UPM PUTRA PERTANIAN UNTUK RAKYAT
UNIVERSITI PUTRA MALAYSIA
BERILMU BERBAKTI

FAKULTI KEJURUTERAAN
FACULTY OF ENGINEERING
فاكولتي كجوروتراعن

Master Programme by Coursework
Faculty of Engineering

Master in
Manufacturing Systems Engineering

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Introduction

This programme is designed to train professionals and equip them with sufficient knowledge in advanced manufacturing systems, as well as skills in the use of computers for design and manufacturing purposes. The programme aims to enhance the knowledge and skills of practicing engineers and graduates in the understanding and application of appropriate methods in the design, development, management, and operation of manufacturing systems for the industries.

Admission Requirements

1. Bachelor's Degree in Engineering or Engineering Technology:
   - CGPA ≥ 2.75; or
   - CGPA 2.50–2.74 with at least 3 years of relevant work experience; or
   - CGPA 2.25–2.49 with at least 5 years of relevant work experience.
2. Bachelor's Degree in a related field of Science or Technology:
   - CGPA ≥ 3.00; or
   - CGPA 2.75–2.99 with at least 3 years of relevant work experience; or
   - CGPA 2.50–2.74 with at least 5 years of relevant work experience.

Note: Holders of a Bachelor's degree in Science and Technology or its equivalent (not in Engineering or Engineering Technology) are required to take and pass a prerequisite module for this programme, namely the course EMM5101 Principles of Industrial Engineering.

Language Requirements

English Language Requirement (for international candidates):
- TOEFL (Paper-based Test): minimum 550, or
- TOEFL (Internet-based Test): minimum 79–80, or
- IELTS (Academic Training): minimum Band 6.0.

Note: Candidates who do not meet the minimum required scores for TOEFL or IELTS will be granted provisional admission. Such candidates will be required to pass the English Placement Test conducted by the University.

Programme Requirements

Credit Requirements for Graduation

Students enrolling under this programme must fulfil 40 credits of coursework to graduate. The credit distribution for compulsory courses, elective courses and dissertation is as follows:
- Compulsory Courses 24 credits
- Elective Courses 6 credits
- Dissertation 10 credits

Note: EMM5990 - Dissertation is carried out over two semesters (4+6 credits)

Course Synopsis

COMPULSORY COURSES

EMM5100 | Research Methodology | 3 Credits
This course encompasses the fundamental principles of research, covering the organization of relevant information, the determination of appropriate research methodology, and the production of research proposal papers. Emphasis is placed on methods, research design and ethics, as well as skills in scientific writing and oral presentation.

EMM5606 | Manufacturing Operations Management | 3 Credits
This course covers the aspects of industrial operations management, product planning, forecasting, master production scheduling, materials requirement planning, capacity planning, inventory management, scheduling, loading and sequencing, supply chain management.

EMM5616 | Industrial Safety, Health and Environmental Management | 3 Credits
This course covers assessments on safety, health and environmental management, which include the identification and control of hazards in the workplace and the human variables involved in causing and preventing accidents. It also discusses the relevant laws, regulations and standards as they apply to workplace safety and health and relevant issues in promoting safety and health in the organization.

EMM5702 | Advanced Manufacturing Technology and Processes | 3 Credits
This course provides the students with concepts, methods of material selection and manufacturing processes using the latest technology by considering the requirements and specifications to produce sustainable products. This course also emphasizes on the development of production technology and effective testing methods to produce quality products.

EMM5706 | Design of Manufacturing Systems | 3 Credits
This course provides the students with concepts, structured methodology and effective tools to analyse, improve operational processes, and apply them in designing the manufacturing system. It emphasizes on the efficient evaluation to ensure the built-in manufacturing system can optimizes the production yields and produces quality products.

EMM5708 | Automation and Robotic | 3 Credits
This course covers a comprehensive understanding of automation and robotic systems, encompassing the evaluation of various types of systems as well as the performance of applications in the industry. The main focus is on the latest technologies in automation and robotics, emphasizing analysis and discussion on the impacts and advantages of using these technologies to enhance operational efficiency. Through this approach, students will gain in-depth knowledge related to automation and robotics.

EMM5710 | Industrial Ergonomics | 3 Credits
This course provides students with techniques in designing, planning and identifying the suitability of ergonomic principles for man-machine system in workplaces and industries. This course also discusses and emphasizes ergonomic principles in equipment applications and workplace environment.

EMM5730 | Intelligent Manufacturing | 3 Credits
This course provides the students with concepts of Industry 4.0 in development and involvement of production processes in intelligent manufacturing, either through sensors or information systems that transform these processes to make them more efficient. It emphasizes the nine pillars of Industry 4.0 with economic and social innovation by deepening Society 5.0.

EMM5990 | Dissertation | 10 Credits
This course covers essential aspects of preparing and conducting research studies, including developing skills in literature review, applying appropriate methodologies, and collecting and analyzing data. Emphasis is also placed on ethical scientific writing, in accordance with established guidelines.

ELECTIVE COURSES

Student must take at least two (2) elective courses out of the listed courses below

EMM5504 | Engineering Product Design and Innovation | 3 Credits
This course covers engineering design process, considering customer needs. It also emphasizes creativity and innovation in designing new products by utilizing computer-based design tools.

EMM5602 | Total Quality Management | 3 Credits
This course covers the theories and principles of quality and its management. Applications of quality standards, strategies, tools, and techniques for industrial implementation are also emphasized.

EMM5614 | Maintenance Management Systems | 3 Credits
This course covers the maintenance management system, which includes the nature and types of failure and maintenance, planned maintenance such as preventive and predictive maintenance. It also emphasizes on the importance of condition maintenance, reliability and maintainability, computerised maintenance management system, its implications and the role and methods of maintenance system auditing in the industry.

EMM5620 | Value Engineering | 3 Credits
This course covers the background and principles of Value Engineering (VE), highlighting its distinction from other improvement techniques. It covers the seven phases of the VE framework and introduces students to various analytical methods, with a focus on function analysis within a synergistic team environment.

EMM5624 | Supply Chain Management | 3 Credits
This course covers the basic understanding, system development and application of supply chain management. This course also emphasizes the importance of implementing effective supply chain management in organizations.

EMM5632 | Engineering Project Management | 3 Credits
This course covers the elaboration of project management in engineering. This course also prepares students with the method to construct project proposals with regard to risk management in project development. Project control and implementation methods are emphasized to ensure the objectives, time and cost of the project can be achieved.

EMM5720 | Data Analytics | 3 Credits
This course covers the concepts, techniques, and applications of data analytics using computer programming, including reading and importing files. Data analysis will be performed using DataFrames through various case studies. The course also emphasizes key data analytics concepts and the role of data in enhancing awareness of the importance of the Internet of Things (IoT) and data visualization.

Fees	Master Without Thesis	
	Malaysian Student	International Student
Basic Fees (1st semester)	RM 1,350	RM 2,400
Basic Fees (2nd and subsequent semester)	RM 1,100	RM 2,150
Credit Fees – Subject to change	RM 370 / credit	RM 450 / credit