



# Bachelor of Environmental Technology With Honours ACADEMIC HANDBOOK



School of Industrial Technology  
Universiti Sains Malaysia  
[indtech.usm.my](http://indtech.usm.my)

**Academic Handbook**  
**Bachelor of Environmental Technology with Honours**  
**Academic Calendar of 2025/2026**

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Published by: School of Industrial Technology, Universiti Sains Malaysia



Full version of the Academic Handbook

## Vision and Mission

### Universiti Sains Malaysia

#### Vision

Transforming Higher Education for a Sustainable Tomorrow

#### Mission

USM is a pioneering, transdisciplinary research intensive university that empowers future talents and enables the bottom billions to transform their socio-economic well-being

## Vision and Mission

### School of Industrial Technology

#### Vision

World class centre in technological innovation for a sustainable tomorrow

#### Mission

1. To be the prime education provider of technologists who are competent, capable of independent thinking, possess communication and analytical skills, and able to fulfil the needs in various industries and socio-economic development.
2. To pursue cutting-edge research in the fields of Food Technology, Bioresource Technology, Environmental Technology, and Bioprocess Engineering Technology.
3. To contribute to the well-being of the community through sustainability-led dynamic transdisciplinary academic programmes, research innovation, teamwork, and continuous improvement.

## Niche Research Area

### School of Industrial Technology

Sustainable Materials, Processing, and Energy Technologies

# History

## School of Industrial Technology

1973

The establishment of the School of Applied Sciences, offering the Bachelor of Applied Science programmes in Electronic Science and Technology, Food Science and Technology, and Polymer Science and Technology.

1984

The name of the School was changed to the School of Engineering Sciences and Industrial Technology. Hence, the curricula were amended to Bachelor of Engineering (B. Eng) and Bachelor of Technology (B. Tech) to meet the requirement of engineering and industrial technology courses.

1986

The School was split into:

- School of Electrical and Electronic Engineering
- School of Materials and Mineral Resources Engineering
- School of Industrial Technology

School of Industrial Technology offered Bachelor of Technology programmes in Food Technology, Polymer Science and Technology, Quality Control & Instrumentation, and Wood, Paper and Coatings Technology.

2001

Polymer Technology and Quality Control & Instrumentation programmes were upgraded into:

- Polymer Engineering programme
- Mechatronic Engineering programme

1999

Environmental Technology programme was introduced by School of Industrial Technology.

2002

Wood, Paper and Coatings Technology programme was renamed Bioresource, Paper and Coatings Technology programme.

2008

Bioprocess Technology programme was introduced by School of Industrial Technology.

2018

Master of Science (Environmental Science) programme was introduced by School of Industrial Technology.

2020

Bioresource, Paper and Coatings Technology programme was renamed Bioresource Technology programme.

2022

Bioprocess Technology programme was changed to Bioprocess Engineering Technology programme.

2025

Master in Bioprocess Technology programme was introduced by School of Industrial Technology.

# Management

## School of Industrial Technology

### DEAN



Assoc. Prof. Dr. Yusri Yusup

### DEPUTY DEAN



Assoc. Prof. Dr. Uthumporn Utra  
@ Sapina Abdullah  
(Academic, Career & International)



Assoc. Prof. Dr. Lee Chee Keong  
(Research, Innovation & Industrial –  
Community Engagement)

### PROGRAMME CHAIRMAN



Dr. Maizura Murad  
(Food Technology)



Ts. Dr. Azniwati  
Abd Aziz  
(Bioresource  
Technology)



Assoc. Prof. Dr.  
Syahidah Akmal  
Muhammad  
(Environmental  
Technology)



Ts. Dr. Siti Baidurah  
Yusoff  
(Bioprocess  
Technology)

### Deputy Registrar



Mdm. Nooraida  
Mad Naser

### Senior Assistant Registrar



Mdm. Khairun  
Nisa Ismail

### Senior Research Officer



Ts. Dr. Che Ku  
Abdullah  
Che Ku Alam

### Senior Science Officer



Mr. Jeffiz Ezuer  
Shafii

### Senior Science Officer



Mr. Mohd  
Syukri  
Baharudin

## Academic Programme

The School of Industrial Technology offers the following bachelor degrees:

- Bachelor of Food Technology with Honours
- Bachelor of Bioresource Technology with Honours
- Bachelor of Environmental Technology with Honours
- Bachelor of Bioprocess Engineering Technology with Honours

Acceptance to any of the above programmes is subjected to selection and entry qualification. Most of the first year courses consist of basic science courses in Chemistry, Mathematics, Physics, and Computer. From level 200, all students are required to enrol for courses relevant to their respective programmes up to level 300 (Bioresource and Environmental Technologies) or 400 (Food and Bioprocess Engineering Technologies), whereby they are required to conduct one final year research project.

Students are also required to undergo industrial training in various industries relevant to their study programme for 12 (Food, Bioresource, and Environment Technologies) or 24 (Bioprocess Engineering Technology) weeks. This training is aimed at exposing the students to actual working practice and atmosphere of the industry.

## Environmental Technology

This programme, which is spread over three and a half years, is gaining popularity and its importance needs no introduction since environmental problems are reported and discussed everyday globally. This programme is designed to enable the graduates to respond directly to the various environmental challenges they will face upon entering the work force.

Examples of courses taught include chemical engineering unit operations, water and industrial wastewater treatment (including the design of treatment plants), solid and scheduled waste management, environmental management system, environmental safety, law and regulations, and air and noise pollution. Students will also learn to appreciate the complex issues relating to social, environmental, and economic sustainability.

The curriculum is based on a strong foundation in chemical process engineering for applications in environment-related processes. The elective courses offered are in-line with holistic and multidisciplinary educational approaches.

## Programme Educational Goal & Objectives

The goal of the Bachelor of Technology (Honours) (Environment) degree programme is to produce graduates who have specialised expertise, solid knowledge, critical thinking, creative, research skills in the field of Environmental Technology to meet the employable needs of the country in various related industries or agencies and graduates and able to lead the community for sustainable national development.

Therefore, the Bachelor of Technology (Honours) (Environment) degree programme is designed to produce graduates:

- who are competent, creative, innovative and capable of solving problems in Environmental Technology on the global and society level for sustainable development.
- who can communicate and work in interdisciplinary teams effectively in the Environmental Technology field.
- who have leadership skills, a positive attitude, and professional ethics in the Environmental Technology field.
- who can contribute to society's well-being and the sustainability of the environment.
- who have an interest in entrepreneurship and constantly strive to acquire new knowledge through research, continuing education and/or professional development activities.

## Mentor-Mentee System & Counselling Service

The mentors are appointed among the academic staff of the school who provide assistance and guidance to students, mainly in academic matters. However, the school has established an open mentor system, whereby probation students are free to see any of the mentors. Nevertheless, probation students are recommended to discuss academic-related problems with mentors from their own programme.

The mentors appointed are as listed below:

| No. | Name                       | Room No. | Phone Extension | E-mail Address |
|-----|----------------------------|----------|-----------------|----------------|
| 1.  | Ts. Dr. Mohd Hafidz Jaafar | 121      | 2107            | mhafidz@usm.my |
| 2.  | Dr. Widad Fadhullah        | 152      | 5202            | widad@usm.my   |

## Programme Learning Outcomes

At the end of the programme, students will be able to:

1. Acquire the advanced and comprehensive theoretical and technical knowledge and skills in the area of Environmental Technology specialised (Knowledge).
2. Identify and resolve issues and problems in a critical, creative, and innovative manner in the area of Environmental Technology specialisation (Thinking Skill and Scientific Approach).
3. Exhibit extensive technical skills in the area of Environmental Technology specialisation (Technical Skill, Practical Skill, Psychomotor).
4. Display a sense of responsibility and master social skills (Social and Responsibility Skill).
5. Acquire the skill to communicate effectively in all walks of life (Communication Skill).
6. Demonstrate basic digital skills for living, learning and working in a society (Digital Skill).
7. Demonstrate numeracy skills in all aspects of life (Numeracy Skills).
8. Function effectively as an individual and in a team with the ability to lead (Leadership Skill).
9. Manage current information and recognise the importance of lifelong learning (Lifelong Education and Information Management).
10. Acquire entrepreneurial knowledge base for career development (Management and Entrepreneurship Skill).
11. Understand and manage the environmental industry in a professional and ethical manner (Professionalism, Value, Attitude and Ethics).

## Programme Requirements

| Course Code Classification | Normal Programme | Min. Total Unit Requirements |
|----------------------------|------------------|------------------------------|
| T                          | 72               |                              |
| E                          | 30               | 120                          |
| U                          | 18               |                              |

### Notes:

T (core courses) – compulsory courses for a particular area of specialisation that must be taken and passed.

E (elective courses) – courses must be taken by students with elective programme to strengthen their technology specialisation courses.

U (university requirements) – courses to fulfil the university requirements.

## Details of Programme

| Type of Programme                                  | Structure of Programme  |
|--|---|
| Bachelor of Environmental Technology with Elective | Students choose several elective courses to widen their specialisation area and their knowledge in industrial technology. |

## Graduation Requirements

- ☑ Fulfil the minimum required (7 semesters) of the residential requirement for the programme of study and has not exceeded the maximum period of study (12 semesters).
- ☑ Fulfil all credit requirements of the courses for the programme of study required units such as the requirements for each component (core, elective, and university courses or option).
- ☑ Obtained a CGPA of 2.00 and above for core courses.
- ☑ Obtained a CGPA of 2.00 and above for the programme.
- ☑ Achieved a minimum of 'C' or a grade point of 2.00 for Bahasa Malaysia, English (4 units), Appreciation of Ethics and Civilisations, Philosophy and Current Issues, and Core Entrepreneurship courses.

# University Requirements for Graduation

| LOCAL STUDENTS  |       | INTERNATIONAL STUDENTS   |       |
|---|-------|--|-------|
| Compulsory Courses  | Units | Compulsory Courses   | Units |
| ❖ LKM400/2 Bahasa Malaysia IV                                   | 2     | ❖ LKM100/2 Bahasa Malaysia I   | 2     |
| English Language ( <b>MUET Band 5+</b> )                        |       | ❖ English Language courses   | 4     |
| ❖ LHP410/2, LHP411/2, or LHP412/2<br><b>and/or</b>              |       | * Students may obtain advice from the School of Languages, Literacies and Translation if they have different English Language Qualification. |       |
| ❖ Foreign language courses                                      |       |  |       |
| English Language ( <b>MUET Band 5</b> )                         |       |  |       |
| ❖ LSP301/2 General English 2<br><b>and</b>                      |       |  |       |
| ❖ LHP410/2, LHP411/2, or LHP412/2                               |       |  |       |
| English Language ( <b>MUET Band 4.0 &amp; 4.5</b> )             | 4     |  |       |
| ❖ LSP201/2 General English 1<br><b>and</b>                      |       |  |       |
| ❖ LSP301/2 General English 2                                    |       |  |       |
| English Language ( <b>MUET Band 3.5 and below</b> )             |       |  |       |
| ❖ LSP101/2 Progressive English*                                 |       |  |       |
| <b>or</b>   |       |  |       |
| ❖ Re-sit MUET   |       |  |       |
| * Prerequisite for LSP201/2 General English 1                   |       |  |       |
| ❖ HFE224/2 Appreciation of Ethics and Civilisations             | 2     | ❖ HFF225/2 Philosophy and Current Issues   | 2     |
| ❖ HFF225/2 Philosophy and Current Issues                        | 2     | ❖ SEA205E/4 Malaysian Studies  | 4     |
| ❖ WUS101/2 Core Entrepreneurship                                | 2     | ❖ Option/English Language  | 2     |
| ❖ WAR122/2 Integrity and Anti-Corruption                        | 2     |  |       |
|   |       | ❖ Co-curricular  | 2     |
| Optional Courses  | Units | Optional Courses   | Units |
| ❖ Co-curricular/Skills Courses/Foreign Language Courses/Options |       | ❖ Co-curricular/Skills Courses/Foreign Language Courses/Options  |       |
| ❖ WSU101/2 Sustainability: Issues, Challenges & Prospect        | 4     | ❖ WSU101/2 Sustainability: Issues, Challenges & Prospect   | 4     |
| ❖ HTV201/2 Thinking Techniques                                  |       |  |       |
| Minimum Requirements  | 18    | Minimum Requirements   | 18    |

**Note: Student must pass all University courses with the minimum grade of C.**

# Curriculum Structure

| COURSE TYPE                                | LEVEL 100 (2025/2026)                        |   | LEVEL 200 (2026/2027)                         |  | LEVEL 300 (2027/2028)                          |                                    | LEVEL 400 (2028/2029) |            | TOTAL UNIT |
|--|--|---|---|--|--|------------------------------------|-----------------------|------------|------------|
|  | SEMESTER 1                                   | SEMESTER 2  | SEMESTER 1                                    | SEMESTER 2                                   | SEMESTER 1                                     | SEMESTER 2                         | SEMESTER 1            | SEMESTER 2 |            |
| CORE (T)                                   | IEA101/4<br>IUK102/3<br>IUK108/4<br>IUK191/4 | IEA123/2<br>IEK108/3<br>IEK115/3                                  | IEA221/2<br>IEK220/4<br>IEK218/3<br>IEK219/3  | IEK205/3<br>IEK211/3<br>IEK221/4<br>IEK219/3 | IEA300/2<br>IEA313/8**<br>IEA322/2<br>IEK307/3 | IEA313/8**<br>IEK308/3<br>IEK309/3 | IEA404/6*             |            | 72         |
|  | 15   | 8   | 9   | 13   | 11   | 10                                 | 6                     |            |            |
|  | SEMESTER                                     | SEMESTER  | SEMESTER                                      | SEMESTER                                     | SEMESTER                                       | SEMESTER                           | SEMESTER              | SEMESTER   |            |
| ELECTIVE (E)                               | BO1102/3<br>IUK190/3                         | IBG111/3<br>IEA112/4<br>IUK291/4                                  | IUK107/4<br>IEA202/2<br>IBK212/2              | IEK217/3<br>IUK208/3<br>IUK292/3             | IEA333/3<br>IEA315/3                           | IEA311/3<br>IEA314/3<br>IEG301/3   |                       |            | 30         |
|  | 6  | 11  | 8   | 9  | 6  | 9                                  |                       |            |            |
|  | SEMESTER                                     | SEMESTER  | SEMESTER                                      | SEMESTER                                     | SEMESTER                                       | SEMESTER                           | SEMESTER              | SEMESTER   |            |
| UNIVERSITY (U)                             | WU5101/2<br>Ko-K/1                           | WAR122/2<br>Ko-K/1<br>Ko-K/Skill/Foreign Language Course/Option/2 | HFF 225/2<br>LKM400/2<br>LSP101/2 or LSP201/2 | HFE 224/2                                    | LSP201/2 or LSP301/2                           | LSP301/2 or LHP411/2               |                       |            | 18         |
|  | 3  | 5   | 6   | 2  | 2  | 2                                  |                       |            |            |
|  | SEMESTER                                     | SEMESTER  | SEMESTER                                      | SEMESTER                                     | SEMESTER                                       | SEMESTER                           | SEMESTER              | SEMESTER   |            |
| <b>TOTAL MINIMUM CREDIT FOR GRADUATION</b> |  |   |   |  |  |                                    |                       |            | 120        |

\* Students must register for this course online during their internship.  
 \*\* Course is offered in TWO (2) semesters (unit counted per semester is 4).

# List and Synopsis of Courses

## Level 100

### 1. BOI102/3 Ecology

This is an introductory course on general ecology for students to understand various principles of ecology. The concept of ecology will be defined in term of the basic components, structures and processes that occur in the ecosystems, communities and population together with the analysis and interpretation of organisms distribution patterns.

### 2. IBG111/3 Industrial Microbiology

Discusses the involvement of microorganisms in industrial processes, specifically in the production of various product materials including enzymes, food, beverages, fuels, pharmaceuticals, organic solvents, cell biomass, and also clean technology that is used for waste treatment and pollution control. Emphasis will be given on the determination of important industrial microorganism, selection and isolation methods, maintenance, storage, improvement of industrial microorganisms, and the involvement of microorganisms in various industries. Relevant practical classes will also be conducted.

### 3. IEA101/4 Introduction to Environmental Science and Technology

This course introduces environmental science as a basis to Environmental Technology. This course will focus on the introduction of application-related technology to address the problems of global pollution. Students are exposed to the fundamentals of environmental chemistry, environmental microbiology and some basic analyses of environmental pollution (water, air and soil), including field and laboratory work.

### 4. IEA112/4 Society and Environment Project

This course introduces students to the community and the environment through the interdisciplinary discipline of natural sciences with socio-political sciences and links environmental-ecological, social and economic aspects toward achieving sustainable societies. Students will be exposed to the concept of capitalism encompassing the world's economic-political system in line with the environmental-ecological crisis. Students will be encouraged to discuss and articulate their views on the interests of various conflicting parties, for example between government, corporate and non-governmental environmental activists. Students will also propose and implement appropriate, individual and group social projects on the exploitation of natural resources and waste generation by the industrial community.

### 5. IEA123/2 Internet of Things for Environmental Monitoring towards Artificial Intelligence

This course introduces Internet of Things (IoT) in environmental monitoring. Students will learn the development of IoT technology. Students will also use Python to program IoT protocols and produce one IoT device for environmental monitoring.

### 6. IEK108/3 Process Fluid Mechanics

**Course Prerequisites:** s IUK102/3

This course introduces students to the concept of fluid statics, incompressible and compressible fluid flow, as well as flow across submerged bodies. Students will also be exposed to the topics of metering, separation, mixing, and pumping. Other topics include Fanning friction factor, pumping power and cost, as well as flow rate calculations.

### 7. IEK115/3 Environment, Safety and Health Legislation

This course exposes the student to the concept of environmental, occupational safety and health management based on two main acts, Environmental Quality Act 1974 and the Occupational Safety and Health Act 1994. This course uses a case study learning approach.

### 8. IUK102/3 Basic Chemical Process Calculations

This course is about general calculations involved in chemical processes. The students will be exposed to mass and energy balance and the steps needed to solve related problems. These topics will help the students solve problems effectively through the correct problem-solving methodology, relevant data collection and data analysis. This course also introduces the student to the properties and phase behaviour of steam, gases as well as basics of chemistry and physics.

### 9. IUK107/4 Chemistry for Technologist

The course syllabus aims for a comprehensive coverage to bolster students' organic and general chemistry foundation. Topics include molecular structure, acidity and basicity, organic nomenclature, stereochemistry, synthesis and reactions of diverse compounds. Spectroscopic methods will be taught for sample constituent and functional group identification.

### 10. IUK108/4 Statistic with Computer Applications

This course discusses basic statistical techniques, frequency tables, graph types, mean, variance and standard deviation. This course will also discuss various methods for analyzing data, including z-test, t-test, chi-square test, analysis of variance, linear correlation and linear regression. These analysis methods are also applied using computer software.

### 11. IUK191/4 Mathematics I

This course introduces the concepts of functions and limits of single variable. Linear, polynomial, logarithmic, exponential and trigonometry functions will be discussed. The focus will be on the understanding of concept and solving of differentiation and integration with applications. Students are then introduced to differential equations focusing on separable differential equation and first-order linear equations. Matrices and determinants are taught in solving systems of linear equations by using Gauss and Cramer methods.

### Level 200

#### 12. IEA202/2 Environmental Bioindicators

##### Course Prerequisites: s IEA101/4

This course provides an understanding of the concept of using biological indicators in ecosystems. The use of this biological indicator is based on the tolerance or existence of an organism in the terrestrial and aquatic ecosystem as a first step of detecting environmental changes.

#### 13. IEA221/2 MATLAB Applications in Industry

##### Course Prerequisites: s IUK102/3

The course introduces the student to MATLAB in industry and the field of environmental technology. The course comprises two parts: MATLAB and Simulink. The programming part focuses on computer programming. The student will be instructed on commands, function concepts, statistical tools, and the programming flowchart. The Simulink part will expose the student to simulation in the industry.

#### 14. IEK205/3 Air Pollution Control Technology

This course exposes students to industrial air pollution problems and control methods. Among the items studied are air quality management, air pollution control devices, meteorological aspects and air pollution dispersion modelling.

#### 15. IEK211/3 Equipment Design for Water Treatment

This course provides exposure on water resources, water characterisation and drinking water standards. This course also explains the water demand, water reticulation system, equipment design of water treatment, and water distribution system.

#### 16. IEK217/3 Environmental Management

This course exposes the students to the concept of planning, implementation and management of the environment through systematic methods. The methods mainly discussed in this course are the Environmental Management System in line with the international standard ISO 14001 and Environmental Impact Assessment (EIA) along with Environmental Management Plan (EMP). Furthermore, students will learn other methods such as environmental performance evaluation, environmental labelling and Life Cycle Assessment (LCA).

#### 17. IEK218/3 Treatment and Management of Solid Wastes

This course introduces treatment and management of solid waste. This course also exposes the students to the legislation, characterisation, generation, collection, transport, disposal, solid waste process, and leachate treatment. Concepts related to landfill design will also be discussed.

#### 18. IEK219/3 Treatment and Management of Scheduled Wastes

This course covers treatment and management of scheduled waste according to Environmental Quality (Scheduled Wastes) Regulation 2005. The management of scheduled wastes, from its generation until its disposal, is discussed. Environmental pollution prevention and minimisation will also be elaborated. Physical, chemical, and biological treatments of scheduled waste will be summarised.

### 19. IEK220/4 Heat Transfer and Applications

**Course Prerequisites:** s IUK102/3

This course introduces the student to the fundamental principles of heat transmission by conduction, convection, radiation, and evaporation. This course will also discuss on the applications of these principles to the solution of industrial heat transfer problems and the design calculations for industrial heat exchanger equipment.

### 20. IEK221/4 Mass Transfer and Separation

**Course Prerequisites:** s IUK102/3

This course introduces the students to the concepts and principles of mass transfer and separation processes. Additionally, unit operations, such as distillation, absorption, adsorption, humidification, filtration, centrifugation, and drying, will be discussed.

### 21. IUK208/3 Experimental Design with Computer Applications

**Course Prerequisites:** s IUK191/4

This course discusses on the Replication, Randomization, Blocking, and Definitions in Experimental Design (Experiment, Treatment, Factor, Level, Experimental unit, Experimental design, Random, Replicate).

### 22. IUK291/4 Mathematics II

**Course Prerequisites:** s IUK191/4

This course expands the concepts of functions and limits to two variables. Linear, polynomial, logarithmic, exponential and trigonometry functions will be discussed. The focus will be on the understanding and solving partial derivatives of differentiation and solving partial double and triple integration with simple applications. Students are then introduced to differential equations focusing on separable differential equation and second-order linear equations. Infinite series, Taylor-MacLaurin series and Fourier series are taught with a view to examine the theory and properties of certain functions that can be represented as sums of series.

### Level 300

#### 23. IEA300/2 Environmental Technology Laboratory

This course exposes the students to various treatment and measuring methods in noise, air, water, solid wastes, and wastewater treatment through experiments.

#### 24. IEA311/3 Environmental Microbiology

This course provides a general introduction to the diverse roles of microorganisms in natural and artificial environments. It will cover topics including cellular architecture, energetics and growth, evolution and gene flow, population and community dynamics, water and soil microbiology, biogeochemical cycling and microorganisms.

#### 25. IEA313/8 Environmental Technology Research Project

**\*\*Course is offered in TWO (2) semesters**

**Course Prerequisites:**

- (i) **Students must take all core courses of levels 100 and 200.**
- (ii) **Students have collected at least 40 credit units of core courses.**

This course will introduce the student problems relating to Environmental Technology. Through research, the student will be tasked to solve the problem. Lecturers will supervise the students in carrying out the literature search, laboratory work, and dissertation writing. The student will also attend a series of lectures on research philosophy, experimental design, scientific thinking, laboratory safety, thesis writing, Viva Voce presentation.

#### 26. IEA315/3 Indoor and Built Environment

This course explains basic terms, parameters, effects (good and poor) of indoor environment and its relationship with humans, building energy consumption and the environment. Students will learn methods of planning, management and indoor environmental control technology of indoor environment in order to achieve healthy working and living conditions of indoor spaces. In addition, legislations, regulations, standards and guidelines at national and international levels on indoor environment will be discussed.

#### 27. IEA322/2 Computer-Aided Design (CAD) Drawing and Application

Introduction to computer-aided design (CAD) drawing, important elements in engineering drawing; 2-D drawing by using the CAD software; application of CAD drawings to create engineering drawings related to technology.

#### 28. IEA333/3 Environmental Product Designing Process

The course is designed to focus on the designing stage in a product development process. Emphasis is given to research and analysis, problem identification and problem-solving, idea development involving design concepts and criteria, and related technical requirements. The student will apply their skills and technical knowledge to formulate design solutions.

**29. IEG301/3 Environmental Forensics****Course Prerequisites:** s IUK108/4

This course provides basic knowledge in environmental forensics by emphasising the use of the relevant methods which are suitable to solve key environmental pollution questions. These methods include chemical and DNA fingerprinting techniques. Chemical fingerprinting techniques to be discussed are mass spectrometry, trace metal analysis, and stable isotopes analysis of light elements, whereas the DNA fingerprinting technique covers methods of DNA extraction and detection of toxin encoding gene. In addition, multivariate statistical methods will be taught to the students in order to recognise patterns of data, and thus obtaining the best information and interpretation from the analyses carried out. At the end of this course, students should know how to organise information and data from various sources in order to tackle the challenges in environmental forensics using critical and logical thinking.

**30. IEK307/3 Noise and Vibration Control Technology**

This course exposes the student to the physical principles of sound, noise and vibration. The student will be taught data collection and analysis techniques. This course will also expose the student to suggest solutions of noise and vibration problems from the aspect of technology and legislation.

**31. IEK308/3 Industrial Wastewater Treatment Plant Design**

In this course, students will be given a project to design a waste water treatment plant. Students are required to integrate the relevant unit operations, taking into account the main objective of meeting the current environmental legislations. Basic and methods of treatment (physical, chemical, and biological) will be discussed.

**32. IEK309/3 Chemical Fate and Transport in the Environment**

The course involves the study of the transport and fate of chemical substances within the three environmental geospheres: water, air and solids. Course objectives are to introduce and evaluate current methods or models for materials transport from an environmental entry site to the various geospheres so that the environmental exposure can be estimated.

**33. IEK314/3 Environmental Audit and Risk Assessment**

In this course, the basic principles of environmental auditing will be discussed. Students will learn how to plan, prepare, conduct an environmental audit and to write an audit report. Also, students will be exposed to the topics of the energy audit, waste audit, occupational safety and health audit, qualification and registration process of auditors as well as risk assessment.

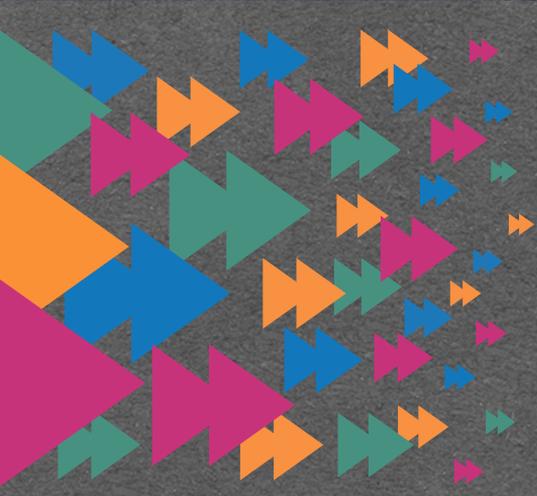
**Level 400****34. IEA404/6 Environmental Technology Industrial Training****Course Prerequisites:** Students have completed FOUR (4) semesters of study, regardless of the accumulated units.

This course involves placement of students to undertake internship at industries. During the internship, student are able to gain an insight into industrial practices and appreciate how principles of science, technology and management are applied in the actual workplace.



# Academic Staff

|   |   |
|---|---|
| Prof. Datuk Ts. Dr. Abdul Khalil Shawkataly       | Prof. Dato' Dr. Azhar Mat Easa                |
| Prof. Dr. Liong Min Tze                           | Prof. Dr. Norli Ismail                        |
| Assoc. Prof. Dr. Cheng Lai Hoong                  | Assoc. Prof. Ir. Dr. Husnul Azan Tajarudin    |
| Assoc. Prof. Dr. Lee Chee Keong                   | Assoc. Prof. Dr. Lee Lai Kuan                 |
| Assoc. Prof. Dr. Japareng Lalung                  | Assoc. Prof. Dr. Leh Cheu Peng                |
| Assoc. Prof. Dr. Mardiana Idayu Ahmad             | Assoc. Prof. Ts. Dr. Mohamad Anuar Kamaruddin |
| Assoc. Prof. Dr. Mohamad Haafiz Mohamad Kassim    | Assoc. Prof. Dr. Mohd Hafidz Jaafar           |
| Assoc. Prof. Dr. Muhammad Izzuddin Syakir Ishak   | Assoc. Prof. Dr. Nurul Fazita Mohammad Rawi   |
| Assoc. Prof. Dr. Syahidah Akmal Muhammad          | Assoc. Prof. Dr. Tan Joo Shun                 |
| Assoc. Prof. Dr. Tan Thuan Chew                   | Assoc. Prof. Dr. Tay Guan Seng                |
| Assoc. Prof. Dr. Uthumporn Utra @ Sapina Abdullah | Assoc. Prof. Dr. Yusri Yusup                  |
| Dr. Abdorreza Mohammadi Nafchi                    | Ts. Dr. Ana Masara Ahmad Mokhtar              |
| Dr. Arniza Ghazali                                | Ts. Dr. Azniwati Abd Aziz                     |
| Dr. Effarizah Mohd Esah                           | Dr. Esam Bashir Abdulsalam Yahya              |
| Dr. Faheem Ullah                                  | Dr. Harlina Ahmad                             |
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