

**Malaysia-Japan International Institute of  
Technology (MJIIT), UTM**

# Undergraduate (UG)

# ACADEMIC GUIDELINES

## 2018/2019



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

Malaysia-Japan  
International  
Institute of Technology  
(MJIT)

Malaysia-Japan International Institute of  
Technology (MJIT), UTM

**Undergraduate (UG)**

# **ACADEMIC GUIDELINES**

## **2018/2019**

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## PRELIMINARIES

This handbook is designed to equip students with information regarding Full-time Undergraduate Degree Programme in Electronic Systems Engineering, Mechanical Precision Engineering and Chemical Process Engineering at MJIIT, Universiti Teknologi Malaysia. It is anticipated that the information given will guide the students on their academics and campus activities throughout their study at MJIIT. The information or contents of this handbook are accurate at the time of printing. Any enquiry regarding the academic guidelines handbook should be addressed to:

**Dean**

**Malaysia-Japan International Institute of Technology (MJIIT)  
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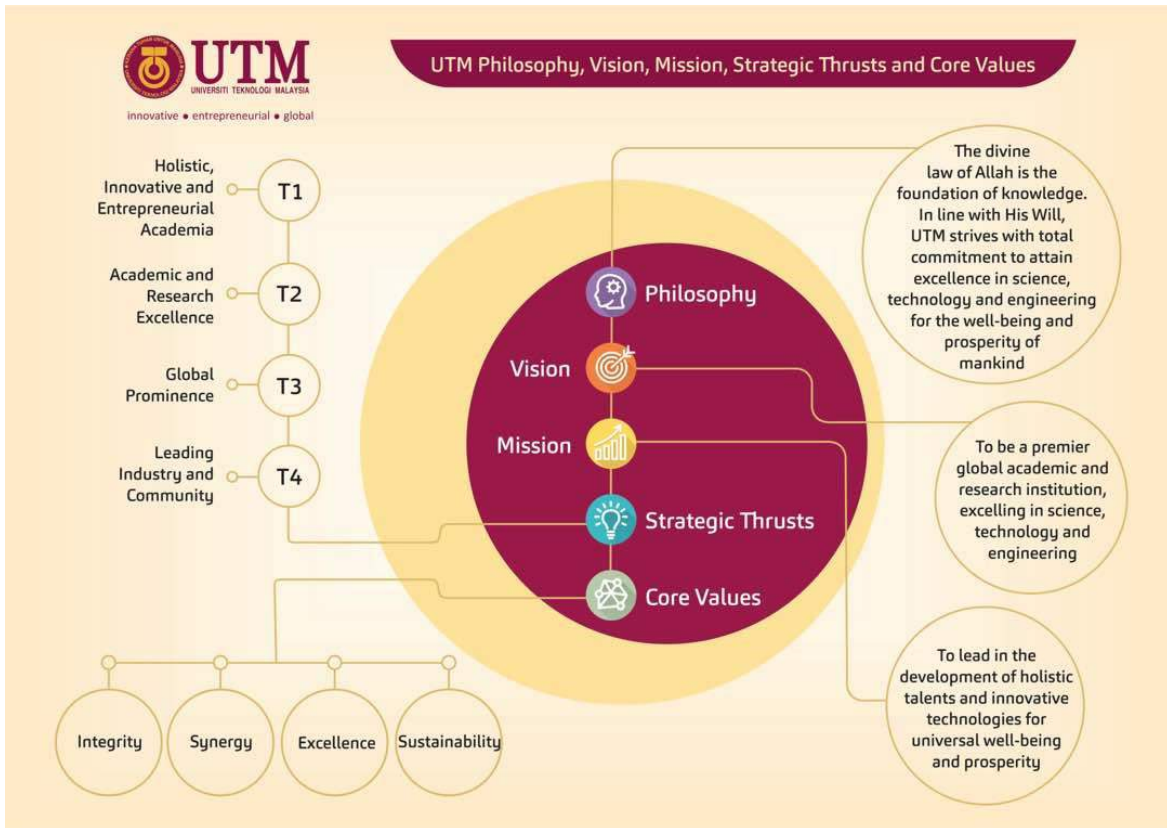
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## UTM Philosophy, Vision, Mission, Strategic Thrusts and Core Values





### **Vision of MJIT**

Leading in cutting edge technology education and research

### **Missions of MJIT**

- Providing Japanese style engineering education blended with Malaysia distinctiveness for sustainable industry and society
- Leading in academic and research excellence in Electronics, Precision, Environmental & Green Engineering and Management of Technology

### **Tagline of MJIT**

*“Nurturing Values, Empowering Minds”*

## UNIVERSITI TEKNOLOGI MALAYSIA

UTM Kuala Lumpur (UTM KL) is a graduate campus of Universiti Teknologi Malaysia (UTM), and is under the same corporate structure as its main campus in Johor Bahru, Johor. The current UTM KL which is located at the center of Kuala Lumpur city used to be the original campus of UTM on Lot 4582 Jalan Semarak, with an area of 47.56 acre. UTM KL is a semi-autonomous branch campus headed by a Pro-Vice Chancellor and the whole structure is governed by the same Board of Directors under the same protocol of Chancellor and Pro-Chancellors. The administrative and academic support for UTM KL is provided by the major administrative offices such as Office of the Registrar, Bursary, Library, Office of Asset and Construction Management, Centre for Information & Communication Technology and Office of Corporate Affairs.

UTM KL is in its own local community affiliated with UTM, offers leading-edge programmes at bachelor and graduate degree levels and provides services both locally and internationally. In the current academic session, the UTM KL is offering full-time undergraduate programmes and postgraduate programmes under its four major faculties: The Razak Faculty of Technology and Informatics, Azman Hashim International Business School, Faculty of Social Sciences and Humanities and Malaysia-Japan International Institute of Technology (MJIT). Some of these faculties also offer part-time executive programmes for working professionals. In addition, part-time and modular programmes are provided by UTMSPACE (The School for Professional and Continuing Education).

There are several centers of excellence in UTM KL which carry out research activities and also offer some academic programmes. Other major supporting units include the branch offices of Innovation & Commercialization Center (ICC), School for Graduate Studies (SPS) and UTM International. Their presence at UTM KL would be supportive of the Campus key results areas and its strategic objectives.



## MALAYSIA-JAPAN INTERNATIONAL INSTITUTE OF TECHNOLOGY

The Malaysia-Japan International Institute of Technology (MJIT), which was established in 2010 as a Government-to-Government Project at Universiti Teknologi Malaysia (UTM), is the culmination of Malaysia's Look East Policy that manifests a unique education project between Malaysia and Japan. Japan has formed a consortium of 29 Universities and has dispatched Japanese lecturers and professors to MJIT providing a significant piquant of the Japanese-oriented engineering program for Malaysian and international students. The interaction between two countries were strengthened by sending exchange students to Japan, setting up training programs at Japanese companies and partnering with Japanese Universities through various academic cooperation. The MJIT Project was one of the major ways to contribute towards enhancing bilateral relations between the two governments. It is also anticipated that with the establishment of MJIT, Malaysian has benefited from new technology introduced by Japan.

MJIT combines the advantage of the Malaysian systematic outcome-based education with the research-intensive approach of Japanese education outlook. The relatively autonomous nature of MJIT allows for greater innovation and creativity among its academic staff and students. It is the desire of MJIT to produce knowledgeable human capital towards the advancement and development of state-of-the-art technology and processes while safeguarding the environment. The blend of Malaysian, Japanese as well as other international professors, who engaged extensively in research, combined with students' diversity created continuity in global experiences within the campus environment. MJIT works closely with Japanese universities and industries to create a distinctive working culture and employs a holistic approach in its program offerings. MJIT does not only focuses on Malaysian students but also welcomes students from Asian and foreign countries, aiming to be the Japanese-oriented engineering hub in Asia. Presently, MJIT offers three (3) undergraduate programmes namely Bachelor of Electronic Systems Engineering, Bachelor of Mechanical Precision Engineering and Bachelor of Chemical Process Engineering.

## MESSAGE FROM THE DEAN



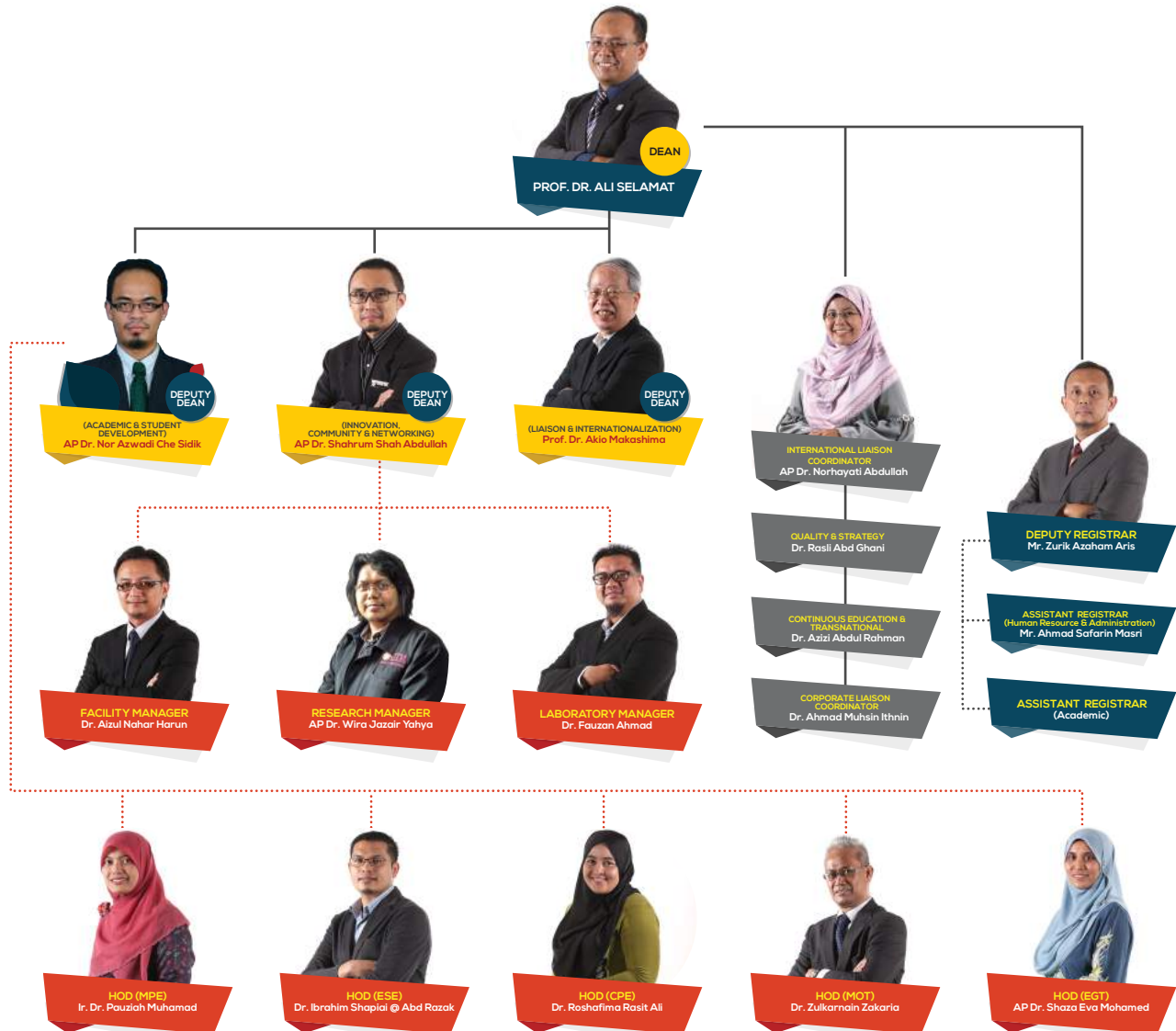
Konnichiwa. My heartiest congratulations and warmest welcome to all students to Malaysia-Japan International Institute of Technology (MJIT), Universiti Teknologi Malaysia (UTM). MJIT UTM is preparing to become world leading Japanese-oriented engineering education hub with support from the Higher Education Department, Ministry of Education, Malaysia, Japan International Cooperation Agency (JICA) and more than 29 Japanese Universities through the Japanese University Consortium (JUC). Our Japanese-oriented engineering education utilizes the K.E.S. (Knowledge-Experience and Self-study)

pedagogy concept of teaching and learning which focuses more on classroom learning in early years and learning through experience and self-study in later years. The well-known 5S concept and Kaizen are incorporated in learning cultures at MJIT, aim to inculcate important values highly sought in today's world including team working, responsible and resilience.

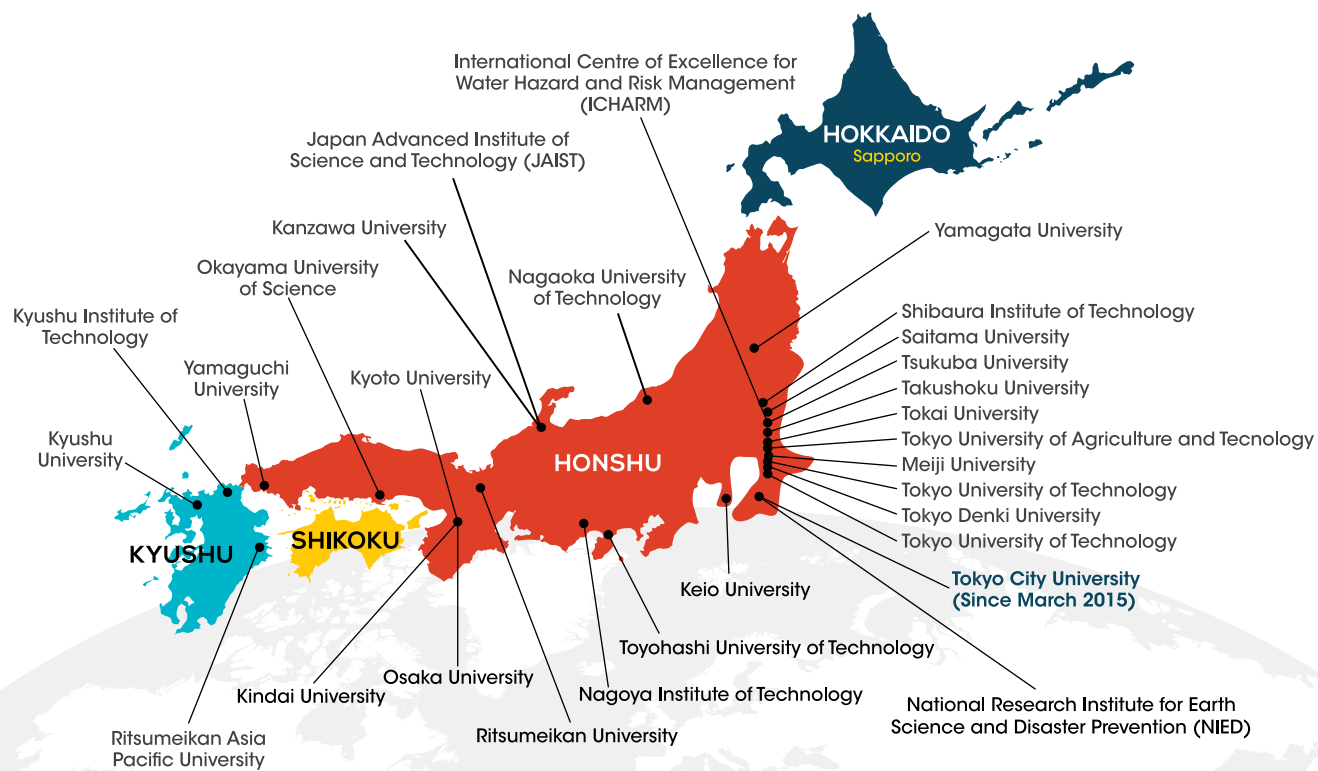
MJIT provides state-of-the-art facilities for postgraduate students comprising of well-established research laboratories under the auspices of innovative Kohza (iKohza) featuring the unique mentoring concept of senpai-kohai. Junior members are nurtured and closely supported by their seniors, combining collegial collaboration and continuous guidance from Professors and senior members of the iKohza. We have strong partnerships with industries such as Takasago Ltd., Daiichi and Mitsubishi Heavy Industries Asia Pacific LTE Ltd. to support our learning and research ecosystems. On behalf of the MJIT family, I wish you successful academic endeavours throughout your study at MJIT. Don't forget to experience the UTM lifestyle while at the same time mastering the Japanese-oriented engineering education with us!

**PROFESSOR DR. ALI SELAMAT**  
Dean

# MJIIT MANAGEMENT ORGANIZATION CHART



# MJIIT CONSORTIUM UNIVERSITIES IN JAPAN



**29 MEMBERS**

# UNIQUENESS OF MJIIIT

## UNIQUENESS OF MJIIT

01

Provides a holistic approach in its human development (Ningen-Ryoku) programmes to develop confidence, decisiveness, independence and maturity in the graduates. These characteristics prevail through emphasis on skills in communication, problem solving, responsibility and ethics in the programme curriculum.

02

Utilizes the K.E.S. (Knowledge. Experience. Self-study) pedagogy concept of teaching and learning approach which focuses on more class contact in lower years, learning through experience and self-study in later years.

03

The unique Senpai-Kohai relationship or mentor-mentee concept is emphasized from the moment the students step into MJIIT until they graduate. The implementation of i-Kohza (research) laboratory system which promotes strong collaborative work by senior and junior researchers as well as continuous guidance from the professors in R&D project strengthens the concept. All students will be part of the i-Kohza system.

04

The successful Japanese concept of 5S and Kaizen will be part of the learning concept of MJIIT, aimed to develop the skills of the Japanese which are envied by many, such as team working, responsibility, and resilience.

05

MJIIT students can pursue Japanese-style of education in English at affordable cost.

06

Selected undergraduate students will have the opportunities to do part of their industrial training or attend some courses in Japan.

07

Postgraduate students will have opportunities for attachment in research laboratories in Japan for three (3) months to one (1) year.

## UNIQUENESS OF MJIT

08

Accessibility to sophisticated equipment in partner university.

09

Strong Japanese-based industrial-linkage gives opportunities for industrial experience and allows students to use their work experience as part of their research.

10

Strong linkages with academics and researchers in Japan to allow students to be jointly supervised through joint research programmes.

11

Twenty seven (27) Japanese universities, two (2) research institutes and five (5) Japanese government agencies form the consortium in support of MJIT.

12

Twenty percent (20%) are international academics staff including the Japanese academics.

13

Scholarships are available for excellent students.



# MJIIT INNOVATIVE KOHZA (*i-Kohza*)



## UNDERGRADUATE RESEARCH

Undergraduate students are encouraged to participate in research activities. In the final year students will be given individual final year project and their progress will be monitored closely by their supervisors. Therefore, to equip the students and accelerate them on their research, MJIIT offers the *iKohza* system. This *iKohza* is led by a senior academic member with group members comprising of academics and researchers of similar interests, and students as junior members. Here the students will be exposed with the high-end equipment and engage in independent and life-long learning in the broadest context of technological change. Below is the list of *iKohzas* and the center of excellence at MJIIT.

RESEARCH FELLOW (Associate Member)	<i>iKOHZA</i>
<ol style="list-style-type: none"> <li>1. COEs / LABs / RGs in Skudai</li> <li>2. Other COEs / LABs from other universities</li> </ol>	<ol style="list-style-type: none"> <li>1. Shizen Conversion &amp; Separation Technology (Shizen)</li> <li>2. Pattern Recognition &amp; Robotics Automation (PRA)</li> <li>3. Air Resources</li> <li>4. Communication Systems &amp; Networks</li> <li>5. Intelligent Dynamic System</li> <li>6. Advanced Devices and Material Engineering</li> <li>7. Tribology and Precision Machining</li> <li>8. Vehicle System Engineering</li> <li>9. Wind Engineering For (Urban, Artificial, Man-Made) Environment</li> <li>10. Biologically Inspired System and Technology</li> <li>11. Embedded System</li> <li>12. Nano-Characterization, Structural Control and Processing Technology</li> <li>13. Optical Devices and Systems</li> </ol>

	14. Takasago Thermal/Environmental System 15. Chemical Energy Conversions and Applications 16. Metabolic Engineering And Molecular Biology 17. Algal Biomass 18. Intellectual Property and Innovation Management
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	<i>Centre of Excellence</i>
	1.DISASTER PREPAREDNESS & PREVENTION CENTRE (DPPC)

Note:

COE – Center of Excellence

LAB – Laboratory

RG – Research Group

## Director of COE

<b>COE</b>	<b>Director</b>
Disaster Preparedness & Prevention Centre (DPPC)	<ul style="list-style-type: none"> <li>Prof. Dr. Masafumi Goto</li> </ul>

## Head of iKOHZA

<b>iKOHZA</b>	<b>Head</b>
Pattern Recognition & Robotics Automation (PRA)	<ul style="list-style-type: none"> <li>Prof. Datin Dr. Rubiyah Binti Yusof</li> </ul>
Shizen Conversion & Separation Technology (Shizen)	<ul style="list-style-type: none"> <li>Prof. Dr. Tomoya Tsuji</li> </ul>
Air Resources	<ul style="list-style-type: none"> <li>Prof. Dr. Mohd Rashid bin Mohd Yusof</li> </ul>
Communication Systems & Networks	<ul style="list-style-type: none"> <li>Prof. Dr. Yoshihide Yamada</li> </ul>
Intelligence Dynamics and System	<ul style="list-style-type: none"> <li>Assoc. Prof. Dr. Aminudin bin Abu</li> </ul>
Advanced Devices and Materials Engineering	<ul style="list-style-type: none"> <li>Assoc. Prof. Ir. Dr Abdul Manaf Bin Hashim</li> </ul>
Tribology and Precision Machining	<ul style="list-style-type: none"> <li>Prof. Dr. Kanao Fukuda</li> </ul>
Vehicle System Engineering	<ul style="list-style-type: none"> <li>Assoc. Prof. Dr Wira Jazair bin Yahya</li> </ul>
Wind Engineering and Environment	<ul style="list-style-type: none"> <li>Dr. Sheikh Ahmad Zaki bin Shaikh Salim</li> </ul>
Biologically Inspired Systems and Technology	<ul style="list-style-type: none"> <li>Dr. Muhamad Kamal bin Mohammed</li> </ul>

	Amin
Embedded System	<ul style="list-style-type: none"> <li>• Prof. Dr. Koichiro Mashiko</li> </ul>
Nano-Characterization, Structural, Control & Processing	<ul style="list-style-type: none"> <li>• Prof. Dr. Noriyuki Kuwano</li> </ul>
Chemical Energy Conversions and Applications	<ul style="list-style-type: none"> <li>• Prof. Dr. Mikio Miyake</li> </ul>
Metabolic Engineering and Molecular Biology	<ul style="list-style-type: none"> <li>• Assoc. Prof. Dr. Hirofumi Hara</li> </ul>
Optical Devices and Systems	<ul style="list-style-type: none"> <li>• Prof. Dr. Minoru Yamada</li> </ul>
Takasago Thermal/Environmental Systems	<ul style="list-style-type: none"> <li>• Prof. Dr. Yutaka Asako</li> </ul>
Algal Biomass	<ul style="list-style-type: none"> <li>• Assoc. Prof. Dr. Koji Iwamoto</li> </ul>
Intellectual Property and Innovation Management	<ul style="list-style-type: none"> <li>• Dr. Mohd Ali Tareq</li> </ul>

## COE RESEARCH INTEREST

Disaster Preparedness & Prevention Centre (DPPC)
<ul style="list-style-type: none"> <li>• Early warning system for flood and landslides</li> <li>• Integration of information, modelling, and mapping technologies to provide situational awareness and decision support via web-accessible graphics and information.</li> <li>• Prevention of flood and landslide</li> <li>• Best practices and effective preparedness programs and policy</li> <li>• Tropical Geo Engineering</li> </ul>

## iKOHZA RESEARCH INTERESTS

Communication Systems and Network	Shizen Conversion & Separation Technology	Pattern Recognition & Robotics
<ul style="list-style-type: none"> <li>• Algorithm</li> <li>• Wireless Sensor Network</li> <li>• Communication Protocol</li> <li>• Network Security</li> <li>• Cloud Computing</li> <li>• Cognitive Radio Network</li> </ul>	<ul style="list-style-type: none"> <li>• Separation and Purification Process</li> <li>• Green Extraction Technology</li> <li>• Oil/Wax/Fat (Lipid)</li> <li>• Biomaterial</li> </ul>	<ul style="list-style-type: none"> <li>• Artificial Intelligence (AI)</li> <li>• Intelligent Systems &amp; Soft Computing</li> <li>• Pattern recognition</li> <li>• Robotics</li> <li>• Control</li> <li>• Process Tomography Instrumentation</li> </ul>

<b>Intelligence Dynamics and System</b>	<b>Air Resources</b>	<b>Intellectual Property and Innovation Management</b>
<ul style="list-style-type: none"> <li>• Noise and Vibration Control</li> <li>• Damaged Detection</li> <li>• Intensity Identification</li> <li>• Non –linear System Identification</li> <li>• Smart Material- Magnetoreological (Magneto rheological) and Electrorheological (ER) fluids application</li> <li>• Vibration damper and active suspension system</li> <li>• Structural Dynamics</li> </ul>	<ul style="list-style-type: none"> <li>• Air Quality Surveillance</li> <li>• Air Pollution Modelling and Assessment</li> <li>• Quantification and Characterization of Atmospheric Aerosols and Toxic Compounds in Incineration or High Temperature Processes</li> <li>• Air Pollution Control System Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• Project Management</li> <li>• Human Resource Development</li> <li>• Operations, Quality dan Project Management</li> <li>• Innovation and Technology Management</li> <li>• Corporate Governance</li> </ul>
<b>Tribology &amp; Precision Machining</b>	<b>Advanced Devices &amp; Materials Engineering</b>	<b>Vehicle System Engineering</b>
<ul style="list-style-type: none"> <li>• Mechanisms of wear</li> <li>• Contact</li> <li>• Numerical analysis</li> <li>• Influence of gases</li> <li>• Lubrication</li> <li>• Elast-Hydrodynamic Lubrication</li> </ul>	<ul style="list-style-type: none"> <li>• Synthesis/growth of carbon nanomaterials, semiconductors, organic/molecular materials and bio-materials as well as their nanostructure formation</li> </ul>	<ul style="list-style-type: none"> <li>• Alternative &amp; emulsion fuels</li> <li>• Engine downsizing</li> <li>• Turbo compound</li> <li>• Waste heat recovery devices</li> <li>• Combustion and engine</li> </ul>

<ul style="list-style-type: none"> <li>Rolling contact</li> </ul>	<p>technologies</p> <ul style="list-style-type: none"> <li>Various novel nanodevices and functional devices covering electronic/photonic devices, sensors and solar cells</li> </ul>	<p>control strategies</p> <ul style="list-style-type: none"> <li>Suspension</li> <li>Vehicle communication</li> <li>Vehicle active safety</li> </ul>
<b>Wind Engineering and Environment</b>	<b>Biologically Inspired Systems and Technology</b>	<b>Embedded System</b>
<ul style="list-style-type: none"> <li>Wind engineering encompassing urban thermal comfort and building physics</li> </ul>	<ul style="list-style-type: none"> <li>Study and analyse the Bio-inspired learning process for development and application of machine learning</li> <li>Neural system</li> <li>Self-organizing learning</li> <li>Swarm intelligence and neurobiological characteristic of the human brain</li> <li>Intelligent system</li> </ul>	<ul style="list-style-type: none"> <li>VLSI</li> <li>Reconfigurable computing</li> <li>Architectural translation of complex algorithms</li> <li>Architecture-centric CAD algorithm development</li> <li>Networking architectures and integrated circuits as well as design-for-testability.</li> </ul>

<b>Chemical Energy Conversions and Applications</b>	<b>Nano-Characterization, Structural, Control and Processing</b>	<b>Metabolic Engineering and Molecular Biology</b>
<ul style="list-style-type: none"> <li>• Research on sustainable energy development via the application of fundamentals of chemical energy conversion reactions and development of new materials to enhance their efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Study the Phenomena of Ions, Electrons and other associated species transfer in Solid Materials and Solid/Liquid or Solid/Gas Interfaces.</li> <li>• Develop the Materials with Fast Transportation</li> </ul>	<ul style="list-style-type: none"> <li>• Tackle the issues related to green technology form microbiological side.</li> <li>• The production of new energy source from biomass/biochar</li> </ul>
<b>Optical Devices and Systems</b>	<b>Takasago Thermal/Environmental Systems</b>	<b>Algal Biomass</b>
<ul style="list-style-type: none"> <li>• Optoelectronics,</li> <li>• Quantum Electronics,</li> <li>• High-frequency Technology,</li> <li>• Optical Communications</li> <li>• Flat-Optical Fibre</li> </ul>	<ul style="list-style-type: none"> <li>• Thermo-fluid science especially renewable energy and energy saving technologies</li> </ul>	<ul style="list-style-type: none"> <li>• production of renewable energy and biomass, reduction of carbon dioxide, a greenhouse effect gas, from the air etc using algae, especially microalgae</li> </ul>



# ACADEMIC CALENDAR FOR 2018/2019 SESSION

**ACADEMIC CALENDAR FOR 2018/2019 SESSION**  
**UNIVERSITI TEKNOLOGI MALAYSIA**  
**DEGREE PROGRAMME**

3 September 2018	Registration for New Students
4 – 7 September 2018	Student Orientation Week
6 - 7 September 2018	Registration of Courses for Semester I, 2018/2019 Session

<b>10 September 2018 – 24 January 2019 (20 weeks)</b>	<b>SEMESTER I</b>
<b>10 September- 5 November 2018</b>	<b>Semester 1 Lectures (Part One) (8 weeks)</b>
19 September 2018	Senate Meeting
17 October 2018	Senate Meeting
10 – 13 November 2018	UTM 61 <sup>st</sup> . Convocation Ceremony
<b>6 – 9 November 2018</b>	<b>Mid-Semester I Break (4 days)</b>
<b>12 November – 19 December 2018</b>	<b>Continuation of Semester 1 Lectures (Part Two) (6 weeks)</b>
21 November 2018	Senate Meeting
<b>10 – 21 December 2018</b>	<b>Pre-Registrations of Courses for Semester II, 2018/2019 (2 weeks)</b>
12 December 2018	Senate Meeting
<b>20 - 21 December 2018</b>	<b>Revision Week (2 days)</b>
<b>24 December 2018- 9 January 2019</b>	<b>Final Examination for Semester I (2 weeks 3 days)</b>
16 January 2019	Senate Meeting
<b>10 - 25 January 2019</b>	<b>Final Break for Semester I (2 weeks 2 days)</b>
20 February 2019	Senate Meeting

<b>24 &amp; 25 January 2019</b>	<b>Registrations of Course for Semester II, 2018/2019 Session</b>
<b>4 - 15 February 2019</b>	<b>Special Examinations for Semester I</b>

<b>28 January – 30 August 2019 (31 weeks)</b>	<b>SEMESTER II</b>
<b>28 January – 27 March 2019</b>	<b>Lectures semester II (First half) ( 9 week)</b>
<b>4 – 8 February 2019</b>	<b>Chinese New Year (1 week)</b>
20 March 2019	Senate Meeting
<b>28 – 29 March 2019</b>	<b>Mid-Semester II Break (2 days)</b>
17 April 2019	Senate Meeting
<b>1 April -14 May 2019</b>	<b>Semester II Lectures (Second half) (6 weeks 2 days)</b>
27 – 28 April 2019	UTM 62 <sup>th</sup> Convocation Ceremony
15 May 2019	Senate Meeting
<b>29 April - 10 May 2019</b>	<b>Pre-Registrations of Courses for Semester 1 2019/2020 Session (2 weeks)</b>
<b>15 – 17 May 2019</b>	<b>Revision Week</b>
<b>20 May – 7 June 2019</b>	<b>Final Examination for Semester II (3 weeks)</b>
19 June 2019	Senate Meeting
<b>10 June – 30 August 2019</b>	<b>Final Semester Long Vacation (12 weeks)</b>
17 July 2019	Senate Meeting
21 August 2019	Senate Meeting
<b>1 - 12 July 2019</b>	<b>Special Examinations for Semester II</b>
<b>28 – 29 August 2019</b>	<b>Registrations of Courses for Semester I, 2019/2020 Session</b>

SHORT SEMESTER	
13 - 14 June 2019	Registrations of Courses for Short Semester 2019/2020 Session
17 June – 9 August 2019	Lectures for Short Semester

### Malaysia Public Holiday

31 August 2018	National Day
10 September 2018	Birthday of His Majesty Seri Paduka Baginda Yang Di-Pertuan Agong Birthday
11 September 2018	Maal Hijrah 1440
17 September 2018	Malaysia Day
6 November 2018	* Deepavali Day
25 December 2018	Christmas
1 January 2019	New Year (Public Holiday for KL Only)
21 January 2019	*Thaipusam
1 February 2019	Federal Territory Day (Public Holiday for KL Only)
5 & 6 February 2019	Chinese New Year
1 May 2019	Labour Day
20 May 2019	* Wesak Day
22 May 2019	Nuzul Al Quran (Public Holiday for KL Only)
5 & 6 June 2019	Eid Al-Fitri
27 July 2019	Birthday of His Majesty Seri Paduka Baginda Yang Di-Pertuan Agong Birthday
11 & 12 August 2019	Eid Al-Adha
31 August 2019	National day

\* Subject to change

# DEGREE OFFERED & PROGRAMME SPECIFICATIONS

# GENERAL PROGRAMME FOR UNDERGRADUATE

## ENGINEERING PROGRAMMES SPECIFICATIONS

MJIT has three (3) undergraduate programmes namely Bachelor of Electronic Systems Engineering (ESE), Bachelor of Mechanical Precision Engineering (MPE) and Bachelor of Chemical Process Engineering (CPE). The entry requirements, Programme Educational Objectives (PEOs), Programme Learning Outcomes (POs) and Programme Award Requirements for these programmes are tabled below.

### ENTRY REQUIREMENTS

#### **ADMISSION TO 1<sup>ST</sup> YEAR**

- A. MoHE Matriculation Programme Holders:**  
**(KPM Matriculation/ UM Asasi Sains / UiTM Asasi)**
- i. University General Requirements**  
Pass Sijil Pelajaran Malaysia (SPM) or equivalent with credit in Bahasa Melayu / Bahasa Malaysia or credit in Bahasa Melayu / Bahasa Malaysia July paper  
**and**  
Pass KPM Matriculation / UM Asasi Sains / UiTM Asasi with CGPA of at least 2.00  
**and**  
achieve Malaysian University English Test (MUET) Band 1
- ii. MJIT Programme Specific Requirements**  
Pass KPM Matriculation / UM Asasi Sains / UiTM Asasi with CGPA of at least 2.80  
**and**  
achieve at least a 'B-' in subject (1) and (2) (for MPE and ESE) subject (1), (2) and (3) (for CPE) as follows:  
(1) Mathematics  
(2) Physics/Engineering Physics

(3) Chemistry / Engineering Chemistry / Biology

**and**

achieve Malaysian University English Test (MUET) **Band 2**

**or**

at least a (**Gred A-**) in **English Language** subject at Sijil Pelajaran Malaysia (SPM) level

**and**

Pass with credit (**Gred C**) in following subjects at Sijil Pelajaran Malaysia (SPM) level:

- Mathematics
- Physics

**and**

***Not handicapped that can prevent them from doing practical work***

**B. STPM Holders:**

**i) University General Requirements**

Pass Sijil Pelajaran Malaysia (SPM) or equivalent with credit in Bahasa Melayu / Bahasa Malaysia or credit in Bahasa Melayu / Bahasa Malaysia July paper

**and**

Pass Sijil Tinggi Pelajaran Malaysia (STPM) with at least:

- grade 'C' (NGMP 2.00) in General Paper;
- and**
- grade 'C' (PNGMP 2.00) in two other subjects.

**and**

achieve Malaysian University English Test (MUET) Band 1



**ii) MJIT Programme Specific Requirements**

Pass STPM with CGPA of at least 2.80

**and**

achieve at least Gred 'B-' (NGMP 2.67) in subject (1) and (2) (for MPE and ESE) subject (1), (2) and (3) (for CPE) as follows:

- (1) Mathematics / Further Mathematics
- (2) Physics / Biology
- (3) Chemistry

**and**

achieve Malaysian University English Test (MUET) **Band 2**

**or**

at least a (Gred A-) in **English Language** subject at Sijil Pelajaran Malaysia (SPM) level

**and**

Pass with credit in following subjects at Sijil Pelajaran Malaysia (SPM) level:

- Mathematics
- Physics

**and**

***Not handicapped that can prevent them from doing practical work***

**C. Others**

Holds other qualifications deemed equivalent by the Government of Malaysia and approved by University Senate

**and**

***Not handicapped that can prevent them from doing practical work***

## **DIRECT ENTRY TO SECOND (2<sup>ND</sup>) YEAR : DIPLOMA UTM QUALIFICATION**

### **A. Diploma Holders and equivalent**

#### **i) University General Requirements**

Pass Sijil Pelajaran Malaysia (SPM) or equivalent with credit in Bahasa Melayu / Bahasa Malaysia or credit in Bahasa Melayu / Bahasa Malaysia July paper

**and**

Obtained a Diploma or holds other qualifications deemed equivalent by the Government of Malaysia and approved by University Senate

**and**

achieve Malaysian University English Test (MUET) Band 1

#### **ii) MJIT Programme Specific Requirements**

##### **FOR BACHELOR OF ELECTRONIC SYSTEMS ENGINEERING**

Obtained a **Diploma in Electrical Engineering**

(Electronic/Mechatronic/Communication) from UTM or Institution of Higher Learning (IPT) with CGPA of at least 2.75

##### **FOR BACHELOR OF MECHANICAL PRECISION ENGINEERING**

Obtained a **Diploma in Mechanical Engineering** (Core/ Industrial/

Manufacturing/Aeronautics/Automotive) from UTM or Institution of Higher Learning (IPT) with CGPA of at least 2.75

## **BACHELOR OF CHEMICAL PROCESS ENGINEERING**

Obtained a **Diploma in Chemical Engineering** from Institution of Higher Learning (IPT) with CGPA of at least 3.00

**or**

Obtained  $2.50 < \text{CGPA} < 3.00$  but with **2 years of working experiences** in related fields

### **COMMON TO ALL PROGRAMMES**

achieve Malaysian University English Test (MUET) **Band 2 or** at least a (**Gred A-**) in **English Language** subject at Sijil Pelajaran Malaysia (SPM) level

**and**

Pass with credit in following subjects at Sijil Pelajaran Malaysia (SPM) level:

- Mathematics
- Physics

**and**

***Not handicapped that can prevent them from doing practical work***

Note: Candidate should submit the complete Diploma examination results (from first to last semester) to UTM. Candidate should also submit a copy of diploma certificate or letter completion of study.

The entry and duration of the study are based on the exemption credits that are approved by UTM.

### **ENTRY REQUIREMENTS FOR INTERNATIONAL STUDENT**

- At least the Senior High School Certificate/Senior Secondary School/other equivalent pre-university examination from the government school (with the period of at least 12 years of study from primary to higher secondary) ;  
**or**
- General Certificate of Education (GCE) 'A' Level , Diploma in the related field or other equivalent pre-university examinations;  
**or**
- Any other certificate that is recognised by Senate of the University equivalent to the above;  
**and**
- Programme's specific requirements;  
**and**
- Language requirements

### **ENGLISH LANGUAGE REQUIREMENT**

All international students applying to UTM must have a **TOEFL 500 (or TOEFL (IBT) >59) or an IELTS Band 5.5 or MUET Band 3**

## PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

Within 3 to 5 years upon graduation, it is expected that the graduates of the programmes are able to achieve the following:

- PEO 1 : Generate innovative ideas or products in local or international industry or government and to work in multidisciplinary teams in implementing these solutions in practice.
- PEO 2 : Establish themselves in a diverse range of careers in technology driven transdisciplinary field with Japanese work culture or engage in business opportunities.
- PEO 3 : Demonstrate ethical responsibility through involvement with community and/or professional organisations and/or contribute towards a sustainable society.
- PEO 4 : Recognised the importance of and engage in life-long learning through formal graduate level education.

## PROGRAMME LEARNING OUTCOMES (POs)

Upon graduation, MJIT students of the engineering programmes are expected to attain twelve (12) learning outcomes. The intended learning outcomes, teaching and learning methods as well as the assessment methods are as follows:

Programme Learning Outcomes			
PO	Intended Learning Outcomes	Teaching and Learning Methods	Assessment
(a) Technical Knowledge and Competencies			
<b>PO1</b>	<b>Engineering Knowledge</b>  Ability to apply knowledge of mathematics, science, engineering fundamentals and Electronic Systems/Mechanical Precision/Chemical Process Engineering to the solution of complex engineering problems.	Lectures, tutorials, laboratory works, project supervisions, cooperative learning (CL), and problem-based learning (PBL)	Examinations, laboratory (reports), individual or group assignments, individual or group projects, CL, PBL (problem solutions).
<b>PO2</b>	<b>Problem Analysis</b>  Ability to identify, formulate, analyse and research literature on complex engineering problems to reach	Laboratory works, tutorials, workshops, project supervisions, cooperative learning (CL), and problem-based learning (PBL)	Examinations, laboratory (reports), individual or group assignments (solutions), individual or group projects (solutions), CL (solutions), PBL (problem solutions).

	substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.		
<b>PO3</b>	<b>Design/Development</b>  Ability to design and develop Electronic Systems/Mechanical Precision/Chemical Process Engineering solution to complex engineering problems that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.	Lectures, tutorials, laboratory works, project supervisions, cooperative learning (CL), and problem-based learning (PBL), <i>ikohza</i> . <i>(ikohza is referred as a strong research group which is responsible for the continuous teaching and learning of subjects and laboratory works)</i>	Examinations, laboratory (reports), individual or group assignments (solutions), individual or group projects (solutions), CL (solutions), PBL (problem solutions), <i>ikohza</i> work

<b>(b) Generic skills</b>			
<b>PO4</b>	<b>Investigation</b>  Ability to conduct investigation into complex problems on Electronic	Lectures, tutorials, laboratory works, project supervisions, cooperative	Examinations, laboratory (reports), individual or group assignments, individual or group

	Systems/Mechanical Precision/Chemical Process Engineering using research based knowledge and research methods learned in iKohza and synthesis of information to provide valid conclusions.	learning (CL), and problem-based learning (PBL)	projects, CL, PBL (problem solutions).
<b>PO5</b>	<b>Modern Tool Usage</b>  Ability to apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling to complex engineering activities with an understanding of the limitations.	Lectures, laboratory works, project supervisions, cooperative learning (CL), and problem-based learning (PBL)	Examinations, laboratory (reports), individual or group assignments, individual or group projects, CL, PBL (problem solutions).
<b>PO6</b>	<b>The Engineer and Society</b>  Ability to apply contextual knowledge to assess societal, health, safety, legal and cultural issues and his/her responsibilities relevant to professional engineering practice	Lectures, invited seminars, project supervisions, industrial attachments	Individual or group projects (solutions), industrial attachment (report and industry evaluation).



<b>PO7</b>	<b>Environment and Sustainability</b>  Ability to explain, compare and summarize the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.	Lectures, invited seminars, project supervisions, industrial attachments	Individual or group projects (solutions), industrial attachment (report and industry evaluation).
<b>PO8</b>	<b>Ethics</b>  Ability to apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice, in multicultural society based on Islamic, ASEAN and Japanese cultures	Lectures, laboratory works, project supervisions	Examinations, laboratory (reports and in-lab performance ), individual or group projects (reports), final year survey/interview, course/instructor evaluation.
<b>PO9</b>	<b>Communication</b>  Ability to communicate effectively on complex engineering activities with the engineering	Lectures, laboratory works, project supervisions, cooperative learning (CL), and problem-based learning (PBL)	Examinations, laboratory (reports), individual or group assignments, individual or group projects, CL, PBL (problem solutions).

	community and with society at large, sometimes in Japanese		
<b>PO10</b>	<b>Individual and Team work</b>  Ability to function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings	Tutorials, laboratory works, project supervisions, active learning (AL), cooperative learning (CL), and problem-based learning (PBL)	Laboratory (reports, in-lab performance, and presentations), individual or group projects (reports and presentation), AL (participation), CL (peer review), PBL (peer review, reports and presentations).
<b>PO11</b>	<b>Life-Long Learning</b>  Ability to recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	Lectures, laboratory works, project supervisions, problem-based learning (PBL)	Laboratory (reports), individual or group projects (solutions, reports and presentation), PBL (solutions, reports and presentation), final year survey/interview, course/instructor evaluation, results of professional engineering exam.
<b>PO12</b>	<b>Engineering Project Management and Finance</b>  Ability to demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work.	Tutorials, laboratory works, cooperative learning (CL), and problem-based learning (PBL)	Laboratory (in-lab performance), CL (peer review), PBL (peer review).

## PROGRAMME AWARD REQUIREMENTS

The program is offered in full-time mode and based on a 2 Semester Academic Year with several courses being delivered and assessed in each Semester. Assessment is based on final examination, coursework conducted throughout the semester.

### **Award requirements:**

Students should:

- For local undergraduate student: achieve a total of 137 credit hours for ESE, 138 credit hours for MPE and 135 for CPE with minimum CGPA of 2.0.
- For international undergraduate student: achieve a total of 139 credit hours for ESE, 140 credit hours for MPE and 137 for CPE with minimum CGPA of 2.0.
- Pass industrial training (equivalent to 6 credit hours).
- Complete the final year project at Year 4.
- As part of the efforts to produce competitive and marketable graduates, UTM has introduced a Professional Skills Certificates for all undergraduate students in addition to their normal academic transcript. UTM School of Professional and Continuing Education (SPACE) is responsible for conducting this programme. The aim of this programme is to provide opportunity for students (especially the final year students) who wish to expand their knowledge beyond the credits curriculum and hence become more competitive in the real world after they graduated. The programme will help them obtain additional knowledge and skills in adapting themselves with their jobs and technical skills in their chosen career. The professional skills are offered in the following areas:
  - i. How to Get Yourself Employed (HTGYE)
  - ii. ISO 9001:2008 Quality Management System

- iii. Occupational Safety and Health Awareness
- iv. How to manage your Finance
- v. Test of English Communication Skills for Graduating Students

**Note:** The students must participate in the courses of item (i – iv) and must pass item (v) as a requirement for graduation.







**TK97**

# **BACHELOR OF ELECTRONIC SYSTEM ENGINEERING**

**ACADEMIC STAFF**  
**DEPARTMENT OF ELECTRONIC SYSTEMS ENGINEERING (ESE)**

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## BACHELOR OF ELECTRONIC SYSTEMS ENGINEERING CURRICULUM

<b>1. Awarding Institution</b>			Universiti Teknologi Malaysia	
<b>2. Teaching Institution</b>			Universiti Teknologi Malaysia	
<b>3. Programme Name</b>			Bachelor of Electronic Systems Engineering	
<b>4. Final Award</b>			Bachelor of Electronic Systems Engineering	
<b>5. Programme Code</b>			TK97	
<b>6. Professional or Statutory Body of Accreditation</b>			Board of Engineers Malaysia (BEM)	
<b>7. Language(s) of Instruction</b>			Bahasa Malaysia and English	
<b>8. Mode of Study (Conventional, distance learning, etc)</b>			Conventional	
<b>9. Mode of operation (Franchise, self-govern, etc)</b>			Self-governing	
<b>10. Study Scheme (Full Time/Part Time)</b>			Full Time	
<b>11. Study Duration</b>			Minimum : 4 yrs Maximum : 6 yrs	
Type of Semester	No. of Semesters		No. of weeks per semester	
	Full Time	Part Time	Full Time	Part Time
Normal	8	-	14	-
Short	1	-	10	-

12. Classification of Courses			
No.	Classification	Credit Hours	Percentage (%)
A.	Programme Core	91	67%
B.	Programme Electives	18	13%

C.	General / University Courses a. Management/Economics/Humanities/Ethics b. Language – English and Japanese c. Co-curriculum/Service Learning	12 12 2	19%
	<b>Total</b>	<b>135</b>	<b>100</b>
<i>For sciences programme, please fill up the following classification.</i>			
No	Classification	Credit hours	Percentage (%)
A	Engineering Courses (a) Lectures (b) Laboratory (c) Final Year Project (d) Industrial training	73 9 6 6	
	Total credit hours for Part A	94	70%
B	<i>Related Courses</i> (a) Applied Science/Math (b) Management/Economics/Humanities/Ethics (c) Co-Curriculum (d) English (e) Japanese	15 12 2 6 6	
	Total credit hours for Part B	41	30%
	<b>Total Credit Hours for Parts A and B</b>	<b>135</b>	<b>100%</b>

<b>13. Total credit hours to graduate</b>	<b>135</b> credit hours
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## Programme Codes and Abbreviations

The curriculum for the Bachelor of Electronic Systems Engineering is given in the following tables. The courses are arranged according to the semester in which they are offered. Students are strongly encouraged to enrol in the courses according to the proposed arrangement. Students may not graduate on time should they fail or withdraw from the courses offered.

Alphabet	Description
S	Type of award for the programme (Bachelor degree)
MJ	Faculty/ Centre offering the programme ( <b>MJ</b> IIT)
E	Specialisation (Electronic Systems)
Numeric	Description
1st	Year of programme
2nd	Field of course
3rd	Course sequence
4th	Course credits

**Year 1 Semester 1**

Code	Course	Credits	L	T	P/S	lab
SMJE 1013	PROGRAMMING FOR ENGINEER	3	2			3
SMJE 1023	FUNDAMENTAL OF ELECTRICAL CIRCUITS	3	2	2		
SMJE 1032	INTRODUCTION TO ELECTRONIC SYSTEM ENGINEERING	2	1		3	
SMJM 1013	ENGINEERING MATHEMATICS I	3	2	2		
UHAS 1172	DINAMIKA MALAYSIA <i>(for local student)</i>	2	2			
UHAK 1022	MALAYSIAN STUDIES III <i>(for International Student)</i>					
UHAK 1012	GRADUATE SUCCESS ATTRIBUTES	2	2			
Total Credits		15	11	4	3	3

**Year 1 Semester 2**

Code	Course	Credits	L	T	P/S	Lab
SMJE 1113	DIGITAL ELECTRONICS	3	2	2		
SMJE 1043	MEASUREMENT AND INSTRUMENTATION	3	2	2		
SMJE 1103	ELECTRICAL POWER SYSTEM	3	2	2		
SMJM 1023	ENGINEERING MATHEMATICS II	3	2	2		
SLAJ 1152 / ULAJ 1122	JAPANESE FOR COMMUNICATION I	2	1	2		
ULAB 1122	ACADEMIC ENGLISH SKILLS	2	1	2		
UKQ* 1**2	CO-CURRICULUM / SERVICE LEARNING	2			3	
Total Credits		18	10	12	3	0

Notes: - L- Lecture; T- Tutorial; P/S- Practical/Studio; Lab- Laboratory

**Year 2 Semester 3**

Code	Course	Credits	L	T	P/S	Lab
SMJE 2083	ELECTRONIC CIRCUITS	3	2	2		
SMJE 2173	DIGITAL SYSTEM DESIGN	3	2			3
SMJE 2062	ELECTRONIC ENGINEERING LABORATORY 1	2				4
SMJM 2033	ENGINEERING MATHEMATICS III	3	2	2		
UMJG 2022 / UHAK 2142	PROFESSIONAL ETHICS & SAFETY (NINGEN-RYOKU)	2	1		3	
UICI 1012	ISLAMIC CIVILIZATION AND ASIAN CIVILIZATION (TITAS) <i>*(for local students)</i>	2	2			
ULAM 1012	MALAY LANGUAGE FOR COMMUNICATION II <i>*(for International student)</i>					
SLAJ 2252	JAPANESE FOR COMMUNICATION II	2	1	2		
Total Credits		17	10	6	3	7

**Year 2 Semester 4**

Code	Course	Credits	L	T	P/S	Lab
SMJE 2053	CIRCUITS AND SIGNALS	3	2	2		
SMJE 2073	ELECTROMAGNETICS	3	2	2		
SMJE 2122	ELECTRONIC ENGINEERING LABORATORY 2	2				4
SMJE 2133	ELECTRONICS SYSTEM	3	2	2		
SMJM 2043	ENGINEERING STATISTICS	3	2	2		
ULAB 2122	ADVANCED ACADEMIC ENGLISH SKILLS	2	1	2		
SLAJ 2352	JAPANESE FOR COMMUNICATION 3	2	1	2		
Total Credits		18	10	12	0	4

Notes: - L- Lecture; T- Tutorial; P/S- Practical/Studio; Lab- Laboratory

**Year 3 Semester 5**

Code	Course	Credits	L	T	P/S	lab
SMJE 3143	COMMUNICATION ELECTRONICS	3	3			
SMJE 3153	CONTROL SYSTEM	3	3			
SMJE 3183	MICROPROCESSOR AND MICROCONTROLLER	3	2			3
SMJE 3813	MONOZUKURI PROJECT	3			9	
SMJM 3053	NUMERICAL METHODS	3	2	2		
UHAK 1032	INTRODUCTION TO ENTREPRENEURSHIP	2	2			
	Total Credits	17	12	2	9	3

**Year 3 Semester 6**

Code	Course	Credits	L	T	P/S	Lab
SMJE 3163	DIGITAL SIGNAL PROCESSING	3	3			
SMJE 3192	ELECTRONIC ENGINEERING LABORATORY 3	2				6
SMJE 3303	INTEGRATED DESIGN PROJECT	3			9	
SMJE 3093	COMPUTER ARCHITECTURE AND MULTIMEDIA TECHNOLOGY	3	3			
SMJE 3203	ARTIFICIAL INTELLIGENCE	3	3			
ULAB 3162	ENGLISH FOR PROFESSIONAL PURPOSES	2	1	2		
	Total Credits	16	10	2	9	6

Notes: - L- Lecture; T- Tutorial; P/S- Practical/Studio; Lab- Laboratory

**Year 3                      Short Semester**

Code	Course	Credits	L	T	P/S	lab
SMJG 3206	INDUSTRIAL TRAINING	6			18	

**Year 4                      Semester 7**

Code	Course	Credits	L	T	P/S	lab
SMJE 4912	FINAL YEAR PROJECT 1	2			2	
SMJE 4**3	ELECTIVE 1	3	3			
SMJE 4**3	ELECTIVE 2	3	3			
SMJE 4**3	ELECTIVE 3	3	3			
SMJE 4212	NINGEN RYOKU (SPECIAL LECTURE)	2	2			
UICL 2302	THE THOUGHT OF SCIENCE AND TECHNOLOGY	2	2			
Total Credits		15	10	0	2	0

**Year 4                      Semester 8**

Code	Course	Credits	L	T	P/S	Lab
SMJE 4924	FINAL YEAR PROJECT 2	4			4	
SMJE 4**3	ELECTIVE 4	3	3			
SMJE 4**3	ELECTIVE 5	3	3			
SMJE 4**3	ELECTIVE 6	3	3			
Total Credits		13	9	0	4	0

Notes: - L- Lecture; T- Tutorial; P/S- Practical/Studio; Lab- Laboratory

## ELECTIVE COURSES

CHOOSE SIX (6) ONLY FROM ANY GROUP

### GROUP 1 COMMUNICATION

CODE	COURSE	CREDIT
SMJE 4113	OPTICAL COMMUNICATION	3
SMJE 4123	RADIO WAVE AND ANTENNA	3
SMJE 4133	WIRELESS AND MOBILE COMMUNICATION	3
SMJE 4343	DATA TRANSMISSION	3

### GROUP 2 INDUSTRIAL AUTOMATION SYSTEM

CODE	COURSE	CREDIT
SMJE 4233	INDUSTRIAL HYDRAULICS AND PNEUMATICS	3
SMJE 4243	CONTROL SYSTEMS DESIGN	3
SMJE 4253	POWER ELECTRONICS AND DRIVES	3
SMJE 4263	COMPUTER INTEGRATED MANUFACTURING	3
SMJE 4293	INDUSTRIAL AUTOMATION	3



**GROUP 3** **BIO-ELECTRONIC SYSTEM**

CODE	COURSE	CREDIT
SMJE 4303	INTRODUCTION TO BIO-ENGINEERING	3
SMJE 4313	IMAGE PROCESSING	3
SMJE 4333	BIOMEDICAL IMAGING SYSTEM	3
SMJE 4353	ROBOTICS	3

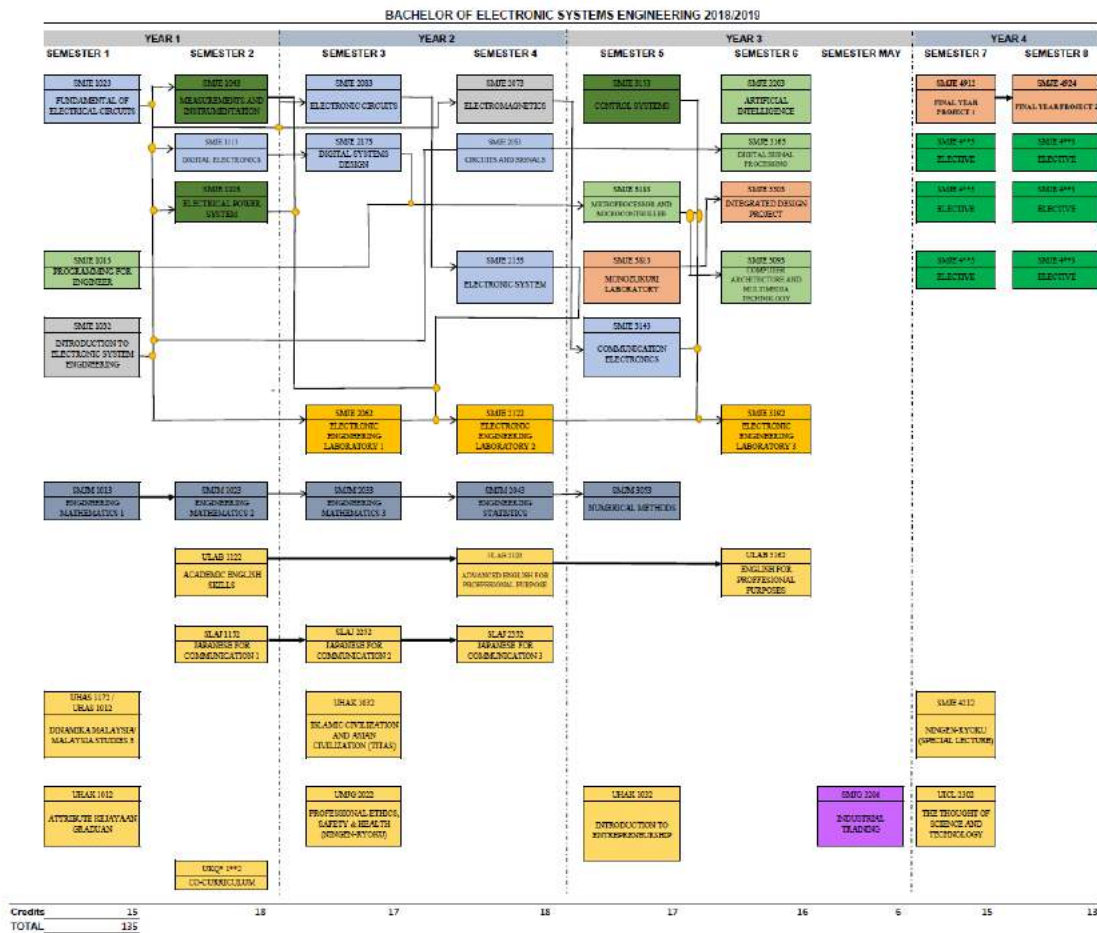
**GROUP 4** **EMBEDDED SYSTEM**

CODE	COURSE	CREDIT
SMJE 4383	ADVANCED PROGRAMMING	3
SMJE 4393	REAL TIME SYSTEMS	3
SMJE 4403	MECHATRONIC SYSTEM DESIGN	3
SMJE 4423	EMBEDDED SYSTEMS DESIGN	3

**GROUP 5** **MATERIAL AND DEVICE**

CODE	COURSE	CREDIT
SMJE 4513	SEMICONDUCTOR MATERIAL ENGINEERING	3
SMJE 4523	SEMICONDUCTOR DEVICE ENGINEERING	3
SMJE 4533	SOLID STATE ELECTRONICS	3
SMJE 4543	ELECTRONIC DEVICE FABRICATION AND CHARACTERIZATION	3

## FLOW OF COURSES IN SMJE PROGRAMME



## SYNOPSIS OF CORE COURSES

### **SMJE 1013      Programming for Engineers**

This course introduces basic concepts of problem solving and programming principles appropriate for scientific and technical applications implemented using the C++ language. The course covers algorithm design, program development, C++ programming language syntax, data types, selection statements, iteration statements, functions, arrays, pointers, structures and classes.

### **SMJE 1023      Fundamentals of Electrical Circuits**

By making use of electrical characteristics of individual electric and electronic elements, several kinds of circuits which realize particular functions will be treated. The devices treated are mainly linear passive devices such as resistors, capacitors, inductors, and nonlinear elements like rectifying diodes. Topics include Ohm's Law, AC and DC, Phase and Phaser, Direct and Parallel Resonance, Power Dissipation (Tangent delta) as well as Impedance and its Matching.

### **SMJE 1032      Introduction to Electronic System Engineering**

This course delivers the contents covering all areas of electronic engineering related fields. Lecture will be given by some lecturers. Relation between electronics and society is also included towards ethical qualifications

### **SMJE 1043      Measurement and Instrumentation**

This course in general deals with electronic measuring devices and methods as well as non-electrical quantities required to measure such as pressure and temperature, etc. This course has also included the discussion and instruction on digital measuring devices and systems. Topics include Error and Probability, DC and AC Quantities, Physical Quantities, Data acquisition, Transducer, Coding and Decoding and Telemetry

### **SMJE 1103      Electrical Power System**

Students will be exposed to the importance of electric power engineering in society. Importance of professional responsibility such as tight safety through engineering is also put on. Topics covered are: Load flow analysis, unbalanced faults analysis and protection requirements, Short circuits, Power system stability, DC machines, Transformers, Power generation. Lecture on safety problems is also given.

### **SMJE 1113      Digital Electronics**

This course introduces the fundamental of digital electronics. The student is first thought about the number system and logic gates before they are exposed to both combinational logic network and combinational MSI logic. In concurrence with this, the fundamental of sequential logic, flip-flop, counter and shift register will be thought.

### **SMJE 2053      Circuits and Signals**

This course introduces the fundamentals of analog and digital signal processing. The course covers the Fourier analysis, Laplace transform, sampling, discrete Fourier transform (DFT), fast Fourier transform (FFT), z-transform, digital filters, and applications of digital signal processing

### **SMJE 2062 Electronic Engineering Laboratory 1**

This course introduces the fundamental of digital electronics. The student is first thought about the number system and logic gates before they are exposed to both combinational logic network and combinational MSI logic. In concurrence with this, the fundamental of sequential logic, flip-flop, counter and shift register will be thought.

### **SMJE 2073 Electromagnetics**

This course provides students fundamentals of electromagnetics. The electromagnetics is a very important course for electrical and electronic engineers. Physical properties of the

electric field and the magnetic field are explained in unified form with help of the mathematics. Several principles underling the electric and the magnetic fields are summarized as Maxwell's equations. Expression of the electromagnetic wave is derived from the Maxwell's equations giving physical insight into the wave.

#### **SMJE 2083      Electronic Circuits**

This course provides students with the coverage of major and essential foundation for sound understanding of electronic circuits. The circuitry covered comprises small signal (ac), power amplifiers, oscillators, and operational amplifiers. A concept or idea integrated circuits is also given.

#### **SMJE 2122      Electronic Engineering Laboratory 2**

Based on not only the knowledge of electrical and electronic engineering but also skills experience in Basic Engineering Laboratory and Electronic Engineering Laboratory 1, more application-oriented components and systems are treated in this Laboratory.

This laboratory works will cover experimental topics on FOUR courses i.e. (i) Measurements and Instrumentation, (ii) Electrical Power Systems, (iii) Electronic Circuit and (iv) Electronic System.

#### **SMJE 2133      Electronic Systems**

This course provides students with the essential foundation for sound understanding of electronic systems. The circuits covered are transistors amplifier, power amplifiers, feedback amplifiers, operational amplifiers application circuits, oscillators, power supplies and multivibrators.

**SMJE 2173      Digital Systems Design**

This course presents design methods to construct digital systems, including combinational circuit and sequential circuit. Topics include: (1) Computer-Aided Design (CAD) tools for design, (2) Hardware Description Languages (HDL) for simulation and synthesis, and (3) state machine specification, design, and simulation. In this course, some of the important features of HDL will be examined. The course will enable students to design, simulate, model and analyze digital designs. The dataflow, structural, and behavioral modeling techniques will be discussed and related to how they are used to design combinational and sequential circuits. The use of test benches to exercise and verify the correctness of hardware models will also be described. Practical experience is gained by implementing various designs on a prototype FPGA board.

**SMJE 3093      Computer Architecture and Multimedia Technologies**

This course introduce to the organization and architecture of computer systems. The course covers data representation, instruction sets, memory systems, input and output devices, processor architectures, and advanced architecture for multimedia computing.

**SMJE 3143      Communication Electronics**

This course consists of introduction to manufacturing processes, common aspect in manufacturing, metal casting, bulk metal forming, sheet metal forming, forming of polymer, machining operations, joining processes, and the latest and competitive environments in manufacturing.

**SMJE 3153      Control System**

The course will introduce the basic concept and components of automatic control systems and some methods of analysis and design feedback control systems. The students will be exposed to use of numerical analysis tool such as MATLAB for control system analysis and design.

**SMJE 3163      Digital Signal Processing**

The course covers Digital Filters design, Adaptive Filters, Hardware and Software of DSP, Correlation and Spectral Estimation of Random signals, and Time-Frequency Spectrum Analysis. This course introduces the Problem/Project Based Learning (PBL) on various applications in DSP. The PBL will focus on audio, speech signal processing.

**SMJE 3183      Microprocessor and Microcontroller**

This course is an introduction to a microprocessor. Students are exposed to the internal architecture of the microprocessor, various instruction sets, and basic hardware design of microprocessor-based systems. Then, the students will be taught about microcontroller and interface with various peripherals.

**SMJE 3192      Electronic Engineering Laboratory 3**

Fully experimental work in laboratory. This lab works will cover open-ended experimental topics on THREE courses i.e. (i) Communication Electronics, (ii) Control System and (iii) Microprocessor and Microcontroller. Experiments are to be carried out every week in a small group. Discussion about experimental data with analysis is required to students, through group discussions and their own reports. Repeating discussion and analysis on experimental results are expected to brush up engineering mind of students involved.

**SMJE 3203      Artificial Intelligence**

This course introduces students to the fundamentals of three important techniques of artificial intelligence (AI), namely, artificial neural networks (ANN), genetic algorithm (GA), and fuzzy logic. These techniques have been successfully applied by many industries in consumer products and industrial systems. ANN provides strong generalization and discriminant properties and offer a simple way of developing system models and function approximation. GA is adaptive heuristic search algorithm based on the evolutionary ideas of natural selection and genetics for optimization and search problems. Fuzzy logic offers

flexibility in developing rule-based systems using natural language type of rules. They are highly applicable for many pattern recognition applications. This course gives the students appropriate knowledge and skills to develop, design and analyze effectively these AI techniques for practical problems with some degree of accuracy. The students will also be given a hands-on programming experience in developing fuzzy logic and neural networks system as well as genetic algorithm, to effectively solve real world problems.

#### **SMJG 3206      Industrial Training**

The students are placed in industries that best suit their area of studies for ten weeks. This course gives a chance of hands-on experience that requires the students to learn the process and to be able to apply their knowledge acquired in class to actual industrial setting. Placement at the respective agency is initiated by the students' applications. Approval of their applications is at the discretion of a faculty board. At the end of the industrial training period, the students are required to write reports regarding their own industrial trainings.

#### **SMJE 3303      Integrated Design Project**

The Integrated Design Project includes students in the Mechanical Precision and Electronics Systems disciplines. This course requires application of the knowledge gained in earlier courses and familiarizes the students with the engineering design process such as definition, synthesis, analysis and implementation, to the design project. This course provides an exposure to teamwork so as to emulate a typical professional design environment, and improve communication and organizational skills. The project is stress on the important of other influences on design such as economics, reliability, performance, safety, ethics and social impacts.

#### **SMJE 3813      Monozukuri Project**

The base idea of monozukuri project is to help the students independently develop their comprehensive monozukuri skills. This will increase the educational value by experience by providing the students with the opportunity for the practical application of the skills and



knowledge that related to the theoretical. The students will be group between 3-4 members and required to develop a simple electronic based working prototype. This course provides an exposure to teamwork, appreciation of monozukuri skills on development of practical application.

#### **SMJE 4212      Ningen-Ryoku: Special Lecture and Industry Visit**

The course provides some basic knowledge of industries which is practical and useful for engineering students. The topics to be given involve various fields relating to electric/electronic industries to mechanical industries as well as industries of other kind. Some lectures involve industry visit. Thus, some contact hours are used for occasional industry visit.

#### **SMJE 4113      Optical Communication**

This course provides fundamental understanding of the optical fiber communication technology. System configuration, optical emitter, optical fiber and the optical detector are overviewed as the beginning. Difference between the coherent light and incoherent light is explained. Theoretical analyses for propagation of the optical wave are given. Basis of laser operation, idea of photon, the spontaneous emission and the stimulated emission are explained. Basis of semiconductor physics is reviewed following operation of the semiconductor laser (laser diode). Characteristics of optical detectors are also explained.

#### **SMJE 4133      Wireless and Mobile Communication**

The wireless and mobile communication course provides a comprehensive understanding to the modern Wireless and Mobile Communication. The course begins with the OSI and TCP/IP models and concentrates on cellular networks, ad hoc networks, access protocols; 2G, 3G, 4G, and LTE; quality of service; routing; mobile-IP; current wireless technologies for

personal and local networks. It also deals with Network Security and Network Simulator (NS2).

### **SMJE 4233      Industrial Hydraulics and Pneumatics**

A significant proportion of automated and manual systems in manufacturing plants around the world utilize pneumatic and hydraulic actuators for fast reliable operation. This course provides the student with (1) an understanding of the fluid power systems, including hydraulic and pneumatic components, (2) safe work practices for hydraulics and pneumatics and includes information on preventive measures for safety hazards in the manufacturing workplace, (3) an overview of basic and advanced pneumatic and hydraulic system components, (4) and guidelines on how to design, operate, and troubleshoot pneumatic and hydraulic systems.

### **SMJE 4243      Control Systems Design**

This course introduces concepts in continuous control design using frequency response, root locus and state variable methods.

### **SMJE 4253      Power Electronic and Drives**

This course provides knowledge on semiconductor power diodes, transistors, thyristors, triacs, GTOs, MOSFETs and IGBTs - static characteristics and principles of operation; triggering circuits; phase control rectifiers; bridge converters - fully controlled and half controlled; principles of choppers and inverters; basis concepts of adjustable speed dc and ac drives.

### **SMJE 4263      Computer Integrated Manufacturing**

This course is designed to highlight the major automation-related subjects within the scope of manufacturing system. Special emphasis will be given to industrial robotics, computer-aided design and manufacturing (CAD/CAM), numerically controlled machine tools (CNC),

computer controlled material handling (AGV), automatic storage systems (AS/RS) and sophisticated sensory systems such as computerized vision. The student must be able to install, implement, and operate such systems, together with other engineers and technicians involved in working within the flexible manufacturing environment.

#### **SMJE 4293      Industrial Automation**

This course helps the students to develop their knowledge of industrial automation by exploring various automation technology such as SCADA, DCS, CAN and industrial buses and work with PLC's in an industrial plant, also system integration with PLCs and computers. The course is backed by extensive laboratory work using automation rigs and equipment. The course would give the students a broad understanding of modern industrial automation technology and will enable them to develop skills in designing, building, programming, debugging and maintaining industrial automated systems

#### **SMJE 4303      Introduction to Bioengineering**

The students will be taught the fundamentals of Bioengineering which has emerged at the intersection of the engineering and biological sciences. In this course, students will explore the application of engineering principles and analyses to the study of biological systems and seek to understand the potential benefits and constraints of engineered materials and devices focus in medical physiology and psychology and its applications. The course will cover principles of electrophysiology, cognitive science and neural information processing.

#### **SMJE 4313      Image Processing**

The students will be taught the fundamentals of digital image and computer vision to help them understand various concepts and algorithms in these topics. Students will gain hands-on experience in using software tools for processing digital images. Further, the students will learn application of image processing in computer vision e.g. object recognition, detection, segmentation etc.

**SMJE 4333      Biomedical Imaging System**

This course introduces students to the principles and design of medical imaging system. The students will also taught to diagnose and interpret some medical images.

**SMJE 4353      Robotics**

This course introduces students to the main aspect of the key technologies in the robotic systems, automated work cells and computer integrated manufacturing systems and system integration in robotic applications. This course is also giving emphasis on the robotic work cell installations and safety in industrial setup

**SMJE 4383      Advanced Programming**

This course extends the introductory learning of “Programming for Engineers” (SMJE1013) to the level of developing practical, medium- to large- scale software systems. Students learn several algorithms of diverse solutions, data structures other than simple array to ease problem solving, as well as the principle of object orientation for large systems. Also, systematic method of debugging, crucial for efficient development, is explained.

**SMJE 4393      Real Time Systems**

‘Real-time’ is a property featuring quick responses to sporadic external events. This course introduces students to the concept, features and application scheme of real time systems, also including the OSs.

**SMJE 4403      Mechatronic System Design**

This course consists of introduction to the synergistic integration of mechanical disciplines, controls, electronics and computers in the design of high-performance machines, devices or processes. This course overviews the principle of mechatronics design and practice to provide extensive coverage of mechanical components and assembly, sensors and actuators,

signal conditioning circuits, modelling and simulation, data acquisition hardware and software, and microprocessors.

#### **SMJE 4423      Embedded System Design**

The course will focus on system-design issues and include a large section on hardware/software co-design. Topics covered include embedded system design challenge and metrics; processor and IC technologies; software and hardware architectures for Embedded System Design (ESD); design flow and tools; the design of standard peripherals, microcontrollers, single-purpose and general-purpose processors; basic concepts of interfacing and communication protocols in ESD.

#### **SMJE 4513      Semiconductor Material Engineering**

This course introduces the basic physics of the semiconductor materials in order to understand the characteristics, operation, and limitations of semiconductor devices. From this course, the students are expected to understand the basics of crystal structures, quantum mechanics, quantum theory for solids, carrier transport phenomena in equilibrium and non-equilibrium states, fundamental of pn structure and pn diode. All of these basic components are vital for students to understand the operation of the present day and future electronic devices.

#### **SMJE 4523      Semiconductor Device Engineering**

This course introduces the physical principles underlying semiconductor device operation and the application of these principles to specific devices. From this course, the students are expected to understand the basics of the characteristics, operation, and limitations of semiconductor devices. By adapting this knowledge, students will be able to develop the required technical skills in solving problems that arise from scaling down of semiconductor devices and in designing new device structures.

**SMJE 4533      Solid State Electronics**

This course is a continuation of semiconductor material engineering and electronic device courses. In this course, students will be exposed to the basic theories of hetero-structures and their applications for electronic and opto-electronic devices including memories. Specifically, students are exposed to the major types of GaAs and GaN-alloyed semiconductors, their physical properties and structures which make them suitable for electronic and opto-electronic devices. Heterojunction bipolar transistors and modulation-doped field effect transistors will be used to describe the basic characteristics needed for electronic device operation. Then, to explain the required characteristics for opto-electronic devices, semiconductor lasers will be used as an example.

**SMJE 4543      Electronics Device Fabrication and Characterization**

This course is an introduction to fabrication processes and characterization of semiconductor devices. The course will focus on the basic physical phenomenon and underlying technologies that involved in each process, and the basic techniques for device characterization. Specifically, students are exposed to two major types of semiconductor growth technologies which are known as Chrosralski growth and epitaxy growth technologies. For device fabrication, students are exposed to mainly the top-down approaches which are lithography and dry etching technique applying plasma processing technologies. Electrical and optical characterization as well as physical characterization using microscopy technologies will be described.

**SMJE 4912      Final Year Project 1**

This course is a first stage of the Final Year Project by research at I-Kohza which involves in preliminary studies and planning on how to carry out the studies that are given to the students. The aim of this system is to inculcate good Japanese ethical values to identify problem and propose appropriate solutions. It is designed to expose the students in writing a research proposal. It will emphasize on the research philosophy and research methodology. At the end of the course, students should be able to write a research proposal in a

professional manner. The students should also be able to manage and plan their research according to the period given.

#### **SMJE 4924      Final Year Project 2**

This course is a second stage of the Final Year Project by research which involve in performing analytical/experimental/simulation works /studies at respective iKohza lab. The results of the project will be discussed with their respective supervisors, iKohza members as well as members of the departments. At the end of the course, students should be able to work independently and to produce a thesis and able to present their findings. The students should also be able to manage and plan their research according to the period given.

**TK99**








# **BACHELOR OF MECHANICAL PRECISION ENGINEERING**



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**DEPARTMENT OF MECHANICAL PRECISION ENGINEERING (MPE)**

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## BACHELOR OF MECHANICAL PRECISION ENGINEERING

<b>1. Awarding Institution</b>			Universiti Teknologi Malaysia	
<b>2. Teaching Institution</b>			Universiti Teknologi Malaysia	
<b>3. Programme Name</b>			Bachelor of Mechanical Precision Engineering	
<b>4. Final Award</b>			Bachelor of Mechanical Precision Engineering	
<b>5. Programme Code</b>			TK99	
<b>6. Professional or Statutory Body of Accreditation</b>			Board of Engineers Malaysia (BEM)	
<b>7. Language(s) of Instruction</b>			Bahasa Malaysia and English	
<b>8. Mode of Study (Conventional, distance learning, etc)</b>			Conventional	
<b>9. Mode of operation (Franchise, self-govern, etc)</b>			Self-governing	
<b>10. Study Scheme (Full Time/Part Time)</b>			Full Time	
<b>11. Study Duration</b>			Minimum : 4 years Maximum : 6 years	
Type of Semester	No. of Semesters		No. of weeks per semester	
	Full Time	Part Time	Full Time	Part Time
Normal	8	-	14	-
Short	1	-	10	-

12. Classification of Courses		
Classification	Credit Hours	Percentage (%)
Program Core	98	72%
Program Electives	12	9%

General / University Courses		
a. Management/Economics/Humanities/Ethics	12	
b. Language – English and Japanese	12	19%
c. Co-curriculum	2	
<b>Total</b>	<b>136</b>	<b>100</b>

*For sciences program, please fill up the following classification.*

No	Classification	Credit hours	Percentage (%)
A	<i>Engineering Courses</i>		
	(a) Lectures	65	
	(b) Laboratory	18	
	(c) Final Year Project	6	
	(d) Industrial training	6	
	Total credit hours for Part A	95	70%
B	<i>Related Courses</i>		
	(a) Applied Science/Math	15	
	(b) Management/Economics/Humanities/Ethics	12	
	(c) Co-Curriculum	2	
	(d) English language	6	
	(e) Japanese	6	
	Total credit hours for Part B	41	30%
	<b>Total Credit Hours for Parts A and B</b>	<b>136</b>	<b>100%</b>

<b>13. Total credit hours to graduate</b>	<b>136</b> credit hours
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## BACHELOR OF MECHANICAL PRECISION ENGINEERING CURRICULUM

The curriculum for the Bachelor of Mechanical Precision Engineering is given in the following tables. The courses are arranged according to the semester in which they are offered. Students are strongly encouraged to enrol in the courses according to the proposed arrangement. Students may not graduate on time should they fail or withdraw from the courses offered.

### Programme Codes and Abbreviations

Alphabet	Description
S	Type of award for the programme (Bachelor degree)
MJ	Faculty/ Centre offering the programme (MJIT)
P	Specialisation (Mechanical Precision)
Numeric	Description
1st	Year of programme
2nd	Field of course
3rd	Course sequence
4th	Course credits

**Year 1 Semester 1**

Code	Course	Credits	L	T	P/S	Lab
SMJP 1013	ENGINEERING DRAWING WITH CAD	3	2		3	
SMJP 1022	EXPERIMENTAL METHOD	2	1			3
SMJP 1033	STATICS	3	3	1		
SMJM 1013	ENGINEERING MATHEMATICS I	3	3	1		
UHAK 1012	GRADUATE SUCCESS ATTRIBUTES	2	2			
UICI 1012	ISLAMIC CIVILIZATION AND ASIA CIVILIZATION (TITAS) <i>(for local students)</i>	2	2			
UHAK 1022	MALAYSIAN STUDIES III <i>(for International students)</i>					
SLAJ 1152 / ULAJ 1122	JAPANESE FOR COMMUNICATION I	2	2			
	Total Credits	17	14	3	3	3

**Year 1 Semester 2**

Code	Course	Credits	L	T	P/S	Lab
SMJP 1043	PROGRAMMING FOR ENGINEERS	3	2		3	
SMJP 1053	DYNAMICS	3	3	1		
SMJP 1062	MATERIALS SCIENCE	2	2	1		
UHAS 1172	DINAMIKA MALAYSIA <i>(for local students)</i>	2	2			
ULAM 1012	MALAY LANGUAGE FOR COMMUNICATION II <i>(for International students)</i>					
SLAJ 2252	JAPANESE FOR COMMUNICATIONS 2	2	2			
SMJP 1203	SOLID MECHANICS	3	3	1		
SMJP 1201	WORKSHOP PRACTICE	1				3
UHAK 1032	INTRODUCTION TO ENTREPRENEURSHIP	2	2			
	Total Credits	18	16	3	3	3

Notes: - L- Lecture; T- Tutorial; P/S- Practical/Studio; Lab- Laboratory

**Year 2 Semester 3**

Code	Course	Credits	L	T	P/S	Lab
SMJP 2103	FLUID MECHANICS	3	3	1		
SMJP 2092	FUNDAMENTAL OF ELECTRICAL ENGINEERING	2	2	1		
UKQ* 1**2	CO-CURRICULUM/SERVICE LEARNING	2			6	
SMJM 1023	ENGINEERING MATHEMATICS II	3	3	1		
ULAB 1122	ACADEMIC ENGLISH SKILLS	2	2			
SMJP 2112	INTRODUCTION TO DESIGN	2	1		3	
SMJP 2133	APPLIED SOLID MECHANICS	3	3	1		
	<b>Total Credits</b>	<b>17</b>	<b>14</b>	<b>4</b>	<b>9</b>	<b>0</b>

**Year 2 Semester 4**

Code	Course	Credits	L	T	P/S	Lab
SMJP 2113	MANUFACTURING PROCESSES	3	3	1		
SMJP 2123	THERMODYNAMICS	3	3	1		
SMJP 2131	LABORATORY I	1				3
SMJP 2143	ELECTRONICS	3	3	1		
UMJG 2022 / UHAK 2142	NINGEN-RYOKU (PROFESSIONAL ETHICS, SAFETY & HEALTH)	2	2			
SMJM 2033	ENGINEERING MATHEMATICS III	3	3	1		
SMJP 2203	APPLIED FLUID MECHANICS	3	3	1		
	<b>Total Credits</b>	<b>18</b>	<b>17</b>	<b>5</b>	<b>0</b>	<b>3</b>

Notes: - L- Lecture; T- Tutorial; P/S- Practical/Studio; Lab- Laboratory



**Year 3 Semester 5**

Code	Course	Credits	L	T	P/S	Lab
SMJP 3163	ENGINEERING COMPONENT DESIGN	3	2		3	
SMJP 3171	LABORATORY II	1				3
SMJM 3053	NUMERICAL METHOD	3	3			
SMJP 3103	APPLIED THERMODYNAMICS AND HEAT TRANSFER	3	3			
UICL 2302	THE THOUGHT OF SCIENCE AND TECHNOLOGY	2	2			
SLAJ 2352	JAPANESE FOR COMMUNICATION III	2	2			
ULAB 2122	ADVANCED ACADEMIC ENGLISH SKILLS	2	2			
	<b>Total Credits</b>	<b>16</b>	<b>14</b>	<b>0</b>	<b>3</b>	<b>3</b>

**Year 3 Semester 6**

Code	Course	Credits	L	T	P/S	Lab
SMJP 3303	INTEGRATED DESIGN PROJECT	3	1		3	
SMJP 3213	MECHANICS OF MACHINES AND VIBRATION	3	3			
SMJP 3223	CONTROL ENGINEERING	3	3			
SMJM 2043	ENGINEERING STATISTICS	3	3			
ULAB 3162	ENGLISH FOR PROFESSIONAL PURPOSES	2	2			
SMJP 4633	CNC CAD / CAM	3	2		3	
	<b>Total Credits</b>	<b>17</b>	<b>14</b>	<b>0</b>	<b>6</b>	<b>0</b>

Notes: - L- Lecture; T- Tutorial; P/S- Practical/Studio; Lab- Laboratory

**Year 3 Short Semester**

Code	Course	Credits	L	T	P/S	Lab
SMJG 3206	INDUSTRIAL TRAINING	6			18	
	Total Credits	6			18	

**Year 4 Semester 7**

Code	Course	Credits	L	T	P/S	Lab
SMJP 4102	FINAL YEAR PROJECT I	2			6	
SMJP 4103	MONOZUKURI PROJECT	3	2		3	
SMJP 4113	MECHATRONICS	3	3			
SMJP 4213	MODELING AND SIMULATION	3	3			
SMJP 4**3	ELECTIVE I	3	3			
	Total Credits	14	11	0	9	0

**Year 4 Semester 8**

Code	Course	Credits	L	T	P/S	Lab
SMJP 4204	FINAL YEAR PROJECT II	4			12	
SMJP 4**3	ELECTIVE II	3	2		3	
SMJP 4**3	ELECTIVE II	3	2		3	
SMJP 4**3	ELECTIVE IV	3	3			
	Total Credits	13	7	0	18	0

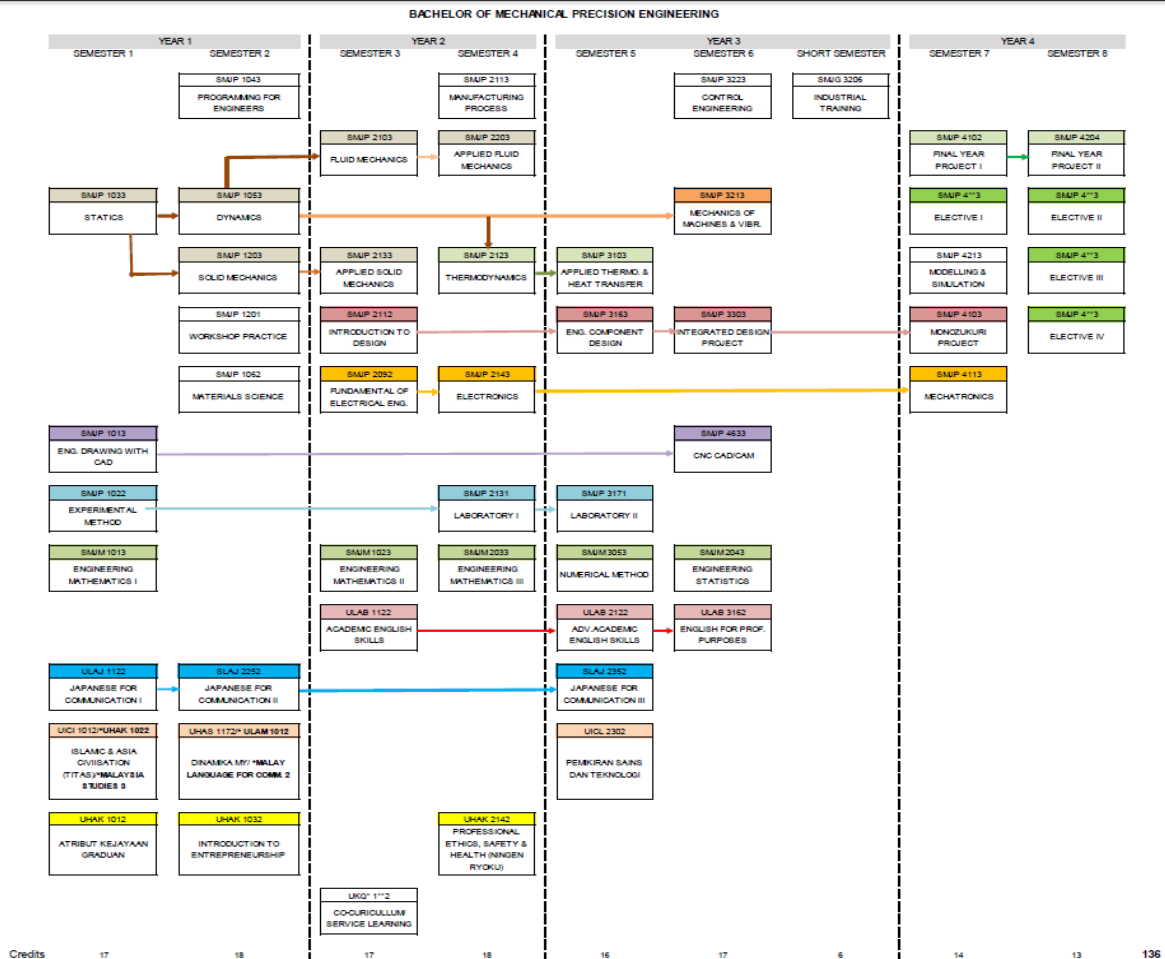
Notes: - L- Lecture; T- Tutorial; P/S- Practical/Studio; Lab- Laboratory

## ELECTIVE COURSES

(Choose FOUR (4) only)

Code	Course	Credit
SMJP 4243	SUB MICROMETRE AND NANOMETRE TECHNOLOGY	3
SMJP 4273	MICROMACHINING PROCESSES	3
SMJP 4293	WELDING ENGINEERING	3
SMJP 4303	NON DESTRUCTIVE TEST TECHNOLOGY	3
SMJP 4313	DESIGN OF EXPERIMENT	3
SMJP 4323	MECHANICS OF MACHINERY	3
SMJP 4353	ROBOTICS	3
SMJP 4363	MICRO ELECTROMECHANICAL SYSTEM	3
SMJP 4343	MICROPROCESSOR AND MICROCONTROLLER	3
SMJP 4333	SENSORS AND ACTUATORS SYSTEM	3
SMJP 4483	QUALITY OF ENGINEERING	3
SMJP 4393	NON-TRADITIONAL MACHINING	3
SMJP 4403	ENGINEERING ECONOMICS AND OPERABILITY	3
SMJP 4413	ADVANCED MACHINE MANUFACTURING	3
SMJE 4403	MECHATRONICS SYSTEM DESIGN	3
SMJE 4293	INDUSTRIAL AUTOMATION	3
SMJE 4263	COMPUTER INTEGRATED MANUFACTURING	3
SMJE 4233	INDUSTRIAL HYDRAULICS AND PNEUMATICS	3
SMJP 3063	TRIBOLOGY	3
SMJP 4423	METROLOGY AND INSPECTION	3
SMJP 3263	VIBRATION AND NOISE	3
SMJP 4043	AIR CONDITIONING MECHANICAL VENTILATION	3

# FLOW OF COURSES IN SMJM PROGRAMME



## SYNOPSIS OF CORE COURSES

### **SMJP 1013      Engineering Drawing with CAD**

The successful completion of this class will provide you the opportunity to develop significant depth of understanding and skill in using AutoCAD. This skill are the core CAD skills needed for employment in a CAD related business, such as in engineering design, manufacturing, architectural, construction, utilities, and others. In this topic, students will learn how to draw engineering drawing using AUTOCAD for geometrical drawing, orthographic projection, isometric projection etc. At the end, students required doing a project using the AutoCAD.

### **SMJP 1022      Experimental Method**

This course introduces experimental measurements and instrumentation techniques, equipment and measurement procedures used by mechanical engineers. Writing laboratory reports, performing data acquisition and applying statistics to experimental data are also introduced.

### **SMJP 1033      Statics**

This course introduces the students to the concepts and applications of the first, second and third laws of Newton. The equations of equilibrium for a particle and a rigid body subjected to a system of coplanar forces and three-dimensional force systems will also be discussed. In addition, students will learn how to determine forces in mechanical structures and frictional forces between contact surfaces.

### **SMJP 1043      Programming for Engineers**

This course introduces basic concepts of problem solving and programming principles appropriate for scientific and technical applications implemented using the C++ language.

### **SMJP 1053      Dynamics**

This course consists of four main topics. There are: (1) Kinematics of a particle: rectilinear and curvilinear motion, absolute dependent motion and relative motion of two particles. (2) Kinetics of a particle: force and acceleration, work and energy, and impulse and momentum. (3) Planar kinematics of a rigid body: translation, rotation, absolute motion and relative motion. (4) Planar kinetics of a rigid body: moment of inertia, force and acceleration, work and energy.

### **SMJP 1062      Materials Science**

Materials Science is an important subject that relates materials structure and their properties. This basic knowledge is necessary for every engineers who are involved in designing certain components and products so that the most suitable materials are utilized. This course consists of introduction to atomic structure, interatomic bonding, structure of crystalline solids, diffusion, crystal imperfections, mechanical properties of metal, dislocation, metal strengthening mechanism, phase transformation, carbon steel and nonferrous metals.

### **SMJP 1203      Solid Mechanics**

This course provides students with the fundamental knowledge of solid mechanics. At the end of the course, the students are expected to be able to determine the strength and stiffness of structures. The structures that will be studied in this course are bars, pins, bolts, shafts, and beams. The types of applied loadings are axial loads, torsional loads, and transverse loads. At the end of the course, students should also be able to determine the mechanical properties of the materials with respect to their strength and stiffness.

### **SMJP 1201      Workshop Practice**

This course presents the principles and hands-on for mechanical engineering programme. In particular, is design to provide hands-on experience using mechanical workshop machinery. Workshops involved are particularly of mechanical engineering such as lathe/milling

machine, welding machine, air condition and CNC Simulator. Students are given one project, should utilize those machines, and have to finish in a certain given period through-out the semester.

### **SMJP 2103      Fluid Mechanics**

The aim of this course is to provide students with an understanding of the properties of fluids and to introduce fundamental laws and description of fluid behaviour and flow. It will emphasize on the concept of pressure, hydrostatic pressure equation and its application in the measurement of pressure, static force due to immersed surfaces, floatation and buoyancy analysis. Dynamic flow analysis inclusive of technique in solving flow problems is introduced especially to solve flow measurement, mass or volumetric flow rate, momentum in flow and loss in pipe network. Lastly, some basic dimensional analysis and similarities will be introduced. At the end of the course, the student should be able to demonstrate an ability to analyse whether statically, dynamically or kinematically problems related directly to fluids.

### **SMJP 2092      Fundamental of Electrical Engineering**

This course covers the basic analysis method of DC circuit with resistors. Several technique of circuit analysis such as node voltage method, mesh current method and transformation theorem are given. Analysis of AC circuit including circuit elements of inductors and capacitors is also given by representing with complex numbers. Concepts of impedance, phase, effective power and apparent power are introduced. Besides that, operational amplifier and filter circuit will be discussed.

### **SMJP 2112      Introduction to Design**

This course is designed to expose student to the concepts and methods to develop an efficient design process and applying it to solve engineering design problems creatively and effectively.

**SMJP 2133      Applied Solid Mechanics**

The course is an extension to Solid Mechanics. It aims to extend the student's knowledge and understanding of the behaviour of materials and structures under a variety of loading conditions. The course covers the plane stress and plane strain transformations, following which several elastic failure criteria are investigated. The students are expected to be able to investigate thick cylinders, structural deformation behaviour using the energy method. This includes the instability problems of struts and elasto-plastic bending of beams. Determinate and indeterminate problems will also be examined. At the end of the course, students should be able to calculate and evaluate stress, strain and deformation of structures in normal loading, torsion and bending. They should also be able to evaluate failure modes and estimate fracture life of structures and components. The aspect of designing safe components and structures will also be emphasized to the students.

**SMJP 2113      Manufacturing Process**

This course consists of introduction to manufacturing processes, common aspect in manufacturing, metal casting, bulk metal forming, sheet metal forming, forming of polymer, machining operations, joining processes, and the latest and competitive environments in manufacturing.

**SMJP 2123      Thermodynamics**

This course consists of basic concept of thermodynamics, phase changes process of substance, types of energy, first law as well as second law of thermodynamics for close and open system.

**SMJP 2131      Laboratory I**

This course presents the principles and methodology for mechanical engineering programme laboratories. In particular, it is designed to understand the theory and application of measuring instruments and equipment, to discuss and evaluate experimental errors, to provide hands-on experience using laboratory instruments. Experiments involved are



particularly of mechanical engineering subjects such as mechanics of machine, strength of material and materials science. Students also learn formal technical writing skills which are required for all written reports.

### **SMJP 2143      Electronics**

This course introduces the fundamentals of electronic materials, device structures, circuits and applications suitable for students majoring in mechanical engineering such as semiconductor diodes, bipolar junction transistor, field-effect transistors, basic gates and integrated circuits. Generally this course is designed so that the students can have the basic knowledge about the electronic engineering - which is required in understanding the mechanical engineering.

### **SMJP 2203      Applied Fluid Mechanics**

This course is designed to enhance the basic knowledge that has been developed in the first stage of Fluid Mechanics and expose the students in analysing the flow field. It will emphasize on the analysis and the importance of boundary layer, ideal and compressible flow in a practical engineering applications. The course will also provide the analysis of flow through fluid machines such as pump and turbine. At the end of the course, students should be able to demonstrate and apply the theory to solve problem related to flow of fluids.

### **SMJP 3163      Engineering Component Design**

This course stresses on one aspect of design which is the design for strength. Other aspects of design are touched on the surface. The design for strength means determining the appropriate size and material of structures or components to be designed so that they are free from mechanical failures such as yielding, fracturing and buckling. Students will be exposed with static and dynamic failure theories. As a start, students are to design simple structures that they have encountered before: rod, beam, shaft and thin and thick cylinders. Following that, students will learn how to design mechanical components that include bolts, welding, bearings, gears and belts. The applications of these components in machinery will

also be exposed. Throughout the semester, students will be tested with open-ended design problems that may come in forms of tutorial, test and projects.

### **SMJP 3171      Laboratory II**

This course presents the principles and methodology for mechanical precision engineering programme. In particular, it designed to understand the theory and application of measuring instruments and equipment, to discuss and evaluate experimental errors, to provide hands-on experience using laboratory instruments. Experiments involved are particularly of mechanical precision engineering course such as Fluid Mechanics, Thermodynamics/Heat transfer and Control. Students also learn formal technical writing skills, which are required for all written reports.

### **SMJP 3103      Applied Thermodynamics and Heat Transfer**

This course aims to develop a fundamental understanding of the processes by which heat and energy are inter-related and converted and by which heat is transferred. The course will review major principles of energy conversion and the modes of heat transfer. The basic laws of thermodynamics and the governing equations for heat transfer and thermodynamics will be introduced and subsequently used to solve practical engineering problems involving thermodynamics and heat transfer. The course will also cover fundamental principles of power generation systems.

### **SMJP 3303      Integrated Design Project**

The Integrated Design Project includes students in the Mechanical Precision and Electronics Systems disciplines. This course requires application of the knowledge gained in earlier courses and familiarizes the students with the engineering design process such as definition, synthesis, analysis and implementation, to the design project. This course provides an exposure to teamwork so as to emulate a typical professional design environment, and improve communication and organizational skills. The project is stress on the important of

other influences on design such as economics, reliability, performance, safety, ethics and social impacts.

### **SMJP 3213      Mechanics of Machines and Vibration**

This course is continuation from dynamic subject. The chapter usually covered several analysis of gear systems, belt, balancing and crank effort diagram. Besides that, topic about governors also discussed. Basic of vibration chapter will include free vibration and force vibration analysis. Generally this course is intended to cover that field of engineering theory, analysis and practice that is described as mechanisms of machines and vibration analysis.

### **SMJP 3223      Control Engineering**

This course introduces students to the fundamental ideas and definitions of control systems such as block diagrams, plants or processes, open loop and close loop control systems, transfer functions and transient and steady state responses. Students will be taught how to obtain mathematical models of actual physical systems such as electrical, mechanical, electromechanical and simple fluid flow systems. Methods of system representation such as block diagram representation and signal flow graphs will be examined. The students will also be exposed to techniques of analysing control systems such as time domain analysis and stability. Additionally, an introduction to the design and analysis of control systems using MATLAB will also be given.

### **SMJP 4103      Monozukuri Project**

This is an advanced course on modeling, design, integration and best practices for use of machine elements such as bearings, springs, gears, cams and mechanisms. Modeling and analysis of these elements is based upon extensive application of physics, mathematics and core mechanical engineering principles (solid mechanics, fluid mechanics, manufacturing, estimation, computer simulation, etc.). These principles are reinforced via a substantial design project wherein students model, design, fabricate and characterize a mechanical system that is relevant to a real world application. Student assessment is based on the

student's ability to synthesize, model and fabricate a mechanical device subject to engineering constraints (e.g. cost and time/schedule).

#### **SMJP 4113      Mechatronics**

The purpose of this course is to provide a focused interdisciplinary experience for undergraduates that encompass the important elements from traditional courses as well as contemporary developments in mechatronics. These elements include measurement theory, electronic circuits, computer interfacing, sensors, actuators, and the design, analysis, and synthesis of mechatronic systems. This interdisciplinary approach is valuable to students because virtually every newly designed engineering product is a mechatronic system. This course objective to cover a review of basic electrical relations, circuit elements, and circuit analysis and semiconductor electronics. Additionally, the fundamentals of unit systems, statistics, error analysis, and mechanics of materials to support and supplement measurement systems topics are also explained.

#### **SMJP 4633      CNC CAD/CAM**

This course provide the fundamental knowledge and principles of Computer Aided Design and Computer Aided Manufacturing and generate the hands on skill and technical application of CNC CAD/CAM through given project.

#### **SMJP 4213      Modeling and Simulation**

In this course, various numerical analysis tools: scientific numerical computing, dynamic simulation, and finite element analysis software, are introduced. How to identify model geometry, boundary conditions, and material properties are discussed considering the physical interpretation of problems. The interpretation of simulation results is also discussed.

#### **SMJP 4102      Final Year Project I**

This course is a first stage of the Final Year Project by research at iKohza which involves in preliminary studies and planning on how to carry out the studies that are given to the

students. The aim of this system is to inculcate good Japanese ethical values to identify problem and propose appropriate solutions. It is designed to expose the students in writing a research proposal. It will emphasize on the research philosophy and research methodology. At the end of the course, students should be able to write a research proposal in a professional manner. The students should also be able to manage and plan their research according to the period given.

#### **SMJP 4204      Final Year Project II**

This course is a second stage of the Final Year Project by research which involve in performing analytical/experimental/simulation works /studies at respective iKohza lab. The results of the project will be discussed with their respective supervisors, iKohza members as well as members of the departments. At the end of the course, students should be able to work independently and to produce a thesis and able to present their findings. The students should also be able to manage and plan their research according to the period given.

#### **SMJP 4243      Sub Micrometre and Nanometre Technology**

This course surveys techniques to fabricate and analyse submicron and nanometre structures, with applications. Optical and electron microscopy is reviewed. Additional topics that are covered include: surface characterization, preparation, and measurement techniques, resist technology, optical projection, interferometric, X-ray, ion, and electron lithography; Aqueous, ion, and plasma etching techniques; lift-off and electroplating; and ion implantation. Applications in microelectronics, microphotonics, information storage, and nanotechnology will also be explored.

#### **SMJP 4273      Micromachining Processes**

The topics cover micromachining techniques view, capabilities and limitations of micromachining, material for micromachining, additives films and materials, bulk micromachining.

**SMJP 4293      Welding Engineering**

The purpose of this course is to give familiar with the concepts and terminology in welding engineering. Student will understand how welding design is built on a foundation oh heat flow stress, structural analysis and fitness for services. In this course the students will learn the basic theory of various materials joining processes including arc, resistance, solid state, and high energy density welding.

**SMJP 4303      Non Destructive Test Technology**

The purpose of this course is to give students a comprehensive introduction to their major courses. The importance to industry and its application in various fields is discussed and how NDT is used for product quality control. Steel manufacture and types of discontinuities are covered. Instruction shall be supported with power point presentation. The students will build up a general knowledge on how NDT testing methods can improve reliability and safety of mechanical systems.

**SMJP 4313      Design of Experiment**

This is a basic course in designing experiment and analysing the resulting data. The course deals mainly with the most common types of experiments that are conducted in industrial setting. The topics covered will include completely randomised design, randomised block design, Latin Squares, nested and repeated measures designs, multiple comparisons, factorial experiments, random and mixed models, confounding and fractional factorials. Course will include at least of tour of businesses where machine design being practiced.

**SMJP 4323      Mechanics of Machinery**

This course is continuation from mechanics machine and vibration subject. The chapter usually covered several analysis of motion analysis in Machinery, Introduction to Kinematic and Kinetics of Rigid Body, Kinematic and Kinetic Analysis of Mechanisms, mechanism, cams, links and slider crank.

**SMJP 4353      Robotics**

This course provides an overview of robot mechanisms, dynamics, and controls. Topics include planar and spatial kinematics, and motion planning; mechanism design for manipulators and mobile robots, multi-rigid-body dynamics; control design, actuators, and sensors.

**SMJP 4363      Micro Electromechanical System**

This course provides an overview of robot mechanisms, dynamics, and controls. Topics include planar and spatial kinematics, and motion planning; mechanism design for manipulators and mobile robots, multi-rigid-body dynamics; control design, actuators, and sensors.

**SMJP 4343      Microprocessor and Microcontroller**

This course is an introduction to a microprocessor. Students are exposed to the internal architecture of the microprocessor, various instruction sets, and basic hardware design of microprocessor-based. Then the students will taught about microcontroller and interface with various peripherals.

**SMJP 4333      Sensors and Actuator System**

This course introduces sensor, transducers and actuation system. The actuation system covered electrical, mechanical, pneumatic and hydraulic systems. Besides that, sensor and transducer also covered electrical and mechanical type of sensors. Generally this course is intended to cover that field of engineering theory, analysis and practice that is described as sensors and actuator systems.

**SMJP 4483      Quality of Engineering**

This is a basic course in designing experiment and analysing the resulting data. The course deals mainly with the most common types of quality conducted in industrial setting. The topics covered will include quality fundamentals, inspection and gauging, SQC, and total quality management (TQM). Course will include at least of tour of businesses where machine design being practiced.

**SMJP 4393      Non-Traditional Machining**

This course provides an introduction to special material processing methods including ultrasonic machining, electrical-discharge machining, laser-material processing, chemical machining, electrochemical machining, electron-beam machining, hydrodynamic machining, and surface treatment techniques, In addition to the principles, techniques for the corresponding process will be discussed.

**SMJP 4403      Engineering Economics and Operability**

This course is designed for investments analysis concepts applied to a wide variety of investment opportunities. The course covers Introduction to mathematical and practical concepts of time value money, application of time value money concepts to development of decision criteria used to evaluate investments in the resource and-non-resource industries, proper application of decision criteria to different investments situations, and inflation.

**SMJP 4413      Advanced Machine Manufacturing**

The course serves the modern methods of manufacturing. These modern methods are based upon the emerging technologies of computer-integrated manufacturing (CIM) and flexible manufacturing (FMS). Student will learn computer-aided design and manufacturing (CAD/CAM), numerically controlled machine tools (CNC), computer controlled material handling (AGV), automatic storage systems (AS/RS), robots, and sophisticated sensory systems.



**SMJE 4403      Mechatronics System Design**

This course consists of introduction to the synergistic integration of mechanical disciplines, controls, electronics and computers in the design of high-performance machines, devices or processes. This course overviews the principle of mechatronics design and practice to provide extensive coverage of mechanical components and assembly, sensors and actuators, signal conditioning circuits, modelling and simulation, data acquisition hardware and software, and microprocessors.

**SMJE 4293      Industrial Automation**

This course helps the students to develop their knowledge of industrial automation by exploring various automation technology such as SCADA, DCS, CAN and industrial buses and work with PLC's in an industrial plant, also system integration with PLCs and computers. The course is backed by extensive laboratory work using automation rigs and equipment. The course would give the students a broad understanding of modern industrial automation technology and will enable them to develop skills in designing, building, programming, debugging and maintaining industrial automated systems.

**SMJE 4263      Computer Integrated Manufacturing**

This course is designed to highlight the major automation-related subjects within the scope of manufacturing system. Special emphasis will be given to industrial robotics, computer-aided design and manufacturing (CAD/CAM), numerically controlled machine tools (CNC), computer controlled material handling (AGV), automatic storage systems (AS/RS) and sophisticated sensory systems such as computerized vision. The student must be able to install, implement, and operate such systems, together with other engineers and technicians involved in working within the flexible manufacturing environment.

**SMJE 4233      Industrial Hydraulics and Pneumatics**

A significant proportion of automated and manual systems in manufacturing plants around the world utilize pneumatic and hydraulic actuators for fast reliable operation. This course provides the student with (1) an understanding of the fluid power systems, including hydraulic and pneumatic components, (2) safe work practices for hydraulics and pneumatics and includes information on preventive measures for safety hazards in the manufacturing workplace, (3) an overview of basic and advanced pneumatic and hydraulic system components, (4) and guidelines on how to design, operate, and troubleshoot pneumatic and hydraulic systems.

**SMJP 3063      Tribology**

This course will provide attendees with basic knowledge of “tribology” which covers friction, wear and lubrication issues. The course will start with solid contact mechanism and proceed to how to control friction and wear utilising scientific and technical knowledge which should be obtained by Year 3. Through the course, the attendees will achieve a technical sense of interdisciplinary approach which is practical and necessary in industrial developments.

**SMJP 4423      Metrology and Inspection**

This course covers limits, fits and tolerances; linear and angular measurements; comparators; gauge design; interferometry; form and finish measurement; alignment and testing methods.

**SMJP 3263      Vibration and Noise**

This course is to familiarise the students with the sources of vibration and noise in machines and make design modifications to reduce the vibration and noise and improve the life of the components. Students will learn one degree of freedom, two and multi-degree of freedom, diagnostic and field measurement and noise control.

**SMJP 4043      Air Conditioning and Mechanical Ventilation**









This course is designed to expose students in Air conditioning and Mechanical Ventilation, skill using analyse well-defined engineering practical problems using conventional and modern tools in their discipline or area of ACRMV specialization. Assist in the formulation of systems, components or processes to meet specified needs of scientific skills. Apply appropriate techniques, resources, and engineering tools to well-defined engineering activities, with an awareness of their limitations. Demonstrate an awareness of and consideration for societal, health, safety, legal and cultural issues and their consequent responsibilities.

**TK79**

# **BACHELOR OF CHEMICAL PROCESS ENGINEERING**

**ACADEMIC STAFF**  
**DEPARTMENT OF CHEMICAL PROCESS ENGINEERING (CPE)**

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## BACHELOR OF CHEMICAL PROCESS ENGINEERING

<b>1. Awarding Institution</b>			Universiti Teknologi Malaysia	
<b>2. Teaching Institution</b>			Universiti Teknologi Malaysia	
<b>3. Programme Name</b>			Bachelor of Chemical Process Engineering	
<b>4. Final Award</b>			Bachelor of Chemical Process Engineering	
<b>5. Programme Code</b>			TK79	
<b>6. Professional or Statutory Body of Accreditation</b>			Board of Engineers Malaysia (BEM)	
<b>7. Language(s) of Instruction</b>			Bahasa Malaysia and English	
<b>8. Mode of Study (Conventional, distance learning, etc)</b>			Conventional	
<b>9. Mode of operation (Franchise, self-govern, etc)</b>			Self-governing	
<b>10. Study Scheme (Full Time/Part Time)</b>			Full Time	
<b>11. Study Duration</b>			Minimum : 4yrs Maximum : 6 yrs	
Type of Semester	No. of Semesters		No. of weeks per semester	
	Full Time	Part Time	Full Time	Part Time
Normal	8	-	14	-
Short	1	-	10	-

12. Classification of Courses			
No.	Classification	Credit Hours	Percentage (%)
A.	Programme Core	98	72%
B.	Programme Electives	12	9 %

C.	General / University Courses a. Management/Economics/Humanities/Ethics b. Language – English and Japanese c. Co-curriculum/Service Learning	26	19%
	<b>Total</b>	<b>136</b>	<b>100</b>

*For sciences programme, please fill up the following classification.*

No	Classification	Credit hours	Percentage (%)
A	Engineering Courses (a) Lectures (b) Laboratory (c) Final Year Project / Design project (d) Industrial training	74 5 13 6	
	<b>Total credit hours for Part A</b>	<b>98</b>	<b>72%</b>
B	Related Courses (a) Applied Science/Math (b) Management/Economics/Humanities/Ethics (c) Co-Curriculum/Service Learning (d) English (e) Japanese	12 12 2 6 6	
	<b>Total credit hours for Part B</b>	<b>38</b>	<b>28%</b>
	<b>Total Credit Hours for Parts A and B</b>	<b>136</b>	<b>100%</b>

<b>13. Total credit hours to graduate</b>	<b>136</b> credit hours
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## BACHELOR OF CHEMICAL PROCESS ENGINEERING CURRICULUM

### Programme Codes and Abbreviations

The curriculum for the Bachelor of Chemical Process Engineering is given in the following tables. The courses are arranged according to the semester in which they are offered. Students are strongly encouraged to enrol in the courses according to the proposed arrangement. Students may not graduate on time should they fail or withdraw from the courses offered.

Alphabet	Description
S	Type of award for the programme (Bachelor degree)
MJ	Faculty/ Centre offering the programme (MJIT)
C	Specialisation (Chemical Process)

Numeric	Description
1st	Year of programme
2nd	Field of course
3rd	Course sequence
4th	Course credits

**Year 1 Semester 1**

Code	Course	Credits	L	T	P/S	Lab
SMJC 1202	INTRODUCTION TO CHEMICAL PROCESS ENGINEERING	2	2			
SMJM 1013	ENGINEERING MATHEMATICS I	3	2	2		
SMJC 1101	ENGINEERING DRAWING WITH CAD	1				3
SMJP 1043	PROGRAMMING FOR ENGINEERS	3	2			3
ULAB 1122	ACADEMIC ENGLISH SKILLS	2	2			
UHAS 1172	DINAMIKA MALAYSIA <i>(for local students)</i>	2	2			
UHAK 1022	MALAYSIAN STUDIES 3 <i>(for International students)</i>					
UHAK1032	INTRODUCTION TO ENTREPRENEURSHIP	2	2			
Total Credits		15	12	2	0	6

**Year 1 Semester 2**

Code	Course	Credits	L	T	P/S	Lab
SMJC 1003	ORGANIC CHEMISTRY 1	3	2	2		
SMJC 1213	THERMODYNAMICS	3	2	2		
SMJM 1023	ENGINEERING MATHEMATICS II	3	2	2		
SLAJ 1152 / ULAJ 1122	JAPANESE FOR COMMUNICATION I	2	2			
ULAB 2122	ADVANCED ACADEMIC ENGLISH SKILLS	2	2			
UMJG 2022 / UHAK 2142	PROFESSIONAL ETHICS, SAFETY AND HEALTH (NINGEN-RYOKU)	2	2			
UHAK 1012	GRADUATE SUCCESS ATTRIBUTES	2	2			
Total Credits		17	14	6	0	0

Notes: - L- Lecture; T- Tutorial; P/S- Practical/Studio; Lab- Laboratory

**Year 2 Semester 3**

Code	Course	Credits	L	T	P/S	Lab
SMJC 2013	ORGANIC CHEMISTRY 2	3	2	2		
SMJC 2223	MASS AND ENERGY BALANCE	3	2	2		
SMJM 2033	ENGINEERING MATHEMATICS III	3	2	2		
SLAJ 2252	JAPANESE FOR COMMUNICATION II	2	2			
SMJC 2022	ANALYTICAL CHEMISTRY	2	2			
SMJC 2113	FLUID MECHANICS	3	2	2		
UICI 1012	ISLAMIC CIVILIZATION AND ASIA CIVILIZATION (TITAS) <i>(for local students)</i>	2	2			
ULAM 1012	MALAY LANGUAGE FOR COMMUNICATION II <i>(for International students)</i>					
Total Credits		18	14	8	0	0

**Year 2 Semester 4**

Code	Course	Credits	L	T	P/S	Lab
SMJC 2701	ORGANIC CHEMISTRY/ ANALYTICAL LAB	1				3
SMJC 2711	CHEMICAL PROCESS ENGINEERING LABORATORY 1	1				3
SMJC 2233	PHYSICAL CHEMISTRY FOR CHEMICAL ENGINEER	3	2	2		
SMJC 2243	CHEMICAL ENGINEERING THERMODYNAMICS	3	2	2		
SMJC 2253	TRANSPORT PHENOMENA	3	2	2		
SMJM 2043	ENGINEERING STATISTICS	3	2	2		
SLAJ 2352	JAPANESE FOR COMMUNICATION III	2	2			
UKQ * 1**2	CO-CURRICULUM/SERVICE LEARNING	2			6	
Total Credits		18	10	8	6	6

Notes: - L- Lecture; T- Tutorial; P/S- Practical/Studio; Lab- Laboratory

**Year 3****Semester 5**

Code	Course	Credits	L	T	P/S	Lab
SMJC 3263	SEPARATION PROCESSES 1	3	2	2		
SMJC 3303	CHEMICAL KINETICS AND REACTOR DESIGN	3	2	2		
SMJC 3313	PROCESS CONTROL AND INSTRUMENTATION	3	2	2		
SMJC 3721	CHEMICAL PROCESS ENGINEERING LABORATORY 2	1				3
SMJC 3273	NUMERICAL METHODS FOR CHEMICAL ENGINEER	3	2	2		
SMJC 3323	FUNDAMENTALS OF MICROBIOLOGY AND BIOTECHNOLOGY	3	2	2		
Total Credits		16	10	10	0	3

**Year 3 Semester 6**

Code	Course	Credits	L	T	P/S	Lab
SMJC 3283	SEPARATION PROCESSES 2	3	3			
SMJC 3333	INTRODUCTION TO ENVIRONMENTAL ENGINEERING	3	3			
SMJC 3731	CHEMICAL PROCESS ENGINEERING LABORATORY 3	1				3
SMJC 3741	CHEMICAL PROCESS ENGINEERING LABORATORY 4	1				3
SMJC 3293	MATERIAL SCIENCES	3	3			
UICL 2302	THE THOUGHT OF SCIENCE AND TECHNOLOGY	2	2			
SMJC 3123	PROCESS ECONOMICS & PROJECT MANAGEMENT	3	3			
ULAB 3162	ENGLISH FOR PROFESSIONAL PURPOSES	2	2			
Total Credits		18	16	0	0	6

**Year 3 Short Semester**

Code	Course	Credits	L	T	P/S	Lab
SMJG 3206	INDUSTRIAL TRAINING	6			18	

Notes: - L- Lecture; T- Tutorial; P/S- Practical/Studio; Lab- Laboratory

**Year 4 Semester 7**

Code	Course	Credits	L	T	P/S	Lab
SMJC 4813	FINAL YEAR PROJECT 1	3			9	
SMJC 4343	CHEMICAL PROCESS DESIGN	3	3			
SMJC 4353	PROCESS SAFETY AND HEALTH	3	3			
SMJC 4**3	ELECTIVE 1	3	3			
SMJC 4**3	ELECTIVE 2	3	3			
	Total Credits	15	12		9	

**Year 4 Semester 8**

Code	Course	Credits	L	T	P/S	Lab
SMJC 4823	FINAL YEAR PROJECT 2	3				9
SMJC 4824	CHEMICAL PLANT DESIGN PROJECT	4	2		6	
SMJC 4**3	ELECTIVE 3	3	3			
SMJC 4**3	ELECTIVE 4	3	3			
	Total Credits	13	8		6	9

Notes: - L- Lecture; T- Tutorial; P/S- Practical/Studio; Lab- Laboratory

**ELECTIVE COURSES****CHOOSE THREE (3) ONLY FROM ANY GROUP****GROUP 1****SUSTAINABLE RESOURCES**

CODE	COURSE	CREDIT
SMJC 4413	FINE CHEMICALS TECHNOLOGY	3
SMJC 4423	POLYMER SCIENCE AND ENGINEERING	3
SMJC 4433	BIOTECHNOLOGY AND BIO-PROCESSING	3
SMJC 4443	FUNDAMENTALS AND APPLICATION OF BIO-SENSORS	3

**GROUP 2****SUSTAINABLE ENVIRONMENT**

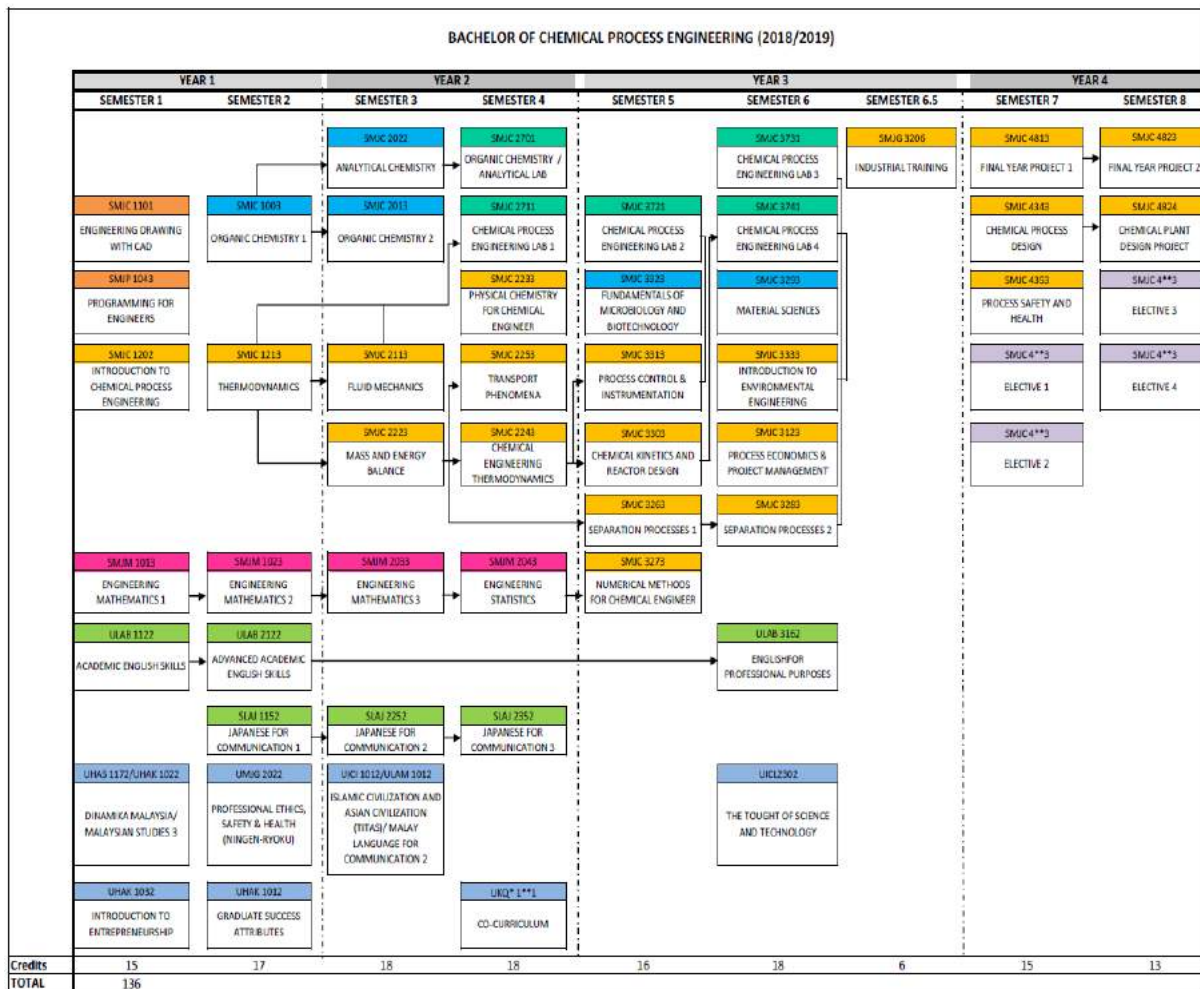
CODE	COURSE	CREDIT
SMJC 4513	AIR POLLUTION CONTROL ENGINEERING	3
SMJC 4523	WASTE WATER ENGINEERING	3
SMJC 4533	SOLID AND HAZARDOUS WASTE MANAGEMENT	3
SMJC 4543	ENVIRONMENTAL MICROBIOLOGY AND BIOTECHNOLOGY	3

**GROUP 3****SUSTAINABLE ENERGY**

CODE	COURSE	CREDIT
SMJC 4613	POWER PLANT ENGINEERING	3
SMJC 4623	ENERGY CONVERSION SCIENCE AND TECHNOLOGY	3
SMJC 4633	FUEL CELL FUNDAMENTALS	3
SMJE 4643	BIOMASS TECHNOLOGY	3



## FLOW OF COURSES IN SMJC PROGRAMME



## SYNOPSIS OF CORE COURSES

### **SMJC 1003      Organic Chemistry 1**

This course discusses the chemistry of alkanes and the fundamental concepts of functional groups in organic compounds. The functional groups include alkenes, alkynes, aromatic hydrocarbons, alcohols, phenols, organo-halogens, ethers, epoxides, aldehydes, ketones, carboxylic acids and their derivatives. In each topic, the students will be introduced to the structures of the functional groups and the nomenclatures (common names and IUPAC names). Physical properties, preparations, reactions and visual tests will also be discussed. Inter-conversion of the related functional groups and their reaction mechanisms are also included.

### **SMJP 1043      Programming for Engineers**

This course introduces basic concepts of computer programming using the C language. The course covers algorithm design, program development, C programming language syntax, data types, selection statements, iteration statements, functions, arrays, pointers and structures.

### **SMJC 1101      Engineering Drawing with CAD**

This course provides a fundamental background in engineering drawing to the students, which will enable them to work more effectively in the various fields of engineering. It emphasizes on the introduction to engineering drawing, fundamentals of engineering drawing, geometry, orthographic and isometric drawing. This course also introduces the sectional and flowchart drawing and computer aided engineering drawing to the students.

### **SMJC 1202      Introduction to Chemical Process Engineering**

Overview of engineering, the profession and its requirements in the Malaysian scenario. Communication (oral and written) and teamwork skills. Basic calculations and unit

conversions. Create an engineering graph and solving iterative problems using computer. It includes ethics, seminar and plant visits.

### **SMJC 1213      Thermodynamics**

This course provides the basic fundamental of thermodynamics for engineering application & problem solving. The topics covered include the first and second laws of thermodynamics, closed system and control volume analysis, entropy, reversible and irreversible processes, properties of pure substances. Application to engineering problems includes vapor power cycles, refrigeration and heat pump & air conditioning systems.

### **SMJC 2013      Organic Chemistry II**

This course introduces students to the classifications, synthesis and reactions of biomolecules such as carbohydrates, peptides, proteins and lipids. It also focuses on the three-dimensional structures and fundamental concepts of stereochemistry. Infrared spectroscopy is included as a technique in characterizing the functional groups of organic compounds.

### **SMJC 2022      Analytical Chemistry**

This course provides an introduction to quantitative chemical analysis, with emphasis on wet chemistry and instrumental methods. Topics in wet chemistry include introduction to analytical chemistry, sampling, sample preparation, data analysis, gravimetric analysis and volumetric analysis. The course also introduces the principles, instrumentation, and application of chromatographic and spectroscopic methods such as gas chromatography, HPLC, ultraviolet-visible spectroscopy, atomic absorption and atomic emission spectroscopy.

### **SMJC 2113      Fluid Mechanics**

This course covers the basic physical properties of fluid and classification of flow. It also provides the student with other topics such as fluid statics, fluid dynamic, the application of Bernoulli, continuity, and momentum equations. Topics such as frictional flow in pipes

include the usage of Moody chart, flow metering, pump, dimensional analysis, and similarity is also included.

#### **SMJC 2223      Mass and Energy Balance**

This course provides students with the basic principles of chemical engineering material and energy balances as well as calculation techniques to solve the material and energy balance problems for chemical process systems and equipment.

#### **SMJC 2233      Physical Chemistry for Chemical Engineer**

This course introduces the fundamental of physical principles that govern the properties and behaviour of chemical systems. Three important are introduced: thermodynamics, electrochemical systems and kinetics. In thermodynamics, students will learn the interrelationship of various equilibrium properties of the system and its changes in processes. In electrochemical systems, electric potential that lead to the determination thermodynamic properties in the electrochemical cells will be discussed. In kinetics, rate processes of chemical reactions, diffusion, adsorption and molecular collisions are included.

#### **SMJC 2243      Chemical Engineering Thermodynamics**

Through this course, students will learn chemical engineering thermodynamic theory and applications in the areas of volumetric properties of fluids, heat effects, thermodynamic properties of fluids, thermodynamics of solutions, and physical and chemical equilibria.

#### **SMJC 2253      Transport Phenomena**

The students will be introduced to the basic principles and application of heat and mass transfer engineering. The understanding from this course will lead to better understanding in distillation, absorption, liquid-liquid extraction, membrane separation, leaching, evaporation and other chemical processes.

**SMJC 2701      Organic Chemistry / Analytical Lab**

This course comprises several laboratory experiments related to organic chemistry. Emphasis is on the basic skills of recrystallization, extraction, separation, reflux and distillation. Upon completion, students should be able to assemble and use basic apparatus for experimental organic chemistry and present scientific data in a clear and logical way and produce a scientific report of their work. Microscale laboratory approach will be implemented to illustrate principles of green chemistry. This course introduces the basic concepts and skills in analytical chemistry practical. The experiments are focused on physicochemical properties of elements and compounds of Group IA, Group IIA, Aluminium, Nitrogen and Sulphur. This course also exposes students to basic skill of handling chemicals and preparing solutions.

**SMJC 2711      Chemical Process Engineering Laboratory 1**

The course covers four fluid mechanics-related experiments which are friction losses in pipe, jet impact, flow measurement and centrifugal pump. In addition, students will conduct experiments related to the basic fundamentals of thermodynamics such as Marcet boiler, vapor compression refrigerator, heat transfer experiment and two stage air compressors. In total, there will be eight experiments to be carried out.

**SMJC 3123      Process Economics & Project Management**

This course combined two subjects which are Process Economics & Project Management. Students are required to compute a specific economic measure of worth for estimated cash flows over a specific period of time in the engineering economy study. In the Project Management study, students will gain knowledge on planning, scheduling, and controlling of project activities to achieve performance, cost, and time objectives, for a given scope of works, while using resources efficiently and effectively.

**SMJC 3263      Separation Process 1**

This course introduces principle in separation process between liquid-liquid, gas-liquid, vapour-liquid and solid-liquid phase. Different types of unit operations involved in the industries such as humidification absorption, distillation, liquid- liquid extraction and solid-liquid extraction (leaching) is also included. Students will also require designing the separation operations using mass transfer principles.

**SMJC 3273      Numerical Methods for Chemical Process Engineering**

This course introduces the students to the techniques of solving problems using numerical methods that involve non-linear equations, systems of linear equation, interpolation and curve fitting, numerical differentiation and numerical integration, eigenvalue problems, ordinary differential equations and partial differential equations.

**SMJC 3283      Separation Process 2**

Students will be introduced with several types of unit operations and separation processes such as particle technology, crystallization, solid-liquid separation, filtration, membrane separation processes, drying and evaporation in this subject. Examples and exercises from related industry will be used in this subject.

**SMJC 3293      Material Science**

Students will learn relationships between structure and physicochemical properties of materials. This course provides a conceptual framework for understanding the structural and physical behaviour of materials. It also attempts to present a general picture of material nature and mechanisms that act upon, modify and control their properties.

**SMJC 3303      Chemical Kinetics & Reactor Design**

This course introduces students to chemical reactor design and theories in the area of chemical reaction engineering with emphasis on homogeneous and heterogeneous reactions. It will examine some problems related to multiple reactions and non-isothermal operations. Students will also work cooperatively on a computer assignment to expose them to solve problems using software packages such as Polymath.

**SMJC 3313      Process Control & Instrumentation**

In this course, students will gain knowledge on the fundamentals of dynamic process modelling, dynamic process behaviours and process control. Lumped parameter systems modelling, distributed parameter systems, feedback control system design, analysis and tuning are introduced. Model estimation techniques for FOPDT systems are also included. Other commonly found control structures, such as feedforward, ratio and cascade control, and plant-wide control systems design are taught qualitatively

**SMJC 3323      Fundamentals of Microbiology and Biotechnology**

This course provides up-to-date and concise information on basic and applied aspects of microbiology in a well-illustrated and simple language. The orientation of this lecture is presented in an understandable manner to the student. The lecture in overall is divided into three sections: Basic, Applied and Medical Microbiology. The Basic Microbiology section covers chapters on fundamental aspects of microbiology as historical milestones in microbiology, microbial taxonomy, structure, physiology, biochemistry, genetics, molecular biology, and physical and chemical control of microorganisms including principles of antimicrobial chemotherapy. The Applied Microbiology section lays emphasis on the diverse applications of microorganisms in industry, health, environment and agriculture and includes chapters on soil, air and water microbiology, food and environmental microbiology, industrial microbiology and biotechnology.

**SMJC 3333      Introduction to Environmental Engineering**

This is an introductory course on the aspect of environmental science and engineering on the causes, effects, measurement and controlling of pollution including air, water, noise solid and hazardous waste and land. The course covers the fundamental aspects of all these pollution with greater emphasizes on three major categories of industrial related pollution i.e. water, air and solid waste management.

**SMJC 3721      Chemical Process Engineering Laboratory 2**

This course covers the fundamentals of dynamic process modelling, dynamic process behaviours and process control. Although more concentration is given to lumped parameter systems modelling, distributed parameter systems is introduced. Feedback control system design, analysis and tuning are dealt with in detail. Also included are model estimation techniques for FOPDT systems. Other commonly found control structures, such as feedforward, ratio and cascade control, and plant-wide control systems design are taught qualitatively

**SMJC 3731      Chemical Process Engineering Laboratory 3**

This subject introduces students to the equipment in the separation processes discussed in Separation I and Separation II. There are five (5) experiments represent the Separation I and four (4) experiments correspond to the Separation II course. Students will be assessed by their performance in the report submitted and by a test that will be conducted at the end of the course after the students have all completed the experiments.

**SMJC 3741      Chemical Process Engineering Laboratory 4**

This laboratory course contains experiments that are covered basis concept in chemical reaction engineering and pollution control such as kinetic analysis of reaction, water and analysis. All experiments require students to apply fundamental laboratory techniques and skills as well as communication skill. Students, in group will demonstrate a mastery of



laboratory techniques and clearly describe the qualitative and quantitative aspects of the experiments performed.

#### **SMJC 4343      Chemical Process Design**

In this course, the students will be exposed to process creation/synthesis, process analysis, process evaluation and process optimisation in generating inherently safe, economic and environmentally friendly processes in this course. They will also use the process simulation tools in their individual and group projects.

#### **SMJC 4353      Process Safety & Health**

This course presents the principles of occupational safety and health involved in the chemical process industry.

#### **SMJC 4813      Final Year Project 1**

This course is a first stage of the Undergraduate Projects by research at i-Kohza which involves in preliminary studies and planning on how to carry out the studies that are given to the students. It is designed to expose the students in writing a research proposal. It will emphasize on the research philosophy and research methodology. At the end of the course, students should be able to write a research proposal in a professional practice. The students should also be able to manage and plan their research according to the period given.

#### **SMJC 4823      Final Year Project 2**

This course is a second stage of the Undergraduate Project by research which involve in performing experimental/simulation works /studies at respective i-Kohza's lab. Discuss the results of the project with their respective supervisors. It will emphasize on the research philosophy and research methodology. At the end of the course, students should be able to write a thesis/ research report in a professional practice. The students should also be able to manage and plan their research according to the period given.

### **SMJC 4824      Chemical Plant Design Project**

This course provides an opportunity to the final year students to apply and integrate fundamental knowledge that they have learned from all the courses offered from the first year of studies to the fourth year to conceptually design an inherently safe, economic and environmentally friendly chemical process plant. The students will explore various aspects in designing a process plant, which include project background, evaluate alternative design and operation options, selection of process route, market survey, site study, gathering data for raw materials and products (e.g. physical properties, cost), constructing process flow sheet, mass and energy balance, heat integration, equipment sizing and costing, waste treatment, safety, Hazard and Operability Analysis (HAZOP) and assessment of project profitability. Commercial process simulator also will be used extensively e.g. ASPEN PLUS, HYSYS, DESIGN II to perform detailed (rigorous) plant design calculations and produce process flow diagrams (PFD). The project is carried out by a team not more than 5 students. At the end of the course, students should be able to prepare a comprehensive report and subsequently present their works. By completing this project, students will develop important generic skills such as, team working, problem-solving, life-long learning, creative and critical thinking as well as written and oral communication skills.

### **SMJC 4413 Fine Chemicals Technology**

Through this course, students will be able to learn the fundamental of fine chemicals technologies, including applications to pharmaceutical drugs, coating materials, and electronic materials.

### **SMJC 4423 Polymer Science & Engineering**

This course provides the fundamentals of polymer science and engineering with emphasis on polymeric materials and their classifications, molecular weight, polymers in solution and solid state, thermal properties and the relationship as well as the implication on polymer synthesis.

### **SMJC4433 Biotechnology and Bioprocessing**

This course will provide knowledge on how biotechnology evolves from the ancient time. It also discusses on how this technology contributes towards the wealth creation, health improvement, environmental protection and issues related to social security globally. The active involvement of Malaysia in biotechnology for a new source of economic engine is also discussed and evaluated. The course will also expose the students to various industrial bioprocessing areas. It will guide the students in being independently acquire and explain information on some key issues in food engineering, biopharmaceutical engineering renewable resources and waste management bioprocessing science and technology.

### **SMJC 4443 Fundamentals and Application of Biosensors**

This course covers the principles, technologies, methods and applications of biosensors. Students will be exposed to fundamentals of measurement science that are applied in biosensors such as optical, electrochemical, mass, and pressure signal transduction. At the end of this course students will be able to link fundamentals of engineering principles and biosystems in biosensors and design and construct biosensors instrumentation.

### **SMJC 4513 Air Pollution Control Engineering**

This course introduces the techniques and procedures to design the air pollution control system for particulate, gaseous or vapour. There are two main objectives of the course. Firstly to present the characteristics of the air pollutants and its method of control. Secondly, to give a formal design training for students based on the actual industrial conditions. Health and safety issues considerations prior to the designing stage of air pollution control are also addressed in the course.

### **SJMC 4523 Wastewater Engineering**

This course aims to provide the students with an overview of the wastewater systems, treatment methods and processes. Students will be able to acquire knowledge on basic wastewater treatment and process design. Students should be skilled in the design of unit processes for conventional and advanced wastewater treatment systems such as coagulation, sedimentation, and chemical treatment. They would gain fundamental knowledge of wastewater treatment processes and operations.

### **SMJC 4533 Solid and Hazardous Waste Management**

This introductory course aims to provide an overview of solid and hazardous waste management, whereby the student will be able to have the basic understanding of waste management upon their completion of the course. The course deals with sources, generation and characteristics of industrial and municipal wastes, analysis of collection systems, handling and disposal practices of municipal wastes, significance of industrial wastes as environmental pollutants, pollution prevention and techniques for processing, treatment and disposal of industrial wastes.

### **SMJC 4543 Environmental Microbiology and Biotechnology**

This course to provide wide-ranging training in environmental microbiology, applicable both to students with previous knowledge of a relevant subject and to those with little background in environmental microbiology. We aim to provide students with theoretical knowledge, practical skills and an appreciation of the application of the subject. We also develop students' communication and generic skills. 'Environmental Microbiology is the study of microorganisms that inhabit the earth and their roles in carrying out processes in both natural and human-made systems'. In this subject there is much emphasis on interfaces

between environmental sciences and microbial ecology. An environmental microbiologist thus needs a good grounding in basic microbiology and molecular biology, but this must be combined with knowledge of environmental science.

### **SMJC 4613 Power Plant Engineering**

Electrical energy conversion to other energy is easy, and it is most convenient and safe form of energy for the short time required to transport as much as possible. At the same time to understand the mechanism of this electrical energy generation, to help students acquire education may be a view of future energy problems.

The current status and future trends are explained as well as the world's energy situation and transition of power resources. Illustrate points of current hydro, thermal, and nuclear power generation. In addition, also describe new technologies and systems such as solar power, wind power, and fuel cell power generation.

### **SMJC 4623 Energy Conversion Science and Technology**

This course consists of energy supply and consumption principles, different types of energy sources, and energy management & evaluation of various conversion paths in relation to renewable and sustainable energy technology.

### **SMJC 4633 Fuel Cell Fundamentals**

This course provides information about various aspects of the hydrogen-based fuel cell and an introduction to several other fuels and fuel cell technologies. This course is intended for engineers in all disciplines who want to learn more about this type of renewable energy. Among topics discussed are the history of the fuel cell, basics of its operation, comparison of

fuel cells with other power sources, and details of several aspects of fuel cells, the various applications and impact to the environment.

### **SMJC 4643 Biomass Technology**

This course dealing with biomass as alternative energy and resources. Topics cover: domestic wastes: chemical components, physical properties, morphology and dimensions: biomass as a source of energy and chemical products: utilization route: combustion: characteristics of biomass as fuel, combustion techniques, mass and energy balance: pyrolysis: techniques. Product distribution, utilization of products; gasification: techniques, product compositions, thermodynamics, product utilization; biogas synthesis: microbiological fundamentals, bioconversion techniques, gas compositions and utilization of biomass as fibre source, pulping process, pulp characteristics and applications; hydrolysis: conversion process, product utilization, and furfural production.

# MJIIIT GENERAL COURSES

## MATHEMATICS COURSES

### **SMJM 1013      Engineering Mathematics I**

This course provides basic knowledge in the concept of matrix, vectors, complex numbers, parametric equations, polar coordinates and power series. It introduces further transcendental function namely hyperbolic and inverses of hyperbolic and trigonometric functions. Differentiation and Integration of these functions are also discussed including the topic on the improper integral.

### **SMJM 1023      Engineering Mathematics II**

This course offers insights to the students into the understanding of the extension of two mathematical concepts which are indispensable to the engineering and technology fields, namely, differentiation and integration of multivariable real functions and vector-valued functions. The basic theory of partial derivatives and multiple integrals of real functions with their applications are discussed. The theory is extended to vector valued functions to describe motion in space, directional derivatives, gradient, divergence and curl, line integrals, surface integrals. Related theorems, namely Green's Theorem, Stokes' Theorem and Gauss or Divergence Theorem and their applications are discussed.

### **SMJM 2033      Engineering Mathematics III**

This is an introductory course on differential equations. Topics include first order ordinary differential equations (ODEs), linear second order ODEs with constant coefficients up to fourth order, the Laplace transform and its inverse, Fourier series, and partial differential equations (PDEs). Students will learn how to classify and solve first order ODEs, use the techniques of undetermined coefficients, variation of parameters and the Laplace transform to solve ODEs with specified initial and boundary conditions, and use the technique of separation of variables to solve linear second order PDEs and the method of d'Alembert to solve wave equation.



**SMJM2043      Engineering Statistics**

This course introduces and discusses the theories, concepts and practical aspects of probability and statistics. It begins with the discussion on the basic statistics, elementary probability theory, properties of probability distributions, sampling distribution, point and interval estimation of parameters and hypothesis testing. Simple linear regression and one-way analysis of variance are also taught in this course. Statistical tools and software for solving engineering statistics problems will also be incorporated in this course.

**SMJM3053      Numerical Methods**

This course discusses techniques of solving problems using numerical methods that involve non-linear equations, systems of linear equation, interpolation and curve fitting, numerical differentiation and numerical integration, eigenvalue problems, ordinary differential equations and partial differential equations. Mathematical tools and software is also incorporated in this course.

## **MJIIT NINGEN-RYOKU COURSES**

### **UMJG 2022/UHAK 2412 Ningen-Ryoku: Professional Ethics, Safety & Health**

This course provides some knowledge on fundamental principles of ethical theory and their application to the professions: Ethics theories and principles, professional morality, Responsibility, Codes of Ethics, Character and Virtue, Lying and Deception in Professional Contexts, privileged Information & Professional Oversight, Privacy and Confidentiality & Informed Consent and Public Access To Professional Expertise. Students will be taken to a few industrial trips to highlight on the importance of acquiring professional ethics for safety reasons.

## **PROGRAM COMMON COURSES**

### **SMJG 3206 Industrial Training**

The training provides the impetus for students to comprehend and appreciate real- life working experiences. Students may realize their ambition and ascertain their career path from the experience gained during training. The industrial attachment provides students the opportunity to meet and network with people in the industry.

### **SMJP4102/SMJE4912/SMJC4813 Final Year Project I**

Final Year Project is conducted within two semesters as Final Year Project I and Final Year Project II. Final Year Project I is a first stage of the Final Year Project by research at i-Kohza which involves in preliminary studies and planning on how to carry out the studies that are given to the students. The aim of this system is to inculcate good Japanese ethical values to identify problem and propose appropriate solutions. It is designed to expose the students in writing a research proposal. It will emphasize on the research philosophy and research methodology. At the end of the course, students should be able to write a research proposal

in a professional manner. The students should also be able to manage and plan their research according to the period given.

### **SMJP4204/SMJE4924/SMJC4823 Final Year Project II**

Final Year Project II is a second stage of the Final Year Project by research which involve in performing analytical/experimental/simulation works /studies at respective iKohza lab. The results of the project will be discussed with their respective supervisors, iKohza members as well as members of the departments. At the end of the course, students should be able to work independently and to produce a thesis and able to present their findings. The students should also be able to manage and plan their research according to the period given.

## JAPANESE LANGUAGE COURSES

Students are required to take all the Japanese Language Courses. It comprises of a total of 6 credit hours.

Japanese Language Courses		Total Credit Hours
(a)	Japanese for Communication I	2
(b)	Japanese for Communication II	2
(c)	Japanese for Communication III	2

### **SLAJ 1152 / ULAJ 1122 Japanese for Communication I**

This course is designed to introduce basic Japanese Language through integrated grammar and focus on the four language skills namely; speaking, writing, reading and listening. The students will intensively learn to pronounce through drilling activity in class. Basic greetings in daily life and sentence structures will be introduced in a progressive manner. Students will also have substantial practice in oral communication through in-class tasks and activities. These tasks and activities will enhance students' confidence to converse in Japanese Language adequately.

### **SLAJ 2252 Japanese for Communication II**

The course is a progression from Japanese for communication I. The course will introduce Kanji, additional grammar and sentence construction to expand students' basic language skills of reading, writing, speaking and listening. The syllabus ranges from the basic Japanese structures to cultured information. The course will employ more active and entertaining activities by students in groups, in the classroom. Learning module/textbook, exercise book and CDs will be used during class. CDs will be used to reinforce their listening and speaking ability in class and after class. Japanese Affairs (culture/ethics/geography etc.) will be

introduced and the student is required to adopt and practice good values and ethics from the lessons.

### **SLAJ 2352 Japanese for Communication III**

The course is a progression from Japanese for Communication II. The course will introduce Kanji, additional grammar and sentence construction to expand students' basic language skills of reading, writing, speaking and listening. The syllabus ranges from the basic Japanese structures to cultured information. The course will employ more active and entertaining activities by students in groups, in the classroom. Learning module/textbook, exercise book and CDs will be used during class. CDs will be used to reinforce their listening and speaking ability in class and after class. Japanese Affairs (culture/ethics/geography etc.) will be introduced and the student is required to adopt and practice good values and ethics.

# UNIVERSITY GENERAL COURSES

## GENERAL COURSES

Undergraduates are required to register for the university and MJIT general courses during their study. The courses are categorised as follows:

Cluster	University General Courses	Total Credit Hours
1	Comprehension of History, Value and Philosophy (UICI 1012 & UHAS 1172 – local student) (UHAK 1022 & ULAM 1012 – International student)	4
2	Soft Skills (UHAK 1012 & UMJG 2022/UHAK2142)	4
3	Knowledge Broaden (UICL 2302)	2
4	Co-curriculum and Service Learning (UKQ* 2**2)	2
5	Language Skills (ULAB1122, ULAB2122, ULAB3162) (SLAJ1152/ULAJ1122)	8
6	Entrepreneurship (UHAK1032)	2
<b>TOTAL</b>		<b>22</b>
Cluster	MJIT General Courses	Total Credit Hours
5	Language Skills - Japanese Language (SLAJ2252 & SLAJ2352)	4
<b>TOTAL</b>		<b>26</b>

## CLUSTER 1 : COMPREHENSION OF HISTORY, VALUE AND PHILOSOPHY (4 CREDIT)

### For local students

- **UICI 1012 Islamic and Asian Civilisation (TITAS)**

The course discusses the introductory to the science of civilisation, the interactions of various civilisations (Malay, Chinese and Indian; Islam in Malay civilisation and its role in Malaysian civilisation establishment), contemporary issues in the Islamic and Asian civilisation, Islam Hadhari and nation-building.

- **UHAS 1172 Dinamika Malaysia (for Local students only)**

This course is designed for first year foreign undergraduates. Students will be exposed to various aspects of the Malaysian culture such as the belief system, religious festivals, customs and etiquette of different racial groups in Malaysia. They will also be introduced to Malaysian traditional music, arts and crafts.

### For International students

- **UHAK 1022 Malaysian Studies 3**

This course discusses History and Politics, Malaysian Constitution, System and Structure of Administration System, Unity and Society, National Development and Religion and Faith in Malaysia. This course aims to produce graduates who understand Malaysia as a nation state towards cultivating the spirit of universality. Teaching and Learning will be conducted in the form of lectures, assignments, exams and learning experiences.

- **ULAM 1112 Malay Language for Communication 2**

The course focuses on writing for specific purposes, in particular, technical writing that students are expected to produce. Students will be introduced to elements of effective writing and techniques of gathering technical information about products, services or work-related information using letters, memorandums, and e-mails for writing reports to a target audience for a specific purpose. In addition, students will be exposed to proper language usage and acceptable writing standards.



## **CLUSTER 2 : SOFT SKILLS (4 CREDIT)**

- **UHAK 1012 Graduate Success Attributes**

This course aims to serve the need of the students to understand and apply the attribute of UTM graduate skills. The course guides students in developing basic communication skills, thinking skills, scholarship skills, teamwork skills, adaptability skills, global citizen skills and enterprise skills to prepare themselves to real world practices. In this course, students will be assessing through debate, case study, group portfolio and projects based learning that requires them to utilize the related skills.

- **UMJG 2022/UHAK 2142 Professional Ethics, Safety and Health (Ningen-Ryoku)**

This course provides knowledge on fundamental principles of professional ethics, safety and health, their application to the engineering profession and sustainable development at local and international level. It also covers the skills and knowledge in promoting and maintaining health and safety in the workplace. The importance of acquiring professional ethics, safety and health will be explored through project based activities, seminar, etc.

## **CLUSTER 3 : KNOWLEDGE BROADEN (2 CREDIT)**

- **UICL 2302 The Thought of Science and Technology**

This course is designed to develop scholarships, thinking skills and global citizens. All of skills are developed through learning activities and assignments. Scholarship skills are measured through tests and exams related to science from the perspective of philosophy, the developmental history, the role of science in life; according to various perspectives and science methodology; technology from a concept point of view and the difference between science and technology.

#### **CLUSTER 4 : CO-CURRICULUM AND SERVICE LEARNING, UKQ\* 2\*\*2 (2 CREDIT)**

The rules are applicable for students who are studying in the full-time programmes at the University:

- 1) The total number of credits for the Bachelors Degree program is two (2).
- 2) Course registration:
  - (i) Students are encouraged to register during the pre-registration period to ensure a place in the course of their choice.
- 3) Credit transfer (credit exemption)
  - (i) UTM graduates are not eligible for credit transfer for all co-curricular courses they have taken in previous programme.

#### **CLUSTER 5 : LANGUAGE SKILLS (8 CREDIT)**

Students must accumulate six (6) credits of English Language courses and additional two (2) credits of Foreign Language course during their study. Each course is taught for four hours per week and the focus is on developing basic skills in reading, writing, listening and speaking using science and technology materials.

##### **ENGLISH COMPULSORY COURSES**

##### **• ULAB 1122 Academic English Skills**

This course emphasizes the four language skills. It focuses on developing students' productive and receptive skills through student-centred activities in academic situations. This includes reading academic texts, listening for main ideas and details, taking notes, writing clearly and coherently, and participating in oral presentation and class discussions. Additionally, enrichment grammar activities are also incorporated to integrate the skills and knowledge. At the end of this course, students should be able to use the English language in daily and academic activities.

- **ULAB 2122      Advanced Academic English Skills**

This subject prepares students for advanced academic communication in English with emphasis on oral communication skills. Students will be assigned projects that require them to look for and extract relevant information from various sources. In the process of completing the projects assigned, students will put into practice various skills developed in the earlier subject as well as skills in collecting data through interviews and questionnaire survey, integrating and presenting information (in oral and written form), time management and group interaction. The various oral activities such as presenting a proposal of the project, giving a briefing on the progress of the report and presenting the completed report are designed to build students' oral communication skills and confidence in expressing themselves, i.e. skills that are much needed in their studies and career.

- **ULAB 3162      English for Professional Purposes**

This course aims to introduce and expose students to the basic principles of communication at the work place. Students will be given the opportunities to practice effective meeting and discussion skills in formal and informal communicative events and read and write appropriate workplace related documents. Students will also be exposed to situations where they learn to function as individuals and team members and interact verbally and nonverbally with appropriate language, style and gestures.

- **SLAJ 1152 / ULAJ 1122   Japanese for Communication I**

This course is designed to introduce basic Japanese Language through integrated grammar and focus on the four language skills namely; speaking, writing, reading and listening. The students will intensively learn to pronounce through drilling activity in class. Basic greetings in daily life and sentence structures will be introduced in a progressive manner. Students will also have substantial practice in oral communication through in-class tasks and activities. These tasks and activities will enhance students' confidence to converse in Japanese Language adequately.

## CLUSTER 6 : ENTREPRENEURSHIP (2 CREDIT)

- **UHAK 1032      Introduction to Entrepreneurship**

This course introduces the fundamental concepts and principles of entrepreneurship and the process of starting a business venture. A three-stage approach is used to achieve the course learning outcome: (a) understanding the individual characteristics of an entrepreneur, (b) analysing business opportunities and forming an entrepreneurial venture, and (c) developing a business model for the new venture idea.

# SEMESTER SYSTEMS & GUIDELINES

### **Academic Advisory System (*Senpai-Kohai*)**

The unique Senpai-Kohai relationship or mentor-mentee concept is emphasised from the moment the students step into MJIT until they graduate. Students will be divided into several groups and an academic staff will be appointed for each group. Senior lecturers will normally be assigned to the new students to ensure maximum advantages to the students. The objectives of this system are:

- (i) To guide and assist students in adapting themselves to the academic system of the University, especially at the initial stage.
- (ii) To advise students in solving academic related problems such as workload, selection of courses and to explain the aim and purpose of the courses.
- (iii) To identify and provide counselling to problematic students as well as to develop a balanced character and positive attitude among students
- (iv) To act as a link between students and MJIT

With various services and facilities provided, the Faculty expects students to be responsible in their study plan. The academic advisor should not be held responsible for the students' failure in completing their study on time. The students are advised to consult their academic advisor for the following matters:

- (i) To obtain information on the semester system and other matters related to their study, during the first week of each semester.
- (ii) To obtain endorsement for registration or withdrawal of courses.
- (iii) To seek advice in planning for their study, particularly in terms of course selection, total number of credits and Duration of Study.
- (iv) To obtain endorsement for application of graduation award.

## MJIIT Students Labelling / Group Identification

Each batch will be identified by their program and their enrolment year.

1	Year
S	Bachelor Degree
M J	Faculty
E	Program

Example : **2 S M J E**

<b>2</b>	<b>S</b>	<b>MJ</b>	<b>E</b>
2 <sup>nd</sup> Year	Bachelor	MJIIT	Electronic System

## Academic Year

The University Academic Year is divided into two regular semesters, namely Semester I and Semester II. Each semester consists of 14 weeks of lectures, as shown in **Table 1**. The University also offers a short semester between the Academic Year. The short semester is not included in the total number of semesters.

**Table 1: Academic Year\***

Without Short Semester		With Short Semester	
Orientation Week	1 week	Orientation Week	1 week
(Before the beginning of the academic year)		(Before the beginning of the academic year)	
SEMESTER I		SEMESTER I	
Lectures	7 weeks	Lectures	7 weeks
Mid Semester Break	1 week	Mid Semester Break	1 week
Lectures	7 weeks	Lectures	7 weeks
Study Break	1 week	Study Break	1 week
Final Examinations	3 weeks	Final Examinations	3 weeks
<b>Total</b>	<b>19 weeks</b>	<b>Total</b>	<b>19 weeks</b>
End of Semester Break	4 weeks	End of Semester Break	4 weeks



### Without Short Semester

SEMESTER II	
Lectures	7 weeks
Mid Semester Break	1 week
Lectures	7 weeks
Study Break	1 week
Final Examinations	3 weeks
<b>Total</b>	<b>19 weeks</b>
End of Academic Year Break	10 weeks
<b>TOTAL</b>	<b>52 weeks</b>
<i>* Subject to change</i>	

### With Short Semester

SEMESTER II	
Lectures	7 weeks
Mid Semester Break	1 week
Lectures	7 weeks
Study Break	1 week
Final Examinations	3 weeks
<b>Total</b>	<b>19 weeks</b>
End of Semester Break	1 week
SHORT SEMESTER	
Lectures & Examinations	8 weeks
End of Semester Break	1 week
<b>TOTAL</b>	<b>52 weeks</b>

### Registration of Programme

- (i) New students are required to register for the programme offered on the date determined by the University.
- (ii) New students who fail to register on time without any acceptable reason will have their admission automatically withdrawn.
- (iii) The registration for senior students is done automatically by the University based on the previous examination results.
- (iv) Senior students, who have discontinued their study because of deferment or being suspended, need to re-register for the programme.

## Registration of Courses

- (i) Students must register for all courses taken in each semester.
- (ii) The registration of the courses must be made before the end of the mandatory course registration date, which is two (2) days before the semester begins.
- (iii) Students must register with the correct course codes and section number.
- (iv) Students can only register for the courses approved by the MJIT.
- (v) Students are responsible to amend any error in the course registration slip within the stipulated period.
- (vi) Registration of Courses (*Hadir Sahaja* - HS)
  - (a) Students are allowed to register for not more than two (2) courses with HS status per semester with permission or direction by the Faculty.
  - (b) The credits for courses registered under HS status are not included in the calculation of GPA and CGPA. However, students who register for the HS courses must meet the attendance requirement and complete all assignment and coursework given by the lecturer.
  - (c) The registration of HS courses will appear in the examination results and in the students' transcript, provided that item (vi)(b) above is fulfilled.
- (vii) Withdrawal of Courses (*Tarik Diri* – TD)
  - (a) With the approval of the course lecturer and the verification of the academic advisor, students can apply to withdraw any registered course not later than Friday of week nine (9) of the respective semester.
  - (b) The course withdrawal is subjected to the minimum credit hours for the semester, unless approval is obtained from the Dean.
  - (c) A TD code will appear in the course registration record and transcripts for the withdrawn course.

## Credit Scheme

Each course has a credit value to signify the importance, learning time and the nature of the course. The credit value of courses may vary depending on the nature of courses as shown in the following table:

**Table 2 : Credit value**

Type of meeting	Total of meeting hours per semester	Credit Value
Lecture	14	1
Practical / Studio/ Site Project	28 or 42	1

### Credit Load per Semester

- (i) All full-time students, except those with Conditional Status (Kedudukan Syarat - KS) or those in the final two (2) semesters must register for no less than the Minimum Credit requirement that is 12 credits per semester, inclusive of HS and HW courses.
- (ii) Students who would like to register for more than eighteen (18) credits must obtain approval from the Dean. However, no student is allowed to take more than 22 credits per semester.
- (iii) A student with a KS status is allowed to register between nine (9) to thirteen (13) credits only for the following semester. Their pre-registration of courses will be cancelled and they must re-register within a specified time.

### ***Credit Earned***

- (i) Credit Earned is defined as credit of the Passed course including the Compulsory Attendance (HW) course but not the Audit (HS) course.
- (ii) For students who are given Credit Transfer, the Credit Earned is the sum of the total transferred credit and the Passed credit.

### ***Credit Counted***

Credit Counted is the credit taken in the current and in all semesters which are used to calculate the GPA and CGPA, respectively. The credit of the HS and HW courses are not included in the Credit Counted.

### ***Credit Exemption***

- (i) Students are awarded Credit Exemption if they possess:
  - (a) A qualification from any accredited institution equivalent to the University's certificate, diploma or degree; or
  - (b) Working experience that has been recognized by the Senate as equivalent to certain courses offered at certificate or diploma or university degree level.

- (ii) Application for Credit Exemption must be made together with the application for admission to the University or not later than week ten (10) during the first semester of study.

### ***Credit Transfer***

- (i) The Credit Transfer pertains to the cross-campus programme.
- (ii) Students can request for a transfer of credit provided that:
  - (a) The course is taken in another institute of higher learning (IPT) approved by the University during the programme of study at the University; and
  - (b) The request for transfer of credit is done during the semester in which the course is taken in that particular IPT.

### *Assessments and Grade*

A student's performance in any course is reflected by the grades obtained. The relationship between marks, grades and credit points is shown in **Table 3**.

**Table 3 : The Relationship Between Marks, Grades and Credit Points**

Marks	Grade	Value Point
90 – 100	A+	4.00
80 – 89	A	4.00
75 – 79	A-	3.67
70 – 74	B+	3.33
65 – 69	B	3.00
60 – 64	B-	2.67
55 – 59	C+	2.33
50 – 54	C	2.00
45 – 49	C-	1.67
40 – 44	D+	1.33
35 – 39	D	1.00
30 – 34	D-	0.67
00 - 29	E	0.00

The passing grade for any course is set by the Faculty upon the Senate's approval. Generally, D+ is the minimum passing grade.

### ***Final Examination***

The final examination must be conducted within a specific time frame, according to guidelines set by the University.

### ***Special Examination***

A special examination can be conducted for cases as follows:

- (a) A student who cannot sit for the final examination due to illness that has been verified by a Medical Officer of the University or any Government Hospital. The mark for the special examination under this case will replace the final examination mark only, while the mark for the coursework remains the same.
- (b) A final semester student with a Good Standing (*Kedudukan Baik* – KB) status but fails one (1) course taken during any of his/her last two semesters, exclusive of the Industrial Training semester.

### ***Academic Standing***

A student's performance is assessed using both GPA and CGPA

$$\text{GPA} = \frac{\text{Total Credit Point of particular semester}}{\text{Total Credit Counted of a particular semester}}$$

$$\text{CGPA} = \frac{\text{Total Credit Point value of all semesters}}{\text{Total Credit Counted of all semesters}}$$

A student's academic standing is determined at the end of every regular semester based on his/her CGPA is as shown in **Table 4** below:

**Table 4: Academic CGPA**

Standing	CGPA
Pass (KB)	$\text{CGPA} \geq 2.00$
Conditional(KS)	$1.70 \leq \text{CGPA} < 2.00$
Fail (KG) (Dismissal)	$\text{CGPA} < 1.70$

With approval from the Senate, a student who obtains a  $\text{GPA} < 1.00$ , but maintains a  $\text{CGPA} > 1.70$  can:

- (i) continue his/her study; or
- (ii) be suspended in the following semester; or
- (iii) be dismissed from the programme.



### Computation of GPA and CGPA

Example of GPA calculation for first year student:

#### Semester 1

Course	Credit Counted (k)	Marks (%)	Grade	Grade Points (m)	Total Grade Points (k×m)
SMJE 1013	3	78	A-	3.67	11.01
SMJE 1023	3	72	B+	3.33	9.99
SMJE 1032	2	80	A	4.00	8.00
SMJM 1013	3	75	A-	3.67	11.01
ULAB 1412	2	89	A	4.00	8.00
UKQS 1**1	1	71	B+	3.33	3.33
SMJG 1012	2	80	A	4.00	8.00
	<b>16</b>				<b>59.34</b>

Total Credit Counted (TCC) = 16

Total Grade Points (TGP) = 59.34

GPA =  $TGP \div TCC = \frac{59.34}{16} = 3.71$ ; for Semester 1, CGPA = GPA

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Example of CGPA calculation

**Semester 2**

Course	Credit Count (k)	Marks (%)	Grade	Grade Points (m)	Total Grade Points (k×m)
SMJE 1043	3	86	A	4.00	12.00
SMJE 1053	3	80	A	4.00	12.00
SMJE 1063	2	86	A	4.00	8.00
SMJM 1023	3	76	A-	3.67	11.01
ULAB 1**2	2	72	B+	3.33	6.66
UHAS 1152	2	86	A	4.00	8.00
UKQ* 1**1	1	90	A+	4.00	4.00
	<b>16</b>				<b>61.67</b>

$$\begin{aligned}
 \text{Total Credit Counted (TCC) for Semester 2} &= 16 \\
 \text{Total Grade Point (TGP) for Semester 2} &= 61.67 \\
 \text{GPA for Semester 2} &= \frac{61.67}{16} = 3.85 \\
 \text{CGPA for semester 2} &= \frac{59.34 + 61.67}{16 + 16} = 3.78
 \end{aligned}$$

## Award and Recognition

AWARD RECOGNITION	CGPA
First Class	3.67 – 4.00
Second Class Upper	3.00 – 3.66
Second Class Lower	2.00 – 2.99

### *The Royal Academic Prize*

The prize is contributed by the Office of the Keeper of the Royal Seal. The prize is awarded to one (1) Bumiputra and one (1) Non-Bumiputra graduates who have obtained a First Class Degree and are actively involved in co-curricular activities. The prize includes cash of RM2, 500, a certificate and a medal.

### *The Chancellor's Award*

This award is bestowed to the best two (2) graduates who have obtained a First Class Honours Degree. The award consists of cash, a certificate and a medal.

### *The Vice-Chancellor's Award*

This award is bestowed to the best graduate who has obtained a First Class Honours Degree from each faculty. The award consists of cash, a certificate and a medal.

### *The Alumni's Prize*

The prize is given to the best graduate from each faculty. The prize consists of cash and a certificate.

### ***The Academic Prize***

The prize is given to the best graduate for each programme in each faculty. The prize is contributed by Statutory and Professional Bodies and Private Companies. The prize consists of cash, a medal and a book or Certificate of Appreciation.

### ***The Dean's List***

A student who obtains a GPA of 3.50 and above will be awarded a Dean's List Certificate, provided that he/she has registered for at least 12 credit hours for that semester excluding courses with HS and HW status. The remark "Dean's List" will be printed on the student's transcript.

### ***The Head Department's List***

A student who obtains a GPA of 3.00-3.49 will be awarded a Head Department's List Certificate, provided that he/she has registered for at least 12 credit hours for that semester excluding courses with HS and HW status.

### ***Marzuki Khalid Award***

This award is bestowed annually to the best MJIT graduates having high achievement in academic and co-curricular activities who obtained First Class Honours Degree. The award includes RM 1000.00 and a certificate.

# STUDENT AFFAIRS

## 1) VISA APPLICATION AND IMMIGRATION

The Immigration Department of Malaysia requires all International Students who have been offered to study at any local Institution of Higher Learning, to apply and obtain a valid student pass (visa) throughout their studies.

Application for student pass or enquiry on immigration related matters are managed by UTM International Office. Please be informed that the application only applies to **registered students** of UTM. Please refer to the related information.

### How to Apply

#### NEW APPLICANT

Please prepare the following documents:

##### i) **Single Students:**

- 2 coloured passport size photos
- A copy of Offer Letter
- A copy of Passport
- A copy of Medical Report (certified by UTM Health Centre)

##### ii) **Students with Dependent(s) - Spouse / Children:**

- 2 coloured passport size photos of each individual
- Passport copy of the applicant (student)
- Passport copy of each individual
- A copy of Marriage Certificate (In English)
- A copy of Birth Certificate

## **EXTENSION**

Please prepare the following documents:

**i) Single Students:**

- 2 coloured passport size photos
- A copy of Registration Slip
- A copy of Passport
- A copy of Medical Report (certified by UTM Health Centre)

**ii) Students with Dependent(s) - Spouse / Children:**

- 2 coloured passport size photos of each individual
- 2 passport copies of the applicant (student)
- A Passport copy of each individual

**\*\*Note:**

- 1) Please ensure that a copy of each document is printed/photocopied on an A4 size paper.**
- 2) Only passport sized photos with coloured background are accepted**
- 3) Any inquiries should be referred to Student Affairs Office (HEMA) UTM Kuala Lumpur**

## Payment

### Visa Fee

Upon submission of passport, you are required to pay the following:

- I. **Student pass**
  - a. New Applicant: **RM300.00** (excluding dependant).
  - b. Extension: **RM120.00** (a year or part of it)
- II. Current Visa/re-entry visa rate (*Amount depends on the country of origin, not exceeding RM100.00*)
- III. Processing fee of **RM650.00** for Journey Performed Visa, JP Visa (*Applicable to dependant(s) who enter Malaysia **without** single entry visa depending on your country of origin*).

### Submission & Collection of Document/Passport

- All students are required to submit application for student visa to UTM International **after registration**.
- Please ensure that submission of application is made **two (2) months** before the expiry of single entry visa/social visit pass issued upon entry in Malaysia.
- The process is expected to complete within one (1) month from the date of submission.
- All students are expected to be responsible for their own passport. The UTM International shall not be in any way responsible for any problem(s) which may result in penalty imposed by the Immigration Office due to late submission or any cause whether intentionally or unintentionally caused by the students.
- Students will be contacted by International Office once the student visa has been issued and the passport is ready for collection.



## 2) MJIT LIBRARY

### Operation Hours

Mon-Fri 8.00am - 5.00pm

**Closed on Public Holidays**

Located at MJIT Ground Floor

You are able to borrow material from MJIT Library using your student card.

## 3) UTM SULTANAH ZANARIAH LIBRARY

### Operation Hours

Mon-Fri 8.00am - 6.00pm

Sat-Sun 8.00am - 5.00pm

**Closed on Public Holidays**

## SERVICES

### ***Catalogue***

An index to all items, electronic and print, held/subscribed to by the Malaysia University Library.

### ***Borrowing***

You can borrow from other university libraries.

Keep track of your due dates and renew your loans through My Record.

- Printing and Photocopying
- Online Training

- Request Library Class - opening gateways to information
- Computer Facilities
- Interactive Guides for library catalogue use
- Navigating the Library website online video for off campus students (Flash Player required)
- Databases - provide access to journal literature either by providing the full text of articles or to article references and abstracts.
- Topic Guides - starting points for finding resources in specific subject areas.
- Study & Discussion Rooms Bookings - small rooms are provided at library for group work or individual study.
- Off Campus Library Service - all listed databases are only accessible within campus only.  
For off campus access please refer to UTM VPN Service.
- Assistance Service Desk in each library, Ask the Library, telephone 03-26154973 or email at [refer@mel.psz.utm.my](mailto:refer@mel.psz.utm.my)

#### **4) MARZUKI KHALID INDUSTRIAL MUSEUM**

Marzuki Khalid Industrial Museum has a collection of industrial goods and products as well as the process of technology development of major industries, especially in Japan. Through the museum, MJIT students will have access to the information of science and technology on the high-tech industry and familiarized with Japanese Industry with its products and R&D activities. It also exhibits the showcases of its own research and R&D activities at MJIT for the visitors to MJIT.

## 5) STUDENT ACCOMODATION

UTM Kuala Lumpur provides residential colleges that can accommodate up to 3000 students in one academic session. These colleges are located at areas namely Kediaman Siswa Jaya. Other accommodation that provided by UTM KL beside the colleges is the rental apartment that located near the campus formerly known as Keramat Hujung Apartment and Jalan Gurney Apartment.

- **KOLEJ SISWA JAYA**

Kolej Siswa Jaya, the student residential accommodation, located at Jalan Rejang, Setapak, approximately 4km from UTM Kuala Lumpur. Unless subject to availability, students may choose to occupy a single or shared room, with an attached inter-connected bathroom. The rate is as specified:

Type of Room	Capacity	Rate*		Remark(s)
		Before Registration	Registered Students	
Single	1 person	RM15.00	10.00	Subject to availability. -No hot shower
Shared	2 persons	RM15.00	10.00	

*\*Note: Rates are subject to change.*

### Procedure

Hostel application can be done by accessing the website <https://hostel.utm.my>

- **THE REGENCY SCHOLAR'S INN UTM KL**

Rooms and suites are available for students with family members. For reservation, please contact 03-2180 6000, or email to [theregencyscholarsinn@gmail.com](mailto:theregencyscholarsinn@gmail.com).

- **RESIDENSI UTM KL**

Apartment are available for students with family members. For reservation, please contact 03-2697 3603, or email to [admin.residensiutmkl@utm.my](mailto:admin.residensiutmkl@utm.my).

#### **4) UTM HEALTH CENTER**

In UTM Kuala Lumpur, we provide health facilities for the staffs and student by having facilities of health center not only in the campus but also in the residential area (Kediaman Siswa Jaya).

Located near the student area, we provide services during office hour and also in emergency time. The officers and staff of medical centre are around the campus 24 hours to make sure that the services can be deliver efficiently and effectively.

Please be free to call for emergency and appointment with the Doctors as below

**Offices:** 03-26154457

**Service:** 03-26154905

**Fax:** 03-26154306

## 5) TRANSPORTATION SERVICES

In UTM Kuala Lumpur, we provide bus services for the student to move along around the campus. The buses are available every day except on semester breaks. The services started as early as 7.00 am in the morning until 12.00 midnight depends on the needs of the students and its' travels from KSJ to UTM Kuala Lumpur every 15 minutes.

There are two kinds of buses that available in UTM Kuala Lumpur that is from varies of buses companies and UTM respectively. The bus services also not only thru-forth the campus but also including the student activities. If the students want to books the buses they may fill the form that is provided in Student Affairs Office (HEMA) and ask for approval.

## 6) STUDENT'S WELFARE

Universiti Teknologi Malaysia has use the Student Group Family Takaful Insurance Scheme for students beginning from the 1996/97 session. The scheme, which is managed by the Syarikat Takaful Malaysia Bhd, replaces the Group Self Accident Takaful Insurance Scheme which was used previously.

Through this scheme, every student invests RM10.00 per semester. It is renewed when the insured period expires every semester until the student graduates. This insurance is for students registered for the full-time undergraduate and postgraduate studies. The purposes of the insurance scheme are:-

- i. To ensure that the welfare of the students are taken care of
- ii. To facilitate professional dealings between the university and organisations (with regard to students' practical/industrial training)
- iii. To facilitate students' programmes/activities.

## 7) EMERGENCY CALLS

### Emergencies

Police/Ambulance	999
Civil Defence	999
Fire & Rescue	999
To Call from any Handphones	999 / 112
Electrical Breakdown	15454

# STUDENT DRESS CODE

UTM students should follow dress code regulations. Students' failure to comply with any of these regulations will be given a warning or fined not more than rm50.00 (for first offence). Students will be referred disciplinary authority for repeated offence.

1. Students are expected **TO BE CLEAN, WELL GROOMED and DRESSED** in a manner appropriate to the Malaysian custom or norms.
2. Students must **MAINTAIN A PROFESSIONAL APPEARANCE** by wearing **collared** shirts/t-shirts, shoes, slacks or long skirts while attending classes and/or on official visits to Faculties/Administration building.
3. Avoid **WEARING INAPPROPRIATE CLOTHING or FOOTWEAR** including:-
  - a. Shorts skirts or boxer shorts
  - b. Round-neck T-shirt.
  - c. Sleeveless shirts.
  - d. Tight slacks/pants.
  - e. Slippers/sandals.
4. During any formal/official university event, male students are **REQUIRED TO BE DRESSED** by wearing long sleeved shirts, necktie, slacks (not jeans) and leather shoes or **COMPLETE NATIONAL OUTFIT**. Female students are **REQUIRED TO WEAR 'BAJU KURUNG'** or any **APPROPRIATE SUIT** such as long skirts or loose slacks.
5. Female students are not allowed to **WEAR VEILS** in campus.
6. Headgears such as **BANDANA or CAPS** must be removed while on formal/official visits or business in campus, except during sport activities.



7. For male students, **HAIR MUST BE NEATLY, TRIMMED and REASONABLE IN LENGTH, COLOURING and FREESTYLE HAIRDO** are strictly prohibited.
8. **MALE STUDENTS** are strictly prohibited **TO PUT ON ANY FEMALE COSTUMES and/or ACCESSORIES** and **VICEVERSA**.
9. Male students are strictly prohibited **TO WEAR BANGLES, BRACELETS, EARRINGS and NECKLACES**; and female students are prohibited to have their **EARS PIERCED MORE THAN ONCE PER EAR**, as it is against the norms of Malaysian society.
10. **TATTOOS** are prohibited on any parts of the body.
11. Students **MUST PUT ON** their **MATRIC CARD** at all times while in campus/premises. The **Matric Card MUST BE WORN** and **DISPLAYED** at chest level.



### Student Dress Code

# GENERAL STUDENT'S ACTIVITIES

MJIT has planned activities for the students to participate while they are pursuing the degree programme. These activities are important in adding their values of knowledge and skills so that the students become more competitive in the real world after they graduated in their chosen career. Such activities will able to help them to better navigate themselves to the university's lifestyle. All the activities are listed in the following table.

Student	Co-curricular	Professional activities
<ul style="list-style-type: none"> <li>• First Year Experience</li> <li>• Regular meeting with academician/MJIT staff (on beginning and end of semester)</li> <li>• Student body</li> <li>• Exchanged student program Malaysia- Japan</li> <li>• EIMARace</li> <li>• Social responsibility (USR)</li> <li>• MJIT entrepreneurship</li> <li>• Industrial visit</li> <li>• Sport Day</li> <li>• Open Day</li> <li>• JENESYS Program</li> <li>• Roboccon</li> <li>• Global Mobility Programme (GMP)</li> </ul>	<ul style="list-style-type: none"> <li>• Skill Workshop</li> <li>• Global Outreach programme (GOP)</li> <li>• Club to critical subjects <ul style="list-style-type: none"> <li>- Language</li> <li>- Specialty</li> <li>- Skills</li> </ul> </li> <li>• Special to Third year (service learning)</li> <li>• Varsity Boat race</li> </ul> <p>** will be initiated by student</p>	<ul style="list-style-type: none"> <li>• Become student member <ul style="list-style-type: none"> <li>- Institution of Engineers Malaysia</li> <li>- Malaysian Society for Engineering and Technology</li> </ul> </li> <li>• Autodesk training</li> <li>• CSWIP (non-destructive test)</li> <li>• CIDB (Green Card)</li> </ul>

# GENERAL INFORMATION ABOUT MALAYSIA

## GENERAL INFORMATION FOR MALAYSIA

**Kuala Lumpur** is the capital and the largest city in Malaysia in terms of population. The city proper, making up an area of 243 km<sup>2</sup> (94 sq mi), has a population of 1.4 million as of 2010. Greater Kuala Lumpur, also known as the Klang Valley, is an urban agglomeration of 7.2 million. It is the fastest growing metropolitan region in the country, in terms of population and economy.

### Arriving at Kuala Lumpur International Airport (KLIA)

The most convenient way to get to your destination from KLIA is to take an Airport Taxi. You need to buy a coupon at the taxi counter situated after the Customs or just outside the arrival lounge. It will cost you about RM100 (about USD35) for a single trip budget taxi to the hotel or KL areas. The drive to the hotel from the airport would take about an hour. For booking please call at (+603) 8948 6590 or fax to (+6089381149) or refer to the website at <http://www.klia-taxi.com/index.html>.

Another convenient way is to try the ride on the Express Rail Link or ERL from KLIA to KL Sentral. The journey takes 28 minutes and cost RM35 (USD12). KL Sentral is the central train station of Kuala Lumpur. From KL Sentral, you can take a taxi to your hotel which cost you around RM15. ERL runs every 15 minutes during peak hours.

### CURRENCY

The unit of currency is the Malaysian Ringgit indicated as RM which is equivalent to 100 sen. The current exchange rate is USD1=RM4.25, or Yen 100=RM3.56

## **VOLTAGE**

The electricity supply in Malaysia is 220-240 volts a.c. at 50 Hz which follows the U.K. configuration.

## **WEATHER**

Malaysia has only two distinct weather patterns, hot and wet. The weather is generally hot and humid with mid-day temperatures at 34°C and night temperature at 24°C. More rain is expected during this time of the year due to the North East Monsoon season and the weather will be a bit cooler.

## **VISA**

Citizens of many countries enjoy visa-free stays of 90 days in Malaysia. For those who are not sure of whether they require a visa into Malaysia can check from the Immigration Department website at <http://www.imi.gov.my>

## **SHOPPING HOURS**

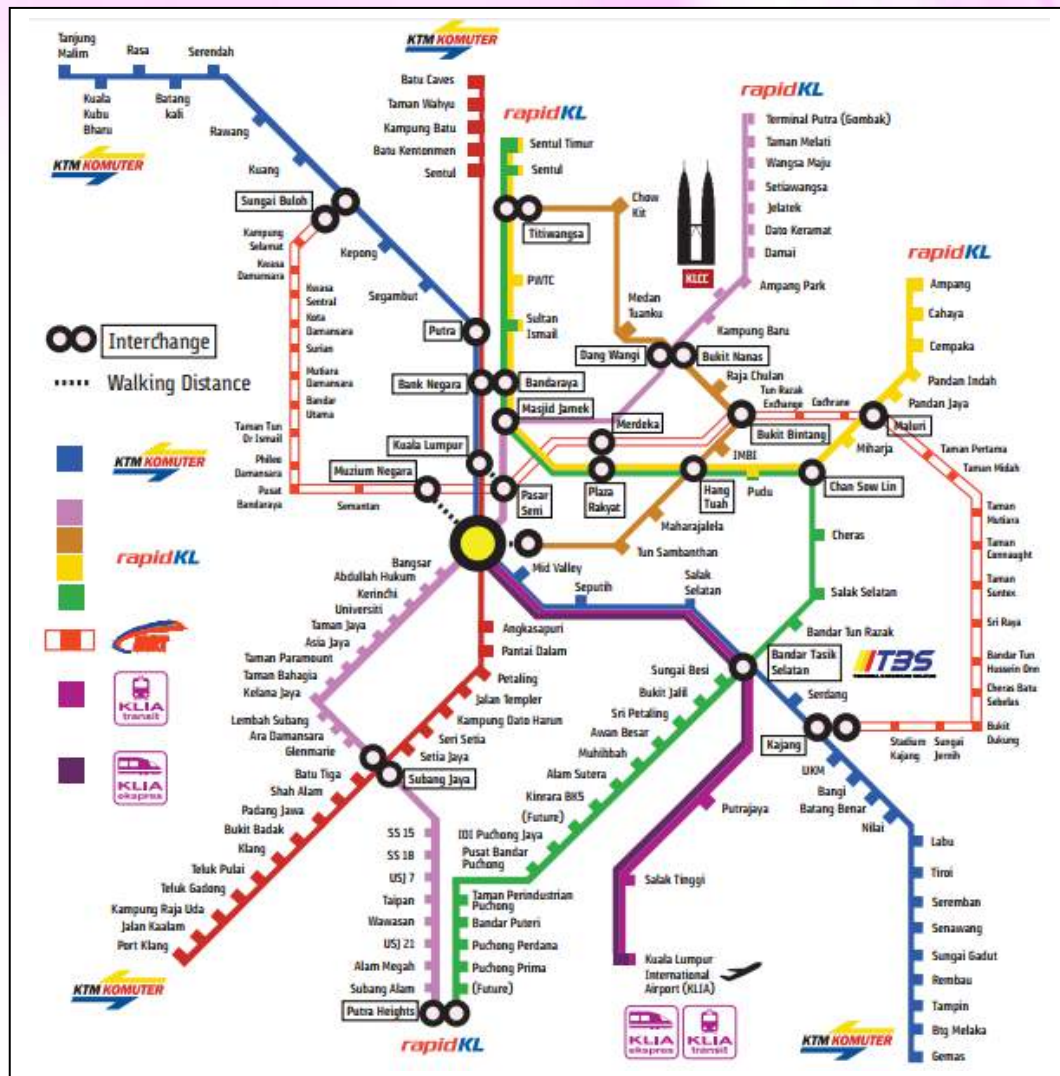
Shops normally open at 10.30AM and close at 10.00PM. Restaurants normally close at 12.00 midnight.

## **TELEPHONES**

The international dialling code is “00” to be followed by the respective country code. For Malaysia, the country code is “60”.









## THE KUALA LUMPUR TRAIN NETWORK









# ENVIRONMENTAL ENGINEERING & GREEN TECHNOLOGY (EGT) STAFF







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