Faculty of Engineering
Department of Mechanical and Manufacturing Engineering
www.eng.upm.edu.my
Master Of Manufacturing Systems Engineering
INTRODUCTION

This programme is designed to train professionals and equip them with adequate knowledge in advanced manufacturing systems and skills in the application of computers for design and manufacturing purposes. This programme is aimed to enhance the knowledge and skill of the practicing as well as the graduating engineers on the understanding and application of suitable methods in the design, development, management and operation of manufacturing systems for industries.

PROGRAMME REQUIREMENTS

Credit Requirements for Graduation

Students enrolling under this programme must fulfill 40 credits of course work to graduate. The credit distributions for compulsory courses, elective courses, project and independent study are as follows:

- Compulsory Courses: 24 credits
- Elective Course: 9 credits
- Project: 6 credits
- Independent Study: 1 credit

Compulsory Courses

Students must take all the listed compulsory courses:

- EMM5602 Total Quality Management: 3 credits
- EMM5606 Manufacturing Operations Management: 3 credits
- EMM5616 Industrial Safety, Health and Environment Management: 3 credits
- EMM5702 Advanced Manufacturing Technology and Process: 3 credits
- EMM5704 Computer Applications in Manufacturing Systems: 3 credits
- EMM5706 Design of Manufacturing Systems: 3 credits
- EMM5708 Automation and Robotics: 3 credits
- EMM5710 Industrial Ergonomics: 3 credits
- Elective Courses

Students must take three elective courses out of the listed courses:

- EMM5502 Finite Element in Computer Aided Engineering: 3 credits
- EMM5504 Engineering Product Design and Innovation: 3 credits
- EMM5506 Reverse Engineering and Rapid Prototyping: 3 credits
- EMM5604 Industrial Marketing Management: 3 credits
- EMM5608 Industrial Organization Management: 3 credits
- EMM5612 Business Accounting: 3 credits
- EMM5614 Maintenance Management Systems: 3 credits
- EMM5618 Manufacturing Project Management: 3 credits
- EMM5620 Value Engineering: 3 credits
- EMM5622 Risk Analysis in Engineering: 3 credits
- EMM5624 Supply Chain Management: 3 credits
- EMM5626 Technology Management: 3 credits
- EMM5712 System Optimisation: 3 credits
- EMM5714 Facilities Layout: 3 credits
- EMM5716 Computer Aided Design and Manufacture: 3 credits

Identification on the elective courses for the student will be made by the program coordinator.

Project And Independent Study

Project

Students are recommended to register for EMM5989-Project for 3 credits in the second semester and another 3 credits in the third semester. Students will be assessed by a panel of examiners based on the submitted report and oral presentation at the end of the project duration.

Independent Study

Every student is required to carry out a guided independent study EMM5977. The topic is chosen from one of the following areas: computer integrated manufacturing, computer aided engineering, manufacturing systems, automation and robotics, production management, computer control, CAD/CAM, quality management, organization management, material technology, ergonomics, or any title deemed appropriate by the program.
Course Synopsis

- EMM5502  Finite Element in Computer Aided Engineering  3 credits
  This course will cover the introduction, CAD software, an overview of finite element method, finite element method applied to elastic stress analysis, finite element solutions for Eigen problems, finite element applied to elastoplastic problems, finite element method as applied to fluid mechanics problems, programming of finite element method, and computer aided process planning project.

- EMM5504  Engineering Product Design and Innovation  3 credits
  This course covers engineering design process, total design, design information, creative design, procedure-based design tools, computer-based design tools, and concurrent engineering.

- EMM5506  Reverse Engineering and Rapid Prototyping  3 credits
  This course covers reverse engineering technology, rapid prototyping technology, rapid prototyping interface data, rapid prototyping application, rapid tools, and rapid production.

- EMM5602  Total Quality Management  3 credits
  This course covers quality management, total quality, customer focus, continuous improvement, techniques of TQM, some factors for consideration in total quality implementation, quality standards, and case studies.

- EMM5604  Industrial Marketing Management  3 credits
  This course provides an understanding of the concepts and theories of marketing management. The topics include the marketing concepts in modern business environment, consumer behaviour and purchasing decisions, decisions and strategies pertaining to marketing mix such as product and pricing strategies, and promotion and distribution policies. Strategic marketing planning, information and control of marketing program will also be discussed. In addition, the course will assess the major techniques in gathering information that determines the marketing objectives and policies of the companies.

- 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, loading and scheduling, inventory control, user interface, computers in production management, planning and control, and quality and its control.

- EMM5608  Industrial Organisation Management  3 credits
  This course will discuss the different aspects of management and effects of environmental forces with emphasis on the responsibility of the manager to plan, organize, lead, and control and implement organizational changes.

- EMM5612  Business Accounting  3 credits
  This course covers the topics which will include financial reporting, accounting principles, concepts and conventions, the accounting equations, the accounting cycle, accounting system, and internal control, cash flow statement, financial statement analysis, accounting assets and liabilities, management accounting, and planning and decision making.

- EMM5614  Maintenance Management System  3 credits
  This course covers the maintenance management system, which includes the nature and types of failure and maintenance, the implementation of planned maintenance system taking into consideration various factors such as plant arrangements, inventory scheduling, and work plan etc. It will also emphasize on the importance of condition maintenance, reliability and maintainability, its implications and the role and methods in maintenance system auditing in the industry.

- EMM5616  Industrial Safety, Health and Environmental Management  3 credits
  This course will discuss on environmental, safety, and health management, which includes the recognition and control of hazards in the workplace and the human variables involved in causal and preventing accidents. It will also discuss the laws, regulations and standards as they apply to workplace safety and health and relevant issues in promoting safety and health in the organization.

- EMM5618  Manufacturing Project Management  3 credits
  This course will cover the aspects of project management in a manufacturing environment, which includes elements of project management and PERT/CPM techniques. It will also equip the students with resource management, forecasting techniques in inventory management, learning curves analysis and its effects on productivity and quality. Manufacturing economic analysis, data analysis and management and expert systems for production scheduling are also included.

- EMM5620  Value Engineering  3 credits
  This course covers background and significance of value engineering (VE), the principles of VE, the meaning and analysis of functions, the role of management in VE, VE techniques, value and decision, scheduling of VE activity, organization, and staffing for VE and VE at work.

- EMM5622  Risk Analysis in Engineering  3 credits
  This course covers background and significance of knowledge and ignorance, risk analysis methods, system definition and structure, reliability assessment, failure consequences and severity, engineering economics and finance, risk control methods, data for risk studies.

- EMM5624  Supply Chain Management  3 credits
  This course covers the introduction to SCM, Logistic Network Configuration, Inventory Management & Risk Pooling, The value information, Supply Chain Integration: Implications of demand and supply uncertainty, Strategic Alliance of Procurement and Outsourcing Strategies, Coordinated Product and Supply Chain Design, Customer value and Supply Chain management, Information Technology for SCM, Decision Support Systems for SCM and International Issues of Supply Chain Management.

- EMM5626  Technology Management  3 credits
  This course covers the introduction, Development of new technologies, making money from new technologies, new product introduction, planning for the future, technology management in application.

- EMM5702  Advanced Manufacturing Technology and Processes  3 credits
  This course will cover product specification and overall manufacturing requirement, selection of materials, factor in manufacturing process selection, metal based manufacturing method, polymer based manufacturing method, manufacturing processes, and manufacturing of semi-conductor component and case studies.

- EMM5704  Computer Applications in Manufacturing Systems  3 credits
  This course covers computer hardware, computer software, computer communication and networks, computer control of manufacturing processes, and artificial intelligence (AI)/expert systems applications in manufacturing.

- EMM5706  Design of Manufacturing Systems  3 credits
  This course will cover the role of manufacturing in the Malaysian economy, manufacturing strategy, manufacturing system, systems layout, material handling, system design, system modeling, flexible manufacturing and assembly systems, quality management, implementation of effective manufacturing systems, application case studies, and field work.

- EMM5708  Automation and Robotics  3 credits
  This course covers and emphasizes on automation, automated material handling system and storage, robot technology and applications, robot motion and vision, robot programming, robot applications and implementing robotics manufacturing.

- EMM5710  Industrial Ergonomics  3 credits
  This course will discuss and emphasize on the application of ergonomic principles in designing man-machine systems of industries. It will cover topics on human systems, human behaviour, biomechanics and physiological of work, anthropometry, workplace and workspace design, work methods, manual material handling and environmental ergonomics.

- EMM5712  System Optimisation  3 credits
  This course provides an in depth study of operation research system parameters, linear programming, non-linear programming, computer evolution, designing evolutionary algorithms and multi-objective optimization for various engineering applications.

- EMM5714  Facilities Layout  3 credits
  This course covers planning and design of facilities layout. Flow analysis technique and activity relationship analysis are also included. Conventional and computer techniques are applied in designing facilities layout.

- EMM5716  Computer Aided Design and Manufacture  3 credits
  This course covers computer aided design and manufacture of products. It includes CAD/CAM system introduction, computer graphic and design, CAD database, CAD and CAM Integration, manual programming and operations of computer aided manufacture.

For more information  
Please contact:

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PROGRAMME COORDINATOR:  
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ADMISSION REQUIREMENTS

An applicant with a bachelor degree in engineering with CGPA 2.500/55%/Second Class Lower and at least three (3) years working experience experiences in relevant field; or
An applicant with a bachelor degree in engineering with CGPA 2.750/60%/Second Class Lower
An applicant with a bachelor degree in science with CGPA 3.000/65%/Second Class Upper OR CGPA 2.750/60%/ Second Class Lower and at least three (3) years working experience experiences in relevant field

* Please refer to programme coordinator for more information on admission requirements

FEES

<table>
<thead>
<tr>
<th>Fees</th>
<th>Master without thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Fees (1st semester)</td>
<td>1,200.00</td>
</tr>
<tr>
<td>Basic Fees (2nd and subsequent semester)</td>
<td>950.00</td>
</tr>
<tr>
<td>Credit Fees</td>
<td>250.00 / credit hour</td>
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<tr>
<td>* subject to change</td>
<td>350.00 / credit hour</td>
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</tbody>
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Language Requirement

• A Malaysian candidate must have obtained at least a credit in English at Sijil Pelajaran Malaysia level or have passed English courses conducted at the Diploma or Bachelor's Level.

• All international candidates from countries where English is not a medium of instruction must have obtained a minimum score of 550 for TOEFL or Band 6 for IELTS. This requirement is not applicable to candidates applying for admission into the Malay Language Studies.

• A candidate without the requisite minimum score for TOEFL or IELTS may be granted a provisional admission. Such candidate will be required to pass an English Placement Test conducted by the University.

• A candidate who has failed the English Placement Test will be required in the first semester to pass a prescribed English course. Should the candidate fail to obtain the prescribed minimum grade, the University may allow him to repeat the prescribed English course in the second semester.

• A candidate who falls after the second attempt will have his candidature suspended until he passes the English course before being allowed to continue with his Masters programme.

Application For Admission

Please apply online via http://www.sgs.upm.edu.my and send your application supporting documents to the address below:

Dean
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