INDUSTRIAL & SYSTEMS ENGR (ISYE)

ISYE 6101. Organizational Behavior for Engineers. 3 Credit Hours.
Studies the scientific generation, formalization, and application of the knowledge of individual and group behaviors that engineers need to function effectively within contexts.

ISYE 6134. 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 6201. Manufacturing Systems. 3 Credit Hours.
Topics include analysis of flows, bottlenecks and queuing, types of operations, manufacturing inventories, aggregeate production planning, lot sizes and lead times, and pull production systems.

ISYE 6202. Warehousing Systems. 3 Credit Hours.
Topics include design and analysis of materials handling systems, warehouse layout, order picking strategies, warehousing inventories, warehouse management systems, integration of production and distribution systems. Credit will not be awarded for both ISYE 6202 and ISYE 6383.

ISYE 6203. Transportation and Supply Chain Systems. 3 Credit Hours.
Topics include supply chain characterization, site location, mode selection, distribution planning, vehicle routing, demand management, replenishment management, geographic information systems, and real-time control issues. Credit will not be awarded for both ISYE 6203 and ISYE 6383.

ISYE 6205. Cognitive Engineering. 3 Credit Hours.
Application of cognitive science concepts to system design, and the development of concepts appropriate for understanding and aiding cognition in naturally or technologically complex environments.

ISYE 6215. Models in Human-Machine Systems. 3 Credit Hours.
The development and use of mathematical models of human behavior are considered. Approaches from estimation theory, control theory, queuing theory, and fuzzy set theory are considered.

ISYE 6223. Understanding and Supporting Human Decision Making. 3 Credit Hours.
Prescriptive and descriptive theories of human decision making are discussed/contrasted. Approaches to aiding human decision making are considered in context of these theoretical frameworks.

ISYE 6224. Topics in Human-Integrated Systems. 3 Credit Hours.
State-of-the-art research directions including supervisory control models of human command control tasks; human-computer interface in scheduling and supervision of flexible manufacturing systems.

ISYE 6225. Advanced Engineering Economy. 3 Credit Hours.
Advanced engineering economy topics, including economic worth, economic optimization under constraints, risk and uncertainty, foundations of utility theory.

ISYE 6227. Introduction to Financial Engineering. 3 Credit Hours.
Advanced techniques for economic analysis of capital investment. Basic terminology and financial engineering concepts for managing and valuing project risk. Real options applications in systems engineering.

ISYE 6229. Productivity Measurement and Analysis. 3 Credit Hours.
Modern measurement of productivity measurement and analysis including principles, issues, and latest techniques associated with benchmarking, efficiency measurement, and productivity tracking. Empirical studies and group projects.

ISYE 6230. Economic Decision Analysis. 3 Credit Hours.
Topics include preferences and utilities, social choice, equilibrium concepts, noncooperative and cooperative game theory, price mechanisms, auction mechanisms, voting theory, and incentive compatibility.

ISYE 6231. Design of Human-integrated Systems. 3 Credit Hours.
Analysis and design of complex work domains in technological environments. Credit not allowed for both ISYE 6231 and AE 6721.

ISYE 6232. Safety-critical Real-time Systems. 3 Credit Hours.
Study of system safety, human error, and software reliability.

ISYE 6234. Measurement and Evaluation of Human-integrated Systems. 3 Credit Hours.
Measurements of complex systems including workload, operator strategy, and performance.

ISYE 6307. Scheduling Theory. 3 Credit Hours.
Includes topics in sequencing and scheduling with emphasis on deterministic machine scheduling problems with some stochastic results examined. Complexity of various problems will be analyzed.

ISYE 6320. Public Impact Applications of Operations Research and Management Science. 3 Credit Hours.
The focus is on the health and public applications of Operations Research. Students will complete a group project with a non-profit organization and discuss papers.

ISYE 6331. Statistics for Supply Chain Engineering. 3 Credit Hours.
Collection, management, and analysis of supply chain data.

ISYE 6332. Finance for Supply Chain Engineering. 3 Credit Hours.
Investment and analysis of operating capital.

ISYE 6333. Operations Research for Supply Chain Engineering I. 3 Credit Hours.
Deterministic models of supply chains including location and material flow. Optimization techniques including linear programming, network flows, integer programming, and heuristics.

ISYE 6334. Operations Research fo Supply Chain Engineering II. 3 Credit Hours.
Probabilistic models of supply chains, including the effects of variability; models of wholesale and retail demand; forecasting and simulation.

ISYE 6335. Supply Chain Engineering I. 3 Credit Hours.
Production scheduling; inventory systems; warehousing, including stocking strategies, order-picking, sortation, automation; distribution.

ISYE 6336. Supply Chain Engineering II. 3 Credit Hours.
Transportation: truck-load and less-than-truckload, and package-courier systems; container shipping, including port operations, steamship scheduling; railroad operations, including intermodal; air cargo. The international freight network and patterns of freight flow. Management and recirculation of trailers/containers. Labor issues.

ISYE 6337. Supply Chain Engineering III. 3 Credit Hours.
Problems of coordination and collaboration along the supply chain; make-or-buy decisions; pricing and auctions; wholesale and retail channels; supply chain dynamics, including the bullwhip effect. Distinctive supply chain issues in key economies.

ISYE 6338. Suppply Chain Strategy. 3 Credit Hours.
Case studies of notable supply chains successes and failures.

ISYE 6339. Supply Chain Information Systems. 3 Credit Hours.
Planning and executing systems for inventory, warehousing, transportation, import/export, etc. Services-oriented architecture, cloud computing; systems integration; RFID and other technologies for scanning and monitoring.

ISYE 6340. Supply Chain Engineering Seminar. 3 Credit Hours.
Through a program of industry speakers and facility tours, student will learn to assess and critique supply chain practice.

ISYE 6341. Capstone Project for Supply Chain Engineering I. 3 Credit Hours.
Small groups of students undertake an industry-sponsored project under faculty guidance.

ISYE 6342. Capstone Project for Supply Chain Engineering II. 3 Credit Hours.
Small groups of students undertake an industry-sponsored project under faculty guidance.

ISYE 6380. Production Planning and Control. 3 Credit Hours.
Fundamentals of Production Planning and Lean Manufacturing.

ISYE 6381. Manufacturing Reliability. 3 Credit Hours.
Fundamentals of Reliability and Maintainability Engineering.

ISYE 6382. Quality Control and Six Sigma. 3 Credit Hours.
Fundamentals of Quality Control and Six Sigma Methods. Credit will not be awarded for both ISYE 6382 and ISYE 3039.

ISYE 6383. Fundamentals of Manufacturing Supply Chain Operations. 3 Credit Hours.
Fundamentals of Manufacturing Supply Chain Operations. Credit will not be awarded for both ISYE 6383 and ISYE 6202 or ISYE 6383 and ISYE 6203.

ISYE 6384. Advanced Manufacturing. 3 Credit Hours.
Introduction to advanced manufacturing and applications of process modeling methods for understanding and improving processes and systems for advanced composites, nanomaterials/nanomanufacturing, and additive manufacturing.

ISYE 6401. Statistical Modeling and Design of Experiments. 3 Credit Hours.
Fundamental coverage of topics in multiple regression and factorial experiments.

ISYE 6402. Time Series Analysis. 3 Credit Hours.
Basic forecasting methods, ARIMA models, transfer functions.

ISYE 6404. Nonparametric Data Analysis. 3 Credit Hours.
Nonparametric statistics and basic categorical data analysis.

ISYE 6405. Statistical Methods for Manufacturing Design and Improvement. 3 Credit Hours.
Fractional factorial designs, response surface methods.

ISYE 6411. Fundamentals of Statistics with Applications. 3 Credit Hours.
Relationships of statistical estimation and linear models with regression, planning and analysis of experiments, and the analysis of correlated data. More mathematical than ISYE 6401.

ISYE 6412. Theoretical Statistics. 3 Credit Hours.
Rigorous introduction to theory of statistical inference. Estimation and testing. Construction and assessment of estimators and tests. Fundamentals of decision theory, minimax, and Bayes Paradigms.

ISYE 6413. Design and Analysis of Experiments. 3 Credit Hours.
Analysis of variance, full and fractional factoral designs at two and three levels, orthogonal arrays, response surface methodology, robust parameter design for production/process improvement.

ISYE 6414. Statistical Modeling and Regression Analysis. 3 Credit Hours.
Simple and multiple linear regression, inferences and diagnostics, stepwise regression and model selection, advanced regression methods, basic design and analysis of experiments, factorial analysis.

ISYE 6416. Computational Statistics. 3 Credit Hours.
This class describes the available knowledge regarding statistical computing. Topics include random deviates generation, importance sampling, Monte Carlo Markov chain (MCMC), EM algorithms, bootstrapping, model selection criteria, (e.g. C-p, AIC, etc.) splines, wavelets, and Fourier transform.

ISYE 6420. Introduction to Theory and Practice of Bayesian Statistics. 3 Credit Hours.
Rigorous introduction to the theory of Beysian Statistical Inference. Bayesian estimation and testing. Conjugate priors. Noninformative priors. Bayesian computation. Bayesian networks and Bayesian signal processing. Various engineering applications.

ISYE 6421. Biostatistics. 3 Credit Hours.
An introduction to fundamental ideas and techniques in Biostatistics, with an emphasis on conceptual understanding and on the analysis of real data sets.

ISYE 6501. Introduction to Analytics Modeling. 3 Credit Hours.
An introduction to important and commonly-used models in analytics, as well as aspects of the modeling process.

ISYE 6525. High Dimensional Data Analytics. 3 Credit Hours.
A variety of topics such as functional data analysis, image processing, multilinear algebra and tensor analysis, and regularization in high-dimensional regression.

ISYE 6644. Simulation. 3 Credit Hours.
Covers modeling of discrete-event dynamic systems and introduces methods for using these models to solve engineering design and analysis problems.

ISYE 6645. Monte Carlo Methods. 3 Credit Hours.
Covers state-of-the-art Monte Carlo simulation techniques. These techniques will be used to model and solve a variety of real-world problems from several diverse areas in science and engineering, including supply chain analysis and design, pattern recognition, VLSI design, network reliability, financial engineering, and molecular biology.

ISYE 6650. Probabilistic Models and Their Applications. 3 Credit Hours.
An introduction to basic stochastic processes such as Poisson and Markov processes and their applications in areas such as inventory, reliability, and queueing.

ISYE 6656. Queuing Theory. 3 Credit Hours.
Processing networks with queuing. Performance analysis using Markov process description of system behavior. Applications and numerical studies in manufacturing, system maintainability, computer systems, telecommunication networks.

ISYE 6661. Linear Optimization. 3 Credit Hours.
Theory, algorithms, and applications of linear programming. Topics include the simplex method and resolution of degeneracy, duality and sensitivity analysis, basis factorization, the dual and revised simplex methods, and geometry of polyhedra. Intended for Ph.D. students.

ISYE 6662. Discrete Optimization. 3 Credit Hours.
Fundamentals of integer and combinatorial optimization. Topics include polyhedra, cuts, Lagrangean duality, complexity, and others. This course is intended for Ph.D. students.

ISYE 6663. Nonlinear Optimization. 3 Credit Hours.
Fundamentals of nonlinear optimization. Topics include optimality conditions; convex programming and duality; unconstrained and constrained methods. Polynomial algorithms and interior point methods. Dual methods. This course is for students seriously considering a PhD.

ISYE 6664. Stochastic Optimization. 3 Credit Hours.
An introduction to sequential decision making under uncertainty. Much of the course is devoted to the theoretical, modeling, and computational aspects of Markov decision processes.

ISYE 6669. Deterministic Optimization. 3 Credit Hours.
An introduction to deterministic optimization methodologies including approaches from linear, discrete, and nonlinear optimization including algorithms and computations. Applications will be introduced as appropriate.

ISYE 6673. Financial Optimization Models. 3 Credit Hours.
An introduction to optimization techniques with special emphasis on applications to finance, including portfolio optimization, immunization, and risk management.

ISYE 6679. Computational Methods in Optimization. 3 Credit Hours.
Strategies and techniques for converting optimization theory into effective computational procedures. Emphasis is on applications in linear, integer, and nonlinear programming; networks and graphs.

ISYE 6701. Energy Technology and Policy. 3 Credit Hours.
Examines energy production, use, and production, use, and policy using quantitative engineering and policy analysis. Addresses resource constraints, physical principles, and policy analysis methods.

ISYE 6739. Basic Statistical Methods. 3 Credit Hours.
Overview of basic tools used in statistical analysis and modeling. Credit not allowed to students seeking a degree in ISYE.

ISYE 6740. Computational Data Analysis: Learning, Mining, and Computation. 3 Credit Hours.
Theoretical/computational foundations of analyzing large/complex modern datasets, including the fundamental concepts of machine learning and data mining needed for both resesarch and practice. Crosslisted with CSE 6740. Credit not awarded for both ISYE 6740 and CS 4641/7641/CSE 6740.

ISYE 6748. Applied Analytics Practicum. 6 Credit Hours.
Practical analytics project experience applying ideas from the classroom to a significant project of interest to a business, government agency, or other organization.

ISYE 6759. Stochastic Processes in Finance. 3 Credit Hours.
Mathematical modeling of financial markets, derivative securities pricing, and portfolio optimization. Concepts from probability and mathematics are introduced as needed. Crosslisted with MATH 6759.

ISYE 6761. Stochastic Processes I. 3 Credit Hours.
Discrete time Markov chains, Poisson and renewal processes; transient and limiting behavior; average cost and utility measures of systems. Intended for Ph.D students. Crosslisted with MATH 6761.

ISYE 6762. Stochastic Processes II. 3 Credit Hours.
Continuous time Markov chains; uniformization, transient and limiting behavior; Brownian motion and martingales; optional sampling and convergence. Intended for Ph.D. students. Crosslisted with MATH 6762.

ISYE 6767. Design and Implementation of Systems to Support. 3 Credit Hours.
Introduction to large-scale system design to support computational finance for options, stocks, or other financial instruments. Some programming experience and previous exposure to stocks, bonds, and options required. Crosslisted with MATH 6767.

ISYE 6769. Fixed Income Securities. 3 Credit Hours.
Description, institutional features, and mathematical modeling of fixed income securities. Use of both deterministic and stochastic models. Crosslisted with MATH 6769.

ISYE 6772. Managing Resources of the Technological Firm. 3 Credit Hours.
This course explores the competitive advantage manufacturing and service firms derive from the effective management of their technology, workforce, materials, and information resources. Crosslisted with MGT 6772.

ISYE 6773. Strategic Management of Technology-based Ventures. 3 Credit Hours.
This course provides a forum for the in-depth examination of issues involving the strategic management of high-tech corporate start-ups and small technology-based businesses. Crosslisted with MGT 6773.

ISYE 6774. Management of Technology Project. 3 Credit Hours.
This course organizes students into multidisciplinary teams devoted to solving a real problem for a technology-based firm. Crosslisted with MGT 6774.

ISYE 6775. Management of Technology Seminar. 1 Credit Hour.
This course introduces the frontiers of key technologies, provides a forum for visiting speakers from the corporate world, and supplements topics from other MOT courses. Crosslisted with MGT 6775.

ISYE 6777. Analysis of Emerging Technologies. 3 Credit Hours.
Methods for technology monitoring, forecasting, and assessment. Crosslisted with PUBP 6777.

ISYE 6779. Dynamic System Simulation and Modeling. 3 Credit Hours.
Models of dynamic systems, such as aircraft,ground vehicles, and machinery, and manual control. Numerical simulation techniques and applications. Interactive simulators. Student programming project. Crosslisted with AE 6779.

ISYE 6781. Reliability Theory. 3 Credit Hours.
Structural properties and reliability of coherent systems.

ISYE 6783. Statistical Techniques of Financial Data Analysis. 3 Credit Hours.
Fundamentals of statistical inference for models used in the modern analysis of financial data. Crosslisted with MATH 6783.

ISYE 6785. The Practice of Quantitative and Computational Finance. 3 Credit Hours.
Case studies, visiting lecturers from financial institutions, student group projects of an advanced nature, and student reports, all centered around quantitative and computational finance. Crosslisted with MATH and MGT 6785.

ISYE 6792. Computer Integrated Manufacturing Systems Seminar. 1 Credit Hour.
Guest speakers on a broad range of manufacturing-related topics: research, applications, and technology. Required for Certificate in Manufacturing. Crosslisted with ECE and ME 6792.

ISYE 6793. Advanced Topics in Quantitative and Computational Finance. 3 Credit Hours.
Advanced foundational material and analysis techniques in quantitative and computational finance. Crosslisted with MATH 6793.

ISYE 6795. 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 and PSYC 6795.

ISYE 6805. Reliability Engineering. 3 Credit Hours.
Topics include hazard functions, life distributions, censoring, life tables, nonparametric and parametric estimation and inference, accelerated life testing, structure functions, reliability and maintenance systems, replacement theory.

ISYE 6810. Systems Monitoring and Prognostics. 3 Credit Hours.
The course focuses on sensor-based condition monitoring techniques, modeling of degradation processes, fault diagnostics and prognostics of failures in engineering systems using stochastic and statistical methods.

ISYE 6815. Industrial Predictive Analytics. 3 Credit Hours.
The course focuses on using Statistical and Machine Learning-based models for survival analysis, and predicting future trends and events.

ISYE 6831. Advanced Simulation. 3 Credit Hours.
Topics include generalized semi-Markov processes; input and output analysis; random number, variate, and sample path generation, rare event simulation; and optimization via simulation.

ISYE 6832. Simulation Theory and Methods. 3 Credit Hours.
Theory, algorithms, and applications of computer simulation. Topics include generalized semi-Markov processes; input-output analysis; random number, variate, and sample path generation; variance reduction techniques; and optimization via simulation. This course is intended for Ph.D. students.

ISYE 6XXX. Industrial & Systems Engineering Elective. 1-21 Credit Hours.

ISYE 7000. Master's Thesis. 1-21 Credit Hours.
Required of degree candidates in the master's thesis option.

ISYE 7201. Production and Service Systems Engineering. 3 Credit Hours.
Advanced models in operations planning, scheduling and control of supply chain, production and service systems. Intended for Ph.D. students.

ISYE 7203. Logistics Systems Engineering. 3 Credit Hours.
Advanced modeling and analysis of freight transportation and logistics systems. Intended for Ph.D. students.

ISYE 7204. Informatics in Production & Service Systems. 3 Credit Hours.
A course covers integration of statistics, signal processing and control for variability reduction (modeling, analysis, diagnosis, control) for complex systems in a data rich environment.

ISYE 7205. Inventory Theory. 3 Credit Hours.
Introduces students to the general quantitative models and fundamental theoretical tools underlying some of the novel inventory management strategies of cutting-edge companies.

ISYE 7210. Real-time Interactive Simulation. 3 Credit Hours.
Principles and laboratory experience in design and implementation of interactive simulations of complex dynamic systems.

ISYE 7400. Advanced Design of Experiments. 3 Credit Hours.
Random and mixed models, nested and blocked designs. Intended for Ph.D. students and those seeking the M.S. in Statistics.

ISYE 7401. Advanced Statistical Modeling. 3 Credit Hours.
Nonlinear models, logistic regression, loglinear models. Intended for Ph.D. students and those seeking the M.S. in Statistics.

ISYE 7405. Multivariate Data Analysis. 3 Credit Hours.
Multivariate ANOVA, principal components, factor analysis etc. Intended for Ph.D. students and those seeking the M.S. in Statistics.

ISYE 7406. Data Mining and Statistical Learning. 3 Credit Hours.
Topics include neural networks, support vector machines, classification trees, boosting and discriminant analyses. Intended for Ph.D. students and those seeking the M.S. in Statistics.

ISYE 7441. Linear Statistical Models I. 3 Credit Hours.
Intended for Ph.D. students and those seeking the M.S. in Statistics.

ISYE 7510. Graph Algorithms. 3 Credit Hours.
Algorithms for graph problems such as maximum flow, covering, matching, coloring, planarity, minimum cuts, shortest paths, and connectivity. Crosslisted with MATH 7510 and CS 7510.

ISYE 7653. Case Studies in Logistics/Manufacturing. 3 Credit Hours.
Advanced topics in logistics and manufacturing through the use of industrial case studies. Difficult modeling issues such as data representation and consistency will be introduced.

ISYE 7661. Theory of Linear Inequalities. 3 Credit Hours.
Theoretical foundations of linear and integer programming. Topics include representation of polyhedra, polarity, simplex and ellipsoid algorithms, diophantine equations, Hilbert bases, total dual integrality, and others.

ISYE 7682. Convexity. 3 Credit Hours.
Convex sets, theory of finite systems of linear inequalities, convex functions, convex programming.

ISYE 7683. Advanced Nonlinear Programming. 3 Credit Hours.
Convex programming; linear, conic quadratic and semidefinite programming; cheap optimization methods for extremely large-scale convex problems.

ISYE 7686. Advanced Combinatorial Optimization. 3 Credit Hours.
Typical coverage includes: Matching theory, network optimization, traversals in graphs, integrality of polyhedra, matroids, covers, cliques, and stable sets.

ISYE 7687. Advanced Integer Programming. 3 Credit Hours.
General integer modeling concepts; valid inequalities and facets; duality; general algorithms such as branch-and-bound and branch-and-cut; special purpose algorithms; applications.

ISYE 7688. Computational Mathematical Programming. 3 Credit Hours.
Study of solution techniques in mathematical optimization, emphasizing computational aspects of both theory and algorithms.

ISYE 7750. Mathematical Foundations of Machine Learning. 3 Credit Hours.
Provides the mathematical background for two of the pillars of modern data science: linear algebra and applied probability.

ISYE 7751. Probabilistic Graphical Models in Machine Learning. 3 Credit Hours.
The course provides an introduction to theory and practice of graphical models in machine learning. It covers three main aspects; representation, probabilistic inference, and learning.

ISYE 7790. Cognitive Modeling. 4 Credit Hours.
A hands-on course covering a range of cognitive methodologies. It explores the analysis, development, construction, and evaluation of models of cognitive processing. Crosslisted with CS and PSYC 7790.

ISYE 7800. Math of Operations Research. 3 Credit Hours.
Topics include Real Analysis (countable sets, basic topological notions, sequence, series, continuity), Basic Linear Algebra (linear transformations, vector spaces, singular value decomposition), and writing mathematical proofs.

ISYE 8010. First Year PhD Seminar. 3 Credit Hours.
Introduce IE/OR/ACO PhD graduate students to faculty and research topics, discuss and demonstrate basic graduate student resources, and acclimatize students to graduate school.

ISYE 8011. Seminar. 1 Credit Hour.
Audit basis only.

ISYE 8012. Seminar. 1 Credit Hour.
Audit basis only.

ISYE 8013. Seminar. 1 Credit Hour.
Audit basis only.

ISYE 8014. Contemporary Topics in System Informatics and Control. 1 Credit Hour.
A seminar course to introduce important research problems and applications related to the system informatics and control in production and service systems.

ISYE 8020. PhD Presentation Seminar. 3 Credit Hours.
Seminar for PhD students in IE/OR/ACO to improve and practice technical communication skills.

ISYE 8795. Colloquium in Cognitive Sciences. 1 Credit Hour.
Reading of research papers by leading cognitive scientists, attendance at their colloquia, and meeting with them to discuss research. Crosslisted with CS and PSYC 8795.

ISYE 8802. Special Topics in ISYE. 2 Credit Hours.
Special Topics in Industrial and Systems Engineering.

ISYE 8803. Special Topics. 3 Credit Hours.
Special topics in Industrial and Systems Engineering.

ISYE 8811. Special Topics. 1 Credit Hour.
Special topics in Industrial and Systems Engineering.

ISYE 8813. Special Topics in Operations Research. 3 Credit Hours.
Special Topics in the field of Operations Research.

ISYE 8843. Advanced Topics in Statistics. 3 Credit Hours.
For Ph.D. students.

ISYE 8851. Topics in Manufacturing. 3 Credit Hours.
Current topics in manufacturing including: manufacturing automation and controls, advanced planning systems, heuristic scheduling techniques, stochastic models of manufacturing systems, advanced warehousing, and materials handling.

ISYE 8852. Topics in Logistics. 3 Credit Hours.
Current topics in logistics including: inventory control in supply chain design, stochastic vehicle routing, computational methods in logistics systems, location theory, and geographic information systems.

ISYE 8861. Advanced Topics in Stochastics. 3 Credit Hours.
Coverage of advanced topics of interest that support research interests of students in the field.

ISYE 8862. Advanced Topics in Simulation. 3 Credit Hours.
Coverage of advanced topics of interest that support research interests of students in the field.

ISYE 8871. Advanced Topics in Linear and Discrete Optimization. 3 Credit Hours.
Topics may vary with each offering and include subjects such as integer programming, combinatorics, graphs and networks, matching, matroids, polyhedral combinatroics, as well as others.

ISYE 8872. Advanced Topics in Nonlinear Optimization. 3 Credit Hours.
Similar to ISYE 8871 but deals with subjects in nonlinear programming, interior-point methods, convexity, global optimization, etc. Topics may vary each term.

ISYE 8893. Special Topics in Cognitive Science. 3 Credit Hours.

ISYE 8900. Special Problems in Industrial Engineering. 1-21 Credit Hours.

ISYE 8901. Special Problems in Operations Research. 1-21 Credit Hours.

ISYE 8997. Teaching Assistantship. 1-6 Credit Hours.
For graduate students holding graduate teaching assistantships.

ISYE 8998. Research Assistantship. 1-6 Credit Hours.
For graduate students holding graduate research assistantships.

ISYE 9000. Doctoral Thesis. 1-21 Credit Hours.