion, delays, and inventory ordering policies.

ISYE 3770. Statistics and Applications. 3 Credit Hours.
Introduction to probability, probability distributions, point estimation, confidence intervals, hypothesis testing, linear regression, and analysis of variance. Crosslisted with MATH 3770 and CEE 3770. Also, credit not awarded for both ISYE 3770 and MATH 3670.

ISYE 3790. Introduction to Cognitive Science. 3 Credit Hours.
Multidisciplinary perspectives on cognitive science. Interdisciplinary approaches to issues in cognition, including memory, language, problem solving, learning, perception, and action. Crosslisted with CS, PST, and PSYC 3790.

ISYE 3803. Special Topics. 3 Credit Hours.
Courses in special topics of timely interest to the profession conducted by resident or visiting faculty.

ISYE 3833. Special Topics. 3 Credit Hours.
Courses in special topics of timely interest to the profession, conducted by resident or visiting faculty.

ISYE 3XXX. Industrial & Systems Engineering Elective. 1-21 Credit Hours.

ISYE 4009. Design of Human-Integrated Systems. 3 Credit Hours.
Topics include general cognitive systems engineering concepts and principles, and specific concepts and principles of interface design, task analysis, prototyping, and empirical usability of evaluation methods.

ISYE 4031. Regression and Forecasting. 3 Credit Hours.
Regression analysis: multiple linear regression, diagnostics, and variable selection. Forecasting: exponential smoothing techniques and autoregressive moving average models.

ISYE 4034. Decision and Data Analytics. 3 Credit Hours.
This course integrates decision and data analytics to solve real-world business problems. It includes hands-on system modeling, data collection and analysis, and reporting writing projects.

ISYE 4045. Advanced Simulation. 3 Credit Hours.
Advanced modeling and statistical concepts in discrete-event simulations; Monte Carlo simulation; estimation of error and risk; advanced input modeling techniques; comparison and optimization of systems.

ISYE 4106. Senior Design. 4 Credit Hours.
Senior design project requiring student to formulate a project plan with an off-campus enterprise. Includes specific milestones, targets, and evaluation criteria.

ISYE 4111. Advanced Supply Chain Logistics. 3 Credit Hours.
This course is a follow-up to ISyE 3103 that covers optimization models and case studies for logistics network design and logistics operations.

ISYE 4133. Advanced Optimization. 3 Credit Hours.
Theory and implementation of practical methods to find good or optimal solutions to optimization problems too large or complex to solve in a straightforward way.

ISYE 4134. Constraint Programming. 3 Credit Hours.
This course is an introduction to constraint programming, from its modeling language to its computational methodology and its applications to scheduling, routing, and resource allocation.

ISYE 4232. Advanced Stochastic Systems. 3 Credit Hours.
The course will cover Jackson Networks and Markov Decision Processes with applications to production/inventory systems, customer contact centers, revenue management, and health care.

ISYE 4301. Supply Chain Economics. 3 Credit Hours.
The course studies techniques for coordination and collaboration in supply chains. Applications include pricing strategies, revenue management, gaming, and incentives.

ISYE 4311. Capital Investment Analysis. 3 Credit Hours.
Students learn core concepts and techniques for economic decision and analysis of complex capital investment problems that involve dimensions of time, uncertainty and strategy.

ISYE 4331. Honors Optimization. 3 Credit Hours.
Topics parallel those in ISYE 4231 with an intended treatment that is more innovative and challenging. Credit not given for both ISYE 4331 and 4231.

ISYE 4501. Energy, Efficiency, and Sustainability. 3 Credit Hours.
Analysis and modeling of energy production and use, material and energy efficiency, sustainability, and cost for systems, products, and services.

ISYE 4698. Undergraduate Research Assistantship. 1-12 Credit Hours.
Independent research conducted under the guidance of a faculty member.

ISYE 4699. Undergraduate Research. 1-12 Credit Hours.
Independent research conducted under the guidance of a faculty member.

ISYE 4740. Bio-Inspired Design. 3 Credit Hours.
We examine evolutionary adaptation as a course for engineering design inspiration, utilizing principles of scaling, adaptability, and robust multifunctionality that characterize biological systems. Credit not allowed for both ISYE 4740 and (BIOL 4740, or PTFE 4740 or MSE 4740 or ME 4740).

ISYE 4800. Special Topics. 0 Credit Hours.
ISYE Senior Design Preparation.

ISYE 4801. Special Topics. 1 Credit Hour.
Courses in special topics of timely interest to the profession, conducted by resident or visiting faculty.

ISYE 4802. Special Topics. 2 Credit Hours.
Courses in special topics of timely interest to the profession, conducted by resident or visiting faculty.

ISYE 4803. Special Topics. 3 Credit Hours.
Courses in special topics of timely interest to the profession, conducted by resident or visiting faculty.

ISYE 4813. Special Topics. 3 Credit Hours.
Courses in special topics of timely interest to the profession conducted by resident or visiting faculty.

ISYE 4823. Special Topics. 3 Credit Hours.
Courses in special topics of timely interest to the profession, conducted by resident or visiting faculty.

ISYE 4833. Honors Topics. 3 Credit Hours.
Topics of current interest in the field of ISYE that are covered with an appropriately high level of innovation and rigor.

ISYE 4843. Special Topics. 3 Credit Hours.
Topics of current interest in the field of ISYE.

ISYE 4852. Special Topics. 2 Credit Hours.
Courses in special topics of timely interest to the profession, conducted by resident or visiting faculty.

ISYE 4991. Special Problems. 1-21 Credit Hours.
A variable hour credit opportunity to develop initiative and apply fundamental principles by performing semioriginal laboratory or research work in ISYE.

ISYE 4992. Special Problems. 1-21 Credit Hours.
A variable credit hour opportunity to develop initiative and apply fundamental principles by performing semioriginal laboratory or research work in ISYE.

ISYE 4993. Special Problems. 1-21 Credit Hours.
A variable credit hour opportunity to develop initiative and apply fundamental principles by performing semioriginal laboratory or research work in ISYE.

ISYE 4XXX. Industrial & Systems Engineering Elective. 1-21 Credit Hours.