Faculty of Engineering
Department of Aerospace Engineering
www.eng.upm.edu.my

Master of Innovation and Engineering Design
INTRODUCTION

The Master Programme in Innovation and Engineering Design (MIED) is uniquely designed for students with a passion for creating new, innovative products, improving existing designs, and research and development of designs and products. The MIED Programme at Universiti Putra Malaysia aims to provide engineers and designers with the latest advanced design techniques to be applied in industrial and engineering works. It is also the first programme of its kind to be established in Malaysia. Students of the MIED Programme will learn a variety of subjects related to Innovation, Design Techniques, Business Practices and Patents. The courses offered are designed to produce graduates with the knowledge and skills to analyse, improve and develop new designs that are able to increase the productivity and quality of products for the benefit of society and industry.

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:

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Compulsory courses</td>
<td>24 credits</td>
</tr>
<tr>
<td>Elective courses</td>
<td>6 credits</td>
</tr>
<tr>
<td>Dissertation</td>
<td>10 credits</td>
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</tbody>
</table>

**Compulsory Courses**

- EAS5100 Research Methodology 3 credits
- EAS5105 Innovation Studies 3 credits
- EAS5106 Innovation and Product Commercialization 3 credits
- EAS5107 Entrepreneurship in Innovation 3 credits
- EAS5401 Engineering Material in Design 3 credits
- EAS5701 Global Design 3 credits
- EAS5703 Advanced Computer Aided Design 3 credits
- EAS5704 Advanced Design Technique 3 credits
- EAS5990 Dissertation 10 credits

Note: EAS5990 - Dissertation is carried out over two semesters (4+6 credits)

**Elective Courses**

Students must also take at least 6 credit from the elective courses listed below:

- EAS5104 System Engineering 3 credits
- EAS5201 Computational Fluid Dynamics 3 credits
- EAS5402 Innovation in Structural Condition Monitoring 3 credits
- EAS5403 Finite Element Analysis 3 credits
- EAS5702 Optimization and Reliability in Design 3 credits
- EAS5705 Multi-Disciplinary Design Methods 3 credits
- EAS5955 Special Topic 3 credits
- EAS5001 Advanced Engineering Mathematics 3 credits
### Course Synopsis

- **EAS5100**  
  **Research Methodology**  
  This course covers best practices research such as research methodology, design and ethics, thesis writing and oral presentations.  
  - 3 credits

- **EAS5105**  
  **Innovation Studies**  
  The course provides an overview of the basic concepts of innovation process and methodology. The emphases are given on development of basic innovation skill and solution to innovation problem.  
  - 3 credits

- **EAS5106**  
  **Innovation and Product Commercialization**  
  This course provides an overview of the basic concepts of intellectual property and further emphasizes patent intellectual property from the development of the designated product to the patent application documentation. The emphases are given on IP development skill and IP commercialization.  
  - 3 credits

- **EAS5107**  
  **Entrepreneurship in Innovation**  
  This course covers an introduction to entrepreneurship and to the process of identifying innovative opportunities, with an emphasis on process of evaluating, conceptualizing, and planning new, technology-based ventures. Emphasis is given on skills of business development and business plan, by considering financial support, management, leadership skill, and global business development, which are supported by variety of case studies.  
  - 3 credits

- **EAS5401**  
  **Engineering Material in Design**  
  This course covers the basic principles of engineering materials in designing, the link between engineering materials and non-engineering factors and methods of development and analysis of engineering materials. Emphasis is given on the ability to identify materials that are appropriate to the design and to analyse materials using charts and methods of material selection.  
  - 3 credits

- **EAS5701**  
  **Global Design**  
  This course covers methods of managing design projects, design document frameworks and design tools and materials used by designers. Emphasis is given on exposure on design processes and the latest design methods.  
  - 3 credits

- **EAS5703**  
  **Advanced Computer Aided Design**  
  This course covers background knowledge of computer-assisted advanced design (CAD) systems and the importance of using CAD software in design. Emphasis is given on drawing skills using design-based computer software to help students produce 2D and 3D design drawings and analyze kinematic movement of a product as well as produce basic products using 3D printers.  
  - 3 credits

- **EAS5704**  
  **Advanced Design Technique**  
  This course covers the process and development of design products ranging from the development of product concepts to making comparisons and selection of potential concepts. Emphasis is given on skills using the latest tools and methods in the development of design products.  
  - 3 credits

- **EAS5980**  
  **Dissertation**  
  This course involves a research or study by a student on a specific topic. It covers literature, methodology, data collection and analysis under a supervision of a lecturer. A proposal report needs to be prepared at the beginning of the study. At the end of the project, the student will submit a complete dissertation and research output for evaluation. The student is also required to present the findings of the study to a panel of assessors.  
  - 10 credits

- **EAS5104**  
  **System Engineering**  
  This course covers the fundamental principles of systems engineering and its implementation to development of complex systems. Emphasis is given to discussion on system life cycle models that reflect transitions in systems engineering activities throughout the system's active life. A generic systems engineering method will be employed in each activities.  
  - 3 credits

- **EAS5201**  
  **Computational Fluid Dynamics**  
  This course covers the methods of computational fluid dynamics and its use in design. Emphasis is given to solving skills of fluid motion equations and skills using advanced techniques in design involving heat transfer and engineering model development for product design.  
  - 3 credits

- **EAS5402**  
  **Innovation in Structural Condition Monitoring**  
  This course covers the processes and methods of identifying the health identity and damage of a product. Emphasis is given on skills in identifying and utilizing appropriate structural health methods, analyzing existing and new design products and monitoring the health of the structure of a design product.  
  - 3 credits

- **EAS5403**  
  **Finite Element Analysis**  
  This course covers the formulation of finite element equations to solve problems related to the resilience of a design. Emphasis is given on various theories of failure in product structure and skills analyzing 2D and 3D stress-strain problems.  
  - 3 credits

- **EAS5702**  
  **Optimization and Reliability in Design**  
  This course covers the latest methods in optimizing product design processes and design reliability. Emphasis is given to skills using optimization techniques and reliability and using the appropriate formula for optimization processes to solve problems related to innovation and design.  
  - 3 credits

- **EAS5705**  
  **Multi-Disciplinary Design Methods**  
  This course covers topics on advanced design methods such as design of experiments, decision-making techniques and methods for multi-disciplinary optimization. It also includes discussion on emerging new and modern methods in product design process. Emphasis is given on selection skills and the use of advanced and up-to-date methods.  
  - 3 credits

- **EAS5955**  
  **Special Topic**  
  This course deals with selected innovation and engineering design fields according to current development. The studies will be based on topics that are determined by the appointed lecturer. The course emphasises knowledge seeking pertaining to the topic and producing technical report in terms of writing and oral individually and/or in group.  
  - 3 credits

- **EAS5001**  
  **Advanced Engineering Mathematics**  
  This course covers the formulation of basic equations to form the appropriate formula for solving a problem. Emphasis is given to skills analyzing various problems in design by taking into account design constraints.  
  - 3 credits

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**For further information**

**Please contact:**

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ADMISSION REQUIREMENTS

a) Bachelor in the field of Engineering or Engineering Technology with a CGPA of 2.750/Second Class Lower or;
b) Bachelor in the field of Engineering or Engineering Technology with a CGPA of 2.500/Second Class Lower with at least three (3) years of working experience in the field of study that is being applied for or;
c) Bachelor in any related field of Science or Technology with a CGPA of 3.000/Second Class Upper or;
d) Bachelor in any related field of Science or Technology with a CGPA of 2.750/Second Class Lower with at least three (3) years of working experience in the field of study that is being applied for or;
e) A qualification equivalent to a Bachelor’s degree recognized by the professional bodies and MQA

Note:
* When candidates with Bachelor of Science or Technology degrees or their equivalents are admitted, prerequisite modules in Engineering must be offered to adequately prepare them for their advanced study

FEES

<table>
<thead>
<tr>
<th></th>
<th>Master without thesis</th>
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<tbody>
<tr>
<td>Basic Fees (1st semester)</td>
<td>RM1,250</td>
</tr>
<tr>
<td>Basic Fees (2nd and subsequent semester)</td>
<td>RM1,000</td>
</tr>
<tr>
<td>Credit Fees</td>
<td>RM 250.00 / Credit Hour</td>
</tr>
</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’

• 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.

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