

Major	Bachelor of Engineering in Industrial Engineering		
Core Requirements			
Code	Title	Credits	Description
CSCI250L	Introduction to Programming Lab	1	This course is a co-requisite for the Introduction to Programming course (CSCI250). The students apply in the lab the fundamentals of programming explained in CSCI250 by solving lab exercises. In this lab, students solve programming problems by using primary data types, selection and repetition structures, methods and arrays. This lab is an opportunity for the students to have direct help when needed from the instructor, but it is not sufficient for practice; students should practice with more exercises on their own.
MATH220	Calculus III	3	The course consists of two parts: Multivariable calculus and vector calculus. The multivariable calculus is the extension of calculus in one variable to calculus in more than one variable: (quadric surfaces, partial differentiation, multiple integration). Vector calculus applies calculus to the concept of vector fields.
MATH225	Linear Algebra with Applications	3	This course provides an introduction to linear algebra topics. Emphasis is placed on the development of abstract concepts and applications for vectors, systems of equations, matrices, determinants, vector spaces, multi-dimensional linear transformations, eigenvectors, eigenvalues, diagonalization and orthogonality. The concepts of linear algebra are extremely useful in physics, economics and social sciences, natural sciences, and engineering.
CHEM200	General Chemistry	3	This course is a first semester course, intended for students who desire to acquire the basic principles in chemistry. The emphasis of the course will be on the fundamental principles of general chemistry, which include terminology, qualitative concepts and quantitative skills. The general topics included in this course are: Quantum Theory of the Atom; Electrons and Periodicity; Bonding; Molecular Geometry; Hybridization; Acid/base Chemistry; Kinetics and reactions mechanism and Solubility and Complex ion equilibria.
EENG250	Electric Circuits I	3	The course provides an introduction to Electrical and Electronics Engineering. The course has been designed to introduce fundamental principles of circuit theory commonly used in engineering research and science applications, the Concepts of voltage, current, power, resistance capacitance and inductance. Circuit analysis techniques such as Kirchhoff's Laws, node voltages, and mesh currents. Thevenin's and Norton's equivalent circuits, in addition to special circuits with op-amp and the response of 1st order RL and RC circuits.
MATH270	Ordinary Differential Equations	3	This course provides an introduction to ordinary differential equations and their applications. The contents of this course include first order equations, separable, exact, and linear equations, second and higher order differential equations, systems of differential equations, series solutions, and Laplace transformation.
CSCI250	Introduction to Programming	3	This course introduces the basic concepts and principles of structured programming in Java. It starts with an introduction to Java showing its syntax and the structure of a program in Java then teaches simple data types, control structures, methods, arrays, and strings.
MATH210	Calculus II	3	This is the second course in the Calculus sequence. The course material includes logarithmic, exponential, and trigonometric functions, their inverses and their derivatives, integration techniques, improper integrals, sequences, infinite series, tests of convergence, alternating series, power series, polar coordinates and its application.
MENG225	Engineering Drawing & CAD	3	This course consists of two parts: 2 D and 3D. It can be defined as a tool in order to generate accurate drawings due to scales in 2 D and in 3 D. It focuses on drawings related to engineering. Drawings may be "descriptive", describing an object or a tool, or they may represent the first step of design (Design of tools and machines).

MENG250	Statics	3	This course treats only rigid-body mechanics and forms a suitable basis for the design and analysis of many types of structural, mechanical, or electrical devices encountered in engineering. As the course name suggests, this course deals with the equilibrium of bodies that are either at rest or move with constant velocity. Therefore, this Statics course provides the students with the principles that treats the statics of particles and rigid bodies, trusses, frames, machines; centroids, centers of gravity; and friction.
MATH310	Probability & Statistics for Scientists & Engineers	3	The course is intended to provide you with the basic probabilistic and statistical concepts with related computational and analytic skills for three main purposes: 1) To become an integrated part of the student scientific education. 2) To give the student an adequate ability for comprehending and interpreting many non-deterministic situations. 3) To appreciate the wide range of applications of such concepts to real-life situations.
ENGG200	Introduction to Engineering	3	Introduction to Engineering is a first-year course designed to help students explore the world of engineering by introducing them to what engineers do, the fundamental principles that form the basis of their work, and how they apply that knowledge within a structured design process. The course gives the student an opportunity to apply those concepts by developing a prototype system as part of a team. The course also enables the student to develop technical presentation skills.
PHYS220	Physics for Engineers	3	This course is designed to provide an overview of calculus based introductory physics, which is a requirement for all undergraduate engineering students. It offers an introduction to mechanical oscillations and mechanical waves, exploring different wave phenomena such as interference of mechanical waves, reflection and refraction of light, in addition to image formation.

Major Requirements			
Code	Title	Credits	Description
IENG310L	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.
EENG370L	Industrial Electronics Lab	1	This lab introduces experiments concerning designing, building, and testing AC sinusoidal steady state and electronic circuits which use diodes, BJTs, and MOSFETs
EENG500L	Industrial Systems Automation and Control Lab	1	This lab introduces the Programmable Logic Controllers (PLC) in both simulation and experimental environments. Starting from the basics (ON/OFF contacts, impulse relays, rising edge, falling edge, and negated coil) in addition to the different connection that can be done (series and parallel connections). Moreover, it will be introducing the use of latching circuits, timers, counters, comparators and so on
IENG551L	Industrial and Manufacturing Workshop	1	This workshop provides students with hands-on field experience on various aspects of industrial 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 safety and health standards.
MENG310	Engineering Material Science	3	An introduction to materials science and different types of materials. The coupling between the chemical properties of elements, atomic structure and inter-atomic bonds is detailed. The interaction between molecular, crystal structure, microstructure and chemical and mechanical properties are emphasized. Crystal defects and diffusion in materials are treated as well as binary phase diagrams. The themes materials selection- and development, processing and properties (chemical and physical) are detailed.

IENG320	Introduction to Environmental Engineering	3	This course introduces the students to the basic concepts of environmental engineering. It will provide an overview of water pollution, air pollution, solid waste, fate and transport of pollutants in the environment, and pollution prevention. Consideration of each area includes general background and key concepts, detailed design examples, and case studies.
EENG370	Industrial Electronics	3	This course introduces many topics related to the operation of basic electrical components and circuits allowing to gain a good grounding in the basics, and to progress into the detail only as far as is appropriate for the need. These topics include: Steady-State Sinusoidal Analysis, Sensors & Actuators, Amplification, Control & Feedback, Operational Amplifiers, Diodes, Field-effect Transistors, Bipolar Junction transistors and Digital Systems.
IENG360	Operations Analysis Methods	3	Operations Analysis is designed to introduce the concepts of work and human-machine interface, analysis, design and measurement of work, method study, and recording at different levels. Process analysis and improvement and applications in design are also introduced. The course highlights the operation analysis, manual work design, time study, predetermined time systems, job analysis, work environment design and design of cognitive work.
IENG350	Introduction to System Engineering	3	This course presents ideas and techniques for the process of designing, developing, testing, debugging and modifying engineering systems. Topics include: Function-oriented and modular design techniques, designing for re-use and maintainability, specification, documentation, verification, validation and quality assurance. Students will work in teams on a system related to their field of study and specialization/interest.
IENG370	Industrial Systems Simulation	3	This is an introductory course to modeling techniques and simulation. It introduces solutions to industrial and service systems problems and challenges using process simulation to enhance organizational performance in an increasingly complex, turbulent, and uncertain industrial environment. This course uses discrete-event simulation, random number generation and testing, and the design of simulation experiments as tools to model the behavior of industrial systems for process analysis and process improvement. It is coupled with a hands-on lab that will introduce modeling concepts of a modern simulation language.
IENG440	Quality Control and Reliability	3	This course introduces the concepts of quality and reliability. It illuminates the principles of quality management systems and provides the essential knowhow for the implementation of such systems within an organization. Students will learn how to identify key processes and create a control system and will understand the principles of auditing, the process-based approach and data analysis. This course will teach the student how to improve the effectiveness of the operations in organizations and the quality of products. It provides students with the know-how to control non-conforming process outputs, products and services, production and service provision, and how leadership and commitment of top management to quality could lead organizations to excellence.
IENG430	Inventory Control	3	This course introduces the modern inventory control methods and techniques. It covers the following topics: An introduction to the subject, detailed forecasting techniques focusing on exponential smoothing and moving average methods, inventory problems for single installation and independently handled items, dealing with deterministic lot sizing, safety stocks and reorder points, continuous or periodic monitoring of inventory levels, coordinated replenishments, and multi-echelon inventory systems, structures and reordering policies. Additional topics related to lot sizing and practical problems connected to the implementation of inventory control systems.

IENG400	Design and Analysis of Engineering Experiments	3	This is a basic course in designing experiments and analyzing the resulting data. The course deals with the types of experiments that are frequently conducted in industrial settings. The prerequisite background is a basic working knowledge of statistical methods. All experiments conducted by engineers and scientists are designed experiments; some of them are poorly designed, and others are well-designed. Well-designed experiments allow you to obtain reliable, valid results faster, easier, and with fewer resources than with poorly-designed experiments. A well-designed experiment can lead to reduced development lead time for new processes and products, improved manufacturing process performance, and products that have superior function and reliability. . Students are required to complete a term project that involves designing, conducting, and presenting the results of a statistically designed experiment. They do this in teams because this is the way that much industrial experimentation is conducted. They must present the results of this project, both orally and in written form.
IENG420	Industrial Engineering Information Systems	3	The objective of this course is to provide knowledge and skills in industrial software systems management, i.e., the planning, procurement, development and integration of software systems in an industrial engineering context. The course also considers the underlying industrial processes. It prepares the student both for technology-intensive professions, e.g. system development (ERD software drawing will be used), and project management (Softwares like PMIS) within organizations supplying or acquiring industrial information and control systems.
IENG410	Human Factors Engineering	3	This is an introductory course to the field of human factors engineering. It is designed to introduce the principles of workplace and environmental design conformity to the physical and mental abilities and limitations of people. The students are expected to acquire proficiency and fundamental understanding of human factors that must be considered in the design and engineering of complex systems.
ENGG450	Engineering Ethics and Professional Practice	3	Engineering Ethics and Professional Practice is a complete study course on the role of ethics in engineering in their historical, philosophical and professional contexts. The course examines the impact of ethical theories and their application to issues encountered in the engineering profession, such as employee rights, whistleblowing, safety, risk and liability, professional responsibility to consumers and employers, conflicts of interest, codes of ethics, legal obligations, environmental and social responsibility. Through the use of real and hypothetical case studies, the course focuses on developing analysis techniques and applying them to ethical problems through independent critical thinking and moral sensitivity.
IENG450	Industrial Engineering CAD/CAM Tools	3	This course consists of two parts: CAD (computer-aided design), 3D modeling, drawings with CATIA and CAM (computer-aided manufacturing), NC manufacturing with Surfcam. The course covers the fundamentals of computer assisted part programming of numerical controlled milling and lathe machine tools using Surfcam CAD/CAM software. Surfcam is used to create G code programs for advanced milling applications and basic turning center (lathes) operations.
IENG460	Production Planning and Control	3	The Production Planning and Control course exposes the student to the techniques and applications of integrated production systems. The main emphasis would be on the development and use of mathematical models and algorithms used to analyze and improve the use of material, labor, and information in production environments.
IENG470	Facilities Planning	3	Facilities Planning introduces fundamental concepts in several main areas of industrial engineering such as facility planning, material handling systems, work analysis and design. Topics such as analysis and design of work space and flow, facility location and layout, material handling systems, motion and time studies and work sampling are covered.

IENG480	Manufacturing Processes	3	This course emphasizes the description, classification and analysis of manufacturing processes. Fundamentals include the casting processes and form casting processes, mold castings, powder metallurgy, metal and nonmetal fabrication processes are included. Metal forming and sheet metalworking are also covered. Manufacturing engineering, production planning and quality control and inspection are also integrated throughout the course.
IENG510	Manufacturing Systems	3	This course provides methodologies to analyze manufacturing systems. It presents the analytical approaches for modeling and analyzing models of manufacturing and production systems. Fundamental topics include probability, inventory and queuing models, optimization, buffer and batch-size analysis and concepts of Lean Manufacturing. Real life examples are discussed in terms of productivity and meeting customer expectations.
EENG500	Industrial Systems Automation and Control	3	This course covers the fundamentals, concepts, and design of PLC (Programmable Logic Controllers) based systems. The students gain knowledge of PLC programing and automation process control within industrial environment. The students get an overview of electrical distribution and hardwire, industrial hardware, I/O modules, industrial networks systems, and SCADA (Supervisory control and data acquisition) systems. The students get an overview of the PLC's typical applications in the manufacturing industry in addition to hand-on design projects.
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.
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. Students will also learn to use EXCEL and LINDO for solving optimization problems.
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.
IENG555	Advanced Concepts in Quality Improvement	3	This course covers the concepts of designing a quality management system. It gives tools for cost saving, solving chronic and sporadic problems. Students will learn principles of quality management systems: auditing and assessment, detecting gaps and how to differentiate between non-conformities, writing audit report and opening improvement action form, calculating Key performance indicators, and writing process and procedures. The students will conduct a management review; taking corrective and preventive action in order to ensure KAIZEN "continual improvement".

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.
ENGG499	Practical Experience	4	Eligible students should register this practical experience in order to complete requirements for graduation. The training facility may be a firm or a research lab external to the university. Registering for this course requires pre-approval of the training facility of choice by the department chair. At the end of the training, the student should submit a report describing the training activities completed for evaluation and credits. Note that the minimum time to be spent at the facility should not be less than 9 weeks with at least 180 working hours.
IENG595	Capstone Project	6	This course requires the student to apply the design, development, testing and writing skills acquired during the Bachelor of Engineering program. A capstone project is typically carried out by a team of two or three students depending on the scope of the project. Under the supervision of a faculty member, the students work through the stages of completing an engineering project from conceptualization through to implementation and testing. Students will have to exercise problem identification, solution design, experimentation, implementation, technical writing, and teamwork skills. The main deliverables of a capstone project are a demonstration of the developed solution, a report describing the entire development life cycle of the solution, and a technical presentation before a committee composed of multiple faculty members to explain the students' work.

General Education Requirements			
Code	Title	Credits	Description
ENGL201	Composition and Research Skills	3	This course builds upon the skills acquired in pre-requisite courses mainly ENGL 151 to further develop students' critical thinking and academic writing competencies. Students will read and respond to a variety of texts from different disciplines and produce a research paper using analytical and critical skills in response to texts.
CULT200	Introduction to Arab - Islamic Civilization	3	This course provides an overview of the history, culture, and civilization of the Arab and Islamic world. It explores the origins of Islam, the role of the Prophet Muhammad, and the development of the Islamic empire. The course also examines the cultural and intellectual achievements of the Islamic world, including art, architecture, science, and literature. Students will gain a deeper understanding of the Arab and Islamic world and its impact on the modern world.

ARAB200	Arabic Language and Literature	3	ØªØªØ£ÙÙÙ ÙÙØ\$Ø-Ø© Ø\$ÙÙÙÙØºØ© Ø\$ÙÙØ¹Ø±Ø"ÙÙØ© ÙÙØ¢Ø-Ø\$Ø"ÙÙØ\$ ÙÙØºÙÙØ± Ø\$ÙÙÙÙØªØ®ØµØµÙÙÙ ÙÙÙÙ Ø«ÙÙØ\$Ø«Ø© Ø£ÙÙØ³Ø\$ÙÙÙÙ Ø£ØØ-ÙÙØ\$ ÙÙØªÙÙØ\$ÙÙÙÙ Ø-Ø±ÙÙØ³Ø\$ÙÙ Ø£Ø³Ø\$Ø³ÙÙØ© ÙÙÙÙ Ø\$ÙÙÙÙØÙÙ ÙÙØ\$ÙÙØµØ±ÙÙ ÙÙØ\$ÙÙØ"ÙÙØ\$ØºØ©. ÙÙØ\$ÙÙØ«Ø\$ÙÙÙÙ ÙÙØªÙÙØ\$ÙÙÙÙ ÙÙØ"Ø\$ØØ« ÙÙÙÙ Ø\$ÙÙØ£Ø-Ø" ÙÙØ\$ÙÙØªØÙÙÙÙÙÙ. Ø£ÙÙØ\$ Ø\$ÙÙÙÙØ³ÙÙ Ø\$ÙÙØ«Ø\$ÙÙØ« ÙÙÙÙØ¹Ø\$ÙÙØ- Ø"Ø¹Ø¶ ØªÙÙÙÙÙÙØ\$Øª Ø\$ÙÙØªØ¹Ø"ÙÙØ± ÙÙØ\$ÙÙØªÙÙØ\$ØµÙÙ.
ENGL251	Communication Skills	3	Workplace Occupational Writing is an advanced interdisciplinary writing course emphasizing workplace and technical communication and editing appropriate to diverse professions. It incorporates practice and study of selected types of discourse employed in professional writing situations, preparing students for different systems of writing in their professional lives. Examples from the writing of workplace professionals are analyzed and used as models to demonstrate the transition from academic to professional writing.
ENGG300	Engineering Economics	3	This course covers the fundamentals of Engineering Economics for engineering professionals to match engineering practice today. It recognizes the role of the engineer as a decision maker who has to make and defend sensible decisions. It emphasizes on the analytical consideration of money and its impact on decision making as well as on other factors such as environmental and social factors and tasks. By the end of the course students will be equipped with basic analytical skills for solving problems of an economic nature real-world example.