School	
Major	Masters of Science in Industrial Engineering

Major Requirements			
Code	**Title**	**Credits**	**Description**
EENG500L	Industrial Systems Automation and Control Lab	1	This lab introduces Programmable Logic Controllers__PLC's in both simulation and experimental environments. Starting with introduction and basic ON/OFF contacts, it switches to series and parallel circuits designed using the contacts. Two-way circuits are introduced, latching and self-latching circuits are discussed and impulse relays are tested. The students learn to pulse a cycle on rising oe falling edge as well as designing and using timers and counters in PLC projects. Multiple "real" applications are performed containing projects controlling heat of an oven, flashing lights, memory usage, conveyor belts and star-delta motor starters. The lab also teaches the student to use WinProladder software using both LADDER language and STEP instructions.
IENG510	Manufacturing Systems	3	This course introduces basic manufacturing systems from design and operations perspectives. Deterministic models for single and parallel machines, flow shops and flexible shops are presented. Topics include: assembly lines, transfer lines, production scheduling and flexible manufacturing systems. Additional topics related to current manufacturing technology and problems are also covered in this course.
IENG550L	Industrial Engineering Field Visit	1	Students will conduct a field visit to an industrial facility. A report will need to be produced with focus on industrial engineering implications and observations. The course is concluded by a student presentation.
IENG560	Infrastructure and Facilities Management	3	This course covers many areas related to facilities planning management, highlighting a wide range of subject matters on the analysis, design and evaluation of manufacturing facilities and material handling systems. The topics covered include definition of facilities planning, role of product process and schedule design, flow analysis and activity relationship, capacity and space requirements planning, computer aided layout planning, material handling systems and equipment, storage and warehousing, mathematical approaches to location problems, and performance evaluation and selection among alternatives.
IENG570	Occupational Safety Engineering	3	This course addresses a broad range of subjects relating to the practice of safety and provides useful practical knowledge which helps in identifying, evaluating, and controlling potential hazards that could harm people and environment such as the control of workplace hazards, occupational injuries, and diseases. It explains the safety codes, standards, ergonomics, and risk assessment and management.
IENG515	Organizational Environments	3	The course introduces the concept of organizations, their external and internal environments, organizational behavior, individuals in organizations, strategy in the workplace, group and team processes and key organizational processes along with success factors.
IENG555	Advanced Concepts in Quality Improvement	3	This course covers foundations of modern methods of quality control and improvement that are used in the manufacturing and service industries. It focuses on the statistical process control and related subjects, such as experimental design and Taguchi method. It enforces the integration of statistical concepts into quality assurance methods. Further management-oriented topics of discussion include total quality management; quality function deployment; activity-based costing; balanced scorecard; benchmarking; failure mode and effects criticality analysis; quality auditing; vendor selection and certification; and the Six Sigma quality philosophy. Real business practice examples are used to illustrate the application of the studied concepts.

IENG565	Industrial Waste Management	3	This course describes the processes of industrial waste treatment and illustrates how current treatment techniques are affected by regulatory and economic constraints, scientific knowledge and tolerances. It provides the basis for a more effective method of waste treatment which is sustainable and supportive of industrial improvements by introducing the EBIC system as a system that tends to attain zero pollution. Overall, it provides valuable information for a better understanding of current practices and regulatory history and how these factors relate to the ability to complete environmental solutions to industrial waste problems.
IENG615	Operations Research	3	Operations research (OR) has many applications in science, engineering, economics, and industry and thus the ability to solve OR problems is crucial for both researchers and practitioners. Modern business managers make many decisions involving the interplay of time, money, energy, and materials. Since most business systems are complex, sophisticated decision making methods that will increase efficiency are needed. The allocation of resources can be represented and analyzed mathematically. This course is designed to equip the student with the knowledge and techniques to formulate, analyze and solve mathematical models that represent real-world problems. Being able to solve the real life problems and obtaining the right solution requires understanding and modeling the problem correctly and applying appropriate optimization tools and skills to solve the mathematical model. We will also discuss how to use EXCEL and LINDO for solving optimization problems.
IENG695A	Master Thesis Project (Part I)	3	The master thesis project is a six credits research and application course that spans over two semesters. Students are expected to develop a theoretical__an applied model in their respective field of specialization. Students should write a thesis describing the research methodology, implementation and results. The developed model might be a valid numerical simulation, a well-functioning prototype__a well-supported mathematical__scientific model.
IENG695B	Master Thesis Project (Part II)	3	The master thesis project is a six credits research and application course that spans over two semesters. Students are expected to develop a theoretical__an applied model in their respective field of specialization. Students should write a thesis describing the research methodology, implementation and results. The developed model might be a valid numerical simulation, a well-functioning prototype__a well-supported mathematical__scientific model.
EENG500	Industrial Systems Automation and Control	3	After completing this course, the student will be able to understand the PLC (Programmable Logic Controllers), which are small computers, dedicated to automation tasks in an industrial environment. The PLC's are programmable power control systems dedicated for electromechanical and electrical systems control: relay control, analog (pneumatic, hydraulic) governors, timing, measurements, control and regulation.
IENG551L	Industrial and Manufacturing Workshop	1	This workshop provides students with hands-on field experience on various aspects of mechanical workshop tools, machining, processes and best practices. As a part of this experience, students will be exposed to: milling processes, lathe machining, electrical welding, drilling, filing and gas welding. Special considerations are given to occupational health and safety standards.
IENG650L	Industrial Engineering Graduate Seminar	1	Industrial Engineering Graduate Seminar

Core Requirements			
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ENGG550	Engineering Project Management and Control	3	This course covers the fundamentals of project management for engineering professionals. It reviews the project management framework in organizations and covers in depth the tools and techniques used in initiating, planning, executing, monitoring, controlling and concluding a project to achieve the set goals within schedule and budget targets. The discussed topics include work breakdown structure; CPM and PERT methods; resource allocation and leveling techniques; cost control and minimization; trade-off analysis in addition to lean and agile techniques. Real life engineering project cases are used to demonstrate the application of project management concepts to engineering projects. The course is aligned with the Project Management Instituteï¿½s (PMIï¿½s) Project Management Body of Knowledge (PMBOK) and helps learners to prepare for PMI certification exams