

# 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 (2-2-3)**

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

## **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 (2-2-3)**

This course provides basic information about engineering materials types, properties, testing, and application. Moreover, it offers the theoretical and practical fundamentals of the different manufacturing processes used in industry.

## **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

**Corequisites:** IET 2103

## **IET 3203 Operations Management (3-1-3)**

Introduces operations management to manage organizational processes and supply chains demand forecasting, inventory models, capacity planning, line balancing, material requirement planning (MRP) and scheduling.

**Prerequisites:** IET 2003 or LGE 2003

## **IET 3213 Lean Thinking and Six Sigma (3-1-3)**

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 3233 Facilities Planning and Material Handling (3-1-3)**

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

## **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 4203 Decision and Risk Analysis (3-1-3)**

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.

**Prerequisites:** IET 3203

## **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 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.

**Prerequisites:** IET 3203

**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.

**Prerequisites:** LGE 2003

**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 4902 Capstone Design Project I (1-3-2)**

Perform tasks such as design, develop and improve a product, process or a system and apply industrial engineering tools and techniques to solve industry related or real-world problems. The capstone design project requires formation of team to identify industry or social problem through research and investigation and provide solutions to address the problem by considering various design constraints and engineering standards. Project team needs to apply project management tools to plan and manage the project, collaborate effectively and achieve the project goal within the specified time.

**Prerequisites:** IET 2902, EGN 3803

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

Perform tasks such as design, develop and improve a product, process or a system and apply industrial engineering tools and techniques to solve industry related or real-world problems. The capstone design project requires formation of team to identify industry or social problem through research and investigation and provide solutions to address the problem by considering various design constraints and engineering standards. Project team needs to apply project management tools to plan and manage the project, collaborate effectively and achieve the project goal within the specified time.

**Prerequisites:** IET 4902