Faculty of Engineering
Department of Chemical and Environmental Engineering
www.eng.upm.edu.my
Master Of Process Safety And Loss Prevention
INTRODUCTION

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 programme will follow both semester system and 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 fulfil 40 credits of course work to graduate. The credit distributions for compulsory courses, elective courses and project are as follows:

<table>
<thead>
<tr>
<th>Compulsory Courses</th>
<th>25 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elective Course</td>
<td>9 credits</td>
</tr>
<tr>
<td>Project</td>
<td>6 credits</td>
</tr>
</tbody>
</table>

Compulsory Courses

Students must take all the listed compulsory courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECH5502</td>
<td>Hazard Analysis and Risk Assessment</td>
<td>3 credits</td>
</tr>
<tr>
<td>ECH5503</td>
<td>Design for Safe Handling of Industrial Chemicals</td>
<td>3 credits</td>
</tr>
<tr>
<td>ECH5504</td>
<td>Applied Hazard and Operability Studies</td>
<td>3 credits</td>
</tr>
<tr>
<td>ECH5505</td>
<td>Process Reliability and Maintainability</td>
<td>3 credits</td>
</tr>
<tr>
<td>ECH5506</td>
<td>Mechanical Failure and Electrical Hazards Prevention</td>
<td>3 credits</td>
</tr>
<tr>
<td>ECH5507</td>
<td>Human Behaviour and Human Error In Engineering</td>
<td>2 credits</td>
</tr>
<tr>
<td>ECH5508</td>
<td>Process Safety Laboratory</td>
<td>1 credits</td>
</tr>
<tr>
<td>ECH5509</td>
<td>Evaluation of Health, Safety and Environment</td>
<td>3 credits</td>
</tr>
<tr>
<td>ECH5510</td>
<td>Disaster Management and Emergency Plan</td>
<td>3 credits</td>
</tr>
</tbody>
</table>

Elective Courses

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECH4102</td>
<td>Environmental Health Engineering</td>
<td>3 credits</td>
</tr>
<tr>
<td>EMM5909</td>
<td>Industrial Safety, Health and Environmental Management</td>
<td>3 credits</td>
</tr>
<tr>
<td>ECH5955</td>
<td>Special Topic</td>
<td>3 credits</td>
</tr>
<tr>
<td>EAB5611</td>
<td>Emergency Risk Management</td>
<td>3 credits</td>
</tr>
</tbody>
</table>

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

Project

Students are required to register ECH5988-Project for 3 credits in the second semester and another 3 credits in the third semester. This course is a project paper on a special topic that will be assigned to the students based on their topic of choice or proposed by their respective supervisors. Students will be examined by a panel of examiners based on the submitted report and oral presentation at the end of the semester.
Course Synopsis

• ECH5502  • Hazard Analysis and Risk Assessment  • 3 credits
This course identifies the interaction between process design and hazard identification. It examines ways for improving the safety of the plant at the process design stage. The techniques of hazard operability study and fault tree analysis are introduced. Risk assessment, including suitable criteria is discussed. Information is given about the way in which safety studies can be integrated within the design process.

• ECH5503  • Design for Safe Handling of Industrial Chemicals  • 3 credits
This course covers transport and thermodynamic properties of materials, handling of flammable materials and explosion of dust, toxicology, design of laboratory safety, safety in process plant design and operation, design of relief systems, and chemical waste disposal.

• ECH5504  • Applied Hazard and Operability Studies  • 3 credits
The course covers the use of HAZOP techniques, detailed study on HAZOP techniques, conducting HAZOP study, identification, evaluation and recording, HAZOP procedure of companies and case study.

• ECH5505  • Process Reliability and Maintainability  • 3 credits
This course covers plant availability, plant reliability, event probability and failure frequency analysis, layer protection analysis and maintainability.

• ECH5506  • Mechanical Failure and Electrical Hazards  • 3 credits
This course covers failures in mechanical design of chemical process equipment, safety aspects in piping design, mechanical handling, safety aspect of lifting machinery and electrical hazards.

• ECH5507  • Human Behaviour and Human Error in Engineering  • 2 credits
This course covers employee’s amenities, accommodation and practice, psychological and ergonomical aspects, human factors in design systems, human reliability: quantitative and qualitative assessment, risk assessment in occupational health and safety, error reduction and communication: making decisions and risks.

• ECH5508  • Process Safety Laboratory  • 1 credit
This laboratory covers computer related exercises to develop and use available softwares in the field of hazard identification, chemical hazards, probability analysis, cause analysis, risk analysis and emergency response analysis.

• ECH5509  • Evaluation of Safety, Health and Environment  • 3 credits
The course covers concept of evaluation in safety, health and environment (SHE), design of evaluation application in SHE, development of evaluation instruments for SHE, sampling technique and data collection, data analysis in SHE evaluation, report writing and development of an instrument to evaluate a SHE programme as a case study.

• ECH5510  • Disaster Management and Emergency Plan  • 3 credits
This course deals with meteorology and natural purification process influence of meteorology phenomena on air quality, global atmospheric change introduction to risk management development of risk management system hazard and safety regulations and health standards in the management of risks, and case studies.

• EMM 5909  • Industrial Safety, Health and Environmental Management  • 3 credits
This course will discuss the safety health and environmental management which includes the recognition and control of hazards in the workplace and the human variables involved in causing and preventing accidents. It will also discuss the various laws, regulations and standards as they apply to workplace safety and health and relevant issues in promoting safety and health in the organization.

• ECH4102  • Environmental Health Engineering  • 3 credits
This course covers water resources, water supply, water treatment process, water pollution, public health and tropical medicine, solid waste disposal, industrial waste treatment, and air pollution control.

• ECH5955  • Special Topics  • 3 credits
The contents of the course depends on the topics selected by the lecturer/s who teach/es the course. It covers the theoretical, application and latest development in related fields that is not covered in other courses.

• EAB5611  • Emergency Risk Management  • 3 credits
This course discusses about risk and project management. It includes managing, planning, controlling and financial risks in major accidents hazards.

For more information

Please contact:

Deputy Dean (Research)
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Universiti Putra Malaysia
43400 UPM, Serdang
Selangor Darul Ehsan
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Tel: 603-8946266/6253
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Email: tdp@eng.upm.edu.my
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Programme Coordinator:

Hamdan Mohamed Yusoff (Dr.)
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Faculty of Engineering
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43400 UPM, Serdang
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Fax: 603-86567120
Email: hamdan@eng.upm.edu.my
Website: http://www.eng.upm.edu.my/~mposafety/
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></td>
<td>Malaysian Student</td>
</tr>
<tr>
<td>Basic Fees (1\textsuperscript{st} semester)</td>
<td>1,200.00</td>
</tr>
<tr>
<td>Basic Fees (2\textsuperscript{nd} and subsequent semester)</td>
<td>950.00</td>
</tr>
<tr>
<td>Credit Fees</td>
<td>250.00 / credit hour</td>
</tr>
<tr>
<td>* subject to change</td>
<td></td>
</tr>
</tbody>
</table>

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 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://www.sgs.upm.edu.my and send your application supporting documents to the address below:

Dean
School of Graduate Studies
Universiti Putra Malaysia
Zon 4, Off Jalan Stadium
43400 UPM Serdang
Selangor Darul Ehsan
Malaysia

Tel. : (603) 8946 4218/4223/4228
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Email : admission@putra.upm.edu.my
Website : http://www.sgs.upm.edu.my