UNDERGRADUATE
ACADEMIC
GUIDELINES

2022/2023
https://mjiit.utm.my/

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Malaysia-Japan
International
Institute of Technology
(MJIIT)

Contents

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:

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UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Vision

A Premier University Providing World-Class Education and Research

Mission

To Develop Holistic Talents and Prosper Lives Through Knowledge and Innovative Technologies

Core Values

INTEGRITY   SYNERGY   EXCELLENCE   SUSTAINABILITY

Strategic Thrusts

ST 1 : World-class Holistic Talents to extend the Frontier of Education and Research

ST 2 : Creative and Resilient Performance Delivery Through Emphatic and Agile Governance

ST 3 : Institutional Growth through Unique Niche and Specialisation for Long-term Sustainability

ST 4 : Transformative Life Experiences through Knowledge Empowerment and Trust

ST 5 : Global Eminence as Malaysian Top Research University in 2025

Strategic Priorities

S1 – Produce holistic talent by developing high quality graduates

S2 – Provide continuous upskilling and reskilling of university staff to achieve excellence in education and research

S3 – To inculcate UTM core values namely Integrity, Synergy, Excellence and Sustainability (ISES) into work and management ecosystem

S4 – Strengthen UTM's R&D&C&I capability and resilience to champion emerging knowledge and research areas

S5 – Nurture strategic nexus between Universiti-Industry-Government-Community (the quadruple helix) ecosystem to sustain university growth

S6 – Provide sustainable campus experience to UTM's students, staff and surrounding community

S7 – Enculturate data driven culture with high level of trust in technology

S8 – Achieve global eminence as a distinguished Malaysia Research University in-line with national and global agenda

MJIIT VISION & MISSION

VISION

Leading in cutting edge technology education and research

MISSION

Providing Japanese style engineering education blended with Malaysia distinctiveness for sustainable industry and society

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Leading in academic and research excellence in Electronics, Precision, Environmental & Green Technology and Management of Technology

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 semiautonomous 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 (MJIIT). 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 (MJIIT), 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 MJIIT 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 MJIIT 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 MJIIT, Malaysian has benefited from new technology introduced by Japan.

MJIIT combines the advantage of the Malaysian systematic outcome-based education with the research-intensive approach of Japanese education outlook. The relatively autonomous nature of MJIIT allows for greater innovation and creativity among its academic staff and students. It is the desire of MJIIT 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. MJIIT works closely with Japanese universities and industries to create a distinctive working culture and employs a holistic approach in its program offerings. MJIIT 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, MJIIT offers four (4) undergraduate programmes namely Bachelor of Electronic Systems Engineering with Honours, Bachelor of Mechanical Precision Engineering with Honours, Bachelor of Chemical Process Engineering with Honours and Bachelor of Software Engineering with Honours.
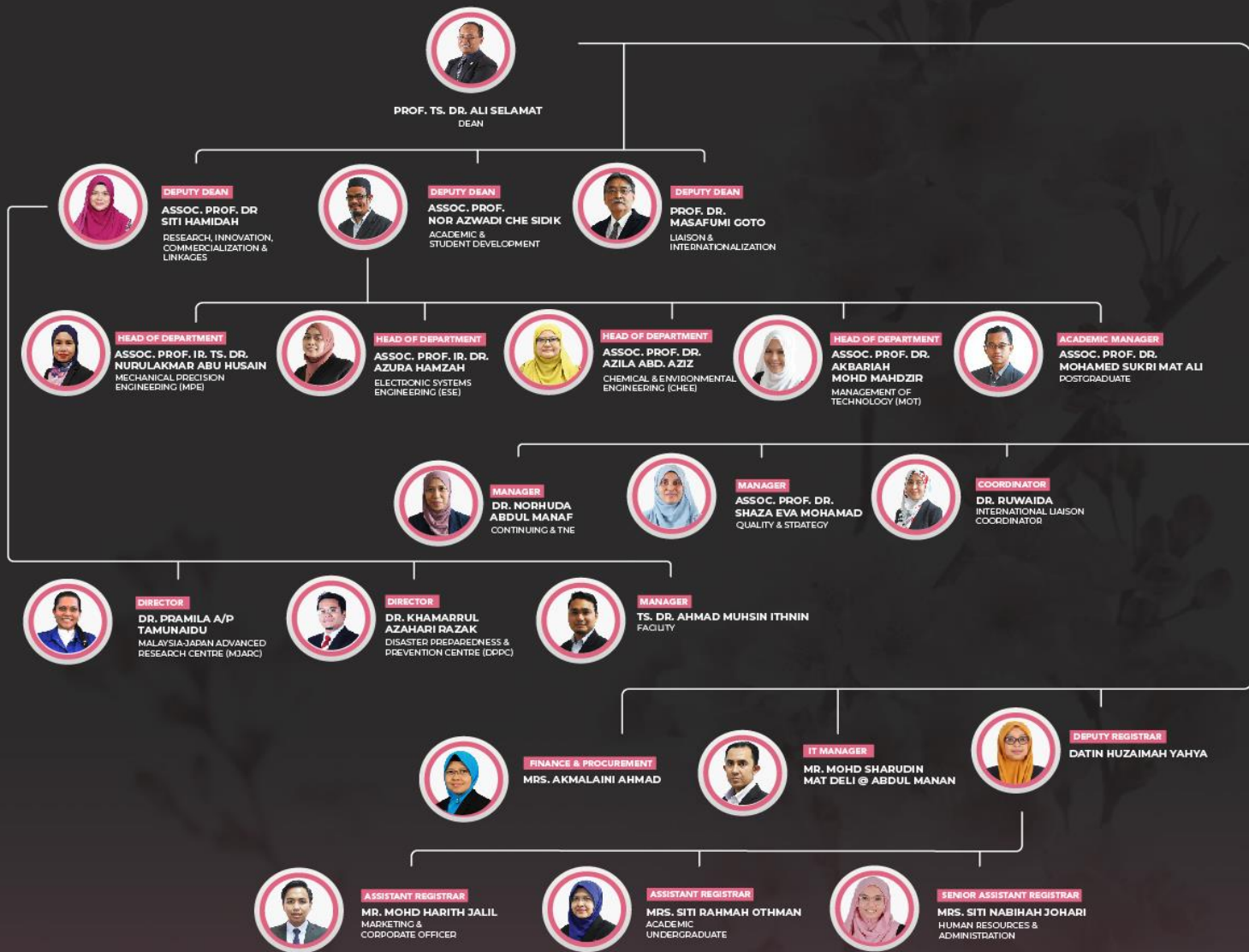
MESSAGE FROM DEAN

Assalammualaikum, Salam Sejahtera, Konnichiwa,

My heartiest congratulations and warmest welcome to all students to Malaysia-Japan International Institute of Technology (MJIIT), Universiti Teknologi Malaysia (UTM). MJIIT UTM is located in Kuala Lumpur which 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 MJIIT, aim to inculcate important values highly sought in today's world including team working, responsible and resilience.

MJIIT provides state-of-the-art facilities for postgraduate students comprising of well-established research laboratories under the auspices of innovative research laboratries (iKohza) featuring the unique mentoring concept of senpai-kohai (senior and junior mentoring). 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 close collaboration with industries such as Takasago Ltd., Daiichi and Mitsubishi Heavy Industries Asia Pacific LTE Ltd, Kantsu Ltd and Leave a Nest to support our learning and research ecosystems. On behalf of the MJIIT family, I wish you successful academic endeavours throughout your study at MJIIT. Don't forget to experience the UTM lifestyle while at the same time mastering the Japanese-oriented engineering education with us!
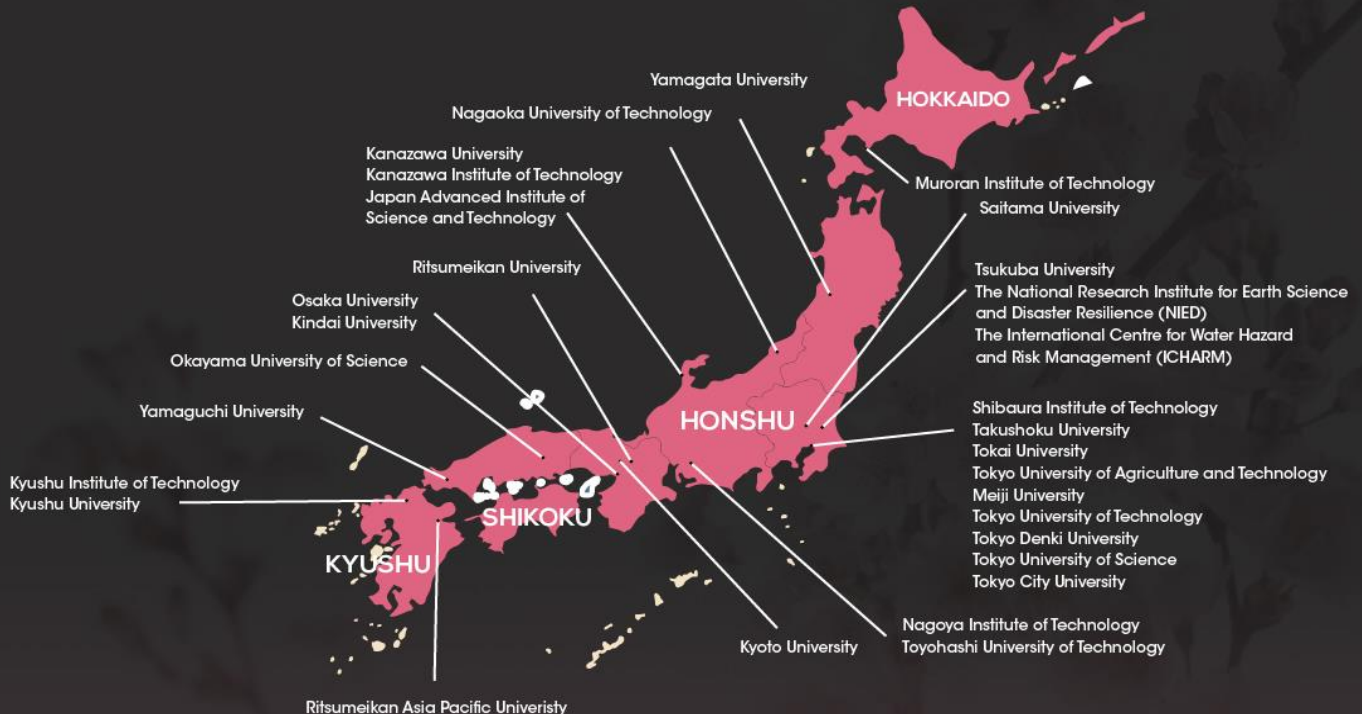
PROFESSOR TS. DR. ALI SELAMAT
DEAN

MJIIT MANAGEMENT ORGANIZATION CHART

PROF. TS. DR. ALI SELAMAT
DEAN

DEPUTY DEAN
ASSOC. PROF. DR SITI HAMIDAH
RESEARCH, INNOVATION, COMMERCIALIZATION & LINKAGES

DEPUTY DEAN
ASSOC. PROF. NOR AZWADI CHE SIDIK
ACADEMIC & STUDENT DEVELOPMENT

DEPUTY DEAN
PROF. DR. MASAFUMI GOTO
LIAISON & INTERNATIONALIZATION

HEAD OF DEPARTMENT
ASSOC. PROF. IR. TS. DR. NURULAKMAR ABU HUSAIN
MECHANICAL PRECISION ENGINEERING (MPE)

HEAD OF DEPARTMENT
ASSOC. PROF. IR. DR. AZURA HAMZAH
ELECTRONIC SYSTEMS ENGINEERING (ESE)

HEAD OF DEPARTMENT
ASSOC. PROF. DR. AZILA ABD. AZIZ
CHEMICAL & ENVIRONMENTAL ENGINEERING (CHEE)

HEAD OF DEPARTMENT
ASSOC. PROF. DR. AKBARIAH MOHD MAHDZIR
MANAGEMENT OF TECHNOLOGY (MOT)

ACADEMIC MANAGER
ASSOC. PROF. DR. MOHAMED SUKRI MAT ALI
POSTGRADUATE

MANAGER
DR. NORHUDA ABDUL MANAF
CONTINUING & TNE

MANAGER
ASSOC. PROF. DR. SHAZA EVA MOHAMAD
QUALITY & STRATEGY

COORDINATOR
DR. RUWAIDA
INTERNATIONAL LIAISON COORDINATOR

DIRECTOR
DR. PRAMILA A/P TAMUNAIDU
MALAYSIA-JAPAN ADVANCED RESEARCH CENTRE (MJARC)

DIRECTOR
DR. KHAMARRUL AZAHARI RAZAK
DISASTER PREPAREDNESS & PREVENTION CENTRE (DPPC)

MANAGER
TS. DR. AHMAD MUHSIN ITHNIN
FACILITY

FINANCE & PROCUREMENT
MRS. AKMALAINI AHMAD

IT MANAGER
MR. MOHD SHARUDIN MAT DELI @ ABDUL MANAN

DEPUTY REGISTRAR
DATIN HUZAIMAH YAHYA

ASSISTANT REGISTRAR
MR. MOHD HARITH JALIL
MARKETING & CORPORATE OFFICER

ASSISTANT REGISTRAR
MRS. SITI RAHMAH OTHMAN
ACADEMIC UNDERGRADUATE

SENIOR ASSISTANT REGISTRAR
MRS. SITI NABIHAH JOHARI
HUMAN RESOURCES & ADMINISTRATION

JAPANESE UNIVERSITY CONSORTIUM

Yamagata University

Nagaoka University of Technology

Kanazawa University
Kanazawa Institute of Technology
Japan Advanced Institute of
Science and Technology

Ritsumeikan University

Osaka University
Kindai University

Okayama University of Science

Yamaguchi University

Kyushu Institute of Technology
Kyushu University

Ritsumeikan Asia Pacific Univeristy

HOKKAIDO

Muroran Institute of Technology

Saitama University

Tsukuba University
The National Research Institute for Earth Science
and Disaster Resilience (NIED)
The International Centre for Water Hazard
and Risk Management (ICHARM)

Shibaura Institute of Technology
Takushoku University
Tokai University
Tokyo University of Agriculture and Technology
Meiji University
Tokyo University of Technology
Tokyo Denki University
Tokyo University of Science
Tokyo City University

HONSHU

Nagoya Institute of Technology
Toyohashi University of Technology

Kyoto University

SHIKOKU

KYUSHU

MJIIT · JAPANESE UNIVERSITY CONSORTIUM

30 MEMBERS

UNIQUENESS OF MJIIT

QUALITY *EDUCATION*

1

100%
ACCREDITED
BY ENGINEERING
ACCREDITATION COUNCIL
MALAYSIA

FINANCIAL *SUPPORT*

2

UP TO **RM 5 MILLION**
OF SCHOLARSHIP
FOR UG & PG (FULL & PARTIAL)

JAPANESE *STYLE EDUCATION*

3

I - KOHZA, RINKOH
5S, MONOZUKIRI
NINGEN - RYOKU
SENPAI - KOHAI
JAPANESE LANGUAGE CLASSES
JAPANESE ACADEMIC STAFFS

WORLD *RANKING*

4

TOP 40
BEST UNIVERSITIES IN ASIA
(QS WORLD UNIVERSITY RANKINGS)

JAPANESE *GOVERNMENT SUPPORT*

5

JICA
JACTIM
RESEARCH GRANTS
SCHOLARSHIPS
VARIETY OF EXCHANGE PROGRAMS

JAPANESE *MOBILITY PROGRAMS*

6

GLOBAL MOBILITY PROGRAM
SAKURA SCIENCE PROGRAM
JENESYS PROGRAM
INDUSTRIAL TRAINING IN JAPAN
JOINT DEGREES & SUPERVISIONS

STATE-OF-THE-ART *LABORATORIES*

7

76 LABS
5 SERVICE LABS
20 *I*-KOHZAS (RESEARCH GROUPS)
9 SANGAKU - RENKEI LABS

EXCLUSIVE *PARTNERSHIPS*

8

WITH **30**
JAPANESE UNIVERSITIES
(THE JAPANESE UNIVERSITY
CONSORTIUM)
& JAPANESE INDUSTRIES

EMPLOYABILITY

9

98% GRADUATE
EMPLOYABILITY WITH
JAPANESE FIRMS IN JAPAN,
MALAYSIA & OTHER REGIONS
ANNUAL JOB FAIRS WITH
JAPANESE COMPANIES

ACCOMMODATION

10

ON-CAMPUS ACCOMODATION
AVAILABLE

MJIIT INNOVATIVE KOHZA (I-KOHZA)

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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 *i*Kohza system. This *i*Kohza 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 *i*Kohzas and the center of excellence at MJIIT.

RESEARCH FELLOW (Associate Member)	*i*KOHZA
1. COEs / LABs / RGs in Skudai 2. Other COEs / LABs from other universities	1. Shizen Conversion & Separation Technology 2. Pattern Recognition & Robotics Automation 3. Air Resources 4. Communication Systems & Networks 5. Intelligent Dynamic System 6. Advanced Devices and Material Engineering 7. Tribology and Precision Machining 8. Advance Vehicle System 9. Wind Engineering for (Urban, Artificial, Man-Made) Environment 10. Biologically Inspired System and Technology 11. Embedded System 12. Engineering Materials and Structure 13. Optical Devices and Systems 14. Takasago Thermal/Environmental System 15. Chemical Energy Conversions and Applications

RESEARCH FELLOW (Associate Member)	*i*KOHZA
1. COEs / LABs / RGs in Skudai 2. Other COEs / LABs from other universities	16. Metabolic Engineering and Molecular Biology 17. Algal Biomass 18. Intellectual Property and Innovation Management 19. Software Engineering of Industrial Revolution (SEIR) Wellness Innovation Technology (WIT)

Centre of Excellence
1. Disaster Preparedness & Prevention Centre (DPPC)
2. Malaysia-Japan Advanced Research Centre (MJARC)

Note:
COE   – Center of Excellence
LAB   – Laboratory
RG   – Research Group

Director of COE

COE	Director
Disaster Preparedness & Prevention Centre (DPPC)	Dr. Khamarrul Azahari bin Razak
Malaysia-Japan Advanced Research Centre (MJARC)	Ir. Dr. Pramila Tamunaidu

Head of iKOHZA

*i*KOHZA	Head
Pattern Recognition & Robotics Automation (PRA)	Assoc. Prof. Ir. Dr. Zool Hilmi bin Ismail
Shizen Conversion & Separation Technology (Shizen)	Prof. Dr. Tomoya Tsuji
Air Resources (AIR)	Ts. Dr. Khairunnisa binti Mohd Pa'ad
Communication Systems & Networks (CSN)	Prof. Dr. Yoshihide Yamada
Intelligence Dynamics and System (ADME)	Prof. Ts. Ir. Dr. Aminudin bin Abu
Advanced Devices and Materials Engineering (ADME)	Prof. Ir. Ts. Dr. Abdul Manaf bin Hashim
Tribology and Precision Machining (TRIPREM)	Prof. Dr. Kanao Fukuda
Advance Vehicle System (AVS)	Dr. Fauzan bin Ahmad
Wind Engineering for (Urban, Artificial, Man-Made) Environment (WEE)	Assoc. Prof. Ir. Ts. Dr. Sheikh Ahmad Zaki bin Shaikh Salim
Biologically Inspired Systems and Technology (BIO-IST)	Assoc. Prof. Dr. Mohd Fauzi bin Othman
Embedded System (ES)	Assoc. Prof. Ir. Dr. Ooi Chia Yee
Engineering Materials and Structure (eMAST)	Prof. Ir. Ts. Dr Saiful Amri bin Mazlan
Chemical Energy Conversions and Applications (CHECA)	Assoc. Prof. Dr. Kamyar Shameli
Metabolic Engineering and Molecular Biology (MEMO-BIO)	Assoc. Prof. Ts. Dr. Nor'Azizi bin Othman
Optical Devices and Systems (ODESY)	Ts. Dr. Sumiaty binti Ambran

*i*KOHZA	Head
Takasago Thermal/Environmental Systems (TAKASAGO)	Prof. Dr. Yutaka Asako
Algal Biomass (ALGAL)	Assoc. Prof. Dr. Koji Iwamoto
Intellectual Property and Innovation Management (IPIM)	Assoc. Prof. Dr. Akbariah binti Mohd Mahdzir
Software Engineering Of Industrial Revolution (SEIR)	Dr. Halinawati binti Hirol
Wellness Innovation Technology (WIT)	Assoc. Prof. Dr. Azila binti Abdul Aziz

COE RESEARCH INTEREST

Disaster Preparedness & Prevention Centre (DPPC)

- Disaster risk reduction and management
- Community Resilience
- Space Science R&D
- Engineering Education
- Open Innovation, SGD
- Technology Mapping
- Patent Analytics
- Cultural Heritage
- Urban Conservation
- Climate Action in the Buildings Sector
- Green Technology
- Fire Risks Assessment
- Sustainable Cities

Malaysia-Japan Advanced Research Centre (MJARC)

- Waste Treatment & Management Technologies
- Energy Systems & Recovery
- Waste-to-Wealth, Waste-to- Energy
- Effluent treatment
- Energy systems and recovery
- Pre & Post-disaster Waste management

*i*KOHZA RESEARCH INTERESTS

Communication Systems and Network	*Shizen* Conversion & Separation Technology	Pattern Recognition & Robotics
• Antennas and Propagation • Antenna for Human Health Care • Radar Cross Section • Cognitive Radio Networks • Cloud Computing • Network Security • Industrial Cybersecurity • Mobile Communication	• Sustainable energy • Biofuels • New materials • Utilization of wastes • Thermodynamic models • Process design & control • Apparatus and assembly design	• Artificial Intelligence • Brain Computer Interface and Swarm Intelligence • Machine Vision • Design Optimization and Workflow • Low Carbon Transport • Automotive Turbocharger • Nonlinear Control • Multiple Agent System • Warehouse Management System • Supply Chain
Intelligence Dynamics and System	**Air Resources**	**Intellectual Property and Innovation Management**
• Noise and Vibration Control • Damaged Detection • Intensity Identification • Non –linear System Identification • Vibration damper and active suspension system	• Air Pollutions • Nanomaterials • Nanofibres • Environmental Engineering • Plasma Processing • Safety, Health & Environment	• Intellectual Property Management • Innovation Management • Business Analytics • Finance • IOT • TRIZ

● Structural Dynamics vibration ● Noise ● Computer fluid dynamics		● Psychometrics ● Entrepreneurship
Tribology & Precision Machining	**Advanced Devices & Materials Engineering**	**Advanced Vehicle System**
● Adhesive wear mechanism study ● Mechanical transmission development ● Piano action tribology ● Trace humidity controller development ● Development of composite coating - Synthesis/growth of oxide and metal coating, as well as expand their potential as self-lubricated coating ● Development of bio-coating for biomedical applications ● Development of Ultrasonically assisted effecter for cutting/grinding fluid	**Material Engineering Area:** ● Synthesis/growth of carbon nanomaterials ● Semiconductors ● Organic/ molecular materials and bio-materials **Micro-nanodevice Area:** ● Novel nanodevices and functional devices covering electronic/photonic devices, microfluidic devices ● Sensors and solar cells	● Bio-signal Processing ● AI & Robotics ● Active Safety & Autonomous Vehicles ● Vehicle Safety ● Product Design ● Structural Dynamics ● Smart Materials

● Development of ball screw shaft finishing machine		
Wind Engineering and Environment	**Biologically Inspired Systems and Technology**	**Embedded System**
● Heat Urban Island ● Thermal Comfort ● Wind Engineering ● Control Application ● IoT ● Artificial Intelligent ● Air Conditioning (HVAC)	● Neural System ● Self-Organization Learning, Swarm Intelligence ● Intelligent System ● Manufacturing Robot ● Neural Network and Artificial Intelligence ● Intelligent Control ● Underwater Robotic ● Deep Learning and Control System	● Digital Systems Design ● Design-for-Testability ● FPGA ● IoT-enabled System
Chemical Energy Conversions and Applications	**Engineering Materials and Structure**	**Metabolic Engineering and Molecular Biology**
● Nanoscience and Nanotechnology ● Functional Polymeric Materials ● Membranes ● Radiation Grafting ● Homo/Heterogeneous Catalysis ● Photo Catalyst	● Magnetorheological ● Composite ● Artificial Intelligence ● Coating ● Machine Learning ● 3D Printing ● Nanomaterials ● Thin Film	● Biodegradation ● Biocoke production ● Soil-cooling temperate crops ● Gene expression ● Lignin bio-depolymerization, ● Copper biodegradation

● Renewable Energy ● Biomass for Biofuels Production ● Environmental Green Chemistry ● Molecular Simulation ● Structural Bioinformatics ● Drug Delivery ● Biomedical Science		

Optical Devices and Systems	Takasago Thermal/Environmental Systems	Algal Biomass
● Optical Communication ● Optical Sensors ● Amplifiers ● Radio over fiber ● Optical Interconnect	● Ow carbon ● Energy saving technologies ● Heat transfer	● Algae ● Microbes ● Biomass production Wastewater ● Organic waste
Software Engineering Of Industrial Revolution	Wellness Innovation Technology	
● Software Engineering ● System Development ● Database ● System Analysis and Design ● IoT (Internet of Things)	● Plant extract ● Nanocarriers ● Cosmetic ● Wellness ● Formulation	

ACADEMIC CALENDAR 2022/2023 SESSION

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UNDERGRADUATE(UG)
ACADEMIC GUIDELINES 2022/2023

ACADEMIC CALENDAR 2022/2023 SESSION
UNIVERSITI TEKNOLOGI MALAYSIA
DEGREE PROGRAMME

10 October 2022	Registration for New Students
10 – 14 October 2022	Student Orientation Week
13 - 14 October 2022	Registration of Courses for Semester I, 2022/2023 Session

17 October 2022 – 17 March 2023 (22 weeks)	**SEMESTER I**
17 October - 2 December 2022	Lectures Semester I (First Half - 7 weeks)
5 - 9 December 2022	Mid-Semester Break for Semester I (1 week)
12 December 2022 – 27 January 2023	Lectures Semester I (Second Half - 7 weeks)
16 - 27 January 2023	Registrations of Courses for Semester II, 2022/2023
30 January - 3 February 2023	Revision Week (1 week)
6 - 24 February 2023	Final Examination for Semester I (3 weeks)
27 February - 17 March 2022	Final Break for Semester I (3 weeks)
16 - 17 March 2023	Registrations of Course for Semester II, 2022/2023 Session (March intake)
20 - 31 March 2023	Special Examinations for Semester I, 2022/2023

Note: Subject to change

20 March – 6 Oktober 2023 (29 weeks)	SEMESTER II
20 March – 21 April 2023	Lectures semester II (First half - 5 weeks)
24 - 28 April 2023	Mid-Semester Break for Semester II (1 week)
1 May - 30 June 2023	Lectures Semester II (Second half - 9 weeks)
TBC	Pre-Registrations of Courses for Semester I, 2023/2024 Session
3 – 7 July 2023	Revision Week (1 week)
10 - 28 July 2023	Final Examination for Semester II (3 weeks)
31 July – 6 October 2023	Final Break for Semester II (10 weeks)
TBC	Special Examinations for Semester II

SHORT SEMESTER	
7 - 8 August 2023	Registrations of Courses for Short Semester 2022/2023 Session
7 August – 6 October 2023	Lectures for Short Semester (10 weeks)

Note: Subject to change

Malaysia Public Holiday

24 October 2022	Deepavali
25 December 2022	Christmas Day
1 January 2023	New Year's Day (Public Holiday for KL Only)
22 & 23 January 2023	Chinese New Year
1 February 2023	Federal Territory Day (Public Holiday for KL Only)
4 February 2023	Thaipusam
8 April 2023	Nuzul Al Quran (Public Holiday for KL Only)
22 & 23 April 2023	Aidilfitri Eid
1 May 2023	Labour Day
4 May 2023	Wesak Day
5 June 2023	Agong's Birthday
28 June 2023	Aidil Adha Eid
19 July2023	Awal Muharram
31 August 2023	National's Day
16 September 2023	Malaysia Day
27 September 2023	The Prophet Muhammad S.A.W Birthday
12 & 13 November 2023	Deepavali
25 December 2023	Christmas Day
1 January 2024	New Year's Day
25 January 2024	Thaipusam
1 February 2024	Federal Territory Day (Public Holiday for KL Only)
10, 11 & 12 February 2024	Chinese New Year

Note: Subject to change

DEGREE OFFERED & PROGRAM SPECIFICATIONS

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UNDERGRADUATE(UG)
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GENERAL INFO FOR UNDERGRADUATE

UTM | Malaysia-Japan International Institute of Technology (MJIIT)

ENGINEERING PROGRAMMES SPECIFICATIONS

MJIIT has three (3) undergraduate programs namely Bachelor of Electronic Systems Engineering with Honours (ESE), Bachelor of Mechanical Precision Engineering with Honours (MPE) and Bachelor of Chemical Process Engineering with Honours (ChEE). The entry requirements, Program Educational Objectives (PEOs), Program Learning Outcomes (POs) and Program Award Requirements for these program are tabled below.

ENTRY REQUIREMENTS

ADMISSION TO 1ST YEAR

A.   *MoHE Matriculation Programme Holders:*
       (KPM Matriculation/ UTM Asasi / 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 / UTM Asasi / UM *Asasi Sains* / UiTM *Asasi* with CGPA of at least 2.00

and

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

ii.   **MJIIT Programme Specific Requirements**

Pass KPM Matriculation / UTM Asasi / UM *Asasi Sains* / UiTM *Asasi* with CGPA of at least 2.50

---

and

achieve at least a '**C+**' 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**

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 2**

ii)   MJIIT Programme Specific Requirements

Pass STPM with CGPA of at least 2.50

and

achieve at least Gred **'C+'** (NGMP 2.33) 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**

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

and

Not handicapped that can prevent them from doing practical work

DIRECT ENTRY TO SECOND (2ND) 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 2**

ii)   MJIIT Programme Specific Requirements

● **FOR BACHELOR OF ELECTRONIC SYSTEMS ENGINEERING WITH HONOURS**

Obtained a **Diploma in Electrical Engineering** (Electronic/Mechatronic/Communication) from UTM or Institution of Higher Learning (IPT) with CGPA of at least 2.50

● **FOR BACHELOR OF MECHANICAL PRECISION ENGINEERING WITH HONOURS**

Obtained a **Diploma in Mechanical Engineering** (Core/ Industrial/ Manufacturing/Aeronautics/Automotive) from UTM or Institution of Higher Learning (IPT) with CGPA of at least 2.50

- **BACHELOR OF CHEMICAL PROCESS ENGINEERING WITH HONOURS**

  Obtained a **Diploma in Chemical Engineering** from Institution of Higher Learning (IPT) with CGPA of at least 2.50

  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 form 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 01

TECHNICAL

Demonstrate mastery of knowledge & competency in manifesting cutting edge technologies

PEO 02

PROFESSIONALISM

Demonstrate professionalism through innovative, entrepreneurial & global qualities

PEO 03

SUSTAINABLE SOCIETY

Contribute to sustainable development for the benefits of society

PROGRAMME LEARNING OUTCOMES

PLO1

ENGINEERING KNOWLEDGE (KW)

ABILITY TO APPLY KNOWLEDGE OF MATHEMATICS, NATURAL SCIENCES, ENGINEERING FUNDAMENTALS, AND AN ENGINEERING SPECIALISATION TO THE SOLUTION OF COMPLEX ENGINEERING PROBLEMS

PLO2

PROBLEM ANALYSIS (THPA)

ABILITY TO IDENTIFY, FORMULATE, CONDUCT RESEARCH LITERATURE, AND ANALYSE COMPLEX ENGINEERING PROBLEMS TO REACH SUBSTANTIATED CONCLUSIONS USING FIRST PRINCIPLES OF MATHEMATICS, NATURAL SCIENCES, AND ENGINEERING SCIENCES

PLO3

DESIGN/DEVELOPMENT (THDS)

ABILITY TO DESIGN SYSTEMS, COMPONENTS OR PROCESSES AND DEVELOP SOLUTIONS FOR COMPLEX ENGINEERING PROBLEMS THAT MEET SPECIFIED NEEDS WITH APPROPRIATE CONSIDERATION FOR PUBLIC HEALTH AND SAFETY, CULTURAL, SOCIETAL, AND ENVIRONMENTAL CONSIDERATIONS

PLO4

INVESTIGATION (THI)

ABILITY TO CONDUCT INVESTIGATION OF COMPLEX ENGINEERING PROBLEMS USING RESEARCH-BASED KNOWLEDGE AND RESEARCH METHODS, INCLUDING DESIGN OF EXPERIMENTS, ANALYSIS AND INTERPRETATION OF DATA, AND SYNTHESIS OF INFORMATION TO PROVIDE VALID CONCLUSIONS

PROGRAMME LEARNING OUTCOMES

PLO5

MODERN TOOL USAGE (SCMT)

ABILITY TO CREATE, SELECT AND APPLY APPROPRIATE TECHNIQUES, RESOURCES, AND MODERN ENGINEERING AND IT TOOLS, INCLUDING PREDICTION AND MODELLING, TO COMPLEX ENGINEERING PROBLEMS, WITH AN UNDERSTANDING OF THE LIMITATIONS

PLO6

THE ENGINEER AND SOCIETY (AD)

ABILITY TO APPLY REASONING INFORMED BY CONTEXTUAL KNOWLEDGE TO ASSESS SOCIETAL, HEALTH, SAFETY, LEGAL AND CULTURAL ISSUES, AND THE CONSEQUENT RESPONSIBILITIES RELEVANT TO PROFESSIONAL ENGINEERING PRACTICE AND SOLUTIONS TO COMPLEX ENGINEERING PROBLEMS

PLO7

ENVIRONMENT AND SUSTAINABILITY (GCS)

ABILITY TO UNDERSTAND AND EVALUATE THE SUSTAINABILITY AND IMPACT OF PROFESSIONAL ENGINEERING SOLUTIONS OF COMPLEX ENGINEERING PROBLEMS IN SOCIETAL AND ENVIRONMENTAL CONTEXTS

PLO8

ETHICS (GSE)

ABILITY TO APPLY ETHICAL PRINCIPLES AND COMMIT TO PROFESSIONAL ETHICS, RESPONSIBILITIES AND NORMS OF ENGINEERING PRACTICE

PROGRAMME LEARNING OUTCOMES

PLO9

COMMUNICATION (CS)

ABILITY TO COMMUNICATE EFFECTIVELY ON COMPLEX ENGINEERING ACTIVITIES WITH THE ENGINEERING COMMUNITY AND WITH SOCIETY AT LARGE, SUCH AS BEING ABLE TO COMPREHEND AND WRITE EFFECTIVE REPORTS AND DESIGN DOCUMENTATION, MAKE EFFECTIVE PRESENTATIONS, AND GIVE AND RECEIVE CLEAR INSTRUCTIONS

PLO 10

INDIVIDUAL AND TEAM WORK (TW)

ABILITY TO FUNCTION EFFECTIVELY AS AN INDIVIDUAL, AND AS A MEMBER OR LEADER IN DIVERSE TEAMS AND IN MULTI-DISCIPLINARY SETTINGS.

PLO 11

LIFE-LONG LEARNING (SC)

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.

PLO 12

ENGINEERING PROJECT MANAGEMENT AND FINANCE (ES)

ABILITY TO DEMONSTRATE KNOWLEDGE AND UNDERSTANDING OF ENGINEERING MANAGEMENT PRINCIPLES AND ECONOMIC DECISION-MAKING AND APPLY THESE TO ONE'S OWN WORK, AS A MEMBER AND LEADER IN A TEAM, TO MANAGE PROJECTS IN MULTIDISCIPLINARY ENVIRONMENTS

PROGRAMME AWARDS 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.

Awards requirements:

Students should:

- For local and international undergraduate student: achieve a total of 136 credit for ESE, 135 credit for MPE and 135 credit for CPE with minimum CGPA of 2.0.
- Pass industrial training (equivalent to 6 credit).
- 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:

PROFESSIONAL CERTIFICATE COURSES

Compulsory	Elective (Any 2)
- Design Thinking for Entrepreneur - Talent and Competency Management - English Communication Skills for Graduating Students (ECS)	- Data Analytics for Organization - Professional Ethics and Integrity - Construction Measurement (Mechanical & Electrical) - Oshe for Engineering Industry and Laboratory - Quality Management for Built Environment and Engineering Professionals - Safety and Health Officer Introductory Course - Industrial Machinery and Lubrication

UT6523004

BACHELOR OF ELECTRONIC SYSTEMS ENGINEERING WITH HONOURS

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Malaysia-Japan
International
Institute of Technology
(MJIIT)

UNDERGRADUATE(UG)
ACADEMIC GUIDELINES 2022/2023

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BACHELOR OF ELECTRONIC SYSTEMS ENGINEERING WITH HONOURS CURRICULUM

1.	**Awarding Institution**	Universiti Teknologi Malaysia
2.	**Teaching Institution**	Universiti Teknologi Malaysia
3.	**Program Name**	Bachelor of Electronic Systems Engineering with Honours
4.	**Final Award**	Bachelor of Electronic Systems Engineering with Honours
5.	**Program Code**	UT6523004
6.	**Professional or Statutory Body of Accreditation**	Board of Engineers Malaysia (BEM)
7.	**Language(s) of Instruction**	Bahasa Malaysia and English
8.	**Mode of Study (Conventional, distance learning, etc)**	Conventional
9.	**Mode of operation (Franchise, self-govern, etc)**	Self-governing
10.	**Study Scheme (Full Time/Part Time)**	Full Time
11.	**Study Duration**	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			
No.	**Classification**	**Credit**	**Percentage (%)**
A.	Program Core	91	67%
B.	Program Electives	23	17%
C.	General / University Courses a. Management/Economics/Humanities/Ethics b. Language – English and Japanese c. Co-curriculum/Service Learning	10 10 2	16%
	Total	**136**	**100%**

For sciences programme, please fill up the following classification.

No	**Classification**	**Credit**	**Percentage (%)**
A	**Engineering Courses** (a) Lectures (b) Laboratory (c) Final Year Project (d) Industrial training	81 6 6 6	
	Total credit for Part A	99	73%

B	**Related Courses** (a) Applied Science/Math (b) Management/Economics/Humanities/Ethics (c) Co-Curriculum (d) English (e) Japanese	15 10 2 4 6	
	Total credit for Part B	37	27%
	Total credit for Parts A and B	**136**	100%
13. Total credit to graduate		**136**	

Program 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 enroll 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 program (Bachelor degree)
MJ	Faculty/ Centre offering the program (MJIIT)
E	Specialisation (Electronic Systems)

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

PROGRAMME STRUCTURE FOR OCTOBER INTAKE

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	3	1		
SMJE 1032	INTRODUCTION TO ELECTRONIC SYSTEM ENGINEERING	2	1		3	
SMJE 1113	DIGITAL ELECTRONICS	3	3	1		
SMJM 1013	ENGINEERING MATHEMATICS I	3	3	1		
UHLB 1112	ENGLISH COMMUNICATION SKILLS *(for MUET 3.5 and below)*	HW	2			
ULRS 1182	APPRECIATION OF ETHICS AND CIVILISATIONS ***(Option 1 for international students, choose 1 only. Compulsory for local students)*	2	2			
UHLM 1012	MALAY LANGUAGE FOR COMMUNICATION 2 **(for international students)*	2	2			
	Total Credits	16				

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

Year 1   **Semester 2**

Code	Course	Credits	L	T	P/S	Lab
SMJE 1043	MEASUREMENT AND INSTRUMENTATION	3	3	1		
SMJE 1103	ELECTRICAL POWER SYSTEM	3	3	1		
SMJE 2062	ELECTRONIC ENGINEERING LABORATORY 1	2				4
SMJM 1023	ENGINEERING MATHEMATICS II	3	3	1		
UHLJ 1122	JAPANESE FOR COMMUNICATION I	2	2			
UMJT 2142	PROFESSIONAL ETHICS & SAFETY (NINGEN-RYOKU)	2	2			
ULRS 1012	VALUE AND IDENTITY	2	2			
	Total Credits	17				

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	3	1		
SMJE 2173	DIGITAL SYSTEM DESIGN	3	2			3
SMJM 2033	ENGINEERING MATHEMATICS III	3	3	1		
SHLJ 2252	JAPANESE FOR COMMUNICATION II	2	1	2		
ULRS 1022	PHILOSOPHY AND CURRENT ISSUE *(for local and international students)* *** (Option 2 for international students, choose 1 only)*	2				
UHLB 2122	PROFESSIONAL COMMUNICATION SKILLS 1	2	2			
	FREE ELECTIVE COURSE 1	2				
	Total Credits	17				

Year 2   **Semester 4**

Code	Course	Credits	L	T	P/S	Lab
SMJE 2053	CIRCUITS AND SIGNALS	3	3	1		
SMJE 2073	ELECTROMAGNETICS	3	3	1		
SMJE 2122	ELECTRONIC ENGINEERING LABORATORY 2	2				4
SMJE 2133	ELECTRONICS SYSTEM	3	3	1		
SMJM 2043	ENGINEERING STATISTICS	3	3	1		
SHLJ 2352	JAPANESE FOR COMMUNICATION III	2	2			
ULRF 2**2	SERVICE LEARNING & COMMUNITY ENGAGEMENT COURSES	2			6	
	Total Credits	18				

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	3	1		
ULRS 3032	ENTREPRENEURSHIP & INNOVATION	2	2			
	Total Credits	17				

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			
UHLB 3132	PROFESSIONAL COMMUNICATION SKILLS 2	2	2			
	FREE ELECTIVE COURSE 2	3	3	1		
	Total Credits	16				

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	0	0	18	0

Year 4　　　　　**Semester 7**

Code	Course	Credits	L	T	P/S	Lab
SMJE 3203	ARTIFICIAL INTELLIGENCE	3	3			
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			
	Total Credits	16				

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				

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

PROGRAMME STRUCTURE FOR MARCH INTAKE

Year 1   **Semester 1**

Code	Course	Credits	L	T	P/S	Lab
SMJE 1113	DIGITAL ELECTRONICS	3	3	1		
SMJE 1043	MEASUREMENT AND INSTRUMENTATION	3	3	1		
SMJE 1023	FUNDAMENTAL OF ELECTRICAL CIRCUITS	3	3	1		
SMJE 2062	ELECTRONIC ENGINEERING LABORATORY 1	2				4
UHLJ 1122	JAPANESE FOR COMMUNICATION I	2	2			
UMJT 2142	PROFESSIONAL ETHICS & SAFTEY (NINGEN-RYOKU)	2	2			
ULRS 1012	VALUE AND IDENTITY	2	2			
	Total Credits	17				

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

Year 1   **Semester 2**

Code	Course	Credits	L	T	P/S	Lab
SMJE 1013	PROGRAMMING FOR ENGINEER	3	2			3
SMJE 1032	INTRODUCTION TO ELECTRONIC SYSTEM ENGINEERING	2	1		3	
SHLJ 2252	JAPANESE FOR COMMUNICATIONS II	2	1	2		
UHLB 2122	PROFESSIONAL COMMUNICATION SKILLS 1	2	2			
SMJE 2083	ELECTRONIC CIRCUITS	3	3	1		
SMJM 1023	ENGINEERING MATHEMATICS I	3	3	1		
UHLB 1112	ENGLISH COMMUNICATION SKILLS *(for MUET 3.5 and below)*	HW	2			
ULRS 1022	PHILOSOPHY AND CURRENT ISSUE *(for local and international students)* *** (Option 2 for international students, choose 1 only)*	2				
	Total Credits	17				

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

Year 2   **Semester 3**

Code	Course	Credits	L	T	P/S	Lab
SMJE 2053	CIRCUITS AND SIGNALS	3	3	1		
SMJE 1103	ELECTRICAL POWER SYSTEMS	3	3	1		
SMJE 2122	ELECTRONIC ENGINEERING LABORATORY 2	2				4
SMJM 2043	ENGINEERING STATISTICS	3	3	1		
SMJM 2033	ENGINEERING MATHEMATICS II	3	3	1		
SHLJ 2352	JAPANESE FOR COMMUNICATION III	2	2			
ULRF 2**2	SERVICE LEARNING & COMMUNITY ENGAGEMENT COURSES	2			6	
	Total Credits	18				

Year 2   **Semester 4**

Code	Course	Credits	L	T	P/S	Lab
SMJE 3143	COMMUNICATION ELECTRONICS	3	3			
SMJM 2033	ENGINEERING MATHEMATICS III	3	3	1		
SMJE 3813	MONOZUKURI PROJECT	3			9	
SMJM 3053	NUMERICAL METHODS	3	3	1		
SMJE 2173	DIGITAL SYSTEM DESIGN	3	2			3
ULRS 3032	ENTREPRENEURSHIP & INNOVATION	2	2			
	Total Credits	17				

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

Year 3   **Semester 5**

Code	Course	Credits	L	T	P/S	Lab
SMJE 2073	ELECTROMAGNETICS	3	3	1		
SMJE 2133	ELECTRONICS SYSTEM	3	3	1		
SMJE 3192	ELECTRONIC ENGINEERING LABORATORY 3	2				6
SMJE 3303	INTEGRATED DESIGN PROJECT	3			9	
UHLB 3132	PROFESSIONAL COMMUNICATION SKILLS 2	2	2			
	FREE ELECTIVE COURSE 2	3	3	1		
	Total Credits	16				

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

Year 3   **Semester 6**

Code	Course	Credits	L	T	P/S	Lab
SMJE 4912	FINAL YEAR PROJECT 1	2			2	
SMJE 3153	CONTROL SYSTEM	3	3			
SMJE 3183	MICROPROCESSOR AND MICROCONTROLLER	3	2			3
UHLM 1012	MALAY LANGUAGE FOR COMMUNICATION 2 *(for International students)*	2	2			
SMJE 4212	NINGEN RYOKU (SPECIAL LECTURE)	2	2			
ULRS 1182	APPRECIATION OF ETHICS AND CIVILISATIONS ** (Option 1 for international students, choose 1 only. Compulsory for local students)*	2	2			
SMJE 4**3	ELECTIVE 1	3	3			
	FREE ELECTIVE COURSE 1	2				
	Total Credits	17				

Year 4   **Semester 7**

Code	Course	Credits	L	T	P/S	Lab
SMJE 4924	FINAL YEAR PROJECT 2	4			4	
SMJE 3093	COMPUTER ARCHITECTURE AND MULTIMEDIA TECHNOLOGY	3	3			
SMJE 3203	ARTIFICIAL INTELLIGENCE	3	3			
SMJE 3163	DIGITAL SIGNAL PROCESSING	3	3			
SMJE 4**3	ELECTIVE 2	3	3			
	Total Credits	16				

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

Year 4   **Short Semester**

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

Year 4   **Semester 8**

Code	Course	Credits	L	T	P/S	Lab
SMJE 4**3	ELECTIVE 3	3	3			
SMJE 4**3	ELECTIVE 4	3	3			
SMJE 4**3	ELECTIVE 5	3	3			
SMJE 4**3	ELECTIVE 6	3	3			
	Total Credits	12				

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

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, and inductors. Topics include basic electrical circuit laws and properties, circuit analysis and theorems, DC/AC networks.

SMJE 1032   Introduction to Electronic System Engineering
This course exposes students to various areas of electronic engineering related fields. Students will be attending lectures from related industries and make some industrial visits. Students will be exposed to the activities in the electronics and electrical workshop.

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. Lectures on safety problems are also given.

SMJE 1113   Digital Electronics

This course delivers the fundamental principles of digital electronics. Introduction to the course begins with numbering systems (with emphasis on binary and hexadecimal) and binary codes. Principles of Boolean algebra and basic logic circuits (the logic gates) are emphasized to build a foundation for succeeding topics in combinational logic. Understanding on combinational logic circuits will be extended to MSI logic basic circuits and operations, MSI logic digital ICs and its internal circuitry and applications. Basic principles of digital memories may be presented as a sub-topic in this area. Upon completing combinational logics, fundamentals of sequential logic circuits will be emphasized equally. Underlying principles of sequential logic circuits such as clock triggering, flip-flops, registers and counters will be focused. State diagrams will be presented with the objective of designing digital logic circuits. Assignments on simple logic circuits and the circuit simulation requires the use of Intel® Quartus II Prime software. Theories and principles of combinational and logic circuits will be enhanced with hands-on experiments in the laboratory.

SMJE 2053   Circuits and Signals

This course introduces fundamentals of Analog signal processing. The course covers the introduction of signals and systems, LTI systems, Properties of Convolution, Laplace Transform, Fourier Series and Transform as well as Analog filter.

SMJE 2062   Electronic Engineering Laboratory 1

This course involves fully experimental work in laboratories. The lab works encompass fundamentals of electrical circuit and digital electronics. Instruction guided experiments are to be carried out every week in a small group. Analysis and discussion on experimental data from the weekly experiment is recorded in the form of a logbook. Prior to each lab work students are required to complete a pre-lab assignment written specifically for every lab work topic. A minimum of one (1) open-ended experiment must be performed once the guided experiments are completed.

SMJE 2073   Electromagnetics

This course provides students fundamentals of electromagnetics. 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 underlying the electric and the magnetic fields are summarized as Maxwell's equations. Expressions of the electromagnetic wave derived from Maxwell's equations give physical insight into the wave.

SMJE 2083   Electronic Circuits

This course provides students with the coverage of major and essential foundations for sound understanding of electronic circuits. The circuitry covered comprises small signal (ac), power amplifiers, oscillators, and operational amplifiers. A concept or idea of 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 work 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 amplifiers, power amplifiers, feedback amplifiers, operational amplifiers application circuits, oscillators, power supplies and multivibrators.

SMJE 2173   Digital Systems Design

This course introduces design methods to construct digital systems, including combinational and sequential circuits, by means of Hardware Descriptive Language (HDL) specifically Verilog. Areas of topics include: (1) Computer-Aided Design (CAD) tools for design, (2) Verilog Hardware Description Languages (HDL) for simulation and synthesis, and (3) state machine specification, design, and simulation. Principles and fundamentals of digital electronics (SMJE 1113) will be reviewed briefly in the refresher session. In this course, some of the important features of HDL will be examined. The course will enable students to design, simulate, model and synthesize digital logic circuits. The dataflow, structural, and behavioral modelling techniques will be discussed and how they are used to design combinational and sequential circuits. Hand-on experience is gained by implementing logic circuits on FPGA development board through weekly lab practices and design projects.

SMJE 3093   Computer Architecture and Multimedia Technologies

This course introduces 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 provides fundamentals of analog and digital communication systems. Methods for analyzing time and frequency characteristics of signal, amplitude and angle modulation methods and circuit configurations, communication error calculations, access methods for multiplex communications, code division multiple access techniques.

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 tools such as MATLAB for control system analysis and design.

SMJE 3163   Digital Signal Processing

This course covers continuous signal and system analysis through Fourier and Laplace transforms. For discrete signal and system analysis, z-transform and discrete and fast Fourier transforms are used. Moreover, FIR and IIR digital filters are explained.

SMJE 3183   Microprocessor and Microcontroller

This course is designed to cover the fundamentals of microprocessor and microcontroller which later leads students to work on lab experiments with microcontrollers with the ultimate objective that at the end of the course, students are able to design and develop a simple microcontroller system for real applications The fundamentals on microprocessor and microcontrollers emphasizes on assembly language programming, hardware interfacing, software design, and applications. Topics include microcontroller software architecture, assembly instruction set, addressing modes, memory map, general purpose inputs/outputs (GPIO), timers, serial/parallel communication interfaces, and interrupts. This course also gives students the exposure and training necessary to effectively use an integrated development environment (IDE) for developing their application programs in

assembly language and C. Topics included in this course are referred from a number of textbooks

SMJE 3192   Electronic Engineering Laboratory 3
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 the 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 offers a simple way of developing system models and function approximation. GA is an 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 systems as well as genetic algorithms, 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 settings. 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 training.

SMJE 3303   Integrated Design Project

Integrated Design Project (IDP) is offered in year 3 semester 2 with 3 credits. 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. IDP shall involve complex problem solving and complex engineering activities which include design systems, components or processes integrating core areas. 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 stressing the importance of other influences on design such as economics, reliability, performance, health, safety, cultural, project management, environmental, ethics and social impacts.

SMJE 3813   Monozukuri Project

This course exposes students to the "Monozukuri" concepts – the Japanese way of making products through creation of innovative works. The course consists of the lectures – to provide students with specific knowledge and skills on project design and analysis which allow students to design, build and verify their project. This course requires application of the knowledge developed in prior courses, and familiarizes the students with the engineering design process such as definition, synthesis, analysis and implementation in the collaborative classroom environment that emphasizes

teamwork. Students are also stressed on the importance of documenting the development progress as well as writing technical reports.

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 cover industries talks and visit related to electronic systems engineering e.g. Automation, Communication, Bioelectronics etc.

SMJE 4113   Optical Communication

This course provides fundamental understanding of optical communication technology. Basic properties of light, fibers and waveguides will be reviewed. Its emphasis on the fiber transmission characteristics such as attenuation, scattering, dispersion, absorption as well as fiber bending loss which influences optical communication system performance. This course will also cover optical transmitter and receiver systems. Basic laser operation, idea of photon, the spontaneous emission and the stimulated emission are explained. Characteristics of optical detectors will also be explained.

SMJE 4123   Radio Wave and Antenna

Based on Maxwell's wave equation, mathematical solutions of electromagnetic fields are derived. Important parameters expressing radio wave propagation are explained. Antennas such as reflectors, arrays, patches and small antennas used in radio wave communications are explained. Measurement methods used for antenna characteristics are explained. Finally, practical antenna characteristics are experienced through antenna fablication and measurements

SMJE 4133   Wireless and Mobile Communication

In this lecture, radio wave technologies of mobile communication are explained. First, historical progress from 1G to 5G is overviewed. Next, important technologies indispensable in the mobile system are explained. As for radio wave technology, radio propagation problems and counterpart technologies are explained. Moreover, some important items such as user capacity and safety regulations of radio wave exposure for the human body are explained.

SMJE 4343   Data Transmission

Data Transmission refers to the movement of data in the form of bits between two or more digital devices. More precisely, data transmission is the physical transfer of data (a digital bit stream or a digitized analog signal) over a point-to-point or point-to-multipoint communication channel. This course builds on the fundamentals of Communication Electronics (SMJE 3143) and focuses on data link layer protocols (Layer 2) of the TCIP/IP or OSI protocol suite. Students will also learn techniques of packet analysis using Wireshark sniffing software.

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:

 • An understanding of the fluid power systems, including hydraulic and pneumatic components.

• Safe work practices for hydraulics and pneumatics and includes information on preventive measures for safety hazards in the manufacturing workplace.

• An overview of basic and advanced pneumatic and hydraulic system components. Guidelines on how to design, operate, and troubleshoot pneumatic and hydraulic systems. This includes designing the Programmable Logic Controller (PLC) ladder diagram for effective operation of the system.

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 the 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 focused 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 systems. The students will also be taught to diagnose and interpret some medical images.

SMJE 4353 Robotics

This course introduces students to the aspect of key technologies in robotic systems, types of robots available worldwide, sensor and actuators for robotics as well as Robot Operating System (ROS). Students also are exposed to overviews of robot usage, configurations, mechanisms, kinematic and position. Topics covered including the practical hands-on of both simulated and physical arm robots applications.

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 arrays 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 timely responses to sporadic external events. This course introduces students to the concept, features and application scheme of real time systems, also including the RTOSs. FreeRTOS on Arduino is used as a platform for hands-on.

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

This course covers design issues of embedded systems from H/W to S/W. H/W includes sensors, ADC, microcontrollers, DAC, actuators, and their interfacing. S/W includes scheduling, RTOS, middleware and state charts. Design methodology, verification and testability issues are also introduced.

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 are 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 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 problems 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 involves 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.

UT6521005

BACHELOR OF MECHANICAL PRECISION ENGINEERING WITH HONOURS

UTM UNIVERSITI TEKNOLOGI MALAYSIA | Malaysia-Japan International Institute of Technology (MJIIT)

UNDERGRADUATE(UG)
ACADEMIC GUIDELINES 2022/2023

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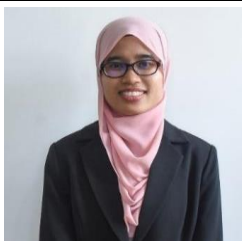
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BACHELOR OF MECHANICAL PRECISION ENGINEERING WITH HONOURS CURRICULUM

1.	Awarding Institution	Universiti Teknologi Malaysia
2.	Teaching Institution	Universiti Teknologi Malaysia
3.	Program Name	Bachelor of Mechanical Precision Engineering with Honours
4.	Final Award	Bachelor of Mechanical Precision Engineering with Honours
5.	Program Code	UT6521005
6.	Professional or Statutory Body of Accreditation	Board of Engineers Malaysia (BEM)
7.	Language(s) of Instruction	Bahasa Malaysia and English
8.	Mode of Study (Conventional, distance learning, etc)	Conventional
9.	Mode of operation (Franchise, self-govern, etc)	Self-governing
10.	Study Scheme (Full Time/Part Time)	Full Time
11.	Study Duration	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**	**Percentage (%)**
Program Core	98	72%
Program Electives	12	9%
General / University Courses a. Management/Economics/Humanities/Ethics b. Language – English and Japanese c. Co-curriculum	13 10 2	19%
Total	**135**	**100%**

For sciences program, please fill up the following classification.

No	Classification	Credit	Percentage (%)
A	**Engineering Courses** (a) Lectures (b) Laboratory (c) Final Year Project (d) Industrial training	65 18 6 6	
	Total credit for Part A	95	70%
B	**Related Courses** (a) Applied Science/Math (b) Management/Economics/Humaniti es/Ethics (c) Co-Curriculum (d) English language (e) Japanese	15 13 2 4 6	
	Total credit for Part B	40	30%
	Total Credit for Parts A and B	**135**	100%
13. Total credit to graduate		**135**

Program Codes and Abbreviations

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 enroll 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 program (Bachelor degree)
MJ	Faculty/ Centre offering the program (MJIIT)
P	Specialization (Mechanical Precision)

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

PROGRAMME STRUCTURE FOR OCTOBER INTAKE

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		
SMJP 1201	WORKSHOP PRACTICE	1				3
SMJP 2112	INTRODUCTION TO DESIGN	2	1		3	
UHLM 1012	MALAY LANGUAGE FOR COMMUNICATION 2 ** (for international students)*	2	2			
ULRS 1182	APPRECIATION OF ETHICS AND CIVILISATIONS *** (Option 1 for international students, choose 1 only. Compulsory for local students)*	2	2			
UHLB 1112	ENGLISH COMMUNICATION SKILLS *(for MUET 3.5 and below)*	HW	2			
	Total Credits	16/18*				

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

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		
SMJP 1203	SOLID MECHANICS	3	3	1		
SMJM 1023	ENGINEERING MATHEMATICS II	3	3	1		
UHLJ 1122	JAPANESE FOR COMMUNICATIONS I	2	2			
ULRS 1012	VALUE AND IDENTITY	2	2			
	Total Credits	18				

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		
SMJP 2133	APPLIED SOLID MECHANICS	3	3	1		
SHLJ 2252	JAPANESE FOR COMMUNICATIONS II	2				
SMJM 2033	ENGINEERING MATHEMATICS III	3	3	1		
ULRS 1022	PHILOSOPHY AND CURRENT ISSUE *(for local and international students)* ** (Option 2 for international students, choose 1 only)*	2	2			
UHLB 2122	PROFESSIONAL COMMUNICATION SKILLS 1	2	2			
	Total Credits	17				

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

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		
SMJM 2043	ENGINEERING STATISTICS	3	3	1		
SMJP 2203	APPLIED FLUID MECHANICS	3	3	1		
ULRF 2**2	SERVICE LEARNING & COMMUNITY ENGAGEMENT COURSES	2			6	
	Total Credits	18				

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			
ULRS 3032	ENTREPRENEURSHIP & INNOVATION	2	2			
SHLJ 2352	JAPANESE FOR COMMUNICATION III	2	2			
U***	FREE ELECTIVE	3	3			
	Total Credits	17				

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

Year 3   **Semester 6**

Code	Course	Credits	L	T	P/S	Lab
SMJP 3303	INTEGRATED DESIGN PROJECT	3	2		3	
SMJP 3213	MECHANICS OF MACHINES AND VIBRATION	3	3			
SMJP 3223	CONTROL ENGINEERING	3	3			
SMJP 4633	CNC CAD / CAM	3	2		3	
UHLB 3132	PROFESSIONAL COMMUNICATION SKILLS 2	2	2			
UMJT 2142	PROFESSIONAL ETHICS & SAFETY (NINGEN-RYOKU)	2	2			
	Total Credits	16				

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 1	2			6	
SMJP 4103	MONOZUKURI	3	2		3	
SMJP 4113	MECHATRONICS	3	3			
SMJP 4213	MODELING AND SIMULATION	3	3			
SMJP 4**3	ELECTIVE 1	3	3			
	Total Credits	14				

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

Year 4   **Semester 8**

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

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

PROGRAMME STRUCTURE FOR MARCH INTAKE

Year 1   **Semester 1**

Code	Course	Credits	L	T	P/S	Lab
SMJP 1043	PROGRAMMING FOR ENGINEERS	3	2		3	
SMJP 2123	THERMODYNAMICS	3	3	1		
SMJP 1062	MATERIALS SCIENCE	2	2	1		
SMJP 2113	MANUFACTURING PROCESSES	3	3	1		
UMJT 2142	PROFESSIONAL ETHICS & SAFETY (NINGEN-RYOKU)	2	2			
UHLJ 1122	JAPANESE FOR COMMUNICATIONS I	2				
ULRS 1012	VALUE AND IDENTITY	2	2			
	Total Credits	17				

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

Year 1   **Semester 2**

Code	Course	Credits	L	T	P/S	Lab
SMJM 1013	ENGINEERING MATHEMATICS I	3	3	1		
SMJP 1022	EXPERIMENTAL METHOD	2	1			3
SMJP 1033	STATICS	3	3	1		
SMJP 1013	ENGINEERING DRAWING WITH CAD	3	2		3	
SMJP 1201	WORKSHOP PRACTICE	1				3
SMJP 2112	INTRODUCTION TO DESIGN	2	1	3		
ULRS 1182	APPRECIATION OF ETHICS AND CIVILISATIONS *** (Option 1 for international students, choose 1 only. Compulsory for local students)*	2	2			
UHLM 1012	MALAY LANGUAGE FOR COMMUNICATION 2 *(for international students)*	2	2			
UHLB 1112	ENGLISH COMMUNICATION SKILLS *(for MUET 3.5 and below)*	HW				
	Total Credits	16/18*				

Year 2   **Semester 3**

Code	Course	Credits	L	T	P/S	Lab
SMJP 4633	CNC CAD / CAM	3	2		3	
SMJP 2131	LABORATORY I	1				3
SMJP 1053	DYNAMICS	3	3	1		
SMJM 1023	ENGINEERING MATHEMATICS II	3	3	1		
SMJP 1203	SOLID MECHANICS	3	3	1		
ULRF 2**2	SERVICE LEARNING & COMMUNITY ENGAGEMENT COURSES	2			6	
	Total Credits	15				

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

Year 2   **Semester 4**

Code	Course	Credits	L	T	P/S	Lab
SMJP 2103	FLUID MECHANICS	3	3	1		
SMJP 2092	FUNDAMENTAL OF ELECTRICAL ENGINEERING	2	2	1		
SMJM 2033	ENGINEERING MATHEMATICS III	3	3	1		
SMJP 2133	APPLIED SOLID MECHANICS	3	3	1		
SHLJ 2252	JAPANESE FOR COMMUNICATIONS II	2	2			
UHLB 2122	PROFESSIONAL COMMUNICATION SKILLS 1	2	2			
ULRS 1022	PHILOSOPHY AND CURRENT ISSUE *(for local and international students)* ** *(Option 2 for international students, choose 1 only)*	2	2			
	Total Credits	17				

Year 3   **Semester 5**

Code	Course	Credits	L	T	P/S	Lab
SMJP 2143	ELECTRONICS	3	3	1		
SMJP 3213	MECHANICS OF MACHINES AND VIBRATION	3	3			
SMJP 3223	CONTROL ENGINEERING	3	3			
SMJP 2203	APPLIED FLUID MECHANICS	3	3	1		
SMJM 2043	ENGINEERING STATISTICS	3	3	1		
UHLB 3132	PROFESSIONAL COMMUNICATION SKILLS 2	2	2			
	Total Credits	17				

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

Year 3   **Semester 6**

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			
SHLJ 2352	JAPANESE FOR COMMUNICATION III	2	2			
ULRS 3032	ENTREPRENEURSHIP & INNOVATION	2	2			
U***	FREE ELECTIVE	3	3			
	Total Credits	17				

Year 4   **Semester 7**

Code	Course	Credits	L	T	P/S	Lab
SMJP 4102	FINAL YEAR PROJECT 1	2			6	
SMJP 3303	INTEGRATED DESIGN PROJECT	3	1		3	
SMJP 4**3	ELECTIVE 1	3	3			
SMJP 4**3	ELECTIVE 2	3	3			
SMJP 4**3	ELECTIVE 3	3	3			
	Total Credits	14				

Year 4   **Short Semester**

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

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

Year 4   **Semester 8**

Code	Course	Credits	L	T	P/S	Lab
SMJP 4204	FINAL YEAR PROJECT 2	4			12	
SMJP 4103	MONOZUKURI	3	2		3	
SMJP 4113	MECHATRONICS	3	3			
SMJP 4213	MODELING AND SIMULATION	3	3			
SMJP 4**3	ELECTIVE 4	3	3			
	Total Credits	16				

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

ELECTIVE COURSES

CHOOSE FOUR (4) ONLY FROM ANY GROUP

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 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

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. These skills 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 drawings using AUTOCAD for geometrical drawing, orthographic projection, isometric projection etc. At the end, students are required to do 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 engineer who is 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, it is designed 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 behavior 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 techniques 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 students should be able to demonstrate an ability to analyze 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 circuits with resistors. Several techniques of circuit analysis such as node voltage method, mesh current method and transformation theorem are given. Analysis of AC circuits 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 amplifiers and filter circuits will be discussed.

SMJP 2112   Introduction to Design

This course is designed to expose students to the concepts and methods to develop an efficient design process and apply 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 behavior 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 behavior 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 aspects 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 concepts of thermodynamics, phase changes process of substance, types of energy, first law as well as second law of thermodynamics for close and open systems.

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 transistors, field-effect transistors, basic gates and integrated circuits. Generally, this course is designed so that the students can have the basic knowledge about electronic engineering - which is required in understanding 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 analyzing the flow field. It will emphasize on the analysis and the importance of boundary layer, ideal and compressible flow in 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 problems 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 the mechanical precision engineering programme. 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 precision engineering courses 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 interrelated 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 stresses the importance 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 a continuation from the Dynamic subject. The chapter usually covered several analysis of gear systems, belt, balancing and crank effort diagrams. Besides that, the topic about governors is 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 analyzing 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 provides the fundamental knowledge and principles of Computer Aided Design and Computer Aided Manufacturing and generates the hands-on skill and technical application of CNC CAD/CAM through a 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 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 problems 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 involves performing analytical/experimental/simulation works /studies at respective iKohza labs. 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 be 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 analyze sub-micron 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, 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 become familiar with the concepts and terminology in welding engineering. Students will understand how welding design is built on a foundation of 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 experiments and analyzing the resulting data. The course deals mainly with the most common types of experiments that are conducted in industrial settings. The topics covered will include completely randomized design, randomized 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 is being practiced.

SMJP 4323   Mechanics of Machinery

This course is a 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 be taught about microcontrollers and interface with various peripherals.

SMJP 4333   Sensors and Actuator System
This course introduces sensors, transducers and actuation systems. The actuation system covered electrical, mechanical, pneumatic and hydraulic systems. Besides that, sensors and transducers also covered electrical and mechanical types 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 Engineering
This is a basic course in designing experiments and analyzing the resulting data. The course deals mainly with the most common types of quality conducted in industrial settings. 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 is 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 investment 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 investment 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). Students 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 technologies 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 systems. 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 utilizing 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 familiarize 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 analyze 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.

UT6524004

BACHELOR OF CHEMICAL PROCESS ENGINEERING WITH HONOURS

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Malaysia-Japan
International
Institute of Technology
(MJIIT)

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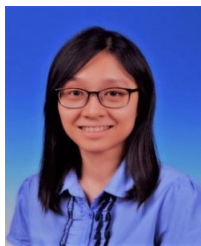
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BACHELOR OF CHEMICAL PROCESS ENGINEERING WITH HONOURS CURRICULUM

1.	**Awarding Institution**	Universiti Teknologi Malaysia
2.	**Teaching Institution**	Universiti Teknologi Malaysia
3.	**Program Name**	Bachelor of Chemical Process Engineering with Honours
4.	**Final Award**	Bachelor of Chemical Process Engineering with Honours
5.	**Program Code**	UT6524004
6.	**Professional or Statutory Body of Accreditation**	Board of Engineers Malaysia (BEM)
7.	**Language(s) of Instruction**	Bahasa Malaysia and English
8.	**Mode of Study (Conventional, distance learning, etc)**	Conventional
9.	**Mode of operation (Franchise, self-govern, etc)**	Self-governing
10.	**Study Scheme (Full Time/Part Time)**	Full Time
11.	**Study Duration**	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			
No.	**Classification**	**Credit**	**Percentage (%)**
A.	Program Core	98	73%

No	Classification		Credit	Percentage (%)
B.	Program Electives		12	9 %

C.	General / University Courses
	  a. Management/Economics/Humanities/Ethics
	  b. Language – English and Japanese
	  c. Co-curriculum/Service Learning
			25	18%

		Total	**135**	**100**%

For sciences program, please fill up the following classification.

No	Classification	Credit	Percentage (%)

A	**Engineering Courses**
	  (a) Lectures
	  (b) Laboratory
	  (c) Final Year Project/Design Project
	  (d) Industrial Training
		74
		5
		13
		6
			73%

	Total credit for Part A	98	73%

B	**Related Courses**
	  (a) Mathematics
	  (b) Management/Economics/Humanities/Ethics
	  (c) Co-Curriculum/Service Learning
	  (d) English
	  (e) Japanese
		12
		12
		3
		4
		6
			27%

	Total credit for Part B	37	27%
	Total Credit for Parts A and B	**135**	100%
13	**Total credit to graduate**	**135**	

Program 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 enroll 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 program (Bachelor degree)
MJ	Faculty/ Centre offering the program (MJIIT)
C	Specialization (Chemical Process)

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

PROGRAMME STRUCTURE FOR OCTOBER INTAKE

Year 1   **Semester 1**

Code	Course	Credits	L	T	P/S	Lab
SMJC 1202	INTRODUCTION TO CHEMICAL PROCESS ENGINEERING	2	2	1		
SMJM 1013	ENGINEERING MATHEMATICS I	3	3	1		
SMJC 1101	ENGINEERING DRAWING WITH CAD	1				3
SMJP 1043	PROGRAMMING FOR ENGINEERS	3	2			3
SMJC 1003	ORGANIC CHEMISTRY I	3				
ULRS 1182	APPRECIATION OF ETHICS AND CIVILIZATION **(Option 1 for international students, choose 1 only. Compulsory for local students)*	2	2			
UHLM 1012	MALAY LANGUAGE FOR COMMUNICATION 2 *(for international students)*	2	2			
UHLB 1112	ENGLISH COMMUNICATION SKILLS *(for MUET 3.5 and below)*	HW	2			
	Total Credits	14/16				

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

Year 1　　　　　**Semester 2**

Code	Course	Credits	L	T	P/S	Lab
SMJC 1213	THERMODYNAMICS	3	3	1		
SMJM 1023	ENGINEERING MATHEMATICS II	3	3	1		
UHLJ 1122	JAPANESE FOR COMMUNICATION I	2	2			
SMJC 2013	ORGANIC CHEMISTRY 2	3	3	1		
UMJT 2142	PROFESSIONAL ETHICS & SAFETY (NINGEN-RYOKU)	2	2			
ULRS 1012	VALUE AND IDENTITY	2				
SMJC 2022	ANALYTICAL CHEMISTRY	2	2			
	Total Credits	17				

Year 2　　　　　**Semester 3**

Code	Course	Credits	L	T	P/S	Lab
SMJC 2223	MASS AND ENERGY BALANCE	3	3	1		
SMJM 2033	ENGINEERING MATHEMATICS III	3	3	1		
SHLJ 2252	JAPANESE FOR COMMUNICATION II	2	2			
U***	FREE ELECTIVE	3				
SMJC 2113	FLUID MECHANICS	3	3	1		
ULRS 1022	PHILOSOPHY AND CURRENT ISSUE *(for local and international students)* ** (Option 2 for international students, choose 1 only)*	2				
UHLB 2122	PROFESSIONAL COMMUNICATION SKILLS 1	2	2			
	Total Credits	18				

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

Year 2   **Semester 4**

Code	Course	Credits	L	T	P/S	Lab
SMJC 2701	ORGANIC CHEMISTRY/ ANALYTICAL LAB	1				3
SMJC 2711	CHEMICAL PROCESS ENGINNERING LABORATORY 1	1				3
SMJC 2233	PHYSICAL CHEMISTRY FOR CHEMICAL ENGINEER	3	3	1		
SMJC 2243	CHEMICAL ENGINEERING THERMODYNAMICS	3	3	1		
SMJC 2253	TRANSPORT PHENOMENA	3	3	1		
SMJM 2043	ENGINEERING STATISTICS	3	3	1		
SHLJ 2352	JAPANESE FOR COMMUNICATION III	2	2			
ULRF 2**2	SERVICE LEARNING & COMMUNITY ENGAGEMENT COURSES	2			6	
	Total Credits	18				

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 PROCESS 1	3	3			
SMJC 3303	CHEMICAL KINETICS AND REACTOR DESIGN	3	3			
SMJC 3313	PROCESS CONTROL AND INSTRUMENTATION	3	3			
SMJC 3721	CHEMICAL PROCESS ENGINEERING LABORATORY 2	1	1			3
SMJC 3273	NUMERICAL METHODS FOR CHEMICAL ENGINEER	3	3			
SMJC 3323	FUNDAMENTALS OF MICROBIOLOGY AND BIOTECHNOLOGY	3	3			
ULRS 3032	ENTREPRENEURSHIP & INNOVATION	2	2			
	Total Credits	18				

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

Year 3   **Semester 6**

Code	Course	Credits	L	T	P/S	Lab
SMJC 3283	SEPARATION PROCESS 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			
SMJC 3123	PROCESS ECONOMICS & PROJECT MANAGEMENT	3	3			
UHLB 3132	PROFESSIONAL COMMUNICATION SKILLS 2	2	2			
	Total Credits	16				

Year 3   **Short Semester**

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

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				

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				

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

PROGRAMME STRUCTURE FOR MARCH INTAKE

Year 1   **Semester 1**

Code	Course	Credits	L	T	P/S	Lab
UHLB 1112	ENGLISH COMMUNICATION SKILLS *(for MUET 3.5 and below)*	HW	2			
SMJC 1213	THERMODYNAMICS	3	1			
SMJM 1013	ENGINEERING MATHEMATICS I	3	3	1		
UHLJ 1122	JAPANESE FOR COMMUNICATION I	2	2			
UMJT 2142	PROFESSIONAL ETHICS & SAFETY (NINGEN-RYOKU)	2	2			
SMJC 2022	ANALYTICAL CHEMISTRY	2	2			
ULRS 1012	VALUE AND IDENTITY	2				
ULRF 2**2	SERVICE LEARNING & COMMUNITY ENGAGEMENT COURSES	2			6	
	Total Credits	16				

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

Year 2   **Semester 2**

Code	Course	Credits	L	T	P/S	Lab
SMJC 1003	ORGANIC CHEMISTRY I	3	3	1		
SMJC 2223	MASS AND ENERGY BALANCE	3	3	1		
SMJC 1202	INTRODUCTION TO CHEMICAL PROCESS ENGINEERING	2	2	1		
SHLJ 2252	JAPANESE FOR COMMUNICATION II	2	2			
SMJP 1043	PROGRAMMING FOR ENGINEERS	3	2			3
SMJC 2113	FLUID MECHANICS	3	3	1		
UHLB 2122	PROFESSIONAL COMMUNICATION SKILLS 1	2	2			
	Total Credits	18				

Year 2   **Semester 3**

Code	Course	Credits	L	T	P/S	Lab
SMJC 2701	ORGANIC CHEMISTRY/ ANALYTICAL LAB	1				3
SMJC 2711	CHEMICAL PROCESS ENGINNERING LABORATORY 1	1				3
SMJC 2013	ORGANIC CHEMISTRY 2	3	3	1		
SMJC 2243	CHEMICAL ENGINEERING THERMODYNAMICS	3	3	1		
SMJC 2253	TRANSPORT PHENOMENA	3	3	1		
SHLJ 2352	JAPANESE FOR COMMUNICATION III	2	2			
SMJM 1023	ENGINEERING MATHEMATICS II	3	3	1		
UHLB 3132	PROFESSIONAL COMMUNICATION SKILLS 2	2				
	Total Credits	18				

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

Year 2   **Semester 4**

Code	Course	Credits	L	T	P/S	Lab
SMJM 2033	ENGINEERING MATHEMATICS III	3	3	1		
SMJC 3263	SEPARATION PROCESSES 1	3	3			
SMJC 3303	CHEMICAL KINETICS AND REACTOR DESIGN	3	3			
SMJC 3313	PROCESS CONTROL AND INSTRUMENTATION	3	3			
SMJC 3721	CHEMICAL PROCESS ENGINEERING LABORATORY 2	1	1			3
SMJC 3273	NUMERICAL METHODS FOR CHEMICAL ENGINEER	3	3			
ULRS 3032	ENTREPRENEURSHIP & INNOVATION	2	2			
	Total Credits	18				

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

Year 3   **Semester 5**

Code	Course	Credits	L	T	P/S	Lab
SMJC 3283	SEPARATION PROCESSES 2	3	3	0		
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 2233	PHYSICAL CHEMISTRY FOR CHEMICAL ENGINEER	3	3	1		
SMJC 3123	PROCESS ECONOMICS & PROJECT MANAGEMENT	3	3			
SMJM 2043	ENGINEERING STATISTICS	3	2	2		
	Total Credits	17				

Year 3   **Semester 6**

Code	Course	Credits	L	T	P/S	Lab
SMJC 4343	CHEMICAL PROCESS DESIGN	3	3			
SMJC 4353	PROCESS SAFETY AND HEALTH	3	3			
SMJC 1101	ENGINEERING DRAWING WITH CAD	1				3
SMJC 3323	FUNDAMENTALS OF MICROBIOLOGY AND BIOTECHNOLOGY	3	3			
SMJC 3293	MATERIAL SCIENCES	3	3			
SMJC 4**3	ELECTIVE 1	3	3			
	Total Credits	16				

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

Year 4   **Semester 7**

Code	Course	Credits	L	T	P/S	Lab
SMJC 4824	CHEMICAL PLANT DESIGN PROJECT	4	2		6	
SMJC 4813	FINAL YEAR PROJECT 1	3			9	
SMJC 4**3	ELECTIVE 2	3	3			
SMJC 4**3	ELECTIVE 3	3	3			
	Total Credits	13				

Year 4   **Short Semester**

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

Year 4   **Semester 8**

Code	Course	Credits	L	T	P/S	Lab
SMJC 4823	FINAL YEAR PROJECT 2	3			9	
SMJC 4**3	ELECTIVE 4	3	3			
ULRS 1182	APPRECIATION OF ETHICS AND CIVILIZATION *(for local students)*	2	2			
UHLM 1012	MALAY LANGUAGE FOR COMMUNICATION 2 *(for international students)*	2	2			
ULRS 1022	PHILOSOPHY AND CURRENT ISSUE *(for local & international students)*	2	2			
U***	FREE ELECTIVE	2				
	Total Credits	13/15				

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

ELECTIVE COURSES

CHOOSE FOUR (4) 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
SMJC4443	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

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 stereo chemistry. 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 behavior 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, vapor-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 behavior 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 behaviors 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 feed forward, 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 pollutions 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 behaviors 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 student shave 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 optimization 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 are search 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.

SMJC 4433   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 bio systems 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 vapor. 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.

SMJC4623   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 fiber source, pulping process, pulp characteristics and applications; hydrolysis: conversion process, product utilization, and furfural production.

BACHELOR OF SOFTWARE ENGINEERING WITH HONOURS

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Malaysia-Japan
International
Institute of Technology
(MJIIT)

PROGRAMME SPECIFICATIONS

The Bachelor of Computer Science (Software Engineering) with Honours is offered full-time. The full-time programme is offered at the MJIIT, UTM in Kuala Lumpur, as Co offering programme with the School of Computing, UTM Johor Bahru.

The study duration for the full-time programme is subject to the student's entry qualifications and lasts four (4) years to a maximum of six (6) years.

The programme is offered full-time and is based on a 2-Semester per academic session. Generally, students are expected to undertake courses equivalent to between fourteen (14) to eighteen (18) credit hours per semester. Assessment is based on coursework and final examinations given throughout the semester.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

After having exposed to 3 to 5 years working experience, our graduates should becomeprofessionals who demonstrate the following competencies:

Code	Intended Educational Objectives
PEO1	Obtain employment as software engineer in local and global industries and organization, where they are competent in applying the fundamental knowledge, computational principles and skills in Software Engineering to develop software of increasing size and complexity across different application areas.
PEO2	Demonstrate an ability to continue to learn throughout their career (i.e. professional, technical or postgraduate education) which can straighten their analytical and critical thinking skills to position them to advanced software engineering practice and to contribute to the intellectual foundations of the software engineering discipline.
PEO3	Involve with a number software project that they are proficient in applyingappropriate methodologies, models and techniques that provide a basis for analysis, design, development, testing and implementation, evaluation, maintenance and documentation of a large-scale Software system.
PEO4	Becoming leaders or technopreneurs in software engineering discipline with combination skills.
PEO5	Demonstrate an awareness of professional ethics and social responsibility as software engineers.

PROGRAMME LEARNING OUTCOMES (PLO)

After having completed the programme, graduates should be able to demonstrate the following competencies:

Code	Intended Learning Outcomes
PLO1 (KW)	Ability to acquire and apply knowledge of Computer Sciences and Software Engineering fundamentals
PLO2 (CG)	Ability to demonstrate comprehensive problem analysis and creative design skill to solve and manage complex computing problems using systematic and current approaches
PLO3 (PS)	Ability to demonstrate technical and scientific expertise in a field of software engineering
PLO4 (IPS)	Ability to perform effective collaboration with stakeholders professionally
PLO5 (CS)	Ability to communicate effectively both in written and spoken form with other professionals and community
PLO6 (DS)	Ability to use digital technologies and software to support studies competently
PLO7 (NS)	Ability to analyze numerical or graphical data using quantitative or qualitative tools in solving problems
PLO8 (LAR)	Ability to function individually or in teams, effectively, with a capability to be a leader.
PLO9 (PRS)	Ability to self-advancement through continuous academic or professional development
PLO10 (ENT)	Ability to initiate entrepreneurial project with relevant knowledge and expertise
PLO11 (ETS)	Ability to conduct respectable, ethical and professional practices in organization and society

PROGRAMME AWARDS REQUIREMENTS

To graduate, students must:
- Achieve a total of 131 credit hours with a minimum CPA of 2.0
- Pass industrial training (equivalent to 12 credit hours), in which 4 credits will be graded and 8 credits as HW (Compulsory Attendance) status.
- Complete Software Engineering Final Year Projects.
- Pass 5 Professional Skills Certificate (PSC):

Compulsory	Elective (Any 2)
- Design Thinking for Entrepreneur - Talent and Competency Management - English Communication Skills for Graduating Students (ECS)	- Data Analytics for Organization - Professional Ethics and Integrity - Construction Measurement (Mechanical & Electrical) - Oshe for Engineering Industry and Laboratory - Quality Management for Built Environment and Engineering Professionals - Safety and Health Officer Introductory Course - Industrial Machinery and Lubrication

ACADEMIC STAFF
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BACHELOR OF SOFTWARE ENGINEERING WITH HONOURS CURRICULUM

12. Awarding Institution	Universiti Teknologi Malaysia
13. Teaching Institution	Universiti Teknologi Malaysia
14. Program Name	Bachelor of Computer Science (Software Engineering) with Honours
15. Final Award	Bachelor of Computer Science (Software Engineering) with Honours
16. Program Code	SECJH
17. Professional or Statutory Body of Accreditation	Ministry of Higher Education
18. Language(s) of Instruction	Bahasa Malaysia and English
19. Mode of Study (Conventional, distance learning, etc)	Conventional
20. Mode of operation (Franchise, self-govern, etc)	Self-governing
21. Study Scheme (Full Time/Part Time)	Full Time
22. Study Duration	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	20	14	14
Short	-	-	-	-

12. Classification of Courses			
No.	Classification	Credit	Percentage (%)
A.	Program Core	74	56.5%
B.	Program Electives	34	25.9 %

C.	General / University Courses		
	a. General	9	
	b. Language – English and Japanese	6	17.6%
	c. Co-curriculum/Service Learning	2	
	d. IT Entrepreneurship	2	
	Total	**127**	**100**%

For sciences program, please fill up the following classification.

No	Classification	Credit	Percentage (%)
A	**Engineering Courses** (e) Lectures (f) Laboratory (g) Final Year Project/Design Project (h) Industrial Training	NIL	NIL
	Total credit for Part A	-	-
B	**Related Courses** (f) Mathematics (g) Management/Economics/Humanities/Ethics (h) Co-Curriculum/Service Learning (i) English (j) Japanese	NIL	NIL
	Total credit for Part B	-	-
	Total Credit for Parts A and B	**127**	100%
13	**Total credit to graduate**	**127**	

PROGRAMME STRUCTURE FOR OCTOBER INTAKE

Year 1   **Semester 1**

Code	Course	Credits	L	T	P/S	Lab
SECI 1013	DISCRETE STRUCTURE	3	2	1		
SECJ 1013	PROGRAMMING TECHNIQUE I	3	2			2
SECR 1013	DIGITAL LOGIC	3	2			2
SECP 1513	TECHNOLOGY & INFORMATION SYSTEM	3	3			
ULRS 1012	VALUE AND IDENTITY	2	2			
UHLB 1112	ENGLISH COMMUNICATION SKILLS *(for MUET 3.5 and below)*	HW	2			
	Total Credits	14/16				

***Students with IELTS Band less than 5.5 or TOEFL less than 525 or TOEFL IBT less than 60 or CEFR less than B2 or MUET less than Band 4 {Malaysian student) must register for UHLB1112 course

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

Year 1   **Semester 2**

Code	Course	Credits	L	T	P/S	Lab
SECI 1113	COMPUTATIONAL MATHEMATICS	3	2	1		
SECI 1143	PROBABILITY & STATISTICAL DATA ANALYSIS	3	2	1		
SECJ 1023	PROGRAMMING TECHNIQUE II	3	2			2
SECR 1033	COMPUTER ORGANISATION AND ARCHITECTURE	3	2			2
SECJ 2203	SOFTWARE ENGINEERING	3	3			
ULRS 1182	APPRECIATION OF ETHICS AND CIVILIZATION ***(Option 1 for international students, choose 1 only. Compulsory for local students)*	2	2			
UHLM 1012	MALAY LANGUAGE FOR COMMUNICATION 2 **(for international students)*	2	2			
	Total Credits	17				

Year 2   **Semester 3**

Code	Course	Credits	L	T	P/S	Lab
SECD 2523	DATABASE	3	2		2	
SECD 2613	SYSTEM ANALYSIS AND DESIGN	3	2		1	
SECJ 2013	DATA STRUCTURE AND ALGORITHM	3	2	1		
SECR 2213	NETWORK COMMUNICATIONS	3	2		2	
SECV 2113	HUMAN COMPUTER INTERACTION	3	3			
ULRF 2**2	SERVICE LEARNING & COMMUNITY ENGAGEMENT COURSES	2	2			
	Total Credits	17				

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

Year 2   **Semester 4**

Code	Course	Credits	L	T	P/S	Lab
SECV 2223	WEB PROGRAMMING	3	2			2
SECR 2043	OPERATING SYSTEMS	3	2			2
SECJ 2154	OBJECT ORIENTED PROGRAMMING	4	2			3
SECJ 2253	REQUIREMENTS ENGINEERING & SOFTWARE MODELLING	3	2		2	
SECJ 2363	SOFTWARE PROJECT MANAGEMENT	3	2			2
UHLB 2122	PROFESSIONAL COMMUNICATION SKILLS 1	2	2	1		
ULRS 1022	PHILOSOPHY AND CURRENT ISSUE *(for local & international students)*	2	2			
Total Credits		17				

Year 3   **Semester 5**

Code	Course	Credits	L	T	P/S	Lab
SECJ 3104	APPLICATIONS DEVELOPMENT	4	2			2
SECJ 3553	ARTIFICIAL INTELLIGENCE	3	3			
SECJ 3303	INTERNET PROGRAMMING	3	2			2
SECJ 3323	SOFTWARE DESIGN & ARCHITECTURE	3	3			
SECJ 3603	KNOWLEDGE-BASED & EXPERT SYSTEMS	3	3			
UHLB 3132	PROFESSIONAL COMMUNICATION SKILLS 2	2				
UHLX 1112	FOREIGN LANGUAGE COMMUNICATION ELECTIVE	2	2			
Total Credits		17				

***Students with IELTS Band less than 5.5 or TOEFL less than 525 or TOEFL IBT less than 60 or CEFR less than B2 or MUET less than Band 4 {Malaysian student) must register for UHLB1112 course

Year 3　　　　　**Semester 6**

Code	Course	Credits	L	T	P/S	Lab
SECJ 3032	SOFTWARE ENGINEERING PROJECT 1	2	3			
SECJ 3343	SOFTWARE QUALITY ASSURANCE	3	3			
SECJ 3563	COMPUTATIONAL INTELLIGENCE	3	3			
SECJ 3623	MOBILE APPLICATION PROGRAMMING	3	2			2
SECJ 3403	SPECIAL TOPIC IN SOFTWARE ENGINEERING	3	3			
SECJ 3483	WEB TECHNOLOGY	3	2			2
S******3	UNIVERSITY FREE ELECTIVES*	3	3			
UBSS 1032	ENTREPRENEURSHIP AND INNOVATION	2	2			
	Total Credits	19				

==*Students must choose University Free Electives subjects offered by faculties other than Faculty of Computing.==

Year 4　　　　　**Semester 7**

Code	Course	Credits	L	T	P/S	Lab
SECJ 4118	INDUSTRIAL TRAINING	8			24	
SECJ 4114	INDUTRIAL TRAINING REPORT	4				
	Total Credits	12				

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

Year 4   **Semester 8**

Code	Course	Credits	L	T	P/S	Lab
SECJ 4134	SOFTWARE ENGINEERING PROJECT 2	4				
SECD 3761	TECHNOPRENEURSHIP SEMINAR	1				
SECJ 3203	THEORY OF COMPUTER SCIENCE	3	3	1		
SECJ 4383	SOFTWARE CONSTRUCTION	3	2		2	
SECJ 4423	REAL-TIME SOFTWARE ENGINEERING	3	2		2	
SECJ 4463	AGENT-ORIENTED SOFTWARE ENGINEERING	3	2		2	
SECH 5**3/SECD 5**3/SECS 5**3	PRISMS ELECTIVE 1	3	3			
SECH 5**3/SECD 5**3/SECS 5**3	PRISMS ELECTIVE 2	3	3			
	Total Credits	14				

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

PRISMS ELECTIVE COURSES

For students who intended to enroll in PRISMS, refer to the PRISMS Section for a list of related elective courses associated with the Postgraduate Programme. The PRISMS elective begins with code SECP/J/R5XX3.

GRADUATION CHECKLIST

To graduate, students must pass all the stated courses in this checklist. It is the responsibility of the students to ensure that all courses are taken and passed. Students who do not complete
any of the course are not allowed to graduate.

NO	CODE	COURSE	CREDIT EARNED (JKD)	CREDIT COUNTED (JKK)	TICK (√) IF PASSED
		COMPUTER SCIENCE COURSES			
		CORE COURSES (74 CREDITS)			
1.	SECI1013	Discrete Structure	3	3	
2.	SECJ1013	Programming Technique I	3	3	
3.	SECR1013	Digital Logic	3	3	
4.	SECP1513	Technology & Information System	3	3	
5.	SECI1113	Computational Mathematics	3	3	
6.	SECl1143	Probability & Statistical Data Analysis	3	3	
7.	SECJ1023	Programming Technique II	3	3	

8.	SECR1033	Computer Organisation and Architecture	3	3	
9.	SECD2523	Database	3	3	
10.	SECD2613	System Analysis and Design	3	3	
11.	SECJ2013	Data Structure and Algorithm	3	3	
12.	SECR2213	Network Communications	3	3	
13.	SECV2113	Human Computer Interaction	3	3	
14.	SECJ2203	Software Engineering	3	3	
15.	SECV2223	Web Programming	3	3	
16.	SECR2043	Operating Systems	3	3	
17.	SECJ2154	Object Oriented Programming	4	4	
18.	SECJ3032	Software Engineering Project I	2	2	
19.	SECJ3203	Theory of Computer Science	3	3	
20.	SECJ4118	Industrial Training	8	HL	
21.	SECJ4114	Industrial Training Report	4	4	
22.	SECJ4134	Software Engineering Project II	4	4	
23.	SECD3761	Technopreneurship Seminar	1	1	

		ELECTIVES COURSES (34 CREDITS) – Choose SECJ3104 and 10 other elective courses from the following list (which can include up to maximum of 4 PRISMS courses, for qualified students)			
	SECJ ELECTIVES COURSES				
24.	SECJ2253	Requirements Engineering & Software Modelling	*3*	*3*	
25.	SECJ2363	Software Project Management	3	3	
26.	SECJ3104	Applications Development	4	4	
27.	SECJ3553	Artificial Intelligence	3	3	
28.	SECJ3303	Internet Programming	3	3	
29.	SECJ3323	Software Design & Architecture	3	3	
30.	SECJ3603	Knowledge-Based & Expert Systems	3	3	
31.	SECJ3343	Software Quality Assurance	3	3	
32.	SECJ3563	Computational Intelligence	3	3	
33.	SECJ3623	Mobile Application Programming	3	3	
34.	SECJ3403	Special Topic in Software Engineering	3	3	
35.	SECJ3483	Web Technology	3	3	
36.	SECJ4383	Software Construction	3	3	
37.	SECJ4423	Real-Time Software Engineering	3	3	
38.	SECJ4463	Agent-Oriented Software Engineering	3	3	
PRISMS ELECTIVES COURSES					
39.	SECR5033	Information Security Governance and	3	3	
40.	SECR5043	Cloud Computing Security	3	3	
41.	SECJ5013	Secure Software Engineering	3	3	

42.	SECR5053	Penetration Testing	3	3	
43.	SECJ5023	Advanced Theory of Computer Science	3	3	
44.	SECJ5033	Advanced Data Structure and Algorithms	3	3	
45.	SECJ5043	Advanced Artificial Intelligence	3	3	
46.	SECP5013	Advanced Analytics for Data Science	3	3	
47.	SECP5023	Big Data Management	3	3	
48.	SECP5033	Business Intelligence and Analytics	3	3	
49.	SECP5043	Data Science Governance	3	3	
50.	SECP5053	Massive Mining and Streaming	3	3	
51.	SECP5063	Statistics for Data Science	3	3	
TOTAL CREDIT OF COMPUTER SCIENCE COURSES (a)			108	100	
UNIVERSITY GENERAL COURSES					
Cluster 1: Appreciation of Philosophy, Value and History(Faculty of Social Sciences and Humanities)					
For Malaysian Students					
1.	UHIS1022	Falsafah dan Isu Semasa	2	2	
2.	UHMS1182	Penghayatan Etika dan Peradaban	2	2	
For International Students					
1.	UHIS1022	Falsafah dan Isu Semasa UHMS1182	2 2	2 2	
	UHIS1022	Falsafah dan Isu Semasa UHMS1182			
	UHLM1012	Malaysia Language for Communication 2	2	2	

Cluster 2: Generic Skills					
1.	UBSS1032	Introduction to Entrepreneurship	2	2	
2.	UHMT1012	Graduate Success Attributes	2	2	
Cluster 3: Knowledge Enhancement					
1.	UHIT2302	The Thought of Science and	2	2	
Cluster 4: Co-Curriculum and Service Learning					
1.	UKQF2xx2	Service-Learning Co-curriculum	2	2	
2.	UKQT3001	Extracurricular Experiential	1	1	
3.	UBSS1032	Introduction to Entrepreneurship	2	2	
Cluster 5: Language Skills **(Language Academy, Faculty of Social Sciences and Humanities)**					
1.	UHLB1122	English Communication Skills	2	2	
2.	UHLB2122	Academic Communication Skills	2	2	
3.	UHLB3132	Professional Communication Skills	2	2	
4.	UHLx1112	Foreign Language Elective	2	2	
Other University Electives					
	Uxxx2xx2	Any 1 course from Cluster 2 or	2	2	
TOTAL CREDIT of UNIVERSITY GENERAL COURSES (c)			23	23	
TOTAL CREDIT TO GRADUATE (a + b + c)			131	123	

OTHER COMPULSORY COURSES		
No.	**PSC COURSE**	
COMPULSORY COURSES		
1.	Design Thinking for Entrepreneur	
2.	Talent and Competency Management	
3.	English Communication Skills for Graduating Students (ECS)	
ELECTIVE COURSES		
4.	Occupational Safety, Health & Environment (OSHE) (*Compulsory to all FEstudents*)	

	5. Choose ONE elective course from the following list:
	    1. Data Analytics for Organization
	    2. Construction Measurement (Mechanical & Electrical Works)
	    3. Professional Ethics and Integrity
	    4. Other electives course offered in future	

SYNOPSIS OF CORE COURSES

SECI1013   Discrete Structure

This course introduces students to the principles and applications of discrete structure in the field of computer science. The topics that are covered in this course are set theory, proof techniques, relations, functions, recurrence relations, counting methods, graph theory, trees and finite automata. At the end of the course, the students should be able to use set theory, relations and functions to solve computer science problems, analyse and solve problems using recurrence relations and counting methods, apply graph theory and trees in real world problems and use deterministic finite automata finite state machines to model electronic devices and problems.

SECJ1013   Programming Technique I

As a fundamental subject, this course equips the students with theory and practice on problem solving techniques by using the structured approach. Students are required to develop programs using C++ programming language, in order to solve simple to moderate problems. The course covers the following: pre-processor directives, constants and variables, data types, input and output statements, control structures: sequential, selection and loop, built-in and user- defined functions, single and two-dimensional arrays, file operations, pointers, and structured data types.

SECR1013   Digital Logic

Digital electronics is the foundation of all microprocessor-based systems found in computers, robots, automobiles, and industrial control systems. This course introduces the students to digital electronics and provides a broad overview of many important concepts, components, and tools. Students will get up-to-date coverage of digital fundamentals-from basic concepts to programmable logic devices. Laboratory experiments provide hands-on experience with the simulator software, actual devices and circuits studied in the classroom.

SECP1513   Technology & Information System

As a primer subject, this course will introduce students to information systems and technology (IS/IT), as well as its uses in daily life both at home and at work. Various aspects of IS/IT encompassing hardware, software, network, communications, internet, multimedia, graphics and systems applications will be introduced. Students will be equipped with basic skills in handling PC installation and productivity tools via practical work in the labs, which shall comprise a major part of the study. At the end of the course, student should be able to distinguish basic IS/IT component and applications.

SECI1113   Computational Mathematics

This course is a combination of linear algebra and numerical methods as preparation for computer science student to apply mathematics knowledge in core knowledge of computer science. The first part of this course is an introduction to linear algebra. The topics that are covered in linear algebra are linear equations, linear combinations, linear independence, linear transformation, and vector spaces. The second part of this course covers numerical methods that can be used to solve non-linear equation, linear systems, eigenvalue problems, interpolation, differentiation and integration. At the end of the course, students should be able to apply mathematics knowledge to solve mathematical problems. Implementation of engineering tools such as MATLAB, would enhance student to use simple programming technique for solving mathematical problems.

SECI1143   Probability & Statistical Data Analysis

This course is designed to introduce some statistical techniques as tools to analyse the data. In the beginning the students will be exposed with various forms of data. The data represented by the different types of variables are derived from different sources; daily and industrial activities. The analysis begins with the data representation visually. The course will also explore some methods of parameter estimation from different distributions. Further data analysis is conducted by introducing the hypothesis testing. Some models are employed to fit groups of data. At the end of course the students should be able to apply some statistical models in analysing data using available software.

SECJ1023 Programming Technique II
Pre-requisite: SECJ1013 Programming Technique I

This course presents the concept of object orientation and object-oriented programming (OOP) techniques using the C++ programming language. It equips the students with the theory and practice on problem solving techniques using the object oriented approach. It emphasizes on the implementation of the OOP concepts including encapsulations, associations and inheritance. At the end of this course, students should be able to apply the OOP techniques to solve problems.

SECR1033 Computer Organisation and Architecture
Pre-requisite: SECR1013 Digital Logic

This course was designed to give the understanding of basic concept of computer organization and architecture. Topics covered in this subject will be on computer performance, types of data and the representative, arithmetic manipulation, instruction execution, micro programmable control memory, pipelining, memory, input/output and instruction format. At the end of this course, the student should be able to understand the concept of overall computer component and realize the current technology in computer hardware.

SECD2523 Database

This course introduces students to the concept of database system and how it is used in daily human life and profession. The focus of the course is to equip students with the knowledge and skills on important steps and techniques used in developing a database, especially in the conceptual and logical database design phase. Among topics covered are database environment, database design, entity relationship diagram, normalization, and structured query language (SQL). Students will be taught to use a database management system (DBMS). Students are required to design and develop the database component of an information system using the learned techniques, DBMS and a development tool. At the end of the course, students should be able to apply the knowledge of designing and developing a good database system.

SECD2613　　System Analysis and Design

The main focus of this course is to provide a practical approach of systems analysis and designing skills for the students using structured methodology. Hence the course enables students to study information system requirements for any system application within an organizational context. The contents are sequentially organized directly from planning, analysis, designing and implementation phases. From the resulting output of the planning and analysis phase shall enable students to form input, output and interface design. Hence a prototype design can be demonstrated.

SECJ2013　　Data Structure and Algorithm
Pre-requisite: SECJ1023 Programming Technique II

This course emphasis on data structure concepts theoretically and practically with detail algorithms for each of data structure. Students will learn abstract data type concepts using class and apply the concept in the implementation of data structures. Apart from it, student will learn recursive concept as a programming style and algorithm efficiency analysis with Big O notation. Various sorting and searching techniques will be discussed as data structure operations. Analysis of each algorithm will also be explained. Further, students will be exposed to linear data structures such as linked lists, stack and queue. Non-linear data structures such as tree and binary search tree will be discussed. Along the course, students should be able to implement and apply the theory and concepts of data structure in the assignments and mini project which are conducted in group.

SECR2213　　Network Communications

This course will discuss the basic topics of computer network and data communications. Based on TCP/IP Internet protocol stack, the course will apply top down approach. Starts with the important and usage of computer network in commonly applications, the approach will go further detail in the technical aspect in data communication. At the end of this course, students will have an understanding and appreciation of how the network works.

SECV2113   Human Computer Interaction

This course will introduce students to human-computer interaction theories and design processes. The emphasis will be on applied user experience (UX) design. The course will present an iterative evaluation-centred UX lifecycle and will introduce a broader notion of user experience, including usability, usefulness, and emotional impact. The lifecycle should be viewed as template intended to be instantiated in many different ways to match the constraints of a particular development project. The UX lifecycle activities we will cover include contextual inquiry and analysis, requirements extraction, design-informing models, design thinking, ideation, sketching, conceptual design, and formative evaluation.

SECJ2203   Software Engineering

This course is designed to give students an introduction to an engineering approach in the development of high-quality software systems. It will discuss the important software engineering concepts in the various types of the common software process models. The students will also learn the concepts and techniques used in each software development phase including requirements engineering, software design and software testing. This course will also expose the students to utilizing object-oriented method (e.g. UML) and tools in analysing and designing the software. At the end of this course, students are expected to be able to appreciate most of the common software engineering concepts and techniques as well as producing various software artefacts, documentations, and deliverables.

SECV2223   Web Programming

This course is designed to introduce students the fundamental of knowledge, technologies and components for web application developments. The basic topics includes the standard HTML for content creation, CSS for content presentation, JavaScript for client-side logics, PHP for server-side logics and MySQL for database processing. At the end of the course, the students should be able to apply the web base technologies and then implement it all in the creating functional data-centric online system project.

SECR2043　　　Operating Systems
Pre-requisite: SECR1033 Computer Organization and Architecture
This course covers introduction to operating systems, which serve as an interface between computer hardware and the user. The operating system is responsible for the management and coordination of processes, sharing of limited resources of the computer. Students will be exposed to the techniques and algorithms that may be applied in designing an operating system. Topics covered include process management, concurrency and synchronization, deadlock, memory management, file management, secondary storage management and I/O management. At the end of the course, the student shall have a clear understanding on the general concepts that underlie of an operating system.

SECJ2154　　　Object Oriented Programming
Pre-requisite: SECJ1023 Programming Technique II
This course presents the concepts of object orientation and object-oriented programming techniques using Java programming language. It provides students with a thorough look at the basic constructs of the Java programming language such as its basic data types and operations. It also emphasizes on the use of standard Java APIs that allow students to develop text-based and GUI applications. It will also provide the programming techniques on exception handling and input/output files. At the end of this course, students should be able to use the basic constructs in object-oriented programming and utilize the selected Java APIs.

SECJ3032　　　Software Engineering Project I
Pre-requisite: 80 credits AND SECJ3104 Application Development
This is the initial part of a 2-part Final Year Project that every student must fulfil successfully. Students are introduced to the methodologies of research and application development through a series of lectures. Students are guided through a step-by-step practice to complete the initial stages of proposal, planning and design of a project. Students must also meet regularly with supervisor(s) who will monitor their continuous progress. Students are required to prepare a report and present their initial work.

SECJ3203   Theory of Computer Science
Pre-requisite: SECI1013 Discrete Structure
                  SECJ2013 Data Structure and Algorithm

The goal of this course is to provide students with an understanding of basic concepts in the theory of computation. This course introduces students to formal languages and automata theory. It will emphasize on languages, grammars and abstract machines i.e. Regular Language, Context Free Language, Regular Grammar, Context Free Grammar, Finite Automata, Push Down Automata and Turing Machine. The course will also provide practice on the acceptability of input string by these machines. At the end of the course, students should be able to apply the theory in constructing these abstract machines and testing them with the right input strings.

SECJ4118   Industrial Training (HW)
Pre-requisite: 92 credits AND CGPA >= 2.0

Industrial Training refers to the placement of a student at an organization for a minimum of 20 weeks to elevate students' knowledge and skills in a specific database profession and at the same time produce graduates who are credible, creative and proficient. This course aims to provide a platform for the students apply their knowledge learned in the university and boost their skills which needed by a profession. It is also intend for the students to gain exposure in every aspect of real career life. The students will be evaluated based on two components; 1) student performance evaluation by organisation supervisor and 2) student performance evaluation by faculty supervisor. The organization supervisor is expected to assess the student performance based on work performance and students personality. The assessment by faculty supervisor more focusing on students' generic skills.

SECJ4114   Industrial Training Report
Pre-requisite: 92 credits AND CGPA >= 2.0

Industrial Training Report refers to the placement of a student at an organization for a minimum of 20 weeks to experience and apply their theoretical knowledge in the industrial training. The students will be evaluated based on four components; 1) technical report, 2) oral presentation, 3) log book and 4) ethics. The aim of the technical report is to educate the students in producing related technical report and able to explain a specific detail on the tasks that have been done during the training. Students need to follow specified format in writing the technical report and submit it within the predetermined date. The students are required to present their training achievement to Industrial Training supervisors (organization and supervisor). Students need to fill in the online log book daily for the purpose of close monitoring between the students and supervisors. Student also needs to practice the good ethical values and work conduct throughout the training. The passing mark is 60%.

SECJ4134   Software Engineering Project II
Pre-requisite: SECJ3032 Software Engineering Project I

This is the second part of a 2-part Final Year Project that every student must fulfil successfully. In this installation, students are required to execute the next phases of their development plan from Part1. Students are now required to code and integrate the different modules that make up the proposed project. Students will test the developed modules and the final fully-integrated project following software development and research testing practices. Students must meet regularly with supervisor(s) who will monitor their continuous progress. Students are required to prepare a report and present their final work.

SECD3761   Technopreneurship Seminar

This 1-credit course will provide module and training for students on how to generate digital income through crowdsourcing platforms and methods. Crowdsourcing is a method to generate online income which the work is offered and implemented digitally in global platforms.

ELECTIVE COURSES

SECJ2253   Requirements Engineering & Software Modelling
Pre-requisite: SECJ2203 Software Engineering

This course provides an introduction to requirement engineering and a thorough look at the software modelling. It will include requirements engineering topics include types of requirements, requirements elicitation techniques, requirements specification: text-based and model-based, requirements validation and negotiation, as well as requirements management. At the end of this course, the students shall have the skills necessary to conduct requirements engineering process with appropriate principles and methods.

SECJ2363   Software Project Management

This course is designed to provide students with in-depth knowledge on software project planning, cost estimation and scheduling, project management tools, factors influencing productivity and success, productivity metrics, analysis of options and risks, software process improvement, software contracts and intellectual property and approaches to maintenance and long term software development. At the end of this course, students should be able to know how to manage a software development lifecycle.

SECJ3104   Applications Development
Pre-requisite: SECJ2203 Software Engineering, SECD2523 Database, SECV2223 Web Programming, SECJ2154 Object Oriented Programming

Application Development is a comprehensive service learning course which requires student to solve a real community problem by developing an application. Students will learn how to practice design thinking, adopting Agile development methodology. This involves an iterative process starting from community engagement, requirement elicitation and analysis, design solution, application construction and iterative verification process. Students are required to do reflection on the outcome of the project. In this course students should be able to develop their soft skills such as leadership, team collaboration, documentation process and communication skill.

SECJ3553   Artificial Intelligence
Pre-requisite: SECJ2013 Data Structure and Algorithm
This course offers students a new perspective on the study of Artificial Intelligence (AI) concepts. The essential topics and theory of AI are presented, but it also includes practical information on data input and reduction as well as data output (i.e. algorithm usage). In particular, this course emphasizes on theoretical and practical aspects of various search algorithms, knowledge representations, and machine learning methods. The course features practical implementations through assignments undertaken both individually and in groups.

SECJ3303   Internet Programming
Pre-requisite: SECJ2154 Object Oriented Programming   SECV2223   Web Programming
This course covers the development of web component with Servlets and Java Server Pages (JSP) Technologies. This course will enable students to obtain the knowledge and skills necessary to quickly build web applications based on Servlet and JSP technologies using the NetBeans IDE and Glassfish/Tomcat web container. Students are exposed to the current methods for analysing, designing, developing, and deploying web applications with Java technologies. At the end of this course, student should be able to develop a web-based application using Servlet, JSP and JavaBeans technologies.

SECJ3323   Software Design & Architecture
Pre-requisite: SECJ2203 Software Engineering
This course provides the students with an in-depth look at the theory and practice of software architecture and design. It introduces the important concepts related to software architecture and design. It emphasizes on the design and (faithful) implementation of a large scale software using the widely accepted architecture styles and design patterns. It will also expose students to the use of the industrial strength design notations (e.g. UML) and CASE tools (e.g. Ent Arch, Visual Studio). In addition, it provides other aspects of a large and complex software design such as user interface design, management, leadership, and ethics. At the end of this course, the students should be able to use the techniques, architectural styles, and design patterns in software design.

SECJ3603   Knowledge-Based & Expert Systems
Pre-requisite: SECJ3533 Artificial Intelligence

This course is designed to expose the students to knowledge-based system that requires expert knowledge in the system development. It emphasizes the theory, concepts and important components in expert system. The students will be introduced the difference between expert system and conventional systems. Students will be experience developing an application using any expert system tools with appropriate methodologies. Having some skill in AI programming, but not essential, is an advantage in the development of the system prototype. The students are expected to be able to work in a team and adhere to professional ethics.

SECJ3343   Software Quality Assurance

The content of the course discusses the Software Quality issues much beyond the classic boundaries of custom-made software development by large established software houses. It dedicates significant attention to the other software development and maintenance environment that reflect the current state of industry. This course is designed to provide students with in depth knowledge on software testing and its test process. The course covers the basic principles of software testing and test activities that include the test plan, test design, monitoring, implementation and test closure. The students will also learn various categories of test design techniques and methods used in both black-box and white-box testing. At the end of this course, students should be able to recognize various types and levels of testing as well as categorizing and applying software testing process and techniques.

SECJ3563   Computational Intelligence
Pre-requisite: SECJ3553 Artificial Intelligence

The aim of this course is to expose the students to current methods and algorithms utilized in area of computational intelligence. The methods include knowledge representation of vague data and inferences using fuzzy logic, learning using neural network and searching using evolutionary algorithms. Students will be equipped with the theories and the necessary skills to model the domain problems suited to the associated techniques or algorithms. This

course will cover the topics on fuzzy logic, neural network and evolutionary algorithms. Hands-on class on how to apply the techniques in solving non-linear problems is also introduced. Conducting a paper review of related journals will expose the students to appreciate the contributions of CI- related techniques in solving real-world problems besides developing academic research writing skill.

SECJ3623   Mobile Application Programming
Pre-requisite: SECJ2154 Object-Oriented Programming
This course is concerned with the development of application for mobile and wireless handheld devices such as personal digital assistants (PDA) and mobile phones. These mobile applications are either native/installation-based, or web applications delivered over HTTP. In this course, the emphasis is placed on the processes, tools and frameworks required to develop applications for current and emerging mobile computing devices. A current and dominant technology will be selected as a basis for teaching programming techniques and design patterns related to the development of these standalone applications and mobile portals to enterprise and m-commerce systems. Students will work at all stages of the software development life- cycle from inception through to implementation and testing. In doing so, students will be required to consider the impact of user characteristics, device capabilities, networking infrastructure and deployment environment, in order to develop software for the targeted mobile environment.

SECJ3403   Special Topic in Software Engineering
This course provides students with current issues related to software engineering in general and specifically in software development life cycle that includes planning, analysis, design, implementation, and maintenance. The key objective of this course is to equip the students with the knowledge in current issues mainly the research done to solve related problems. Based on the given topic in current research, the students should argue and think critically what could be other alternatives besides the current solutions.

SECJ3483 Web Technology
Pre-requisite: SECJ2154 Object Oriented Programming SECV2223 Web Programming
The content of the course is divided into 2 main parts. The first is on the state of the art of web technology (Web2.0 and Web3.0). The student will be introduced to various topics such as web services, frontend web application, world wide web data (JSON), mobile technologies, social network, collaborative content management and semantic web. The second part is on the technologies/API and actual development on the next evolution of web application - the frontend web application. The students will be introduced to various related APIs and technologies for the development of frontend web and hybrid mobile application. Javascript as the main development language. jQuery as the library for managing frontend view. Bootstrap and framework7 for responsive CSS. AJAX and JSON for communicating and data transfer to the backend. PHP Slim framework for the RESTFul backend API development. Finally, Phonegap/Cordova as compiler for compiling Javascript frontend web application into hybrid mobile app.

SECJ4383   Software Construction
Pre-requisite: SECJ2203 Software Engineering
This course provides students with two main phases in software development life cycle that are software construction and evolution. The knowledge subareas for software construction include software construction fundamentals, managing construction, practical considerations. In addition, the knowledge subareas for software evolution or maintenance include software maintenance fundamentals, key issues in software maintenance, maintenance process, and techniques for software maintenance. The key objective of this course is to equip the students with the skills to manage software construction towards maintainable software that is easy to maintain in future.

SECJ4423   Real-Time Software Engineering
Pre-requisite: SECJ2203 Software Engineering

This course equips the students with knowledge in embedded real-time systems and real-time software development particularly on how software engineering approaches assist real-time software development. The knowledge unit for this course area emphasize the following topics; real-time concepts, embedded real-time development methodologies, real-time operating systems, embedded real-time hardware fundamental and real-time analysis. The objective of this course is to introduce students with key software engineering practices in real-time software development and give practical experience to the students in developing embedded real-time software using appropriate software methods and tools.

SECJ4463   Agent-Oriented Software Engineering
Pre-requisite: SECJ 2203 Software Engineering
SECJ2154 Object Oriented Programming

The course begins with an overview of the software agent multiagent system (MAS). Then we focus on agent system architecture and infrastructure from a software engineering viewpoint, including requirements for agent-based systems, modelling and design of agent-based systems, development process for agent-based systems. Topics such as agent architecture, agent communication language and knowledge sharing, agent coordination and belief desire intention for agent modelling are discussed. Java Agent Development Framework (JADE) is used for development and will be in line with the material presented. GAIA will be used as framework for the design of the MAS requirement specification. For managing knowledge for the agent, Java rule agent (JSR94) will be introduced.

MJIIT
GENERAL
COURSES

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ACADEMIC GUIDELINES 2022/2023

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 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.

SMJM 2033   Engineering Mathematics III
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.

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

UMJT 2142   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 credits.

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

UHLJ 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.

SHLJ 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.

SHLJ 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

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Malaysia-Japan
International
Institute of Technology
(MJIIT)

UNDERGRADUATE(UG)
ACADEMIC GUIDELINES 2022/2023

GENERAL COURSES

Undergraduates are required to register for the university and MJIIT general courses during their study. The courses are categorized as follow:

Cluster	University General Courses	Total Credit
1	Appreciation of Ethics and Civilizations (ULRS 1022 & ULRS 1182 – Local) (ULRS 1022/ULRS 1182 & UHLM 1012 – International)	4
2	Soft Skills (ULRS 1012 & UMJT 2142)	4
3	Service Learning & Community Engagement Courses (ULRF 2XX2)	2
4	Language Skills – English Language (UHLB 1112*, UHLB 2122, UHLB 3132)	6
5	Entrepreneurship & Innovation (ULRS 1032)	2
	TOTAL	**18**
Cluster	**MJIIT General Courses**	**Total Credit**
5	Language Skills - Japanese Language (UHLJ 1122, SHLJ 2252 & SHLJ 2352)	6
	TOTAL	**24**

*Credit exemption for MUET above band 4

NEW MODEL OF GENERAL COURSES FOR UTM UNDERGRADUATE PROGRAM
16 Credits

MALAYSIA CORE VALUE	VALUE & IDENTITY	GLOBAL CITIZEN	COMMUNICATION SKILLS	ENTREPRISING SKILLS
4 CREDITS	2 CREDITS	2 CREDITS	6 CREDITS	2 CREDITS
LOCAL STUDENTS • UHIS1022 Philosophy and Current Issues • UHMS1182 Appreciation of Ethics and Civilisations **INTERNATIONAL STUDENTS** • UHIS1022 Philosophy and Current Issues **OR** • UHMS1182 Appreciation of Ethics and Civilisations **AND** • UHLM1012 Malay Language for Communication 2	ULRS1012 Value and Identity	ULRF2XX2 Service Learning & Community Engagement Courses	• UHLB 2122 Professional Communication Skills 1 **AND** • UHLB 3132 Professional Communication Skills 2 **AND** • UHLX 1112 Foreign Language for Communication	ULRS1032 Entrepreneurship & Innovation

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

For local students

● **ULRS 1022   Philosophy and Current Issue**
This course encapsulates philosophical relation to National Education Philosophy and the Rukun Negara. The use of philosophy as a tool to purify the culture of thought in life through the arts and methods of thinking and human concepts. The main topics in philosophy, namely epistemology, metaphysics and ethics, are discussed in the context of current issues. Emphasis is given to philosophy as a basis for intercultural dialogue and to foster universal values. At the end of the course, students should be able to view the disciplines of knowledge as a whole and interdependent body of knowledge.

● **ULRS 1182   Appreciation of Ethics and Civilizations**
This course explains the ethical concepts from the perspective of different civilizations. The course also aims to identify system, the level of development, advancement and culture in strengthening social cohesion. Besides, discussion on the contemporary issues in the aspects of economy, politic, social, culture and environment from an ethical and civilization perspectives can produce students who are morally and professionally.

For International students

● **ULRS 1022　Philosophy and Current Issue**
This course encapsulates philosophical relation to National Education Philosophy and the Rukun Negara. The use of philosophy as a tool to purify the culture of thought in life through the arts and methods of thinking and human concepts. The main topics in philosophy, namely epistemology, metaphysics and ethics, are discussed in the context of current issues. Emphasis is given to philosophy as a basis for intercultural dialogue and to foster universal values. At the end of the course, students should be able to view the disciplines of knowledge as a whole and interdependent body of knowledge.

OR

● **ULRS 1182　Appreciation of Ethics and Civilization**
This course explains the ethical concepts from the perspective of different civilizations. The course also aims to identify system, the level of development, advancement and culture in strengthening social cohesion. Besides, discussion on the contemporary issues in the aspects of economy, politic, social, culture and environment from an ethical and civilization perspectives can produce students who are morally and professionally.

AND

● **UHLM 1012　Malay Language for Communication 2**
This course aims to train students to communicate in basic Malay in everyday life. Students will be exposed to spoken and written English language easily. Students will be exposed to basic Malay spoken and written. At the end of the course, students are expected to be able to communicate and write simple sentences effectively.

CLUSTER 2: SOFT SKILLS (4 CREDIT)

- **ULRS 1012   Value and Identity**

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.

- **UMJT 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)

- **UHIT 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, ULRF 2**2 (2 CREDIT)

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

1) The total number of credits for the Bachelor's 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 program.

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 in on developing basic skills in reading, writing, listening and speaking using science and technology materials.

ENGLISH COMPULSORY COURSES
● UHLB 1112   English Communication Skills
This course emphasizes the four language skills. It focuses on developing students' productive and receptive skills through student-centered 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.

- **UHLB 2122   Academic Communication 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.

- **UHLB 3132   Professional Communication Skills**

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.

- **UHLJ 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.

- **SHLJ 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.

- **SHLJ 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.

CLUSTER 6: ENTREPRENEURSHIP (2 CREDIT)

● **ULRS 1032 Entrepreneurship & Innovation**

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) analyzing business opportunities and forming an entrepreneurial venture, and (c) developing a business model for the new venture idea.

SEMESTER SYSTEMS AND GUIDELINES

Academic Advisory System

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 MJIIT

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**

2	**S**	**MJ**	**E**
2nd 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 below. The University also offers a short semester between the Academic Year. The short semester is not included in the total number of semesters.

Academic Year*

Without Short Semester

Orientation Week	1 week
(Before the beginning of the academic year)	
SEMESTER I	
Lectures	7 weeks
Mid Semester Break	1 week
Lectures	7 weeks
Study Break	1 week
Final Examinations	3 weeks
Total	**19 weeks**
End of Semester Break	4 weeks

With Short Semester

Orientation Week	1 week
(Before the beginning of the academic year)	
SEMESTER I	
Lectures	7 weeks
Mid Semester Break	1 week
Lectures	7 weeks
Study Break	1 week
Final Examinations	3 weeks
Total	**19 weeks**
End of Semester Break	4 weeks

Without Short Semester	With Short Semester

Without Short Semester

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

With Short Semester

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

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 MJIIT.

(v)   Students are responsible to amend any error in the course registration slip within the stipulated period.

(vi)   Registration of *HS* Course (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.

(vi) 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 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:

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

Vertical Credit Transfer

(i)   Vertical credit transfer can be given to students who have diplomas and degree recognized by the Senate.

(ii) The limit of vertical credit transfer that may be granted cannot exceed 30% (or according to the percentage set by the relevant Professional Bodies) of the total number of credits required for the award of a degree

(iii) Applications for vertical credit transfer should be made when applying for the programme.

(iv) Only courses with a minimum grade C can be considered for vertical credit transfer. The Faculty may specify a higher minimum grade (if necessary).

(v)   Students are not allowed to register for a course that has been granted a vertical credit transfer. If students still register, it will be cancelled.

(vi) Vertical credit transfer is not allowed from a higher level to a lower level programme.

(vii) Vertical credit transfer is not allowed for any course in minor programme.

(viii) Vertical credit transfer will be re-evaluated if there is a change in a student's programme.

Vertical Credit Transfer Guidelines

(i) Vertical Credit Transfer refers to the exemption of credit during application process based on the student's achievement in a related course. It is an exemption for some of the credit requirements for graduation based on the current qualification (diploma, degree or experience) endorsed by the government

(ii) No Vertical Credit Transfer is allowed for programmes which have been undertaken and have obtained a degree in the same field and level from other Institute of Higher Learning (IHLs).

(iii) Application for Vertical Credit Transfer must be made to the student's faculty during the application for the programme.

Horizontal Credit Transfer

(i)   Students who are taking courses through student mobility programme at other IHLs recognised by the Senate can apply for Horizontal Credit Transfer.

(ii) The course that is given the horizontal credit transfer is a course that has been approved by the Faculty before the students join the mobility programme.

(iii) There is no limit to horizontal credit transfer between programmes within the University.

(iv) Students from other IHLs in Good Status (KB) may be considered for horizontal credit transfer at the University

(v)   The limit of horizontal credit transfer allowed from other IHLs is not more than 50% of the total credit for graduation

(vi) Horizontal credit transfer will be re-evaluated if there is a change in a student's programme.

(vii) Students are required to register all the courses to be transferred during the current semester.

(viii) Students should inform the Faculty of the grade obtained for all of the courses they enroll in as soon as they receive the results from the IHL.

(ix) For the same programme, horizontal credit transfer can be considered for Good Status (KB) students who withdraw from study. This is subject to a period not exceeding three (3) years from the date of withdrawal. The original record of the student is retained and the number of semester that can be used is the balance of the predetermined number of semesters. This process can only take place once during the course of study for the programme.

(x)   As per Item (ix), for a different programme, the number of semesters that can be used is subject to the amount of approved horizontal credit transfer as shown in Table below.

Total No. of Vertical Credit Transfer	Maximum Duration (Semester)
<20	(1.5 x regular duration) – 0
20 - 33	(1.5 x regular duration) – 1
34 - 50	(1.5 x regular duration) – 2
51 – 60	(1.5 x regular duration) – 3

(xi)   Students who opt to use horizontal credit transfer facility must fulfill the period of residence of at least TWO (2) regular semesters at the University.

(xii)   Students may apply for a horizontal credit transfer through APEL(C) without bringing a grade. The maximum credit is subject to 30% of the total credit for graduation

(xiii)   Students may apply for horizontal credit transfer for MOOC courses provided that they pass a qualification test set by the University for the course. The maximum number of credits is subject to 30% of the total credit for graduation.

Horizontal Credit Transfer Guidelines

(i)   Horizontal Credit Transfer refers to the transfer of credit to a student who graduated in an equivalent course at any IHL during his study at the University. The courses applied for the Horizontal Credit Transfer should be equivalent to and has to meet the curriculum requirements of the programme being studied.

(ii)   Approved Horizontal Credit Transfer will be taken into account in the calculation of student's GPA and CGPA.

(iii)   Students are not allowed to spend their final semester at other IHL using the Horizontal Credit Transfer facility unless they obtain consent from the Senate.

(iv)   Only students with an active registration status are eligible to opt for the Horizontal Credit Tranfer.

(v)   Application to enroll in a course to obtain Horizontal Credit Transfer from other IHLs should be made within ONE (1) ACADEMIC REGULATIONS [60] semester before the student can participate in the mobility programme.

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 the table below:

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 below:

Academic CGPA

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

With approval from the Senate, a student who obtains a GPA < 1.00, but maintains a 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
UHLB 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
	16				**59.34**

Total Credit Counted (TCC) = 16

Total Grade Points (TGP) = 59.34

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

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
UHLB 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
	16				**61.67**

Total Credit Counted (TCC) for Semester 2   = 16
Total Grade Point (TGP) for Semester 2   = 61.67
GPA for Semester 2   = $\dfrac{61.67}{16}$ = 3.85

CGPA for semester 2   = $\dfrac{59.34+61.67}{16+16}$ = 3.78

Award and Recognition

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 3.67 and above will be awarded a Dean's List Certificate, provided that he/she has registered for at least 12 credits for that semester excluding courses with HS and HW status. The remark "Dean's List" will be printed on the student's transcript.

Marzuki Khalid Award

This award is bestowed annually to the best MJIIT graduates having high achievement in academic and co-curricular activities who obtained First Class Honours Degree. The award includes RM1000.00 and a certificate.

STUDENT'S AFFAIRS

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Malaysia-Japan
International
Institute of Technology
(MJIIT)

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 contact International Office at 0321805199 / isckl@utm.my or walk in to their office at Level 8 Menara Razak UTMKL for inquiry / further information.

2) MJIIT LIBRARY

Operation Hours

Mon-Fri 8.00am - 5.00pm
Closed on Public Holidays

Located at MJIIT Level 2.
You are able to borrow material from MJIIT Library using your student card.

3) UTM LIBRARY KUALA LUMPUR

Operation Hours

Mon-Fri 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 03-2615 4301 or email at lib-enquirykl@utm.my

4) STUDENT ACCOMODATION

UTM Kuala Lumpur provides residential colleges that can accommodate up to 2800 students in one academic session. These colleges are located at areas namely Kediaman Siswa Jaya. Kolej Siswa Jaya, the student's residential accommodation, located at Jalan Rejang, Setapak approximately 2 km from UTM Kuala Lumpur. For information, please email to aishah.kl@utm.my.

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

Positioned in the heart of Kuala Lumpur, sits The Regency Scholars Hotel approximately 1km from the iconic Petronas Twin Tower. For reservation, please contact 03-2733 3320 6000, or email to theregencyscholarshotel@gmail.com.

- **RESIDENSI UTM KL**

Apartment are available for students with family members. For reservation, please contact 03-2615 4922/ 03-2715 6517, or email to admin.residensiutmkl@utm.my.

5) 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). Clinic in campus operates during office hour for weekdays. After office hours and public holiday, we will be operating via on call mode in the residential area (KSJ). Please be free to call for emergency and appointment with the Doctors as below:

Offices: 03-26154457
Service: 03-26154905

6) 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 7.20 am in the morning until 10.30 pm depends on the needs of the students and its' travels from Kolej Siswa Jaya (KSJ) to UTM Kuala Lumpur every 30 minutes.

The bus services also not only thru-forth the campus but also including the student activities. If the students want to book the buses, they may fill the form that is provided in Student Affairs Office (HEP) and ask for approval.

7) EMERGENCY CALLS

Emergencies

Police/Ambulance	999
Civil Defense	999
Fire & Rescue	999
To Call from any Hand phones	999 / 112

STUDENTS' DRESS CODE

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Malaysia-Japan
International
Institute of Technology
(MJIIT)

UNDERGRADUATE(UG)
ACADEMIC GUIDELINES 2022/2023

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.

TATACARA BERPAKAIAN PELAJAR UTM

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Semua pelajar **DIWAJIBKAN MEMAKAI KAD MATRIK/PINTAR** semasa berada di dalam kawasan kampus termasuk semasa berada di premis yang dimiliki oleh universiti. Kad matrik/pintar **MESTILAH DIPAKAI** dan **DIPAMERKAN** di bahagian hadapan paras dada.

SITUASI	PAKAIAN YANG DIBENARKAN
Semasa menghadiri kuliah, melakukan urusan rasmi atau kegiatan lain di Sekolah/ Fakulti/ Kolej/ Bahagian Pentadbiran dan di mana sahaja di khalayak ramai dalam Kampus Pelajar diwajibkan berpakaian sopan: baju kemeja, baju t-berkolar, berkasut, berseluar panjang, berskirt panjang di bawah paras lutut.	
Semasa menghadiri majlis rasmi universiti Pelajar lelaki diwajibkan berpakaian kemas seperti berkemeja lengan panjang, bertali leher dan berseluar panjang (bukan *jeans*), berkasut kulit atau berpakaian kebangsaan lengkap. Pelajar perempuan diwajibkan berpakaian sopan seperti berbaju kurung atau seperti berskirt labuh di bawah paras lutut atau berseluar panjang dan longgar (tidak sendat/ketat).	
Semasa menjalankan aktiviti makmal, sukan dan kebudayaan Pelajar hendaklah mematuhi amalan pakaian dan peraturan yang dikuatkuasakan.	

PERINGATAN: Pelajar yang Didapati Ingkar, Boleh Dikenakan Amaran atau Denda Tidak Melebihi RM50.00 (Kesalahan Pertama) atau Dihadapkan kepada Jawatankuasa Tatatertib Pelajar bagi Kesalahan Berulang.

Maklumat lengkap boleh dirujuk dalam Buku Peraturan Mahasiswa UTM
Diluluskan dalam Mesyuarat Jawatankuasa Pengurusan UTM Bil. 18/2020 bertarikh 10 Ogos 2020.

GENERAL STUDENTS ACTIVITIES

UTM
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MJIIT 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
- First Year Experience - Regular meeting with academician/MJIIT staff (on beginning and end of semester) - Student body - Exchanged student program Malaysia- Japan - EIMARace - Social responsibility (USR) - MJIIT entrepreneurship - Industrial visit - Sport Day - Open Day - JENESYS Program - Roboccon - Global Mobility Programme (GMP)	- Skill Workshop - Global Outreach programme (GOP) - Club to critical subjects - Language - Specialty - Skills - Special to Third year (service learning) - Varsity Boat race	- Become student member - Institution of Engineers Malaysia - Malaysian Society for Engineering and Technology - Autodesk training - CSWIP (non-destructive test) - CIDB (Green Card)

GENERAL INFORMATION ABOUT MALAYSIA

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UNIVERSITI TEKNOLOGI MALAYSIA

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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^2 (94 sq mi), has a population of 8.2 million as of 2021. 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 USD24) 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 https://www.taxi2airport.com.

Another convenient way is to try the ride on the Express Rail Link or ERL from KLIA to KL Sentral. The journey takes 35 minutes and cost RM55 (USD14). 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=RM4.18, or Yen 100=RM3.70

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

TELEPHONES

The international dialing code is "00" to be followed by the respective country code. For Malaysia, the country code is "60".

THE KUALA LUMPUR TRAIN NETWORK

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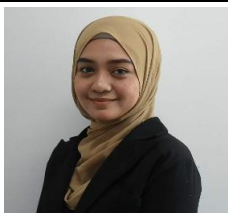Phone: +603-2203 1518
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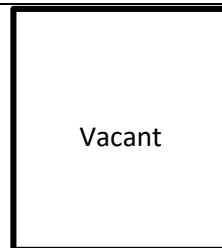Phone: +603-2203 1213
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UNDERGRADUATE
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