

## Admission Requirements

- i. Bachelor in the field of Engineering or Engineering Technology with CGPA of 2.750 or;
- ii. Bachelor in the field of Engineering or Engineering Technology with CGPA of 2.500-2.749 with at least 3 years of working experience in relevant field or;
- iii. Bachelor in the field of Engineering or Engineering Technology with CGPA of 2.250-2.499 with at least 5 years of working experience in relevant field or;
- iv. Bachelor in any related field of Science or Technology with CGPA of 3.000 or;
- v. Bachelor in any related field of Science or Technology with CGPA of 2.750-2.999 with at least 3 years of working experience in relevant field or;
- vi. Bachelor in any related field of Science or Technology with CGPA of 2.500-2.749 with at least 5 years of working experience in relevant field.

*Note: Candidates with Bachelor of Science or Technology degrees or their equivalents are accepted for admission, prerequisite modules in Engineering will be offered to adequately prepare them for their advanced study.*

## Language Requirements

International candidates are required to fulfill English language requirement as follows:

- a) 550 for TOEFL Paper-based Test (Academic Version); or
- b) Band 6.0 for IELTS (Academic Training); or
- c) 79-80 for TOEFL Internet-based Test (Academic Version).

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.



## Fees

Fees	Master without thesis	
	Malaysian Student	International Student
Basic Fees (1 <sup>st</sup> semester)	RM 1,425	RM 2,475
Basic Fees (2 <sup>nd</sup> and subsequent semester)	RM 1,175	RM 2,225
Credit Fees * subject to change	RM 370 / credit	RM 450 / credit



## APPLICATION

Please apply online via:  
<http://sgsportal.upm.edu.my:8080/sgsportal>  
[www.sgs.upm.edu.my/prospective\\_students-2964](http://www.sgs.upm.edu.my/prospective_students-2964)

For further information, please contact :

### DEAN

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 Website: [www.eng.upm.edu.my](http://www.eng.upm.edu.my)  
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### PROGRAMME COORDINATOR

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# MASTER IN PROCESS SAFETY AND LOSS PREVENTION

Department of Chemical and Environmental Engineering  
 Faculty of Engineering, Universiti Putra Malaysia

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This programme is designed to equip professionals with a comprehensive knowledge in identification, management and control of process safety towards prevention of major accidents and losses in plant operation. This is inline with CIMAH regulations which require fundamental understanding of scientific knowledge and practices in chemical handling and plant operation. The program will commence via semester system; however, selected course of each semester will be offered via modular approach. In a modular approach, each 3-credit course (a module) will be covered in an intensive one-week professional course to satisfy the 42 hours requirement of a semester. At the satisfactory completion of the module, students will be given a certificate of completion as well as the choice to accumulate the credits for the fulfillment of the master programme.

## PROGRAMME REQUIREMENTS

### Credit Requirements for Graduation

Students enrolling under this programme must fulfill 42 credits of courses to graduate. The credit distributions for compulsory courses, elective courses and project are as follows:

- Compulsory Courses 26 credits
- Elective Courses 6 credits
- Dissertation 10 credits

### Compulsory Courses

Students must take all the listed compulsory courses;

ECH5100	Research Methods	3 credits
ECH5502	Hazard Analysis and Risk Assessment	3 credits
ECH5503	Design for Safe Handling of Industrial Chemicals	3 credits
ECH5505	Process Reliability and Maintainability	3 credits
ECH5506	Mechanical Failure and Electrical Hazards	3 credits
ECH5514	Human Behaviour and Human Error	3 credits
ECH5516	Process Safety Laboratory	2 credits
ECH5517	Consequence Analysis	3 credits
ECH5520	Process Safety Management	3 credits
ECH5990	Dissertation	10 credits

**Note: ECH5990 - Student must take one project course which will be carried out in two consecutive semesters.**

### Elective Courses

Students must take only two elective courses (6 credits) from the following list;

#### Technical Electives

ECH5518	Fire and Explosion Engineering	3 credits
ECH5519	Industrial Hygiene Design	3 credits
EAB5421	Forensic Science	3 credits
ECH5804	Corrosion Engineering	3 credits

#### Management Electives

ECH5501	Atmospheric Risk Management	3 credits
ECH5510	Disaster Management and Emergency Plan	3 credits
ECH5511	Health, Safety and Environmental Protection	3 credits
ECH5521	Special Topics in Process Safety	3 credits

\*\* Available elective courses for the student will be provided by the program coordinator.

## Course Synopsis

### ECH5100 | Research Methods | 3 Credits

This course covers the best practices of research designs. Emphasis are given on the methods of organizing relevant information, determining appropriate research methodology, producing research proposal, academic writing, and ethical considerations in engineering research.

### ECH5502 | Hazard Analysis and Risk Assessment | 3 Credits

This course covers the interaction between process design and hazard identification. Risk assessment as method used for safety enhancements of the plant at the flowchart process design and operational stages is emphasized. Risk assessment and the safety system design were integrated and thoroughly discussed.

### ECH5503 | Design for Safe Handling of Industrial Chemicals | 3 Credits

This course covers inherent properties of hazardous materials and handling of industrial chemicals. The safety system design for laboratory and process plants is discussed in detail. Issues related to chemical waste disposal are emphasized.

### ECH5505 | Process Reliability and Maintainability | 3 Credits

(This course covers the principles in analyzing plant reliability and maintainability based on equipment failure and repair data considering layer of protection. The strategy for equipment criticality, assessment, and maintenance are also provided for obtaining good plant availability, high plant performance and safe plant operation.)

### ECH5506 | Mechanical Failure and Electrical Hazards | 3 Credits

This course covers the review and evaluation of mechanical failures in chemical process and handling equipment, and electrical hazards. It covers the design aspects, safe handling, hazards and related risk control measures.

### ECH5514 | Human Behaviour and Human Error | 3 Credits

(This course covers the evaluation concepts of workers selection in human resource management. Analysis of human reliability using qualitative and quantitative models is emphasized. Human error improvement method affecting the decision-making process is discussed.)

### ECH5516 | Process Safety Laboratory | 2 Credits

(The course activities are related to hazard identification process, incident investigation, risk and consequence assessment as well as methods to avoid failure and prevent loss in a facility or in an organization. The activities are supported by the use of related advanced software.)

### ECH5517 | Consequence Analysis | 3 Credits

This course covers the concept of hazard consequence analysis of accidental chemical release in industrial facilities. The source and dispersion modelling, consequences analysis and impact of hazardous materials release are studied.

### ECH5520 | Process Safety Management | 3 Credits

This course encompasses assisted laboratory works to perform hazard identification process, quantitative risk evaluation and probability analysis related to process safety and loss prevention.

### ECH5990 | Dissertation | 10 Credits

Every student is required to carry out a supervised research in the area of process safety and loss prevention. The research has to be implemented according to a proper process and the results are reported verbally and in writing.



### ECH5510 | Disaster Management and Emergency Plan | 3 Credits

This course covers the management principles, planning and analysis of disaster and emergency management in handling disaster and emergency situations in a more systematic and organized manner. The development of emergency response plan and the decision for disaster management and its implications are also emphasized.

### ECH5518 | Fire and Explosion Engineering | 3 Credits

This course covers the fundamentals of fire and explosion science, hazards and risk analysis. Active fire and explosion protection systems, which include detectors, alarm and smoke control are developed. The impacts of fire and explosion to human and environment are evaluated.

### ECH5519 | Industrial Hygiene Design | 3 Credits

This course covers the concept of industrial hygiene and the related hazards control approach. Design of safe and healthy workplace that includes ventilation and control of physical hazards, safe workstation, and ergonomics are discussed.

### ECH5521 | Special Topics in Process Safety | 3 Credits

This course deals with topics in the field of process safety and loss prevention according to current issues and development. Emphasis is given to information retrieval, analyzing information or data based on the given topics and the issues are assessed. Findings are reported critically.

### EAB5421 | Forensic Science | 3 Credits

This course covers investigations of disasters, industrial accidents, fire risks by analysing physical evidence using forensic techniques and witness interviews.

### ECH5501 | Atmospheric Risk Management | 3 Credits

This course covers the understanding of practice of performing and managing regulatory atmospheric risk assessments, the evaluation of the effects of air toxic emissions on human health.

### ECH5511 | Health, Safety and Environmental Protection | 3 Credits

This course covers the principles and protection of health, safety and environmental protection, risk assessment and management, waste handling as well as the use of personal protective equipment.

### ECH5804 | Corrosion Engineering | 3 Credits

This course covers the principles, type, testing and prevention of corrosion for the purpose of handling corrosion problems economically and safely.