



**PROGRAMME SYNOPSIS**  
**Year 1 Semester 1**

**Course: ETI 3913 Calculus**

**Synopsis:**

This course covers basic calculus in functions, limits, derivatives and integrals. It provides exposure and practice for students to gain calculus skills that are useful in their Technology or Science Based Programme.

**Course: ETI 3113 Physical Chemistry I**

**Synopsis:**

This course provides the students with the basics of calculation of the rate of reaction, the different order of reactions, and catalysis. The second half of the course focuses more on the electrochemistry such as the redox reactions, Galvanic cells, thermodynamics of redox reactions, battery, corrosion, and electrolysis.

**Course: ETI 3122 Physical Chemistry Lab I**

**Synopsis:**

This course covers the practical activities that enable students to have hands on experience on methods used by the physical chemist. The experiments involve titration, pH measurement, chemical kinetics, simple reaction, and rate constant.

**Course: ETI 3313 Inorganic Chemistry I**

**Synopsis:**

This course covers the basic concepts of inorganic chemistry focusing on structure, reactivity and periodicity of inorganic substances of main group elements. It also includes symmetry and group theory, molecular orbitals, Acid-base, donor-acceptor chemistry, Group 1 (IA) and Group 2 (IIA), and bonding in coordination chemistry. There will be practicals for students to do experiments related to topics.

**Course: ETI 3322 Inorganic Chemistry Lab I**

**Synopsis:**

This laboratory practical emphasis on the basic skills of inorganic chemistry experiments on calibration, periodic table, symmetry group theory, acid base, solid state, main group element and bonding.

**Course: MPU3113 Hubungan Etnik**

**Synopsis:**

Kursus ini memfokuskan perbincangan tentang hubungan etnik di Malaysia yang mana ianya merupakan proses hubungan sosial yang dinamik. Tujuan kursus ini adalah untuk meningkatkan pemahaman pelajar-pelajar tentang konsep kesepaduan sosial, potret hubungan etnik, konsep-konsep asas hubungan etnik, integrasi dan masyarakat

integrasi di Malaysia, pembangunan politik, pembangunan ekonomi, dan perlembagaan Malaysia dalam konteks hubungan etnik di Malaysia, integrasi dan menangani cabaran, agama dan masyarakat, sumbangan kerajaan dan masyarakat dan inter-etnik dan intra-etnik.

**Course: MPU3412 Co-curriculum**

**Synopsis:**

Students will take part in organizing university's and outside events to gain opportunity of training and learning of specific techniques and skills related to the themes of the events apart from participating in soft skills improvement programs while joining other outdoor sports activities. These will allow students to practice effective communication skills, both verbally or written, polish managerial skills while becoming leaders and managing events in the university, and cultivate awareness of lifelong learning while exposing to well-diversify of knowledge, skills and techniques.

**Year 1 Semester 2**

**Course: ETI3923 Statistics**

**Synopsis:**

This subject covers experimental design, statistical method of quality control in the industry, statistical tools and strategies for process control improvement.

**Course: ETI3213 Organic Chemistry I**

**Synopsis:**

This course covers basic hydrocarbon groups in alkanes, alkenes, alcohols, alkyl halides, carbonyl and amine. It provides exposure and practice for students to gain organic chemistry skills that are useful in their Technology or Science Based Programme.

**Course: ETI3222 Organic Chemistry Lab I**

**Synopsis:**

This course provides exposure and practice for students to gain organic chemistry skills that are useful in their Technology or Science Based Programme.

**Course: ETI3133 Physical Chemistry II**

**Synopsis:**

The course covers the concepts and principles of physical chemistry focusing more on the thermodynamics of a reactional system. The first few topics discuss about the thermal aspect of a chemical reaction and the first law of thermodynamics. The third and the fourth topics cover the calculation of enthalpies. The fifth topic discusses about the variation of entropy of a reactional system. The final topic discusses the concept of free energy in a reversible reaction.

**Course: ETI3142 Physical Chemistry Lab II**

**Synopsis:**

This course covers the practical activities that enable students to have hands on experience on methods used by the physical chemist. The experiments involve titration, pH measurement, chemical kinetics, simple reaction, and rate constant.

**Course: MPU3123 Tamadun Islam & Tamadun Asia (TITAS)**

**Synopsis:**

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**Course: UCS3412 Bahasa Kebangsaan**

**Synopsis:**

Kursus ini membolehkan pelajar mempertingkatkan kecekapan berbahasa sesuai dengan intelek pelajar untuk berkomunikasi secara lisan dan tulisan dalam konteks rasmi, kreatif dan bukan kreatif. Mata pelajaran ini disediakan untuk mempertingkat kecekapan berbahasa sesuai dengan intelek pelajar untuk berkomunikasi dengan lisan dan tulisan dalam konteks rasmi, kreatif dan bukan kreatif.

**Year 2 Semester 1**

**Course: ETI3233 Organic Chemistry II**

**Synopsis:**

This course covers stereochemistry, conformational analysis, aromatic and heterocyclic chemistry and organic synthesis. It provides exposure and practice for students to gain advanced organic chemistry skills that are useful in their Technology or Science Based Programme.

**Course: ETI3242 Organic Chemistry Lab II**

**Synopsis:**

This laboratory practical provides exposure and practice for students to gain advanced organic chemistry skills that are useful in their Technology or Science Based Programme.

**Course: ETI3333 Inorganic Chemistry II**

**Synopsis:**

This course covers topics of electronic spectra and reaction in coordination chemistry, organometallic compounds, reaction and catalysis; and application of inorganic medicinal compounds.

**Course: ETI3342 Inorganic Chemistry Lab II**

**Synopsis:**

This lab practical gives exposure to topics on reaction in coordination chemistry, organometallic compounds, reaction and catalysis; and application of inorganic medicinal compounds.

**Course: ETF3143 Food Chemistry**

**Synopsis:**

This course is designed to give students an understanding of the chemical aspects of food composition, structure and chemistry of food components. Emphasis is given to the functional properties and chemical reactions of the major

components of foods: carbohydrates, lipids, proteins, enzymes, carbohydrates, water, etc. as they relate to the composition, preservation, processing, stability, flavour, and nutritional characteristics of foods.

**Course: UCS3122 Professional English**

**Synopsis:**

This course provides a comprehensive reference guide on technical communication principles, skills and practice in workplace. It explains the principles of effective communication, both written and oral, and provides solid advice and practical guidelines on how to strengthen communication skills and produce good technical writing. It introduces the theory, specimen documents, suggested layouts and explanations that develop skills and understanding.

**Course: UCS3112 Communication in the Workplace**

**Synopsis:**

This course comprises of basic knowledge and skills in workplace communication, providing a fundamental exposure and guide to the various forms of communication in the workplace covering both verbal communications and written communication. These include practice in conveying ideas and opinions, writing proposals and business letters, preparing reports, oral communication and presentation.

**Year 2 Semester 2**

**Course: ETI3713 Environmental Chemistry**

**Synopsis:**

This subject introduces the effect of chemicals to the environment including air and water pollution, global warming, green house effects, sludge disposal, water and effluent treatment system, quality control. Students will also learn about the rules and regulation under the Environmental Quality Act, Department of Environment (DOE) Malaysia, and Waste Management System. Students will be exposed to the identification of pollutants, method to estimate and also will get to know the role of the relevant bodies such as the DOE Malaysia, the industries, as well as their role as industrial chemist graduates.

**Course: ETI3353 Inorganic Processing Chemistry**

**Synopsis:**

This subject provides basic principles of chemical technology including distillation, extraction, absorption and adsorption as well as the metal industries. Manufacturing, application, analysis and hazard in handling inorganic chemicals such as hydrochloric acid, nitric acid, sulphuric acid, caustic soda, common salt, borax, bleaching powder, sodium thiosulphate, hydrogen peroxide, potash alum, chrome alum, potassium dichromate and potassium permanganate are also included. A special emphasis will be given to the process flow of inorganic chemicals production and handling as well as metal industries.

**Course: ETI3153 Polymer Chemistry**

**Synopsis:**

This course covers the fundamental concepts of polymer chemistry including topics on classification of polymer, polymerization mechanisms, chemical bonding and polymer structure, thermal transition and polymer modification. The topic will be on basic knowledge of polymer chemistry with some information on what is applied in the industry. Students will also be exposed to the practical activities for hands on experience on polymer chemistry work. The practical will be covered on identification of polymer, separation and purification of polymer, condensation of polymer, emulsion, viscosity and glass transition temperature.

**Course: ETI3513 Unit Operation**

**Synopsis:**

This course covers material balances, energy balances, mass transfer, heat transfer, particle technology, fluid mechanics, distillation, absorption and extraction, evaporation and drying, separation processes, and ideal reactors which are applied in industries. A special emphasize will be given to the process flow, material balance and energy balance. Student will be exposed to the basic principal of a process that is commonly practices in current industries.

**Course: ETI3522 Unit Operation Lab**

**Synopsis:**

This unit operation practical laboratory gives exposure to students to have hands on experience by conducting experiment on distillation, absorption and extraction, evaporation and drying, separation processes, as well as ideal reactors. Experimental design and set up will be aligned with the process flow and setting up in industries. Therefore, the students will be provided with the basic knowledge of unit operation, systems and relevant process flow in industries.

**Course: EEC3632 Engineering Programming**

**Synopsis:**

The students will be given an introductory subject to basic computer software and computer Programming to solve simple engineering problems. Topics include: Introduction to Microsoft Words and Preparation of Report, formal letter etc, Introduction to Computer Programming – Excel Spreadsheet and Problem Solving, Microsoft Project and Project Scheduling.

**Course: UCS3212 Creativity and Innovation**

**Synopsis:**

This subject explores creativity and innovation thinking skills with an exposure of principles of thinking, methods of generating ideas, creativity in problem solving techniques, creativity in writing as well as giving the experience of producing creative and innovative product through project given.

**Year 3 Semester 1**

**Course: ETI3533 Bioprocessing**

**Synopsis:**

This course aims to give students an understanding of the multidisciplinary nature of bioprocess technology and the basic principles involved. It includes understanding of microbiology, biochemistry and simple engineering aspects of scale-up bioprocesses. The course mainly focuses on industrial and environmental aspects of biotechnology and applications of biotechnology in the environment: bioremediation; sewage and wastewater treatment processes and bioleaching. Topics such as cloning or any other current topic is included as a special topic of interest.

**Course: ETI3253 Organic Processing Chemistry**

**Synopsis:**

This subject covers the organic processing in industry involving fermentation process, production of pesticides, oil and fats, sugar and starch. The synthesis and distillation process will also be touched in general. A special emphasis will be given to products such as soap, detergent, oil and fats, sugar as well as starch. Those products are continuously produced and consumed, indicating the importance of knowing the technology behind. Students will have the opportunity to have industrial visits in order to have better understanding of the process.

**Course: ETI3413 Analytical Chemistry**

**Synopsis:**

This course covers an introduction to the basic instrumental methods of chemical analysis which are commonly used in analytical laboratories. These include titrimetry, gravimetric, chromatography, solvent extraction and flow injection analysis. It provides exposure and practice for students to gain analytical chemistry skills that are useful in their Technology or Science Based Programme.

**Course: MPU3312 Entrepreneurship Skills**

**Synopsis:**

This course also provides an understanding of an individual as entrepreneur and the process of creating and growing a new venture. The topics include theory of entrepreneurship, types of entrepreneurship, the importance of entrepreneurship and factors affecting entrepreneurship, entrepreneurship develop in Malaysia, entrepreneurial creativity and innovation, opportunity identification, business plan, business support system and form of business entities and relate legal requirements.

**Course: MPU3212 Malaysian Economy**

**Synopsis:**

This course provides the student with an overview of the Malaysian economy and its economic interaction with other countries. Various topics will be discussed, including: The fundamental of Malaysian Economic structure, government policies, economic sectors (agricultural and industrial, services), social issues (education, poverty, population, labour force) and economic plans and policies towards high income economy (Iskandar, NCER, ECER, SCORE, and SDC).

**Year 3 Semester 2**

**Course: ETI3623 Industrial Quality Management**

**Synopsis:**

This course gives an overview of the good and quality management system inclusive of industrial based scenario which should be equipped among graduates parallel with ISO 17025:2005

**Course: ETI3424 Instrumental Analysis**

**Synopsis:**

This course covers basic instrumental analysis of IR, UV Vis, AAS, proton NMR and mass spectroscopy. It provides exposure and practice for students to gain chemical spectroscopy skills that are useful in their Technology or Science Based Programme. Students will learn about the principle of the instrument, how it is operated, functional group absorption for IR, Beer's Lambert Law applied in UV, nuclear shielding etc in NMR, results interpretation as well as typical industrial application of those instrument.

**Course: ETI3813 Final Year Project I**

**Synopsis:**

Students are required to execute a project (research) under an identified supervisor in an agreeable field of chemistry and documented the findings. Student will learn to gather information of the related topic through literature survey/review activities, construct research methodology, built-up results and discussion (if manageable and sufficient data were obtained), anticipate the expected results (if no data were obtained), and write conclusion and references. Finally, students are required to submit a research proposal and a draft project/research report comprising of Title, Introduction, Literature Review/Survey, Research Methodology/Experimental, Results and Discussion / Expected Results, Conclusion and References.

**Course: UCS3312 Green Technology**

**Synopsis:**

This subject explores the green technology with basic knowledge and fundamental green principles in recycling, green home living, green daily life, green buildings, alternative energy, green transportation, green business and green economics.

**Year 4 Semester 1**

**Course: ETI3613 Industrial Safety and Health**

**Synopsis:**

Overview of the safety and health aspects inclusive of industrial based scenario which should be equipped among graduates parallel with Industrial Relation Act 1967, Employment Act 1955 and Occupational Safety and Health Act 1994.

**Course: ETI3823 Final Year Project II**

**Synopsis:**

This course is a continuation of ETI 3813. Students are required to execute a project (research) under an identified supervisor in an agreeable field of chemistry and documented the findings. Student will learn to gather information of the related topic through literature survey/review activities, construct research methodology, built-up results and discussion (if manageable and sufficient data were obtained), anticipate the expected results (if no data were obtained), and write conclusion and references. Finally, students are required to submit a research proposal and a draft project/research report comprising of Title, Introduction, Literature Review/Survey, Research Methodology/Experimental, Results and Discussion / Expected Results, Conclusion and References.

**Year 4 Semester 2**

**Course: ETI3918 Industrial Training**

**Synopsis:**

Student shall be placed in an industry or research area at least 10 weeks under industrial supervision. The training will be evaluated and student is requested to provide one written report after the industrial training is over.

## Elective Courses

### Course: ETI3\*\*3 Palm Oil Chemistry

#### Synopsis:

This course covers the major processing technology of palm oil based industries in Malaysia as well as the fundamental structure, chemistry, fatty acids compositions, properties of palm oil and food products derived from palm oil. This course also reviewed the issues related to palm oil technology such as health conscious, trans fat, standard and quality control during processing and etc. Students will also learn on the current trends of oil palm industry as well as the management of oil palm byproducts.

### Course: ETI3\*\*3 Corrosion Chemistry

#### Synopsis:

The topics in this course explain the theory of corrosion including factor affecting corrosion process and types of corrosion. It also explains the nature of protective material, major corrosion prevention methods and more importantly it discusses the corrosion in industrial project.

### Course: ETI3\*\*3 Nanochemistry

#### Synopsis:

This course covers fundamental and theories of nanoscience and progress through topic including synthesis and stabilization of nanoparticles, experimental techniques, group of carbon, organic nanoparticles, size effects in nanochemistry, as well as nanoparticles application.

### Course: ETI3\*\*3 Natural Product Chemistry

#### Synopsis:

This course introduces the basic concepts of natural product chemistry. The biosynthetic pathway of secondary metabolites such as terpenes, flavonoids and alkaloids will be discussed. Isolation, classification and structural identification of terpenes, flavonoids and alkaloids will be covered. Other topics include are classes of natural product, anti-infectives from nature, nature's pleasure and danger.

### Course: ETI3\*\*3 Protein Chemistry

#### Synopsis:

This course covers chemistry aspects of protein, peptide and nucleotide. It includes an introduction to amino acids and nucleotides, structure of protein and peptide, and protein synthesis.

### Course: ETI3\*\*3 Petroleum Chemistry

#### Synopsis:

This course describes the chemistry of petroleum and how the properties can be translated into predictability in petroleum refinery. The topics include composition of petroleum, analysis and evaluation, heteroatom in heavy crude oil, thermal chemistry of petroleum, hydrocracking as well as instability and incompatibility of petroleum products.