

## 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 admitted, prerequisite modules in Engineering must 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

\*Fees are subject to change from time to time with the approval of the University authorities



## 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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### PROGRAMME COORDINATOR

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# MASTER IN ENVIRONMENTAL ENGINEERING

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

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## INTRODUCTION

This programme is designed to equip professionals with knowledge on the problems of environmental pollution and its improvement for the good of mankind. It prepares professionals with knowledge and skills in environmental control and management and in the solution of environment-related problems.

## PROGRAMME REQUIREMENTS

### Credit Requirements for Graduation

Students enrolling under this programme must fulfill 41 credits of courses to graduate. The credit distributions for compulsory courses, elective courses and project are as follows:

• Compulsory Courses	25 credits
• Elective Courses	6 credits
• Dissertation	10 credits

### Compulsory Courses

Students must take all the listed compulsory courses;

ECH5100 Research Methodology	3 credits
ECH5513 Environmental Management Principles	3 credits
ECH5101 Environmental Health Technology	3 credits
ECH5102 Principles of Environmental Engineering	3 credits
ECH5103 Wastewater Treatment Design	3 credits
ECH5104 Solid Waste Management & Design	3 credits
ECH5106 Toxic and Hazardous Waste Technology	3 credits
ECH5404 Environmental Engineering Laboratory	1 credits
ECH5522 Atmospheric Risk Management	3 credits
ECH5990 Dissertation	10 credits

**Note: ECH5990 -Dissertation can be completed in one semester or at most in two consecutive semesters.**

### Elective Courses

Students must take only two elective courses (2 credits) out of the listed below;

ECH5105 Noise Pollution Engineering	3 credits
ECH5108 Ecotoxicology	3 credits
ECH5110 Circular Economy for Sustainable Environment	3 credits
ECH5111 Technology Innovation	3 credits
ECH5502 Hazard Analysis and Risk Assessment	3 credits
ECH5511 Safety, Health and Environmental Protection	3 credits
ECH5512 Water Management	3 credits
ECH5804 Corrosion Engineering	3 credits
ECH5955 Special Topic	3 credits

Please refer to Program Coordinator for the availability of the elective courses.

## Course Synopsis

### ECH5100 | Research Methodology | 3 Credits

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

### ECH5513 | Environmental Management Principles | 3 Credits

This course covers environmental management principle and practice, management standards and monitoring as well as future approaches in handling national and global environmental changes. Development activities are related to the environmental conditions. Sustainable development goals are discussed

### ECH5101 | Environmental Health Technology | 3 Credits

This course covers planning on public health measures and preparedness against emerging environmental, health and safety related issues. Health problems from various sources, disposal and management of solid, toxic and hazardous wastes are identified. The effects to human health, environment and economy are evaluated.

### ECH5102 | Principles of Environmental Engineering | 3 Credits

This course covers description on various physical processes involved in the movement of pollutants through the environment as well as the treatment and pollution control. The solution of mass and energy balance calculations for environmental engineering processes are implemented. Principles of chemical and biological ecosystem for chemical stream fate in the natural and engineered systems are assessed.

### ECH5103 | Wastewater Treatment Design | 3 Credits

This course covers basic principles, methods and plant design in wastewater and sludge treatment from preliminary to final stages in fulfilling current requirements. Biological treatment in treating wastewater pollutants is emphasized.

### ECH5104 | Solid Waste Management & Design | 3 Credits

This course covers assessment on basic principles of existing and emerging technologies for municipal solid waste treatment and product recovery from wastes. Principles of scientific and sustainable solid waste management in solving practical municipal solid waste management challenges are applied.

### ECH5106 | Toxic and Hazardous Waste Technology | 3 Credits

This course covers evaluation on sources and types of hazardous waste and relationship between process principles and waste treatment technologies. Fate of contaminants and toxicological effects to human health and environment are assessed. Selection of suitable treatment methods for various types of toxic and hazardous wastes are implemented.

### ECH5404 | Environmental Engineering Laboratory | 1 Credits

This course covers measurement of pollutants in water, wastewater, soil, air and noise in groups using the standard methods of environmental analysis by following the proper safety measures during the practical work. Reports based on practical results with the needs of appropriate environmental law are assessed.

### ECH5108 | Ecotoxicology | 3 Credits

This course covers relationship between risk assessment strategies with risk assessment of toxic agents in environment. Principles of environmental toxicology are related with the exposure sources, disposition, distribution and fate of toxicants in the environment and effects of toxicants upon organic life are discussed. Toxic fate and transport in environment as well as contemporary issues pertaining the toxicants are explained.

### ECH5522 | Atmospheric Risk Management | 3 Credits

This course covers the understanding of practice of performing and managing regulatory atmospheric risk assessments. Evaluation of the effects of air toxic emissions on human health is also discussed.

### ECH5105 | Noise Pollution Engineering | 3 Credits

The course covers appropriate assessment on noise propagation models to the environment outside and inside. Noise pollution management plans are developed. Suitable methods and isolators are related to noise and vibration pollution control.

### ECH5804 | Corrosion Engineering | 3 Credits

This course covers corrosion concept and related reaction with the use of suitable testing methods to determine the rate and types of corrosion. Corrosion control and prevention are implemented by selecting suitable material and environment and also adopting effective methods that will be assessed for its effectiveness.

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

This course covers assessment on the risks and health, safety and environment and prevention techniques. Regulations and standards relating to health, safety and the environment are identified. Determination of prevention level and utilization of appropriate personal protective equipment are implemented. Health, safety and environmental audit in the workplace are developed.

### ECH5110 | Circular Economy for Sustainable Environment | 3 Credits

This course covers topics of circular economy and its relationship with environmental management, sustainable development and life cycle analysis. Its application in cities and industrial manufacturing are also discussed.

### 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.

### ECH5111 | Technology Innovation | 3 Credits

This course covers the exploration on innovative ways of thinking about connections between organizations, environmental management and innovation. Idea of a coupled system which offers a more innovative and dynamic way of conceptualizing the inter-connected aspects of human-environment relations are investigated. The impact of innovation to the ecosystem is discussed.

### ECH5512 | Water Management | 3 Credits

This course covers planning on appropriate methods for water treatment. Issues related to water quality, pollution, management and control are described. The use of groundwater for water supply is assessed.

### ECH5955 | Special Topic | 3 Credits

This course focuses on selected issues and trends related to the field of environmental engineering and management. Exploration of key issues and new directions is conducted to recommend solutions through analysis of critical issues and problems.

### ECH5990 | Dissertation | 3 Credits

Every student is required to carry out supervised research in the area of environmental engineering. The research must be implemented according to a proper process and the results are reported verbally and in writing.