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. The programme is aimed to enhance the knowledge and skill of 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 fulfil 40 credits of coursework to graduate. The credit distributions for compulsory courses, elective courses and dissertation are as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compulsory Courses</td>
<td>24</td>
</tr>
<tr>
<td>Elective Courses</td>
<td>6</td>
</tr>
<tr>
<td>Dissertation</td>
<td>10</td>
</tr>
</tbody>
</table>

Compulsory Courses

Students must take all the listed compulsory courses:

- EMM5100 Research Methodology 3 credits
- EMM5602 Total Quality Management 3 credits
- EMM5606 Manufacturing Operation Management 3 credits
- EMM5616 Industrial Safety, Health and Environmental Management 3 credits
- EMM5702 Advanced Manufacturing Technology and Processes 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 two (2) elective courses out of the listed courses:

- EMM5504 Engineering Product Design and Innovation 3 credits
- EMM5506 Reverse Engineering and Rapid Prototyping 3 credits
- EMM5614 Maintenance Management Systems 3 credits
- EMM5620 Value Engineering 3 credits
- EMM5624 Supply Chain Management 3 credits
- EMM5630 Project and Risk Management in Engineering 3 credits
- EMM5714 Facilities Layout 3 credits

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

Dissertation

Students are recommended to register for EMM5990 for 4 credits in the second semester and another 6 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 dissertation duration.
Course Synopsis

- **EMM5100**  • Research Methodology  • 3 credits
This course covers best practices in research such as research methodology, design and ethics as well as academic writing and oral presentations.

- **EMM5504**  • Engineering Product Design and Innovation  • 3 credits
This course covers the concepts and effective structured methodology in engineering design process by considering the customer needs. It also emphasizes on creativity and innovation in designing new product by using computer-based design tools.

- **EMM5506**  • Reverse Engineering and Rapid Prototyping  • 3 credits
This course covers the fundamental principles of reverse engineering and rapid prototyping for product development with fast, flexible and effective approach. This course also focuses on identifying the advanced manufacturing process technologies with the use of rapid prototyping in the product design. Emphasis is also given to discussion on rapid manufacturing method and workflow in the product manufacturing.

- **EMM5602**  • Total Quality Management  • 3 credits
This course prepares students to identify the role, importance, implementation and contribution of total quality in industry. It also prepares students to apply methods and techniques to help upgrade quality continuously in an organisation.

- **EMM5606**  • Manufacturing Operations Management  • 3 credits
This course provides students with concepts, methodology and tools to analyse, improve core operational capabilities, and apply them in manufacturing business organisations. It also emphasizes on the strategic decision-making to ensure successful transformation of inputs to outputs in an efficient manner, simultaneously meeting customer requirements.

- **EMM5614**  • Maintenance Management Systems  • 3 credits
This course provides students with techniques and strategies to analyse profitability performance, production capacity and equipment reliability in the maintenance management. It also emphasizes on the importance of the maintenance planning and control with various best practices to achieve organizational requirements.

- **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.

- **EMM5620**  • Value Engineering  • 3 credits
This course covers the background of value engineering (VE), the principles of VE, the difference between VE and other improvement techniques, the VE framework includes 7 phases of the VE framework. This course exposes students to the use of various analytical techniques especially function analysis in synergetic team.

- **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.

- **EMM5630**  • Project and Risk Management in Engineering  • 3 credits
This course covers the elaboration of project and risk management in engineering. This course also prepares students with the method to construct project proposals with regard to risks in project development. Project control and implementation methods are emphasized to ensure the objectives, time and cost of the project can be achieved.

- **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 Robotics  • 3 credits
This course provides the student with concepts, methodology and application of automation system including analyzing the performance and effectiveness of automation and robotic systems in industry. This course also emphasizes on application of robotic, numerical control, computer integration and relates it application with the manufacturing process and material handling.

- **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.

- **EMM5714**  • Facilities Layout  • 3 credits
This course provides students with planning, facilities layout design, flow analysis and activity relationship analysis for the development of facilities layout. Conventional technique and modern computing are applied in designing facilities layout to reduce the flow of material handling at minimal cost.

- **EMM5990**  • Dissertation  • 10 credits
This course involves a research or study by a student on a specific topic. It is carried out in two semesters and covers literature review, methodology, data collection and analysis. The scope of research or study will be determined by the supervisor in consultation with the student. At the end of the first semester, the student needs to submit a preliminary report and at the end of second semester, the student needs to submit a final report. The student is also required to present the findings of the research study to a panel of assessors.

For further information

Please contact:

Deputy Dean (Postgraduate Studies)
Faculty of Engineering
Universiti Putra Malaysia
43400, Serdang
Selangor Darul Ehsan
Malaysia

Tel: 603-9769 6266/6253
Email: eng_tds@upm.edu.my
Website: http://www.eng.upm.edu.my/akademik/siswazah/master_secara_kerja_kursus-2294?L=en

Website: http://www.eng.upm.edu.my
Email: khairol@upm.edu.my
Telephone: 603-9769 3830

Department of Mechanical & Manufacturing Engineering
Faculty of Engineering
Universiti Putra Malaysia
43400, Serdang
Selangor Darul Ehsan
Website: http://www.eng.upm.edu.my/akademik/siswazah/master_secara_kerja_kursus-2294?L=en
ADMISSION REQUIREMENTS

a) An applicant with a Bachelor degree Engineering with CGPA 2.75/Second Class Lower or;
b) An applicant with a Bachelor degree in Engineering with CGPA 2.50/Second Class Lower and at least three (3) years working experience in relevant field or;
c) An applicant with a Bachelor degree in Science or Technology with CGPA 3.00/Second Class Upper or;
d) An applicant with a Bachelor degree in Science or Technology with CGPA 2.75/Second Class Lower and at least three (3) years working experiences in relevant field or;
e) An applicant with an equivalent qualification to Bachelor degree recognized by the professional bodies or Malaysian Qualifications Agency (MQA).

Note:
* Candidates with Bachelor degree in Science or Technology or equivalents are required to take remedial course to fulfil the pre-requisite module established by programme coordinator.
* Refer to programme coordinator for more information on admission requirements.

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 Paper-based Test (Academic Version); or Band 6.0 for IELTS (Academic Training); or 79-80 for TOEFL Internet-based Test (Academic Version).

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

FEES

<table>
<thead>
<tr>
<th>Fees</th>
<th>Master without thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaysian Student</td>
<td>International Student</td>
</tr>
<tr>
<td>Basic Fees (1st semester)</td>
<td>RM 1,250</td>
</tr>
<tr>
<td>Basic Fees (2nd and subsequent semester)</td>
<td>RM 1,000</td>
</tr>
<tr>
<td>Credit Fees (subject to change)</td>
<td>RM 250.00 / Credit Hour</td>
</tr>
<tr>
<td></td>
<td>RM 2,300</td>
</tr>
<tr>
<td></td>
<td>RM 2,050</td>
</tr>
</tbody>
</table>

Application For Admission

Please apply online via http://sgsportal.upm.edu.my:8080/sgsportal/
Tel. : (603) 9769 4218/4223/4228
Website : http://www.sgs.upm.edu.my/prospective_students-2964