



# ACADEMIC PROFORMA 2025/2026

## DIPLOMA IN APPLIED SCIENCES



QS  
WORLD  
UNIVERSITY  
RANKINGS

**WE ARE RANKED #1001-1200**  
(Overall 8,467 Evaluated Institutions)  
Malaysia ranked #28  
QS World University Rankings 2026



QS  
WORLD  
UNIVERSITY  
RANKINGS  
ASIA 2025

**248**  
Universiti Tun Hussein Onn University of  
Malaysia (UTHM)



PUSAT PEMBANGUNAN  
AKADEMIK DAN TVET  
CENTER FOR ACADEMIC AND TVET DEVELOPMENT  
UNIVERSITI TUN HUSSEIN ONN MALAYSIA



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Universiti Tun Hussein Onn Malaysia  
July 2024

## Contents

|                                                                   |    |
|-------------------------------------------------------------------|----|
| Foreword from Vice Chancellor                                     | 3  |
| Foreword from Deputy Vice Chancellor (Academic and International) | 4  |
| Foreword from Dean, Centre for Diploma Studies                    | 5  |
| Vision of University                                              | 6  |
| Mission of University                                             | 6  |
| Education Philosophy of University                                | 6  |
| Logo of University                                                | 6  |
| Board of Directors of University                                  | 10 |
| Members of Senate                                                 | 11 |
| Centre for Diploma Studies                                        | 14 |
| Vision of Centre for Diploma Studies                              | 14 |
| Mission of Centre for Diploma Studies                             | 14 |
| External Examiner at Centre for Diploma Studies                   | 16 |
| Industrial Advisor at Centre for Diploma Studies                  | 16 |
| Centre for Diploma Studies Staff Directory                        | 17 |
| Aims of Programme                                                 | 20 |
| Programme Educational Objectives (PEO)                            | 20 |
| Programme Learning Outcomes (PLO)                                 | 20 |
| Curriculum Structure                                              | 22 |
| Synopsis of University Courses                                    | 23 |
| Synopsis of Centre for Diploma Studies Core Courses               | 24 |
| Career and Further Education Prospect                             | 42 |
| Further Education Pathway                                         | 42 |

## Foreword by the Vice Chancellor



Assalamualaikum Warahmatullahi Wabarakatuh and greetings.

I extend heartfelt congratulations and a warm welcome to each of you as you embark on your academic journey with us. Your decision to join UTHM marks a significant milestone, and I am deeply **honoured** by your trust and commitment.

As an academic institution, we not only recognize the importance of the intertwined dimensions of economic, social, and sustainability (ESG) factors in the post-pandemic era but also embrace our responsibility to actively contribute to their advancement. Our commitment is unwavering as we strive to strengthen our core business pillar by focusing on various crucial aspects.

Firstly, we are dedicated to enhancing our academic delivery to ensure our students receive the highest quality education in today's rapidly evolving world. This commitment involves continually refining our curriculum, integrating innovative teaching methods, and cultivating critical thinking skills. Our aim is to equip students with the knowledge and capabilities needed to effectively address complex societal challenges. Secondly, we place significant emphasis on research efforts that contribute to sustainability objectives. By fostering a culture of interdisciplinary collaboration, we strive to generate pioneering research and innovative solutions that tackle pressing economic, social, and environmental issues. Our goal is to make meaningful contributions to the sustainable development of both local and global communities. In addition to our core priorities, we actively enhance our impact by engaging with diverse stakeholders. Through partnerships, community outreach programs, and knowledge exchange initiatives, we aim to extend our positive influence beyond our institution. By leveraging our expertise and resources, we seek to address societal needs, promote inclusive growth, and enhance well-being. Furthermore, our efforts are guided by a commitment to good governance. We uphold the highest standards of transparency, accountability, and ethical practices. By fostering responsible decision-making and cultivating a culture of integrity, we aim to create an environment that builds trust, encourages collaboration, and ensures the long-term sustainability of our institution.

In summary, our dedication centers on achieving dynamically synergistic sustainability. We reinforce our core business pillar through enhanced academic delivery, impactful research endeavours, and enriched services. Upheld by our unwavering commitment to good governance, we believe these principles empower us to actively contribute to shaping a more sustainable and resilient future for all.

Lastly, but certainly not least, I extend a heartfelt welcome to all new students. I invite you to become valued members of our community. As you embark on this transformative journey, rest assured that my commitment is to ensure your experiences are enriching and enjoyable. Additionally, I sincerely wish you success in all your endeavours as you navigate this educational path.

*"With Wisdom, We Explore"*

Best wishes.

**PROFESSOR. DR. MAS FAWZI BIN MOHD ALI**  
**Vice-Chancellor**  
**Universiti Tun Hussein Onn Malaysia**

## Foreword by the Deputy Vice Chancellor (Academic and International)



Assalamualaikum Warahmatullahi Wabarakatuh and Salam Sejahtera.

We extend our heartfelt congratulations and a cordial welcome to all the fresh faces embarking on their academic journey at Universiti Tun Hussein Onn Malaysia (UTHM) in the upcoming academic term of 2024/2025. Here at UTHM, we take pride in our distinct qualities and educational opportunities that distinguish us from the rest. Our pledge to provide an exceptional learning experience remains unwavering, as we are dedicated to helping you achieve academic success and surpass your own expectations.

I want to extend my sincere appreciation and congratulations to the Centre for Academic Development and Excellence (CAD) and the faculties for successfully creating this academic proforma. This resource is incredibly valuable as it provides a concise overview of the different programs offered. Serving as a helpful tool, it not only guides students but also assists them in effectively planning their academic journey. By providing essential information and perspectives, it enables students to make informed choices and navigate their educational endeavors with confidence.

The Ministry of Higher Education Malaysia (MOHE) has set in motion new initiatives to enhance academic facilities and digital resources to meet the country's educational requirements. This effort includes a focus on digitalization to establish a more conducive, secure, and efficient learning environment, while also promoting innovation, adaptability, and global competitiveness.

In order to keep students engaged and boost enrolment numbers, we are implementing several effective measures. These measures include introducing hybrid programs and shortening the study period. As a university affiliated with the Ministry of Higher Education (MOHE), we request your support and understanding as we endeavor to execute these beneficial initiatives. Moreover, we are committed to promoting Technical and Vocational Education Training (TVET) programs as part of our long-term objective to become a leading Global Technopreneur University (GTU) by 2030.

It is crucial, from our perspective, to enhance, strengthen, and sustain our programs and workforce. We are proud to mention that all 110 of our programs are accredited by the Malaysian Qualification Agency (MQA) and their relevant professional organizations. This accreditation is maintained through the commitment of our knowledgeable staff, both in academic and support roles, who consistently engage in skill-building and training programs. I truly believe that the programs implemented by UTHM will offer invaluable opportunities for you to develop and improve your skills. With the introduction of this new system, I anticipate great academic accomplishments and successes for all of you. This is a pivotal moment for you to create a positive impact not only in our country but also in the broader international community.

Best wishes,

**PROFESSOR DR. SHAHRUDDIN BIN MAHZAN @ MOHD ZIN**

Deputy Vice Chancellor (Academic and International)  
Universiti Tun Hussein Onn Malaysia

## Foreword by the Dean



Assalamualaikum Warahmatullahi Wabarakatuh and Warm Greetings

Congratulations and a warm welcome to Universiti Tun Hussein Onn Malaysia (UTHM), a distinguished leader in TVET higher education. We are honored to have you join the Centre for Diploma Studies (CeDS), where we are committed to nurturing you into skilled semi-professionals in the fields of engineering, science, and technology.

At CeDS, our core mission is to manage and operate high-quality diploma programs that align with the dynamic needs of today's industries. Our vision is to produce graduates who will actively contribute to Malaysia's national development, equipped with a broad, well-rounded academic foundation. We offer seven diverse programs in

civil engineering, mechanical engineering, electrical engineering, chemical engineering, applied science, information technology, and animation technology, each designed to meet the latest industry trends.

In response to the growing demands of the digital economy, Industry 4.0 (IR 4.0), and the adoption of Artificial Intelligence (AI) technologies, we have continuously aligned our programs to ensure that they provide a comprehensive education that bridges the skills gap in the workforce. As Malaysia advances in its digital transformation agenda outlined in the 12th and 13th Malaysia Plans (RMK12 & RMK13), we strive to ensure that our graduates are equipped with the technical know-how and problem-solving capabilities needed to succeed in a technology-driven future.

All of our diploma programs are accredited by the Malaysia Qualifications Agency (MQA), ensuring the highest standards of education. Moreover, four of our engineering programs have received the prestigious accreditation from the Board of Engineers Malaysia (BEM), further reinforcing the quality and relevance of the education we offer.

UTHM is renowned not only for its world-class teaching facilities but also for its commitment to creating a conducive learning environment. Our campus infrastructure, which is continuously upgraded, includes state-of-the-art libraries, residential colleges, cafeterias, sports facilities, wireless internet, and more. These facilities are designed to support your academic journey and personal growth.

As you embark on your educational journey at UTHM, we encourage you to utilize this proforma as a guide to help you plan your studies and make the most of the opportunities available to you. Together, let us prepare for the future and contribute to shaping Malaysia's digital landscape.

Wishing you success in your studies and beyond.

**"WITH WISDOM WE EXPLORE"**

**DR. MUHAMMAD FAIZAL BIN ISMAIL**

Dean

Centre for Diploma Studies (CeDS)

Universiti Tun Hussein Onn Malaysia



### **Vision**

To be a global technical university in sustainable technology and transportation

### **Mission**

Provide technical solution for industry and community based on tauhidic paradigm

### **Education Philosophy of University**

UTHM education and training, founded on the tauhidic paradigm, strive to produce competent, professional and entrepreneurial graduates, driven by advanced technologies for global development.

### **Logo of University**

The logo of UTHM displays a proton, a book, a tiered mortar board (levels of learning), a book-rest and a shield.

Symbolism:

- |                |                                                 |
|----------------|-------------------------------------------------|
| • Red          | Bravery                                         |
| • Blue         | Collaboration                                   |
| • Silver       | Quality/ Prestige                               |
| • Book-rest    | Knowledge                                       |
| • Proton       | Science and Technology                          |
| • Book         | Knowledge                                       |
| • Mortar board | Levels of study                                 |
| • Circle       | Resilient and related to global characteristics |
| • Shield       | Confidence                                      |

The whole concept of the logo represents UTHM as a learning institution that supports knowledge expansion and development at all levels of study in science and technology.

**Blue** represents the close relationship among UTHM community in ensuring successful and resilient implementations of the University programmes as well as its education and research activities that are carried out for the benefit of mankind.

**Red** symbolises the adventurous nature of UTHM in exploring new fields to establish itself as a leader in the applications of science and technology. Thus, this reflects the spirit and self-esteem of the UTHM community.

## Chancellor



**HIS ROYAL HIGHNESS**  
**TUNKU ISMAIL IBNI SULTAN IBRAHIM**  
Tunku Mahkota Johor

**Pro-Chancellor**



**Yang Amat Mulia Tunku Idris Iskandar Al-Haj Ibni Sultan Ibrahim**  
Tunku Temenggong Johor



**Yang Berhormat Tan Sri Dato' Dr. Haji Azmi Bin Rohani**  
Setiausaha Kerajaan Johor

## **Board of Directors of University**

### **Chairman**

---

**YBhg. Dato' Sri Ibrahim bin Ahmad**

### **Members**

---

**YBhg. Prof. Dr. Mas Fawzi bin Mohd Ali**

Vice-Chancellor, Universiti Tun Hussein Onn Malaysia

**Mrs. Mahfuzah binti Baharin**

Deputy Under-Secretary,  
(Sector of Tax Incentive & Sectoral) TSBC (GCS) Tax Division  
Ministry of Finance Malaysia

**YB. Dato' (Dr.) Haji Nooh bin Gadot**

Advisor, Johor Islamic Religious Council

**YBhg. Datuk Md Jais bin Haji Sarday**

Board Member, Universiti Tun Hussein Onn Malaysia

**YBrs. Mr. Shahril Anwar bin Mohd Yunos**

Managing Partner, Virtus Capital Partners Sdn Bhd

**YBhg. Datuk Haji Mohd Lassim bin Burhan**

Board Member, Universiti Tun Hussein Onn Malaysia

**YBrs. Ir. Ts. Abdul Rahman bin Bahasa**

Chief Executive Officer, Recove Group

**YBrs. Encik Hasry bin Harun**

Chief Executive Officer, Malaysia Rail Development Corporation

**YBrs. Prof. Ir. Dr. Mohd. Amri bin Lajis**

Professor, Universiti Tun Hussein Onn Malaysia

**YBrs. Mohamad Irza bin Dahari @ Zahari**

Administration and Diplomatic Officer, Department Of Higher Education

### **Secretary**

---

**YBrs. Mr. Naim bin Maslan**

Registrar/Chief Operating Officer (COO), Universiti Tun Hussein Onn Malaysia

### **Members of Senate**

#### **Chairman**

---

**Prof. Dr. Mas Fawzi bin Mohd Ali**

Vice Chancellor

## **Members**

---

**Prof. Dr. Shahrudin bin Mahzan @ Mohd Zin**

Deputy Vice Chancellor (Academic and International)

**Prof. Ts. Dr. Rabiah Binti Ahmad**

Deputy Vice Chancellor (Research and Innovation)

**Prof. Ts. Dr. Abdul Rasid bin Abdul Razzaq**

Deputy Vice Chancellor (Student Affairs and Alumni)

**Prof. Dr. Afandi bin Ahmad**

Provost UTHM, Pagoh Branch Campus

**Prof. Ir. Dr. Md Saidin Bin Wahab**

Assistant Vice Chancellor / Chief Digital Officer (CDO) (Digital and Infrastructure)

**Prof. Dr. Mohamad Zaky bin Noh**

Dean, Centre for Graduate Studies

**Prof. Ir. Ts. Dr. Mohd Haziman bin Wan Ibrahim**

Dean, Faculty of Civil Engineering and Built Environment

**Prof. Ts. Dr. Asmarashid Bin Ponniran**

Dean, Faculty of Electrical and Electronic Engineering

**Prof. Ts. Dr. Amir Bin Khalid**

Dean, Faculty of Mechanical and Manufacturing Engineering

**Assoc. Prof. Dr. Shafie Bin Mohamed Zabri**

Dean, Faculty of Technology Management and Business

**Ts. Dr. Mohd Hasril bin Amiruddin**

Dean, Faculty of Technical and Vocational Education

**Prof. Ts. Dr. Mohd Farhan bin Md. Fudzee**

Dean, Faculty of Computer Science and Information Technology

**Assoc. Prof. Ts. ChM. Dr. Hatijah binti Basri**

Dean, Faculty of Applied Science and Technology

**Assoc. Prof. Ts. Dr. Jumadi bin Abdul Sukor**

Dean, Faculty of Engineering Technology

**Dr. Muhammad Faizal bin Ismail**

Dean, Centre for Diploma Studies

**Dr. Lutfan bin Jaes**

Dean, Centre for General Studies and Co-curricular

**Assoc. Prof. Dr. Hj. Azmi Bin Abdul Latiff**  
Dean, Centre for Language Studies

**Prof. Dr. Abd Rahman bin Ahmad**  
Dean, Johor Business School

**Assoc. Prof. Dr. Rosli Bin Omar**  
Director, Centre for Academic Development and TVET

**Assoc. Prof. Dr. Badaruddin bin Ibrahim**  
Director, Malaysia Research Institute for Vocational Education and Training

**Dr. Zahrul Akmal bin Damin**  
Institute for Social Transformation and Regional Development (TRANSFORM)

**Prof. Ts. Dr. Mohd Khairul bin Ahmad**  
Institute for Integrated Engineering (I<sup>2</sup>E)

**Prof. Ts. Dr. Aeslina Binti Abdul Kadir**  
Faculty of Civil Engineering and Built Environment

**Prof. Ts. Dr. Norzila binti Othman**  
Faculty of Civil Engineering and Built Environment

**Prof. Ir. Dr. Erwan bin Sulaiman**  
Faculty of Electrical and Electronic Engineering

**Prof. Dr. Nafarizal bin Nayan**  
Faculty of Electrical and Electronic Engineering

**Prof. Dr. Hasan Zuhudi bin Abdullah**  
Faculty of Mechanical and Manufacturing Engineering

**Prof. Dr. Ahmad Jais bin Alimin**  
Faculty of Mechanical and Manufacturing Engineering

**Prof. Sr. Dr. Wan Zahari Wan Yusof**  
Faculty of Technology Management and Business

**Prof. Ts. Dr. Alina binti Shamsuddin**  
Faculty of Technology Management and Business

**Prof. Ts. Dr. Soew Ta Wee**  
Faculty of Technology Management and Business

**Prof. Ts. Dr. Rosziati binti Ibrahim**  
Faculty of Computer Science and Information Technology

**Prof. Dr. Rozaida binti Ghazali**  
Faculty of Computer Science and Information Technology

**Prof. Ts. Dr. Zaidi bin Embong**  
Faculty of Applied Sciences and Technology

**Prof. Ir. Dr. Mohd Amri bin Lajis**  
Faculty of Engineering Technology

**Prof. Ir. Dr. Chan Chee Ming**  
Faculty of Engineering Technology

**Ts. Dr. Khalid bin Isa**  
Director, Student Development Centre

**Prof. Dr. Nazri bin Mohd Nawi**  
Director Centre Information Technology

**Prof. Eur Ing. Ir. Ts. Dr. Shahiron bin Sahidan**  
Faculty of Civil Engineering and Built Environment

**Mr. Naim bin Maslan**  
Registrar / Chief Operating Officer (COO) / Secretary of Senate

**Mr. Ismail bin Harun**  
Bursar / Chief Financial Officer (CFO)

**Mdm. Zaharah binti Abd Samad**  
Chief Librarian

**Mdm. Norliah Binti Yaakub**  
Legal Advisor

**Prof. Ir. Ts. Dr. Mohd Irwan bin Juki**  
Pengerusi Majlis Profesor Universiti

## **Centre for Diploma Studies**

### **Centre Vision**

Excellent in providing multidisciplinary education in science and technology

### **Centre Mission**

Producing graduates who contribute to national development through a holistic academic program

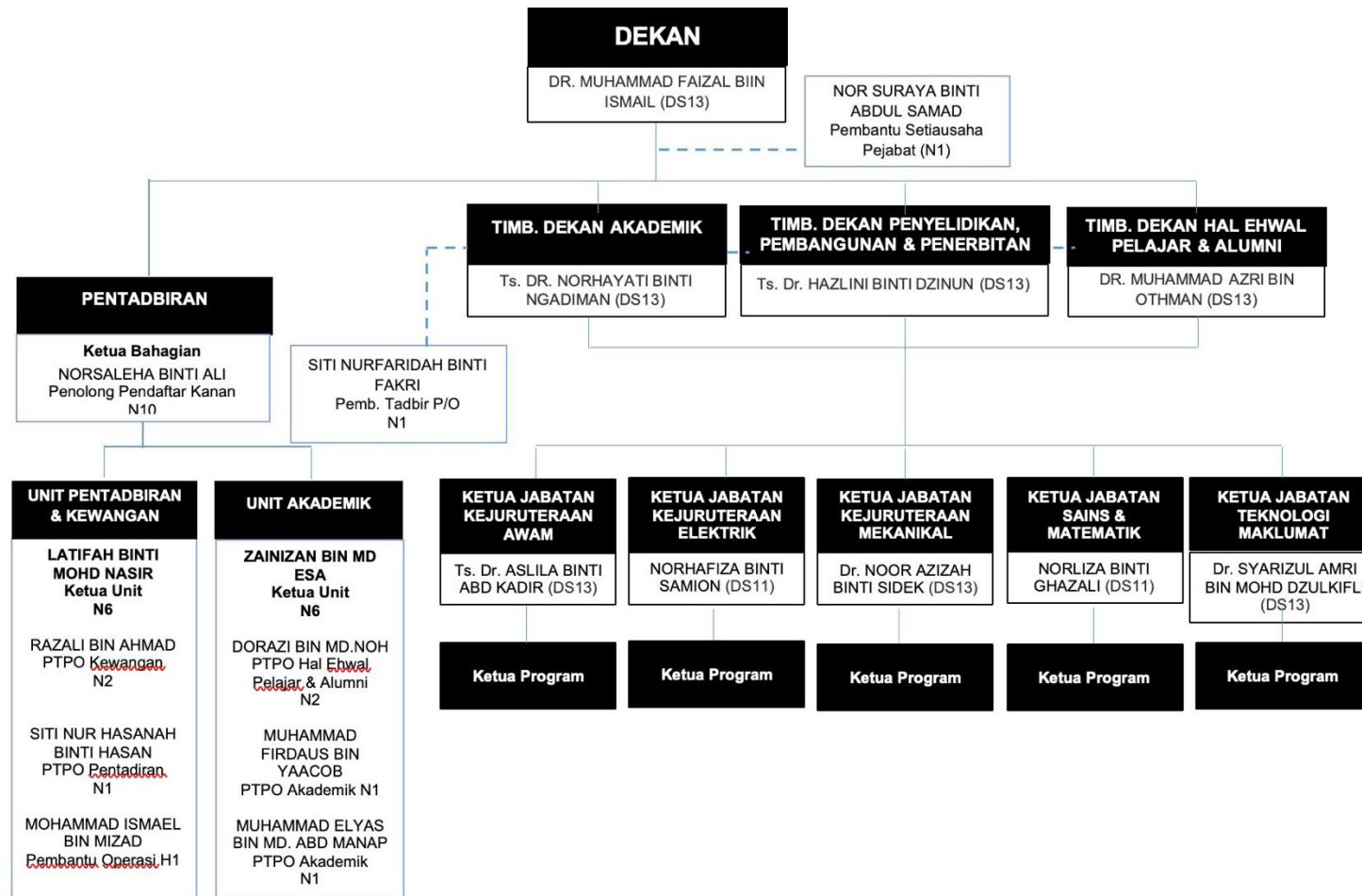
Diploma programmes had been offered in UTHM since the establishment of Pusat Latihan Staf Politeknik (PLSP) in 1994. It started with only three programmes which are managed by the respective departments. All were transferred to the corresponding faculties when Kolej Universiti Teknologi Tun Hussein Onn (KUiTTTHO) was established in 2001.

The establishment of the Centre for Diploma Studies was announced by the Vice Chancellor on the 1<sup>st</sup> of August 2009. This enabled all the diploma programmes to be centrally managed under one roof which would increase the competitiveness of the programmes offered.

It is the aim of the Centre for Diploma Studies to offer diploma programmes at UTHM which are going to be the main choice of applicants. Students are expected to show academic excellence as well as participating in co-curriculum activities which will further develop their potential in order to achieve the quality needed to fulfill the global occupational market. In addition, graduates of these programmes also have the wide opportunity to further their studies at Bachelor Degree level at various faculties in UTHM.

Now, the Centre for Diploma Studies, offer seven (7) diploma programmes which are managed by five(5) departments and is led by a Dean who is assisted by three (3) Deputy Deans. The organizational chart of the Centre for Diploma Studies is shown in the next page:

## CeDS Organization Chart



## **External Examiner and Industrial Advisor at Centre for Diploma Studies**

### **Department of Sciences and Mathematics**

#### **External Examiner**

---

**Assoc. Prof. ChM. Dr. Juliana binti Jumal**

Ph.D (Chemistry), Universiti Kebangsaan Malaysia (UKM), MSc (Chemistry), Universiti Kebangsaan Malaysia (UKM), Bsc. (Chemistry), Universiti Kebangsaan Malaysia (UKM)

**Ir. Dr. Arman bin Abdullah**

Ph.D (Civil Engineering) (Universiti Teknologi Malaysia), MEng (Environmental Engineering) (Universiti Putra Malaysia), B. Eng. (Chemical Engineering) (Universiti Teknologi Malaysia).

#### **Industrial Advisor**

---

**Mohd Fadzil bin Hasbullah**

Mill Manager

Sime Darby Plantation Bhd

Lot 2819, Ladang Devon, Mukim Chin Chin, 77000, Jasin, Melaka

Dip. (Mechanical Engineering), Universiti Teknologi Malaysia (UTM), Dip. (Palm Oil Milling Technology), Universiti Putra Malaysia (UPM).

**Ts. Nor Jannatun Adni binti Ibrahim**

Waste Water Treatment Engineer

Samtec Plating (M) Sdn.Bhd

4, Jalan SiLC 2/1, 79200, Gelang Patah, Johor

Meng. (Environmental), Universiti Teknologi Malaysia (UTM), B. Eng (Chemical), Universiti Teknologi Malaysia (UTM)

**Ts. Mohd Azlan bin Hj. Mat Ali**

Senior Process Engineer

Lynas (M) Sdn.Bhd

PT17212, Jalan Gebeng 3,

Kawasan Perindustrian Gebeng, 26080 Kuantan,

Pahang Darul Makmur, Malaysia

MSc. (Process Plant Operation), Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA), B.

Eng. (Chemical), Universiti Teknologi Malaysia (UTM)

## Staff Directory

### Administration

---

#### Dean

##### **Dr. Muhammad Faizal bin Ismail**

PhD. (Electrical Engineering) (UTM),  
M. Eng. (Electrical Engineering) (UTM),  
B. Eng. (Hons) (Electrical Engineering-Telecommunication) (UTM)

#### Deputy Dean (Academic)

##### **Ts. Dr. Norhayati Binti Ngadiman**

PhD. (Environment) (UKM),  
Master of Technical and Vocational Education (UTHM),  
B. Eng. (Mineral Resources) (USM)

#### Deputy Dean (Student Affairs and Alumni)

##### **Dr. Muhammad Azri Bin Othman**

PhD. (Manufacturing Engineering) (UTeM),  
M.Eng (Manufacturing System) (UPM),  
B. Eng. Manufacturing (Robotic & Automation) (UTeM)

#### Deputy Dean (Development, Research and Publication)

##### **Ts. Dr. Hazlini binti Dzinun**

PhD (Gas Engineering) (UTM),  
M. Eng. (Civil Engineering–Environment) (UTM),  
B. Eng. (Hons) (Chemical Engineering) (UTM)

#### Office Secretary

##### **Nor Suraya binti Abdul Samad**

BSc. Computational Mathematics (UiTM),  
Diploma in Computer Science (UiTM)

#### Administrative Assistant (Deputy Dean Secretary)

##### **Siti Nurfaridah binti Fakri**

Dip. (Hotel & Catering Management) (Politeknik Sultan Ibrahim)

#### Senior Assistant Registrar

##### **Puan Norsaleha Binti Ali**

M. Business Administration (UiTM), Bach. (Hons). Business Management (Finance),  
Diploma in Banking (UiTM)

#### Assistant Administrative Officer (Academic)

##### **Latifah binti Mohd Nasir**

Dip. (International Business) (Politeknik Shah Alam)

#### Assistant Administrative Officer (Administrative and Finance)

##### **Zainizan bin Md Esa**

Dip. (Islamic Management & Administration) (Kolej Tek. Islam Antarabangsa Melaka)

#### Administrative Assistant (Clerical & Operation) Student Affairs and Alumni

##### **Dorazi bin Md Noh**

Malaysian Certificate of Education SMK Dato' Sulaiman,

**Administrative Assistant (Clerical & Operation) Administrative and Finance**

**Razali bin Ahmad**

Malaysian Certificate of Education Sek Tinggi Batu Pahat

**Administrative Assistant (Clerical & Operation) Administrative**

**Siti Nur Hasanah binti Hasan**

Diploma in Science UiTM

**Administrative Assistant (Clerical & Operation) Academic**

**Muhammad Elyas Bin Md. Abd Manap**

Malaysian Certificate of Education (SMK Taman Indah, Tampin)

**Administrative Assistant (Clerical & Operation) Academic**

**Muhammad Firdaus bin Yaacob**

Malaysian Certificate of Education (SMK KhirJohari)

**General Office Assistant**

**Mohammad Ismael Bin Mizad**

Lower Secondary Assesment, Sek Men. Kebangsaan Dato' Bentara Luar

## **Department of Sciences and Mathematics**

---

### **Academic Staff**

#### **Head of Department**

**Dr. Norliza binti Ghazali**

PhD (Technology Management) (UTHM), MBA. (Strategic Management) (UTM), BSc. (Social Sciences) (USM)

**Dr. Dilaeleyana binti Abu Bakar Sidik**

PhD Eng (Tech)(UTHM)MEng (Chemical)(UTM), BEng (Chemical)(UMP)

**Ts. Aida binti Muhamad**

MEng (Civil Engineering) (UTHM), BSc.(Hons). (Chemistry) (UKM)

**Siti Fatimah binti Mohd Noor**

MSc. (Molecular Biology) (UKM), BSc.(Hons). (Genetics) (RIHS)

**Rozainita binti Rosley**

MSc. (Chemical Synthesis) (UPM), BSc, (Hons) (Petroleum Chemistry) (UPM)

**Dr. Norbaizura binti Nordin**

PhD (Physic) (UKM), MSc. (Physic Instrumentation) (UPM), BSc, (Hons) (Physic) (UPM)

**Misbahul Muneer bin Abd Rahman**

BEng. (Chemical) (UiTM)

**Nurhana binti Mohamad**

MSc. (Mathematics) (UTM), BSc. (Industrial Mathematics) (UTM)

**Jamilah binti Mohd Ghazali**

MSc (Applied Mathematics)(UiTM), BSc(Mathematics Management)(UiTM)

**Dr. Norhazimah binti Abdul Halim**

PhD (Bioprocess Engineering) (UMP), MEng (Bioprocess) (UMP), BEng (Chemical)(Biotechnology)(UMP)

**Dr. Raudah binti Mohd Adnan**

PhD (Technology Management) (UTHM), MBA (Marketing) (UPM), BBA (Marketing) (UiTM), Dip of Ed (Arts) (UPSI), Dip. Bus. Studies (UiTM)

**Dr. Siti Noraiza binti Ab Razak**

PhD (Physics) (UTM), MSc (Physics) (UTM), BSc (Health Physics) (UTM)

**Norazreen binti Sharip**

MSc (Physics) (UTM), BSc (Health Physics) (UTM)

**Norain binti Ahmad Nordin**

MSc. (Mathematics) (UTM), BSc. (Industrial Mathematics) (UTM)

**Shazana bte Hashim**

MSc. (Applied Statistic) (UPM), BSc. (Statistics) (UiTM)

**Nuramirah binti Juma'at.**

MSc. (Mathematics Engineering) (UTM), BSc. (Mathematics) (UTM)

**Dr. Norhaliza binti Abu Bakar**

PhD (App. Mathematics) (UTHM), MSc. (App. Mathematics) (UPM), BSc. with Education (Honours) Mathematics (UPM)

**Dr. Muhammad Sufi bin Roslan**

PhD (Physics) (UTM), MSc (Physics) (UTM), BSc (Physics)(UTM)

**Dr. Nur Shahirah binti Mohd Aripin**

EdD (Doctor of Education) (UTHM), MEng (Chemical) (UKM), BEng (Chemical)(UiTM)

**Ts. Nurul Izzati binti Mohd Ismail**

MEng (Bioprocess) (UTM), BEngTech (Biosystem)(UniKL).

**Dr. Basirah binti Fauzi**

PhD (Chemical Engineering) (UTM), MPhil (Chemical Engineering) (UTM), BEng (Chemical-Bioprocess) (UTM)

**Ts. Dr. Hazlini Binti Dzinun**

PhD (Gas Engineering) (UTM), MEng (Civil-Environmental Planning) (UTM), BEng (Chemical) (UTM)

**Dr. Adnin Afifi binti Nawi**

PhD (Mathematics) (UTM), BSc (Mathematics) (UTM)

**Dr. Mohd Zulariffin bin Maarof**

PhD (Mathematics) (UTM), Msc. (Mathematics) (UTM), Bsc. (Mathematics) (UTM)

**Zul Afiq bin Sazeli**

MSc. (Applied Mathematics) (UiTM), BSc. (Mathematics) (UiTM)

**Dr. Mohd Khairul Nizam Bin Mohd Zuhan**

PhD (Chemical Engineering) (USM), MEng (Chemical) (UMP), BEng (Chemical Engineering - Biotechnology) (UMP)

**Dr. Siti Samahani Binti Suradi**

PhD (Polymer Engineering) (UTM), MEng (Chemical) (UMP), BEng (Chemical) (UTM)

## **Programme Name**

Diploma in Applied Sciences (DAU)

## **Programme Aims**

Diploma in Applied Sciences is to produce semi – professional's human resource based on the following PEO

## **Programme Educational Objectives (PEO)**

Program Educational Objectives are to produce semi – professional's human resource that are able to:

- PEO 1    Apply theoretical and practical knowledge in solving pure and applied science problems.
- PEO 2    Practice knowledge effectively, professionally and ethically in issues of pure and applied science
- PEO 3    Interact with professionals and the community effectively to carry out leadership responsibilities in an organization
- PEO 4    Develop career development and entrepreneurship in lifelong learning

## **Programme Learning Outcomes (PLO)**

Upon graduation, a graduate should acquire the followings:

- PLO 1     Apply knowledge of applied sciences and mathematics in sciences and technology.
- PLO 2     Identify problems and generate alternative solutions to mathematical problems, pure science and applied science.
- PLO 3     Apply scientific knowledge, skills, essential tools and techniques, technology in the practice of applied science.
- PLO 4     Collaborate as a member in diverse learning and working communities in sciences and technology team.
- PLO 5     Interact with professionals and the community effectively both in written or oral forms.
- PLO 6     Use a broad range of information, media and technology applications.
- PLO 7     Demonstrate skill in numerical, graphical and visual data.
- PLO 8     Developing a potential of leadership skill and professionalism in group effectively.
- PLO 9     Recognize effectively in self-directed lifelong learning and professional pathways.
- PLO 10    Demonstrate entrepreneurial competency skills for career development.
- PLO 11    Practicing knowledge professionally, ethically and humane in the context of applied science and society.

## Curriculum Structure

Table 1: Summary of curriculum for Diploma in Applied Science

| Year         | Semester | Course Code              | Courses                                     | Credit | Total |
|--------------|----------|--------------------------|---------------------------------------------|--------|-------|
| 1            | Special  | UQU 11402                | Integriti dan Antirasuah                    | 2      | 6     |
|              |          | UHB 11*02                | Foreign Language                            | 2      |       |
|              |          | DAU 18102                | Occupational Safety and Health              | 2      |       |
|              | I        | UHB 13002                | Introduction to English Communication       | 2      | 18    |
|              |          | UQ* 1***1                | Co-Curriculum I                             | 1      |       |
|              |          | DAU 14403                | Algebra                                     | 3      |       |
|              |          | DAU 16402                | Cell biology                                | 2      |       |
|              |          | DAU 12102                | General Chemistry                           | 2      |       |
|              |          | DAU 10103                | Physics Mechanics                           | 3      |       |
|              |          | DAU 10503                | Statistics I                                | 3      |       |
|              |          | DAU 16102                | Scientific Writing                          | 2      |       |
|              | II       | UHB 23002                | English for Career Development              | 2      | 19    |
|              |          | UQ* 1***1                | Co-Curriculum II                            | 2      |       |
|              |          | DAU 10803                | Statistics II                               | 3      |       |
|              |          | DAU 10203                | Fundamentals of electric and electronic     | 3      |       |
|              |          | DAU 16202                | Creative and Innovation                     | 2      |       |
|              |          | DAU 16503                | Introduction to Biochemistry                | 3      |       |
|              |          | DAU 12303                | Physical Chemistry                          | 3      |       |
|              |          | DAU 11302                | Fundamentals of Food Science and Technology | 2      |       |
| 2            | I        | UQI 10402 /<br>UQI 11502 | Pengajian Moral/Pengajian Islam             | 2      | 19    |
|              |          | DAU 20403                | Analytical Chemistry                        | 3      |       |
|              |          | DAU 20303                | Material Science and Technology             | 3      |       |
|              |          | DAU 23103                | Thermodynamics                              | 3      |       |
|              |          | DAU 20703                | Calculus                                    | 3      |       |
|              |          | DAU 21*03                | Elective I                                  | 3      |       |
|              |          | DAU 25102                | Final Year Project I                        | 2      |       |
|              | II       | UQI 11402                | Falsafah dan Isu Semasa                     | 2      | 19    |
|              |          | DAU 20103                | Business and Entrepreneurship               | 3      |       |
|              |          | DAU 23302                | Analytical Instrumentation                  | 2      |       |
|              |          | DAU 20203                | Environmental and Waste Management Systems  | 3      |       |
|              |          | DAU 24403                | Ordinary Differential Equation              | 3      |       |
|              |          | DAU 22*03                | Elective II                                 | 3      |       |
|              |          | DAU 25203                | Final Year Project II                       | 3      |       |
| 3            | I        | DAU 25309                | Industrial training                         | 9      | 9     |
| Total Credit |          |                          |                                             |        | 90    |

## Synopsis of University Courses

| Year                        | Sem                             | Course Code              | Courses                               | Credit | Total     |
|-----------------------------|---------------------------------|--------------------------|---------------------------------------|--------|-----------|
|                             | S<br>p<br>e<br>c<br>i<br>a<br>l | UQU 11402                | Integriti dan Antirasuah              | 2      | 4         |
|                             |                                 | UHB 11*02                | Foreign Language                      | 2      |           |
| 1                           | I                               | UQ* 1***1                | Co-Curriculum I                       | 1      | 3         |
|                             |                                 | UHB 13002                | Introduction to English Communication | 2      |           |
|                             | II                              | UQ* 1***1                | Co-Curriculum II                      | 1      | 5         |
|                             |                                 | UHB 2***2                | English for Career Development        | 2      |           |
| 2                           | I                               | UQI 10402 /<br>UQI 11502 | Pengajian Moral/Pengajian Islam       | 2      | 2         |
|                             | II                              | UQI 11402                | Philosophy and Current Issues         | 2      | 2         |
| 3                           | -                               | -                        | -                                     | -      | -         |
| <b>Total Overall Credit</b> |                                 |                          |                                       |        | <b>16</b> |

## Synopsis of Centre for Diploma Studies Core Courses

### UQU 11402 Integrity and Anticorruption

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#### Synopsis

This course covers the basic concepts of corruption, including the values of integrity, anti-corruption, forms of corrupt behavior, abuse of power in daily activities and organizations, and methods of preventing corruption. Corruption-related cases are also discussed. The teaching and learning methods are implemented in the form of 'experiential learning' through individual and group activities. By the end of this course, students will be able to understand the practices of integrity, concepts of corruption, anti-corruption, and abuse of power, as well as the prevention of corruption in society and organizations.

#### References

1. Mohd Firdaus Ramlan (2021). *Tumbuk Rusuk: Pengkisahan Dari Tirai Besi*. Akademi Kajian Rantau Nusantara Akar. Batu Caves, Selangor.
2. Mohamad Tarmize Abdul Manaf (2020). *Nota Pencegahan rasuah*. Bahagian Pendidikan Masyarakat, Suruhanjaya Pencegahan Rasuah Malaysia. Putrajaya
3. Mohamad Tarmize Abdul Manaf et al. (2020). *Kursus Integriti dan Rasuah IPT*. Bahagian Pendidikan Masyarakat, Suruhanjaya Pencegahan Rasuah Malaysia. Putrajaya.
4. Pusat Governans, Integriti dan Antirasuah Nasional (2019). *Pelan Antirasuah Nasional 2019-2023*. Jabatan Perdana Menteri, Putrajaya.
5. Syed Hussein Alatas. (2009). *Rasuah: Sifat, Sebab dan Fungsi*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
6. Zulkanain Abdul Rahman, Ahmad Kamal Ariffin Mohd Rus & Noor Ain Mat Noor (2017). *Sejarah Perjuangan SPRM: Satu Perjalanan*. Universiti Malaya, Kuala Lumpur.
7. Syed Hussein Alatas (1999). *Corruption and the Destiny of Asia*. Simon and Schuster Asia.

### UQI 10402 Islamic Studies

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#### Synopsis

This course explains about Islamic concept as ad-deen. It discusses the study of al-Quran and al-Hadith, Sunnism, schools of Islamic theology, development of schools of Fiqh, principles of muamalat, Islamic Criminal Law, Islamic work ethics, issues in Islamic family law and current issues.

#### References

1. Nik Kamal Wan Mohammed dan Lain-lain (2018), *Modul Pembelajaran Pengantar Pengajian Islam (UQI10402)*, cetakan keempat 2018, Batu Pahat: Penerbit UTHM.
2. Al-Anjari, Fouzi (2013), *Al-Asya'irah: Akidah Sebenar Ahli Sunnah Wal Jamaah*, Seremban: Creative Publika. (BP166.14. A54 2013)
3. Roziah Sidik (2011), *Pengajian Islam*, Selangor: Oxford Fajar. (BP42. R69 2011)
4. Mohd Fauzi Mohd Amin (2011), *Pemeriksaan Fardhu Kifayah berteraskan Al-Quran dan Al-Sunnah*, Negeri Sembilan: USIM. (BP130.8. P45 2011)
5. Azzam, Abdul Aziz Muhammad (2010), *Fiqh Muamalat: Sistem Transaksi dalam Fiqh Islam*, Jakarta: Amzah. (BP158.C59. A99 2010)

## **UQI 11502 Moral Studies**

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### **Synopsis**

This course explains about the introduction to moral concepts, moral aspects and their importance in daily life. Western moral theory as well as the pure values of the great religions of the world. Morality in various fields of employment, ethics in science and technology and finally current moral issues.

### **References**

1. Eow Boon Hin. 2008. Moral Education. Longman. (LC268.E48 2008)
2. Ahmad Khamis. 1999. Etika Untuk Institusi Pengajian Tinggi. Kuala Lumpur. Kumpulan Budiman. (LC315.M3. A35 1999)
3. Mohd Nasir Omar. 1986. Falsafah Etika; Perbandingan Islam dan. Kuala Lumpur. JPM.

## **UQI 11402 Philosophy and Current Issues**

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### **Synopsis**

This course covers the relationship of philosophy with the Philosophy of National Education and Rukunegara. The use of philosophy as a tool to purify the culture of thought in life through art and thinking methods as well as human concepts. The main topics in philosophy namely epistemology, metaphysics and ethics are discussed in the context of current issues. Emphasis is given to philosophy as the basis for inter-cultural dialogue and fostering common values. At the end of this course, students will be able to see the disciplines of knowledge as a comprehensive body of knowledge and related to each other.

### **References**

1. Dzulkifli, A.R. & Rosnani, H. (2019) Pentafsiran Baharu Falsafah Pendidikan Kebangsaan dan Pelaksanaannya Pasca 2020. Kuala Lumpur: IIUM Press.
2. Phillips, D.C. (Ed.) (2014). Encyclopaedia of Educational Theory and Philosophy, (1st Ed.). SAGE Publication.
3. Al-Attas, S.M. Naquib. (1991). The Concept of Education in Islam. Kuala Lumpur: ISTAC.
4. Hospers, J. (1997). An Introduction to Philosophical Analysis, (4th Ed.). London: Routledge.
5. Al-Farugi, I.R. (1994). Al-Tawhid: Its Implications for Thought and Life, (2nd Ed.). Herndon: IIIT.

## **UHB 13002 Introduction To English Communication**

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### **Synopsis**

This course aims to enhance the students' level of proficiency in the four language skills (listening, speaking, reading & writing) and to equip them with adequate communicative abilities at the tertiary level. Through guided or independent learning, students will be able to identify relevant information in texts on topics of interest and to write on familiar topics.

### **References**

1. Argentar, D. M., Gillies, K. A. N., Rubenstein, M. M., & Wise, B. R. (2020). Reading and writing strategies for the secondary English classroom in a PLC at work: A guide to closing literacy achievement gaps and improving student ELA standards skill development. Solution Tree.

2. Bottomley, J., Maude, K., Prymachuk, S., & Waugh, D. (2019). Communication skills for your education degree. Critical Publishing.
3. Brownlie, F. (2019). Grand conversations, thoughtful responses: A unique approach to literature circles. Portage & Main Press.
4. Raymond Murphy (2019). English Grammar in Use Books and Interactive eBooks 5th edition: A self- study Reference and Practice Book for Intermediate Learners of English (5th). Cambridge University Press Edisi : 5 / No. Semakan : 2
5. Vorholt, J. (2018). New ways in teaching speaking, second edition. TESOL Press.

## **UHB 23002 English for Career Development**

**Prerequisite Course:** UHB 13002 Introduction To English Communication

### **Synopsis**

This course employs a task-based learning approach and focuses on developing students' delivery of speech in oral interactions relevant to their career development. Particular emphasis will be given to promote the mastery of self-directed learning, teamwork, research, reasoning and creativity. This course also enables students to acquire the skills necessary in preparing their professional advancement.

### **References**

1. Md. Zamin, A. A., et al. Workplace Communications for Graduating Students: A Quickguide, ISBN978-967-19771, Printed by Ultimate Print Sdn Bhd.
2. Shivananda, S., Doddawad, V. G. The Usefulness of Hybrid Platform Meetings for Research Ethics Committees Review Meetings. Volume 127, 2022, ISSN1368-8375.
3. Standaert, W., Muylle, S., Basu, A. Business Meetings in A Postpandemic World: When and How to Meet Virtually. Volume 65, Issue 3, 2022, Pages 267-275, ISSN 0007-6813,
4. Standaert, W., Muylle, S., Basu, A. How Shall We Meet? Understanding The Importance of Meeting Mode Capabilities for Different Meeting Objectives. Volume 58, Issue 1, 2021, 103393, ISSN 0378-7206
5. Termini, C. M., et al. Using Virtual Interviewing to Create A More Accessible Hybrid Academic Job Market. Volume 184, Issue 26, 2021, Pages 6217- 6221, ISSN 0092-8674,

## **UWB 11\*02 Foreign Language**

### **Synopsis**

This course is designed for students to learn the basic foreign language. Students are exposed to the skills of listening, reading, speaking, and writing with basic vocabulary, grammar and structure. Students are also exposed to real daily situations which will help them to communicate using foreign language.

### **References**

1. Lim Hong Swan, Yeoh Li Cheng, 2010. Mandarin Made Easy Through English.
2. Batu Pahat: Penerbit UTHM. PL1129.E5. L554 2009
3. Booth, Trudie Maria, 2008. French Verbs Tenses. Mc Graw-Hill. Call no.: P 2271, U66 2008.
4. Gabriele Kopp, Siegfried Büttner, 2004. Planet 1: Deutsch für Jugendliche: Kursbuch. Ismaning: Germany: Hueber Verlag. PF3129. K664 2004 Mohd Hisyam Abdul Rahim; Ahmad Sharifuddin Mustapha; Mohd Zain Mubarak. 2008. Bahasa Arab UMR 1312. Batu Pahat: Penerbit UTHM. PJ6115 .M445 2008

5. Surie Network, (2000): Minna no Nihongo: Kaite Oboeru, Tokyo: 3A Corporation. PL539.3 M56 2000

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**UQ\* 1\*\*01 Co-Curriculum I**

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**Synopsis**

The course offer various form of activities for student of Bachelor Degree and Diploma. Eight fields of activities offer are Public Speaking, Entrepreneurship, Sports, Community Services, Volunteership, Leadership, Culture and Innovation

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**UQ\* 1\*\*01 Co-Curriculum II**

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**Synopsis**

The course offer various form of activities for student of Bachelor Degree and Diploma. Eight fields of activities offer are Public Speaking, Entrepreneurship, Sports, Community Services, Volunteership, Leadership, Culture and Innovation.

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**DAU 20103 Business and Entrepreneurship**

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**Synopsis**

This course aims to nurture an entrepreneurial culture among students and exposed them to the basics of entrepreneurial concepts, entrepreneurial attributes as well as the development of creative and innovative skills that allow them to identify business opportunities and non-business. This course is designed to ensure students gain knowledge and skills related to fundamentals of business and entrepreneurship such as introduction to entrepreneurship, business ownership, regulations and support services, business environment assessment, marketing plans, operational plans, financial planning and business management plans.

**References**

1. Norliza Ghazali & Raudah Mohd Adnan: Perniagaan dan Keusahawanan (2016) Penerbit UTHM
2. Sarimah Hanim Aman Shah & Cecilia Soon Teik Lan (2016). Entrepreneurship. (4th ed). Oxford Fajar
3. Mohd Nor Hakim Bin Yusoff & Fakhrul Anwar Zainol. (2020). Rancangan Perniagaan Untuk Keusahawanan. Penerbit UMK
4. Kamal M.Y., Lukman Z.M. & Mazdan Ali Amaran. (2019). Keusahawanan Konsep Dan Asas Pengurusan. UNIMAS Publisher. ISBN 978-967-2298-02-1.
5. Abdul Aziz Ab Latif, Izaidin Abdul Majid, Mohd Abdullah Jusoh, Mohd Isnain Ali, Nur Asyikah Azahari, Mohamad Naim Idris (2018). Asas Keusahawanan : Perusahaan Mikro, Kecil Dan Sederhana. UMK Publisher. ISBN 978-967-22292-6-1

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**DAU 18102 Occupational Safety and Health**

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**Synopsis**

This course introduces students to knowledge and skills in occupational safety and health in workplace. Scope of study includes Health, Safety and Environment Managements: introduction to OSH, OSHA 1994 (Act 514), FMA 1967, EQA 1974, occupational safety and

health management system, safety, health and environment culture; Risk Management and Assessment: introduction to risk management, risk assessment techniques, HIRARC; Physical Injury & Controls: introduction to physical injury, construction work, electrical work, mechanical work, chemical work; Health Hazards: introduction to health hazards & hygiene, chemical hazards, physical hazards, biological hazards, hygiene; Accident Investigation & Reporting: introduction, accident investigation, investigations and causes of incident, incident analysis and data collection method.

## References

1. Occupational Safety and Health Act and Regulations. MDC Publishers Printer Sdn. Bhd. 2001. Call number: KPG1390.M34 2001 rw N2."
2. Occupational Safety and Health Act and Regulations.
3. MDC Publishers Printer Sdn. Bhd. 2001. Call number: KPG1390.M34 2001 rw N2."
4. Factories and Machinery Act & Regulations. MDC Publishers Printer Sdn. Bhd. 2001. Call number: KPG1390.A31967. A4 2001 rw N1."
5. Ismail Bahari (2006). Pengurusan Keselamatan dan Kesihatan Pekerjaan. Edisi ke-2. McGraw Hill Education (Malaysia). Call number: T55.I85 2006.
6. Davies, V. J., and Tomasin K. (2006). Construction Safety Handbook. 2nd ed. London: Thomas Telford. Call number: TH443.R43 2006.

## DAU 14403 Algebra

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### Synopsis

This course introduces fundamental algebraic concepts, serving as the foundation for advanced mathematical studies across various disciplines. Topics include real numbers, polynomials, inequalities, sequence and series, trigonometric, matrices, vectors and complex numbers. Students will solve algebraic expressions, analyze systems of equations, and apply matrix operations. The course is delivered through lectures, tutorials, and collaborative activities, with assessments comprising quizzes, assignments, and a final examination. By the end of the course, students will have strengthened their analytical thinking and developed essential problem-solving skills for further mathematical studies and everyday applications.

### References

1. Moyer, Robert E., and Murray R. Spiegel. 2019. Schaum's Outline of College Algebra. 5th ed. New York: McGraw-Hill Education. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781260120769>.
2. Safier, Fred. 2020. Schaum's Outline of Precalculus. 4th ed. New York: McGraw-Hill Education. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781260454208>.
3. Amato, G., Calosci, M., Maggesi, M., & Brogi, C. P. (2020). Universal algebra in UniMath. Mathematical Structures in Computer Science, 1-23.
4. Saeid, A. B., Daneshpayeh, R., Jahanpanah, S., & Xin, X. L. (2024). On L-sub Q-algebras. Soft Computing, 1-14.
5. Bell, J., & Buzaglo, L. (2024). Enveloping Algebras of Derivations of Commutative and Noncommutative Algebra.
6. Gustafson, R.D. and Hughes, J. College algebra. Boston, MA : Cengage Learning. 2017. ISBN: 9781305652231.

## DAU 16402 Cell Biology

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### Synopsis

The Cell Biology course will explore the structure and function of cells, focusing on the chemistry underlying biological processes. This course will examine the chemical principles involved in cell biology, including the macromolecules that comprise cells and the various types of cells. Key topics will include cell organelles, membrane structure, composition, transport mechanisms, cell energy and metabolism, cell communication, and cell continuity. Through experiments conducted in this course, students will gain a deeper understanding of cellular biology, enhancing their comprehension of cellular processes.

### References

1. Fried, George H., and George J. Hademenos. 2019. Schaum's Outline of Biology. 5th ed. New York: McGraw-Hill Education. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781260120783>.
2. Raven P. H., Johnson G. B., Mason K. A., Losos J. B., Singer S. R. (2011). Biology, 9th ed. New York. Mc Graw Hill. [QH 308.2. B58.2011].
3. Alberts, Bruce, (2014). Essential of Cell Biology 4th edition. New York, NY: Garland Science. [QH581.2. E87 2013].
4. Becker, Ralph, (2015). Cell Biology. New York, NY: Callisto Reference. [UTHM Parit Raja: QH581.2.C44 2015]. [Pagoh Edu Hub: QH581.2.C44 2015].
5. Marielle Hoefnagels, (2009). Biology: Concepts and Investigations, 2nd ed. New York. Mc Graw Hill. [QH 307.2. H63. 2012].
6. Ross, F.C, Bailey, D and Enger, E.D (2009). Concepts in Biology. 13th. Ed. Berkshire, McGraw-Hill.

## DAU 12102 General Chemistry

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### Synopsis

General Chemistry covers a comprehensive range of fundamental topics in the field. Starting with chemistry and measurements, fundamentals of chemistry and atomic concept, electronic structure of atom, and periodic table. It then explores the crucial properties of gaseous, and acid-base. This well-rounded syllabus provides students with a solid foundation in general chemistry, equipping them with the necessary knowledge and skills to further their studies in applied science disciplines.

### References

1. Mouraviev, N., & Avramenko, A. (2020). Entrepreneurship for deprived communities : Developing opportunities, capabilities and enterprise culture. Emerald Publishing Limited. EBOOK ISBN 9781789739855
2. Mouraviev, N., & Avramenko, A. (2020). Entrepreneurship for deprived communities : Developing opportunities, capabilities and enterprise culture. Emerald Publishing Limited. EBOOK ISBN 9781789739855
3. Felder, R. M. and Rousseau, R. W. (2004). Elementary Principles of Chemical Processes, 3rd Edition. John Wiley & Sons Inc.
4. Edward S. Rubin. Introduction to Engineering & the Environment. McGraw Hill; 2001. .Call No.: TA170 .R83 2001 N7
5. Luyben, W. L. and Wenzel, L. A. (1988). Chemical Process Analysis: Mass and Energy Balances. Prentice Hall International Series, the Physical and Chemical Engineering Sciences, 1st Edition. Prentice Hall.
6. Henley, E. J. and Bieber, H. (1959). Chemical engineering calculations: mass and energy balances. McGraw-Hill.

## DAU 10503 Statistics I

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### Synopsis

This course covers topics of statistics, which are students will know some basic terms in statistics and the role of statistics. Students also learn variables, sources of data and scale of measurement. It also introduces how to organize and graph data such as frequency table, pie chart, histogram and bar chart. Then, it emphasizes descriptive statistics, which includes measures of central tendency, measures of variability and measures of position. Students will introduce with the research fundamental include research design, research questions and how to be sampling the data. After that, they will learn how to model the data and find the relationship between variables.

### References

1. Fein, E. C., Gilmour, J., Machin, T., & Hendry, L. (2022). Statistics for Research Students. University of Southern Queensland. ISBN 978-0-6453261-0-9.
2. Hsu, Hwei P. 2020. Schaum's Outline of Probability, Random Variables, and Random Processes. 4th ed. New York: McGraw-Hill Education. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781260453812>.
3. Spiegel, M. R., & Stephens, L. J. (2018). Schaum's Outline of Statistics (6th Editio). McGraw-Hill Education. <https://www.accessengineeringlibrary.com/content/book/9781260011463>.
4. Ahmed, Abdella. (2024). Chapter one Introduction to Statistics. 10.13140/RG.2.2.19043.36640.
5. Johansson, Robert. (2024). Statistics. 10.1007/979-8-8688-0413-7\_13.

## DAU 16102 Scientific Writing

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### Synopsis

Scientific writing provides students with learning to apply multiple theories, concepts, and techniques for creating and evaluating written communication. Students learn to write effectively for diverse audiences within a specific area or discipline using appropriate standards and conventions. Students learn to apply critical thinking to writing and writing process, including revision.

### References

1. Thomas, C.G., 2021. Research methodology and scientific writing. Thrissur: Springer. ISBN: 978-3-030-64865-7
2. Lebrun, Jean-Luc, and Justin Lebrun. Scientific Writing 3.0: A Reader and Writer's Guide. World Scientific, 2021.
3. Lövei, Gábor. Writing and Publishing Scientific Papers: A Primer for the Non-English Speaker. Open Book Publishers, 2021.
4. Perry, Jill Alexa, Debby Zambo, and Robert Crow. The improvement science dissertation in practice: A guide for faculty, committee members, and their students. Myers Education Press, 2020.

## DAU 10803 Statistics II

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### Synopsis

This course covers topics in probability where students are introduced to the probability of an events, conditional and independent events. Students also solve random variable problem such as expected value, variance and standard deviation on discrete and continuous random variable. Then, students enhanced their prior knowledge of random variable to solve Binomial, Poisson and normal distribution. They then studied the central limit theorem and used them to find the normal approximation to Binomial and Poisson distribution. Next, this course also explains on the sampling distribution of single and two means. After that, students are exposed to the concept of estimation and confidence interval for single and difference of two means and also hypothesis testing.

## References

1. SAHU, S. K. Conditional Probability and Independence. Cham: Springer International Publishing, 2024. DOI 10.1007/978-3-031-37865-2\_4. Disponível em: <https://research-ebsco-com.ezproxy.uthm.edu.my/linkprocessor/plink?id=8fec0cb7-0f59-3a0d-b6d7-bc941674fc2e>. Acesso em: 26 dez. 2024.
2. Hsu, Hwei P. 2020. Schaum's Outline of Probability, Random Variables, and Random Processes. 4th ed. New York: McGraw-Hill Education. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781260453812>.
3. Spiegel, M. R., & Stephens, L. J. (2018). Schaum's Outline of Statistics (6th Editio). McGraw-Hill Education. <https://www.accessengineeringlibrary.com/content/book/9781260011463>
4. Ilowsky, B., and Dean, S. (2018). Introductory Statistics. Houston: OpenStax
5. Arak M. Mathai and Hans J. Haubold (2018) Probability and Statistics: A Course for Physicists and Engineers. Boston: De Gruyter (De Gruyter Textbook). Available at: <https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=2944607&site=ehost-live&scope=site>

## DAU 10203 Fundamentals of Electric and Electronics

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### Synopsis

This course introduces students to electric, and magnetism knowledge needed related to electric on charge, field, potential, current and circuit. The application involves the vector resultant, velocity, drift velocity, current density, resistance, Ohm's Law, resistivity and conductivity, temperature dependence of resistance, capacitors, capacitance, electromotive force (emf), energy, electric power, internal resistance, serial and parallel resistance, terminal potential difference and Kirchhoff's Law. The course also discusses the magnetism in force of moving charge, Biot-Savart rule, magnetic force on current due to a straight wire, current loop, solenoids and electromagnetic induction involving Faraday's Law and Lenz's Law.

### References

1. Scherz, Paul, and Simon Monk. 2016. "CHAPTER PRELIMINARIES." Chap. 3.0 in Practical Electronics for Inventors. 4th ed. New York: McGraw-Hill Education. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781259587542/toc-chapter/chapter3/section/section1>
2. Deb, S. R., and Sankha Deb. 2010. "Mechatronics and Computer Interfacing." Chap. 7 in Robotics Technology and Flexible Automation. 2nd ed. New York: McGraw-Hill Education. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9780070077911/chapter/chapter7>
3. Coombs, Clyde F., Jr., and Happy T. Holden. 2016. "INTRODUCTION." Chap. 1.1 in Printed Circuits Handbook. 7th ed., edited by Clyde F. Coombs Jr. and Happy T. Holden. New York: McGraw-Hill Education. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9780070077911/chapter/chapter1>

[com.ezproxy.uthm.edu.my/content/book/9780071833950/toc-chapter/chapter1/section/section2](https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9780071833950/toc-chapter/chapter1/section/section2)

4. Beiser, Arthur. 2009. "Direct-Current Circuits." Chap. 25 in Schaum's Outline of Applied Physics. 4th ed. New York: <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9780071611572/chapter/chapter25>

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## **DAU 16202 Creative and Innovation**

### **Synopsis**

This course focuses on developing a creative person who will eventually think strategically, relatively and critically. The knowledge and skills acquired throughout the course will later be applied by the students in solving problems and making decisions in the future. In this course, students will be exposed to various creativity and problem-solving techniques. Some of the skills to be covered throughout the course are problem solving, techniques in creativity and techniques in innovation.

### **References**

1. Jager, Cherylene de, and Anton Muller. Creative Intelligence CQ@Play : Shaping Your Future in the Fourth Industrial Revolution, Knowledge Resources, 2020. ProQuest Ebook Central, <https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=6152110>.
2. Sherwood, Dennis. Creativity for Scientists and Engineers : A Practical Guide, Institute of Physics Publishing, 2022. ProQuest Ebook Central, <https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=31253152>.
3. Multi Level Issues in Creativity and Innovation, edited by Michael D. Mumford, et al., Emerald Publishing Limited, 2008. ProQuest Ebook Central, <https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=330149>.
4. Sherwood, D. 2001. Smart Things to Know about Innovation and Creativity.
5. Capstone Oxford. Call number: HD53 .S53 2001.

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## **DAU 16503 Introduction to Biochemistry**

### **Synopsis**

Introduction to Biochemistry explores the chemical principles underlying biological systems, including water chemistry, enzyme function, membrane structure, and transport mechanisms. The course also covers energy production through carbohydrate and lipid metabolism, as well as fundamental molecular biology topics such as DNA/RNA structure, replication, transcription, and translation. It provides essential biochemical knowledge for students pursuing studies in biological, health, or applied sciences.

### **References**

1. Fried, George H., and George J. Hademenos. 2019. Schaum's Outline of Biology. 5th ed. New York: McGraw-Hill Education. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781260120783>
2. Raven P. H., Johnson G. B., Mason K. A., Losos J. B., Singer S. R. (2011). Biology, 9th ed. New York. Mc Graw Hill. [QH 308.2. B58.2011]
3. Alberts, Bruce, (2014). Essential of Cell Biology 4th edition. New York, NY : Garland Science. [QH581.2 .E87 2013].
4. Becker, Ralph, (2015). Cell Biology. New York, NY : Callisto Reference. [UTHM Parit Raja: QH581.2.C44 2015].[Pagoh Edu Hub: QH581.2.C44 2015]
5. Marielle Hoefnagels, (2009). Biology: Concepts and Investigations, 2nd ed. New York. Mc Graw Hill. [QH 307.2. H63. 2012]

6. Ross, F.C, Bailey, D and Enger, E.D (2009). Concepts in Biology. 13th. Ed. Berkshire, McGraw-Hill.

### **DAU 12303 Physical Chemistry**

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#### **Synopsis**

Physical chemistry covers the mechanisms and processes of natural phenomena of physical reaction to environment or daily activities. This course is an overview of the fundamental of states of matter, atomic mass and structures, thermodynamics, Hess's Law, the chemical equilibrium includes Le Chatelier Principle. This course shall also cover the subdisciplines of physical chemistry includes electrochemistry. The delivery methods throughout the course includes lectures, discussion, test, quiz, and assignments. This is to ensure that students shall be able to measure, correlate, and explain the quantitative aspects of Physical Chemistry. The communications and problem-solving skills in students shall be cultivated and developed throughout the course.

#### **References**

1. Chang, R. 2019. Chemistry. McGraw-Hill Education. ISBN NO: 978-1-260-08531-0 [31.3.C456. 2019]
2. Donald, A. 2011. Physical Chemistry, 6th. University Science Book. ISBN NO: 978-1-891389-60-3 [209567. 2011]
3. Martin, et al. 2018. Physical Chemistry. McGraw Hill Education. ISBN NO: 978-1-259-74109-8 [QD33.2. S5 2018]
4. Jones, A. 2005. Chemistry An Introduction for medical and Health Sciences. John Wiley & Sons Ltd: England. [QP514.2. J66. 2005]
5. Kuhn, H. et al. 2009. Principles of Physical Chemistry, John Wiley; Hoboken, NJ. [QD453.3. K83. 2009]
6. Davis, W. M. 2012. Physical Chemistry: a modern introduction 2nd ed. CRC Press. [QD453.3. D38. 2012]

### **DAU 11302 Fundamentals of Food Science and Technology**

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#### **Synopsis**

This course gives a comprehensive overview of food science and technology. The integration of basic principles in food safety, food components and human nutrition. The principles of appropriate technology of food processing and preservation are also included. This course also covers the preparation and presentation of informative and persuasive speeches related to food science and technology.

#### **References**

1. Singh, N., & Singh, I. S. (2018). Food nutrition, science and technology. <https://ebookcentral.proquest.com>
2. Traitler, H., Dubois, M. J. -, Heikes, K., Petiard, V., & Zilberman, D. (2018). Megatrends in food and agriculture: Technology, water use and nutrition. <https://ebookcentral.proquest.com>
3. Jeantet, R., Croguennec, T., Schuck, P., & Brule, G. (Eds.). (2016). Handbook of food science and technology 3: Food biochemistry and technology. <https://ebookcentral.proquest.com>
4. Debby, N. 2014. Food safety management programs: applications, best practices, and compliance. CRC Press, Boca Raton. Call number: TP372.5. N48 2014.
5. Kumar, U. 2014. Food Science Processing Technology. Venus, New Delhi. Call number: TP370. K85. 2014.

- 6.Sizer, F.S. and Whitney, E. 2014. Nutrition: Concepts and Controversies. Cengage Learning, Belmont. Call number: QP141. S59. 2014.

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**DAU 20403 Analytical Chemistry**

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**Synopsis**

The course discusses the fundamentals of analytical chemistry, basic chemical concept of quantities and concentrations, titrimetry method, basic spectrophotometry analyses of UV/Vis and FTIR and chromatographic separation methods and their applications of HPLC and GC.

**References**

1. Skoog, Douglas A (2014), Fundamentals of analytical chemistry, Belmont, CA: Cengage - Brooks/Cole, ISBN: 9780495558286, QD75.4. E4 .C76 2014
2. Crouch, Stanley R (2014), Applications of Microsoft Excel in Analytical Chemistry, Pacific Grove, Calif.: Brooks/Cole Cengage Learning, ISBN: 781285087955, QD75.22. F86 2014
3. Lewis, Jaylen (2012), Electro - Analytical Chemistry, London: Auris Reference, QD115. E434 2012.
4. Barboz, Alistair (2012), Analytical chemistry, Nottingham: Auris Reference, ISBN: 9781781541425, QD75. A52 2012.
5. Khopkar, S.M. (2009). Basic Concept of Analytical Chemistry,3rd Ed. London: New Age Science, QD75.2. K46 2009.

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**DAU 20303 Material Science and Technology**

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**Synopsis**

This course introduces the types, classification, properties, processing and application of materials. Topics include are solid state chemistry, crystalline and non-crystalline materials, metals and alloys, ceramics, polymers and advanced materials. The delivery methods throughout the courses include lectures, practical and discussion and assess through various quiz, test, final exam, individual observation and presentation. Upon completion, students should be able to gain knowledge of materials science and technology in order to expose students to the current scenario in materials industries.

**References**

1. Gupta, A. 2016. Material Science for Engineers. CBS Publishers (TA403.6. G87 2016)
2. Castiglioni, C. and Milani, A. 2017. Introduction to Materials Science. McGraw-Hill Education.
3. Shackelford, J.F. 2015. Introduction to Materials Science for Engineers.
4. Pearson Education Limited.
5. Marikani, A. 2017. Materials Science. PHI Learning Pvt. Ltd.
6. Brostow, W., Haley E. and Lobland, H. 2017. Materials: Introduction and Applications. John Wiley & Sons, Inc.
7. Soo-Jin Park and Min-Kang Seo. 2011. Interface science and composites /. Amsterdam: Elsevier and Academic Press. Tunku Tun Aminah Library.Call number: QC173.4. I57 .P37 2011 v.18 (1) Pagoh Resource CenteCall number: QC173.4. I57. P37 2011 v.18 (1).

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**DAU 23103 Thermodynamics**

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**Synopsis**

Thermodynamics is essentially the study of the internal motions of many body systems. In general, this course introduces to students to the principles, concepts, and laws of classical

and statistical thermodynamics and its applications that require quantitative knowledge of thermodynamic properties from a macroscopic to a molecular level. It covers a basic concept of thermodynamics, thermodynamic properties of materials and thermodynamic processes. Topics covered include the energy transfer and energy analysis of systems and processes using the explained first and second laws of thermodynamics. The principles of gas power and refrigeration cycles are also briefly highlighted.

## References

1. Smith, J.M.; Van Ness, H.C.; Abbott, M.M.; "Introduction to Chemical Engineering Thermodynamics", 7th edition, McGraw-Hill, 2005
2. Sandler, S. I., Chemical and Engineering Thermodynamics, 3rd ed., New York, Wiley, 2006
3. Felder and Rousseau, Elementary Principles of Chemical Processes, 3rd ed., New York, Wiley, 2006.
4. R.A. Serway, (1997). Physics for Scientists and Engineers, International Editions.
5. Douglas C. Giancoli, (2000). Physics for Scientist and Engineers with Modern Physics, 3rd Ed., Prentice Hall.

## DAU 20703 Calculus

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### Synopsis

This course focuses on calculus, including functions, limits, differentiation, and integration. Applications such as rate of change, optimization, and area calculations are also emphasized. Students will solve problems using techniques like substitution, partial fractions, and numerical methods. Teaching combines lectures and tutorials, with assessments including quizzes, projects, and final exams. By the end of the course, students will develop problem-solving skills and apply calculus concepts effectively.

### References

1. Kapur, J. N. Mathematical Modelling, Mercury Learning & Information, 2023. ProQuest eBook Central, <https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=30405189>.
2. Bronson, Richard, and Gabriel B. Costa. 2022. A in Schaum's Outline of Differential Equations. 5th ed. New York: McGraw Hill. <https://www-accessengineeringlibrarycom.ezproxy.uthm.edu.my/content/book/9781264258826/front-matter/preface1>.
3. Bronson, Richard, and Gabriel B. Costa. 2022. A in Schaum's Outline of Differential Equations. 5th ed. New York: McGraw Hill. <https://www-accessengineeringlibrarycom.ezproxy.uthm.edu.my/content/book/9781264258826/front-matter/preface1>.
4. Khan, R. N. (2023). Is Mathematics a Barrier for Engineering? International Journal of Mathematical Education in Science & Technology, 54(9), 1853-1873.
5. Rzyankina, E., George, F., & Simpson, Z. (2024). Enhancing Conceptual Understanding in Engineering Mathematics Through E-Textbooks. IEEE Transactions on Education, 1- 8.
6. Vrabie, Ioan 1. (2011). Differential equations: an introduction basic concepts, results, and applications. World Scientific, N Jersey. [QA371. Y'72 20111.

## DAU 25102 Final Year Project I

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Prerequisite Course(s): Has taken 40% of total credit for convocation

### Synopsis

This course covers topics for writing proposals. The proposal must include four chapters: an introduction, literature review, methodology, and expected results. At the end of this course,

the student will present the proposal and make some corrections based on the examiner's recommendation.

### References

1. Panduan Penulisan Tesis UTHM, (2012).  
[https://cgs.uthm.edu.my/images/Thesis\\_Writing\\_Guide.pdf](https://cgs.uthm.edu.my/images/Thesis_Writing_Guide.pdf)
2. Panduan Pelaksanaan Projek Diploma Sains Gunaan, Pusat Pengajian Diploma, UTHM (2014).

## **DAU 23302 Analytical Instrumentation**

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### Synopsis

This course will emphasise on the various sample preparation techniques, the technique for producing the calibration curve and the proper technique for basic operation of selected instruments. The method for analysing the data as well as the preparing the analysis reports will be also covered. In this course, students will operate selected analytical instruments such as Ultraviolet-Visible (UV-VIS), Fourier Transform Infrared (FTIR), Gas Chromatography (GC), and High-Performance Liquid Chromatography (HPLC).

### References

1. Petrozzi, Sergio, Practical instrumental analysis methods, quality assurance and laboratory management, Weinheim: Wiley-VCH-Verl., 2013. QD79.I5. P47 2013.
2. Cazes, Jack, Ewing's analytical instrumentation handbook, 3rd edition, Boca Raton, FL : CRC Press, 2005. QD79.I5. E94 2005.
3. McMahon, Gillian, Analytical instrumentation: a guide to laboratory, portable and miniaturized instruments, Chichester: John Wiley, 2007. QD79.15.M52 2007.
4. Khandpur, R. S., Handbook of analytical instruments, New Delhi: McGraw-Hill, 1989. Q185. K48 1989.
5. Settle, Frank A., Handbook of instrumental techniques for analytical chemistry, Upper Saddle River, NJ: Prentice-Hall PTR, 1997. QD79.I5 .H36 1997.

## **DAU 20203 Environmental and Waste Management Systems**

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### Synopsis

This course provides a comprehensive overview of the principles, practices, and technologies involved in managing environmental quality and solid, liquid, and gaseous wastes. It covers key topics such as pollution control, environmental regulations, waste minimization, recycling, treatment methods, and sustainable resource management. Students will explore both conventional and modern approaches to waste handling, including landfill management, incineration, biological treatment, and advanced material recovery systems. By the end of the course, students will be equipped with the knowledge and tools necessary to design and implement effective and sustainable waste management strategies in compliance with environmental standards and policies.

### References

1. Beard, J. M. (2013). Environmental Chemistry. 2nd. Ed. Boca Raton: Taylor & Francis. TD193.B42 2013.
2. Kumar, Uday (2013). Concepts in Environmental Chemistry TD193.K82 2013.
3. Smith K.A. & Mullins C.E. (2000), Soil and Environmental Analysis: Physic Method (2nd Ed), S592.3. S64 2004.

4. Tchobanoglous, G., F. L. Burton, and H. D. Stensel. Wastewater Engineering: Treatment and Reuse. 4th ed. Metcalf and Eddy Inc., New York, NY: McGraw-Hill, 2003. ISBN: 0070418780.
5. Vesilind, P. Aarne Heine, Lauren G. Morgan, Susan M. Introduction to environmental engineering. Call No.: TD145. V47 2010.
6. Bishop P.L. Pollution Prevention: Fundamentals and Practice; McGraw Hill; 2000. .Call No.: TD897. B57 2000.

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### **DAU 24403 Ordinary Differential Equation**

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#### **Synopsis**

This course covers advanced mathematical topics such as differential equations, Laplace transforms, and their applications. Students will solve first- and second-order differential equations and analyze problems using Laplace transform techniques. The course includes lectures and group projects, with assessments such as quizzes, assignments, and a final exam. By the end of the course, students will have developed problem-solving and critical thinking skills necessary for real life applications.

#### **References**

1. Kapur, J. N. Mathematical Modeling, Mercury Learning & Information, 2023. ProQuest eBook Central.  
<https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=30405189>.
2. Bronson, Richard, and Gabriel B. Costa. 2022. A in Schaum's Outline of Differential Equations. 5th ed. New York: McGraw Hill. <https://www-accessengineeringlibrarycom.ezproxy.uthm.edu.my/content/book/9781264258826/front-matter/preface1>.
3. Khan, R. N. (2023). Is Mathematics a Barrier for Engineering? International Journal of Mathematical Education in Science & Technology, 54(9), 1853-1873.
4. Rzyankina, E., George, F., & Simpson, Z. (2024). Enhancing Conceptual Understanding in Engineering Mathematics Through E-Textbooks. IEEE Transactions on Education, 1- 8.
5. Abd. Wahid Md Raji. The first course of calculus for science and engineering students Skudai: Penerbit UTM, 2013. ISBN: 9789835208621.

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### **DAU 25203 Final Year Project II**

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**Prerequisite Course(s):** Final Year Project I

#### **Synopsis**

Fermentation technology is the components to encompass complete coverage of all activities starting right from upstream, mid-stream to downstream. However greater emphasis is given on the operation, maintenance of the fermenter. Most fermentation practical involve a lot of upstream and downstream preparations and the actual fermentation process is continuous running from hours into days.

#### **References**

1. Panduan Penulisan Tesis UTHM, (2012).  
[https://cgs.uthm.edu.my/images/Thesis\\_Writing\\_Guide.pdf](https://cgs.uthm.edu.my/images/Thesis_Writing_Guide.pdf).
2. Panduan Pelaksanaan Projek Diploma Sains Gunaan, Pusat Pengajian Diploma, UTHM (2014).

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### **DAU 25309 Industrial Training**

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**Prerequisite Course(s):** Has taken 60% of total credit for convocation

## **Synopsis**

Students are required to undergo an industrial training in applied science field for 18 weeks. They will be trained by the agency/organization such as planning, management, design, field investigation, evaluation and assessment in related industries.

## **References**

1. Pejabat Hubungan Universiti dan Industri, 2012. Panduan Latihan Industri (Program Sarjana Muda dan Diploma. UTHM.

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## **DAU 21103 Digital Electronics**

### **Synopsis**

This course introduces students to the knowledge of digital logic levels and application of knowledge to understand digital electronic circuits. This course covers combinational and sequential logic circuits. Topics include number systems, Boolean algebra, logic families, analogy to digital (AD) conversion, and other related topics. Upon completion, students should be able to construct, analyze, verify, and troubleshoot digital circuits using appropriate techniques and test equipment.

### **References**

1. Salina Muhamad (2013) Digital Electronics.Oxford : Oxford Unicersity Press, 2013. Call number: TK7868.D5. S245. S3.
2. Harsany, Stephen C., (2000). Introduction to electronics: DC/AC circuits, McMillan. Call number: TK7867 .H36 2000.
3. Gates, Earl D., (2001). Introduction to electronics: a practical approach, Thomson Delmar Learning. Call number: TK7816. G374 2001.

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## **DAU 21203 Data Science**

### **Synopsis**

This course provides an introduction to Data Science that covers the principles of Data Science, fundamental concepts relating to different types of data, concepts of Artificial Intelligents and Machine Learning.

### **References**

1. M. Y. Naseri et al., "Integrating Data Science into Undergraduate Science and Engineering Courses: Lessons Learned by Instructors in a Multi university Research-Practice Partnership," in IEEE Transactions on Education, vol. 68, no. 1, pp. 1-12, Feb. 2025, doi: 10.1109/TE.2024.3436041.
2. H. D. Mafukidze, A. Nechibvute, A. Yahya, I. A. Badruddin, S. Kamangar and M. Hussien, "Development of a Modularized Undergraduate Data Science and Big Data Curricular Using No-Code Software Development Tools," in IEEE Access, vol. 12, pp. 100939-100956, 2024, doi: 10.1109/ACCESS.2024.3429241.
3. IoT, Cloud and Data Science, edited by S. Prasanna Devi, et al., Trans Tech Publications, Limited, 2023. ProQuest eBook Central, <https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=30403402>.
4. Data Science for Mathematicians, edited by Nathan Carter, CRC Press LLC, 2020. ProQuest eBook Central, <https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=6309040>.

5. Harrison, Ewen, and Riinu Pius. R for Health Data Science, CRC Press LLC, 2020. ProQuest eBook Central, <https://ebookcentral.proquest.com/lib/uthmebooks/detail.action?docID=6378890>.

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### DAU 21403 Organic Chemistry

#### Synopsis

This course deals primarily with the basic principles to understand the structure and reactivity of organic molecules. Emphasis is on substitution and elimination reactions and chemistry of the carbonyl group. The course covers the introduction to organic molecules, stereochemistry, organic reactions, alkanes, alkenes, alkynes, and radical reactions.

#### References

1. Carey, Francis A. 2017. Organic Chemistry. ISBN 9780073511214. (QD251.3 .C37.2017)
2. Solomons, T.W.G. 2016. Organic Chemistry. ISBN 9781119248972. (QD251. S64. 2016)
3. Elnagdi, M. H., Sadek, K. U., & Mekheimer, R. A. (2018). Spectroscopic Identification of Organic Molecules: WORLD SCIENTIFIC.
4. Wang, Zerong., Comprehensive organic name reactions and reagents. ISBN 0471704504 9780470286623. (QD77 /. W36 2009)
5. <https://ebookcentral.proquest.com/lib/uthmebooks/reader.action?docID=3011563&query=organic+chemistry>

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### DAU 21503 Microbiology

#### Synopsis

The Microbiology course covers the fundamental principles of microbiology. The structure, physiology, and ecology of viruses, bacteria, fungi, and protists will be discussed. Aspects of microbiology that are important in health, sanitation, and food processing are also discussed. The essential microbiology laboratory skills will be applied via practical experiments in laboratory.

#### References

1. Linda Bruslind. General Microbiology. 1st Edition (2020). Oregon State University. ISBN 978-1-955101-17-2.
2. Willey J., Sherwood, L. and Woolverton, C. 2011. Prescott's Microbiology. 8th Ed. McGraw Hill, USA. [QR41.2. W54 2011].
3. Willey J., Sherwood, L. and Woolverton, C. 2011. Prescott's Microbiology. 8th Ed. McGraw Hill, USA. [QR41.2. W54 2011].
4. Tortora, G.J., Funke, B.R. and Case, C.L. 2010. Microbiology: An Introduction. 10th Edition. Benjamin-Cummings Publishing Company. USA. [QR41.2. T67 2010]
5. Madigan, M.T., Martinko, J.M., Stahl, D.A. and Clark, D.P. 2009. Brock Biology of Microorganisms. 12th Edition. Pearson International, USA. [QR41.2. B76 2009].
6. Black, J.G. 2008. Microbiology: Principles and Explorations. 7th Edition. John Wiley & Sons, USA. [QR41.2. B52 2008]

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### DAU 22603 Nuclear Physics

#### Synopsis

This course introduces students to the knowledge required in the field of science and technology. The topics discussed are Radioactivity: Structural of Nucleus, Natural radioactivity, Types of radiation, Decay process, Transformation Kinetics. Radiation Matter Interaction:

Nature of matter, nuclear radiations, nuclear reactions, Transformation mechanism. Dosimetry Radiation: Exposure, Radiation effects, Basic internal biological dosimetry, Unit of radiation dose Biological Effects Against Radiation: Dose Response feature, Radiation effects, Basic internal biological dosimetry, Unit of radiation dose. Radiation Safety Guide: Basic principle of radiation protection, principles for reducing radiation exposure, Aspects of shielding in diagnostic radiology, The regulatory bodies. Health Physics Instrumentation: Radiation detectors, Dose measurement instrumentation, newer radiation detection devices. Radiation Protection: External radiation protector, Internal radiation protector, Critical radiation protector.

## References

1. Giambatista A., Richardson B.M., Richardson R.C., (2013). College Physics:With an integrated approach to forces and kinematics 4th Ed., New York: Mc Graw-Hill QC21.3. G52 2013.
2. Jearl Walker, (2008). Fundamentals of Physics Extended 8th Ed. John Wiley & Sons (Asia) Pte.Ltd. ISBN 978-0-470-04618-0.
3. Husin Wagiran, (2006). Neutron Dan Penjanaan Tenaga Nuklear Edisi 2. Jabatan Fizik, Fakulti Sains Universiti Teknologi Malaysia, Skudai, Johor.
4. Dr.Azizan Ismail, et.al, (2005). Matriculation Physics Sem2. Higher Learning Publisher Sdn.Bhd 705037-A.

## DAU 22203 Data Visualization

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### Synopsis

This course introduces students to the principles and practices of data visualization, emphasizing the effective presentation of data through visual formats such as charts, graphs, dashboards, and reports. Students will learn to analyze, model, and visualize data using tools like Microsoft Power BI and Excel. Topics include visual design principles, storytelling with data, and advanced visualization techniques. Practical skills such as selecting appropriate visuals, building data models, and conducting data analysis will be developed through lectures, labs, and problem-based learning. Assessments include quizzes, projects, and demonstrations. By the end of the course, students will be able to create meaningful data visualizations and communicate complex information clearly and accurately.

### References

1. Dejan, Sarka, Jernej Rihar. Advanced Analytics with Power BI and Excel: Learn Powerful Visualization and Data Analysis Techniques Using Microsoft BI Tools along with Python and R : Learn Powerful Visualization and Data Analysis Techniques Using Microsoft BI Tools along with ..., Orange Education PVT Ltd, 2023. ProQuest eBook Central, <https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=30786188>.
2. Aigner, Wolfgang, et al. Visualization of Time-Oriented Data, Springer London, Limited, 2023. ProQuest eBook Central, <https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=31063500>.
3. Wang, Y., Liu, Y., Yu, L. et al. A comparative study of table-sized physicalization and digital visualization. J Vis (2025). <https://doi.org/10.1007/s12650-025-01056-7>
4. Borges, Mariana Gomes, Claiton Marques Corrêa, and Milene Selbach Silveira. "Decoupling narrative visualizations into components: Helping designers to tell data-driven stories." Information Visualization 24.2 (2025): 135-149.

## DAU 22703 Inorganic Chemistry

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### Synopsis

This course is designed to introduce students to fundamental principles underpinning inorganic chemistry. The course will give detailed consideration to theories of atomic structure, the nature of bonding in molecules and inorganic complexes as well as chemical equilibrium and chemical kinetics. This course is aimed to provide a fundamental knowledge for the vast industrial applications in relevant industries.

### References

1. Pfennig, Brian W. 2015. Principles of Inorganic Chemistry ISBN 9781118859100 (QD151.3. P43 2015).
2. Catherine Housecroft and Alan G. Sharpe. 2018. Inorganic Chemistry 5th Edition ISBN 9781292134147.
3. Mark Weller, Tina Overton, Jonathan Rourke and Fraser Armstrong 2018. Inorganic Chemistry 7th Edition ISBN 9780198768128.
4. Wai-Kee Li, Hung Kay Lee, Dennis Kee Pui Ng, Yu-San Cheung, Kendrew Kin Wah Mak, and Thomas Chung Wai Mak. 2018. Problems in Structural Inorganic Chemistry 2nd Edition ISBN 9780198823902.
5. Mark T. Weller and Nigel A. Young. 2017. Characterisation Methods in Inorganic Chemistry ISBN 9780199654413.

### DAU 22503 Unit Operation in Food Processing

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#### Synopsis

This course covers the unit operations related to food processing encompass psychometrics, evaporation, drying, freezing, membrane separation, filtration, sedimentation, centrifugation, mixing and mechanical size reduction.

#### References

1. Singh, R. P. and Heldman, D. R. 2014. Introduction to Food Engineering. 5th Edition. Academic Press, Amsterdam. Call number: TP370. S56 2014.
2. Berk, Z. 2009. Food Process Engineering and Technology. Elsevier, Amsterdam. Call number: TP370. B47 2009.
3. Chakraverty, A. and Singh, R. P. 2014. Postharvest Technology and Food Process Engineering. CRC Press, Boca Raton. Call number: SB175.C42 2014.
4. Heldman, D.R. and Lund, D.B. 2007. Handbook of Food Engineering. 2nd Edition. CRC Press, Boca Raton. Call number: TP370.4 .H37 2007.
5. Rao, C. G. 2009. Essentials of Food Process Engineering. CRC Press, Boca Raton. Call number: TP370. R36 2009.
6. Bhesh, B. and Yrjo H. R. 2012. Food Materials Science and Engineering. Wiley-Blackwell, Ames, Iowa. TX531. B42 2012.

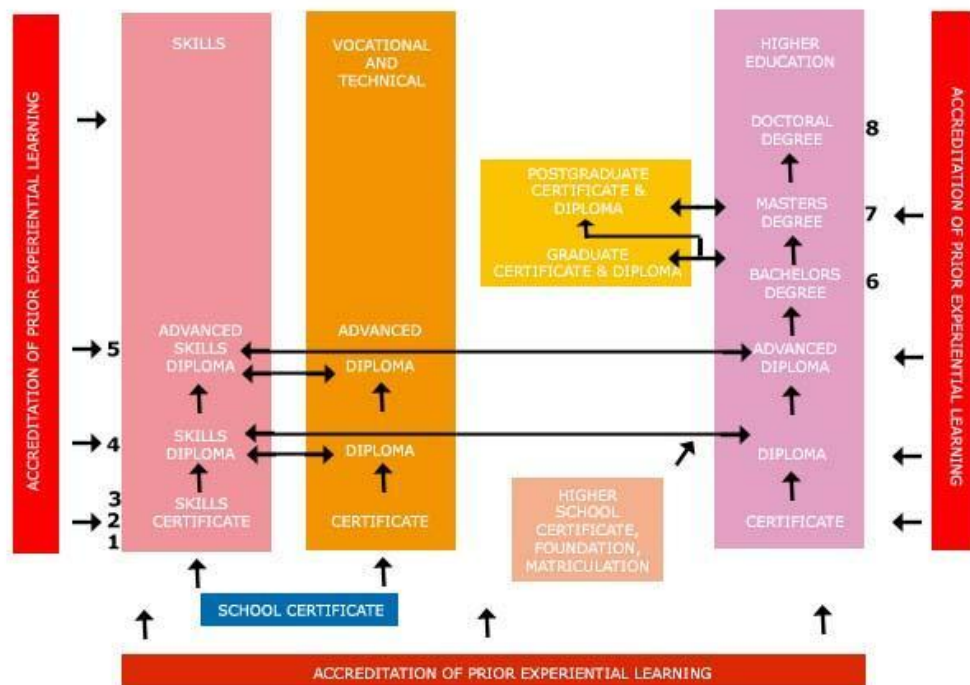
#### Career and Further Education Prospect

Applied science covers a broad field which include food technology, industrial chemistry, biotechnology, forensic science and applied physics. Career prospects for graduates of Diploma in Applied Sciences such as Science Officer and Assistant Laboratory Assistant in the industrial sector or research centers.

Figures below show examples of jobs and career pathway in Centre of Diploma Studies UTHM and according to Malaysian Qualification Framework



### MQF BASED ON QUALIFICATION LEVEL AND EDUCATIONAL PATHWAY



Educational Pathway according to Malaysian Qualification Framework

**MALAYSIAN QUALIFICATIONS FRAMEWORK:  
QUALIFICATIONS AND LEVELS**

| MQF Levels | Sectors              |                                      |                                    | Lifelong Learning                                   |
|------------|----------------------|--------------------------------------|------------------------------------|-----------------------------------------------------|
|            | Skills               | Vocational and Technical             | Higher Education                   |                                                     |
| 8          |                      |                                      | Doctoral Degree                    | Accreditation of Prior Experiential Learning (APEL) |
| 7          |                      |                                      | Masters Degree                     |                                                     |
|            |                      |                                      | Postgraduate Certificate & Diploma |                                                     |
| 6          |                      |                                      | Bachelors Degree                   |                                                     |
|            |                      |                                      | Graduate Certificate & Diploma     |                                                     |
| 5          | Advanced Diploma     | Advanced Diploma                     | Advanced Diploma                   |                                                     |
| 4          | Diploma              | Diploma                              | Diploma                            |                                                     |
| 3          | Skills Certificate 3 | Vocational and Technical Certificate | Certificate                        |                                                     |
| 2          | Skills Certificate 2 |                                      |                                    |                                                     |
| 1          | Skills Certificate 1 |                                      |                                    |                                                     |

Qualifications and Levels of Education according to Malaysian Qualification Framework



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