

# IET-INDUSTRIAL ENGINEERING (IET)

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## **IET 2003 Introduction to Industrial Engineering (3-1-3)**

Introduces fundamental study areas of industrial engineering and the industrial engineering profession in relation to other disciplines.

## **IET 2103 Technology Innovation and Integration (3-1-3)**

Provides the foundation for automatically capturing data in a system. Topics include automatic identification and data capture systems including bar codes, radio frequency identification, smart cards, biometrics, and the integration of these technologies in problem solving.

## **IET 2213 Work Measurement and Ergonomics (2-2-3)**

Introduces motion and time study tools and techniques used to map and improve industrial and service processes, human capabilities, job requirements, and tool and workstation design.

## **IET 2223 Quality Control (3-1-3)**

Introduces basic concepts of quality engineering and management with a focus on statistical quality control using control charts, capability analysis and acceptance sampling.

**Prerequisites:** MTH 1113 or LSM 1113

## **IET 2233 Introduction to Maintenance Management (3-1-3)**

Introduces concepts and methods maintenance management with a focus on building corrective, preventive and predictive maintenance programs. Topics include maintainability, maintenance planning and scheduling, spare parts inventory management, total productive maintenance and performance evaluation.

## **IET 2413 Manufacturing Technologies and Materials (3-1-3)**

Introduces mechanical properties of materials (metals, polymers, ceramics and composites) and manufacturing technologies (casting, forging, extrusion, drawing, machining and joining) used to process materials.

## **IET 2421 Engineering Measurements Lab (0-3-1)**

Introduces measurement methods and techniques for linear, angular, surface, pressure, temperature, force and strain-related measurements.

## **IET 2902 Sophomore Design Project (1-2-2)**

Introduces engineering design process, procedures and techniques. Identifies various components, resources, and common elements within an industrial engineering real life application. Considers the balance between the general knowledge of project management and available tools. Covers health, safety and environmental aspects related to Industrial Engineering discipline. Requires the formation of a team to apply gained knowledge, simple data and decision analysis techniques necessary to achieve a pre-assigned output.

**Prerequisites:** IET 2003

## **IET 3203 Operations Management (2-2-3)**

Introduces capacity planning and line balancing, demand forecasting, inventory models, material requirement planning (MRP) and scheduling.

**Prerequisites:** MTH 1113

## **IET 3213 Lean Thinking and Six Sigma (2-2-3)**

Introduces fundamental principles of lean thinking and six sigma methodologies for industry and service organizations. Focus is on the creation of value through the sustainable elimination of waste to improve quality, productivity and work environment.

**Prerequisites:** IET 2223, IET 2213

## **IET 3233 Facilities Planning and Material Handling (2-2-3)**

Introduces empirical and analytical approaches for flow analysis, space requirements, facility layout, material handling.

## **IET 3303 Operations Research (3-1-3)**

Introduces principles of formulating and solving linear programming models analytically and using software tools for applications in production, logistics, and project management (transportation, transshipment, assignment, and network models).

**Prerequisites:** IET 3203

## **IET 3313 Applied Engineering Statistics (3-1-3)**

Provides review of hypotheses testing, simple linear regression, multiple linear regressions, and matrix approach to multiple linear regressions. Covers single factor analysis of variables, multi-factor analysis of variables, design of experiments, randomized block design, and non-parametric statistics. Includes practical sessions on engineering applications using software packages (SAS, SPSS, Minitab, etc. ...).

**Prerequisites:** MTH 1113 or LSM 1113

## **IET 3613 Financial Analysis and Cost Accounting (3-1-3)**

Introduces concepts and methods for costing products and services. Topics include cost concepts and classifications, job costing, activity-based costing, process costing, cost-volume-profit analysis, financial statements and evaluation of financial performance.

## **IET 4103 Enterprise Information Management (2-2-3)**

Introduces the basics of information sharing and security, data networks, database design and website development for industrial and service applications.

**Prerequisites:** IET 3203

## **IET 4113 Energy Science and Technology (3-1-3)**

Introduces conventional and renewable energy technologies, energy sources, production and uses, energy systems, storage and transport, conservation of energy and the future of energy.

## **IET 4133 Managerial Accounting (3-1-3)**

Introduces business-management approach to use accounting information for internal reporting and decision-making is crucial in developing managerial skills. Covers major topics of managerial accounting including profit planning and control measures. Provides in-depth knowledge in cost accounting by focusing on its role in internal reporting and the resulting decision making processes contributes to the development of analytical skills. Includes basic costing systems, pricing and profitability concepts and principles, cost allocations, product quality, and investment decisions.

**Prerequisites:** IET 3613

## **IET 4203 Decision and Risk Analysis (2-2-3)**

Introduces principles of decision making under certainty and under risk. Topics include single and multiple criteria decision models, decision trees and influence diagrams, and Bayesian decision models.

**Prerequisites:** IET 3303

## **IET 4223 Human Resource Management (3-1-3)**

Introduces to principles of human resource management. Topics include skill assessment, recruiting, training, developing and retaining employees, employee health, safety, rights, privacy, security and evaluation and reward systems, employee and labor relations, compensation, and performance evaluation.

## **IET 4233 Service Systems Engineering (3-1-3)**

Introduces the application of industrial engineering methods to the analysis and improvement of services including healthcare, education and government services.

**Prerequisites:** IET 2003

**IET 4243 Total Quality Management (3-1-3)**

Introduces the fundamental principles and tools of total quality management (TQM). Topics include customers' focus, leadership, strategic planning, human resource practices, performance measures and quality improvement tools.

**Prerequisites:** IET 2223

**IET 4303 Queuing Theory and Process Simulation (2-2-3)**

Introduces principles of building and analyzing waiting line models in production and services using queuing theory and discrete event simulation.

**Prerequisites:** IET 3303, IET 3313

**IET 4383 Performance Management (3-1-3)**

Compare traditional and contemporary approaches to performance management in order to develop an important area of knowledge in human resource management. Learning about the design and implementation of performance management systems, and the role of compensation, incentives and rewards in performance management contributes to vital HR skills.

**IET 4403 Industrial Robotics (3-1-3)**

Introduce usage of robotics applications in industry, robotic systems. Sensors and actuators, and robot programming and control.

**Prerequisites:** IET 3233

**IET 4413 Computer Integrated Manufacturing (3-1-3)**

Provides review of computer technology in manufacturing systems. Topics include Computer Numeric Control (CNC), Computer Aided Manufacturing (CAM), Programmable Logic Control (PLC), Automated Guided Vehicles (AGV) and Automated Storage and Retrieval Systems (AS/RS).

**Prerequisites:** IET 2413

**IET 4503 Introduction to Marketing (3-1-3)**

Introduces current theories and concepts of marketing. Topics include marketing environment, consumer behavior, market segmentation, product concept, promotion, integrated marketing communication, pricing, distribution channels and strategic marketing.

**IET 4513 Purchasing and Contract Management (3-1-3)**

Examines the processes by which goods and services are acquired through purchasing and contract management. Topics include procurement, contract strategies, source selection, identifying contract type, product liability and risk, the bid process and response evaluation; contract risk assessment, contract negotiation, and contract law.

**IET 4523 Warehouse and Inventory Management (3-1-3)**

Provides review of types of warehouses, methods of organizing the warehouse environment, and determining efficient inventory control procedures. Covers technology applications related to the management of warehouse and inventory stock keeping units (SKU) are investigated. Storage of inventory, placement of inventory, picking, packing, shipping, and other internal logistics management topics will be explored.

**Prerequisites:** LGE 2003

**IET 4553 Manufacturing in Supply Chain (3-1-3)**

Introduces manufacturing and supply chain dynamic interaction. Covers common manufacturing systems, methods of manufacturing planning and control is essential to effectively evaluate the supply chain, manufacturing decisions; supplier service and customer service levels. Includes manufacturing decision-making models in the development of solutions to overcome supply chain challenges.

**IET 4563 Supply Chain Strategy and Management (3-1-3)**

Examines the development of supply chain strategies and their interrelationships and impact on business competitive advantage is an insightful task. Presents a framework to strategically manage supply chains in rapidly changing markets builds further knowledge in the area of supply chain management, and learning how recent developments and best practices in supply chain management have supported the achievement of improved supply chain performance keeps supply chain management skills up to date.

**IET 4573 Supply Chain Risk Management (3-1-3)**

Provides supply chain from a risk management perspective; Identifying and analyzing the risk of failure points within the supply chain; quantifying risks via metrics. Covers required skills to plan, manage, control, share and avoid supply chain risks attributed to various causes and unforeseen events are developed through the analysis of local and international scenarios, and case studies.

**IET 4583 Procurement and Inventory Management (3-1-3)**

Examines business buying decisions, approaches of inventory management, assessment of inventory decisions affecting buying practices, including sourcing, procurement and supply management, or inventory classification. Provides review of modern approaches to managing inventory such as cost analysis, information systems used to make inventory decisions, critical thinking, and managerial skills.

**IET 4593 Customer Relationship Management Systems (3-1-3)**

Covers customer Relationship Management (CRM) to support business processes and development. Examines utilization of the information technology resources, strategies, software and processes needed to support an effective CRM strategy. Assesses CRM techniques, to enhance customer service, sales force effectiveness and marketing strategy. Evaluates the benefits of creating customer loyalty, developing market intelligence and embedding a customer relationship management system into an organization.

**IET 4603 Enterprise Resource Planning (3-1-3)**

Develops understanding of the concept of ERP systems and business processes interaction in an ERP system in areas of: Procurement, Materials Management, Production Planning and Execution, Sales Order Management, Financial Accounting and Controlling, and Enterprise Asset Management. Develops in-depth theoretical and practical knowledge regarding ERP through exercises and case studies.

**IET 4623 Logistics and Transportation I (3-1-3)**

Explores the practices of logistics and transportation in the supply chain in the analysis of the performance of a firm. Presents functions of transportation, warehousing, material handling, packaging, cold chains, security, insurance and economics in logistics, and framework of how logistics and transportation can optimize supply chain efficiency and improve customer satisfaction.

**IET 4653 Logistics and Transportation II (3-1-3)**

Covers transportation management and logistics methods to optimize supply chain objectives. Includes analyses cost implications of logistics and transportation in making products available to customers and firm performance evaluation. Covers solutions and decisions making for the supply chain involving the efficient integration of suppliers, manufacturers and retail stores with logistics and transportation, encompassing the activities of the firms from the strategic, tactical and operational level.

**IET 4783 ISO Standards and Excellence (3-1-3)**

Provides an overview of the ISO family of international standards. Engage with industry to develop quality management systems in accordance with ISO standards. Compares various organizational performance, benchmarking, quality awards and other measures of excellence, such as the Baldrige Quality Award, Khalifa Quality Award and Dubai Quality Award.

**IET 4803 Special Topics in Industrial Engineering (3-1-3)**

Presents a theoretical or practical topic proposed by the faculty beyond what is offered in existing courses. Can be repeated for credit.

**IET 4893 Directed Study (3-1-3)**

Explores and investigate a topic beyond the existing course material under the supervision of a faculty member.

**IET 4902 Capstone Design Project I (1-2-2)**

Perform all aspects of an industrial engineering design project including the formation of a team to propose, plan and design an industrial engineering project. Carry total responsibility for the completion of the project milestones and course objectives while working under the mentorship of a faculty or industry engineer. The team is evaluated on its ability to coordinate efforts to propose the project design criteria, components, resources, implementation schedule, and estimated cost.

**IET 4912 Capstone Design Project II (1-3-2)**

Perform all aspects of an industrial engineering design project including the formation of a team to propose, plan and design an industrial engineering project. Carry total responsibility for the completion of the project milestones and course objectives while working under the mentorship of a faculty or industry engineer. The team is evaluated on its ability to coordinate efforts to propose the project design criteria, components, resources, implementation schedule, and estimated cost.

**Prerequisites:** IET 4902