

UNDERGRADUATE HANDBOOK

Academic Session : **2023/2024**

Prepared by :
**Faculty of Informatics and
Computing**



Faculty of Informatics and Computing, Universiti Sultan Zainal
Abidin, Kampus Besut • 2023

© Copyright Faculty of Informatics and Computing, 2023

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical including photocopy, recording or any information storage and retrieval system, without written permission from the Faculty of Informatics and Computing, Universiti Sultan Zainal Abidin.

Published in Malaysia by
FACULTY OF INFORMATICS AND COMPUTING
UNIVERSITI SULTAN ZAINAL ABIDIN
Kampus Besut
22200 Besut
Terengganu Darul Iman, MALAYSIA.
<https://www.fik.unisza.edu.my>

CONTENTS

| | |
|---|-------|
| Foreword by The Vice Chancellor | 4 |
| Foreword by The Dean | 5 |
| Academic Calendar Bachelor & Diploma Programmes Session 2023/2024 | 6-7 |
| Universiti Sultan Zainal Abidin at a Glance | 8 |
| UniSZA's Vision, Mission, Core Values, Niche and Motto | 9 |
| University Authorities and Officers | 10-12 |
| Background of the Faculty | 13 |
| Vision, Mission and Objectives of The Faculty | 14 |
| Faculty Management | 15-16 |
| Academic Members of Faculty | 17-21 |
| Undergraduates Programmes | |
| List of Undergraduates Programmes | 22 |
| Programmes Entry Requirements | |
| Diploma in Computer Science (DCS) | 23 |
| Diploma in Information Technology (DIT) | 23 |
| Bachelor of Computer Science (Software Development) with Honours (BCS-SD) | 24-25 |
| Bachelor of Computer Science (Computer Network Security) with Honours | 24-25 |
| Bachelor of Computer Science (Internet Computing) with Honours | 24-25 |
| Bachelor of Information Technology (Informatics Media) with Honours | 26 |
| Undergraduate Programmes of Study | |
| Bachelor of Computer Science (Software Development) with Honours (BCS-SD) | 27 |
| Bachelor of Computer Science (Computer Network Security) with Honours (BCS-CNS) | 34 |
| Bachelor of Computer Science (Internet Computing) with Honours (BCS-IC) | 40 |
| Bachelor of Information Technology (Informatics Media) with Honours (BIT-MI) | 46 |
| Diploma in Computer Science (DCS) | 53 |
| Diploma in Information Technology (DIT) | 58 |
| Course Synopsis Bachelor | 63-77 |
| Course Synopsis Diploma | 78 |
| Marking Scheme | 90 |
| Undergraduate Handbook Committee | 91 |

Foreword by The Vice Chancellor



Assalamualaikum Warahmatullahi wa Barakatuh, greetings.

I would like to welcome and congratulate all students who were chosen to study in UniSZA. Indeed, your presence in UniSZA is the right step to equip and prepare yourself as talented individuals who are knowledgeable, skilled, as well as possess good character and admirable leadership qualities for the sake of our religion, race and country.

Education in the 21st century is about embracing digital technology. With technology constantly evolving, this is no easy task. Educators, in particular, have to keep up with not only the latest developments in their field but new teaching methods as we seek to equip future generations of Malaysians with technical, creative and communication skills.

I would like to begin by expressing my utmost gratitude to the Almighty for His divine mercy and His grace, this handbook is able to be published.

The main objective of this handbook is as a reference material for students to understand and be familiar with the faculty, academic system and programs offered. You are going through an introduction phase to the academic world.

Finally, congratulations to all parties who worked together to complete the publication of this Undergraduate Handbook. All efforts put into this should be an example to be followed by all staff and students of UniSZA in line with the process of realizing Knowledge for the Benefit of Humanity.

Thank you.

Professor Dato' Dr. Fadzli Bin Adam

Vice Chancellor

Universiti Sultan Zainal Abidin

Foreword by The Dean



May peace, mercy, and blessings of Allah, God the Almighty, be upon you. We offer our highest gratitude and praise to Allah, the Almighty. It is with great pleasure that we extend our heartfelt congratulations to all students who have chosen to pursue their educational journey at UniSZA, seeking a platform to acquire knowledge.

In accordance with the University of Sultan Zainal Abidin's (UniSZA) ambitious mission of attaining a prestigious worldwide status, our staff maintains a steadfast dedication to fostering students who exhibit exceptional academic achievements and admirable personal qualities.

Our faculty stands ready to support and create an environment conducive to learning, ensuring that every student can strive for academic excellence and develop commendable traits. As you embark on this educational journey, remember that excellence and expertise in your chosen field can only be achieved through unwavering dedication and clear objectives.

Therefore, it is essential to begin planning and devising effective strategies to attain remarkable success, not just for your own growth but for the betterment of our faith, nation, and country. We sincerely hope that each of you will harness the available opportunities to the fullest as esteemed members of the Faculty of Informatics and Computing.

May your learning journey be joyful and rewarding, and may success accompany you in all your endeavours. May peace be with you all.

Prof. Madya Ts. Dr. Mohd Khalid bin Awang

Dean, Faculty of Informatics and Computing
Universiti Sultan Zainal Abidin

Academic Calendar Bachelor & Diploma Programmes Session 2023/2024

SHORT SEMESTER (1) FOR DIPLOMA NEW COHORT AND SPECIAL SEMESTER FOR BACHELOR

| PROGRAM | DURATION | DATE | PUBLIC HOLIDAYS |
|---|----------|-------------------------------|---------------------------------------|
| REGISTRATION FOR NEW STUDENTS DIPLOMA PROGRAMME | 5 days | 23 – 27 July 2023 | |
| MINGGU MESRA SISWA | | | |
| LECTURE WEEKS | 7 weeks | 30 July – 14 September 2023 | 31 August 2023 – National Day |
| REVISION | 3 days | 15 – 17 September 2023 | 16 – 17 September 2023 – Malaysia Day |
| FINAL EXAMINATION | 4 days | 18 – 21 September 2023 | |
| SEMESTER BREAK | 16 Days | 24 September – 7 October 2023 | 28 September 2023 – Maulidur Rasul |

BACHELOR AND DIPLOMA NEW COHORT SEMESTER I

| PROGRAM | DURATION | DATE | PUBLIC HOLIDAYS |
|--|----------|-----------------------------------|---|
| REGISTRATION FOR NEW STUDENTS BACHELOR PROGRAMME | 9 days | 1 – 5 October 2023 | |
| MINGGU MESRA SISWA | | | |
| LECTURE WEEKS | 7 weeks | 8 October – 23 November 2023 | 12 November 2023 – Deepavali |
| MID SEMESTER BREAK | 9 Days | 24 November – 2 December 2023 | |
| LECTURE WEEKS | 7 weeks | 3 December 2023 – 18 January 2024 | 25 December 2023 - Christmas |
| REVISION | 9 Days | 19 – 27 January 2024 | |
| FINAL EXAMINATION | 18 Days | 28 January – 22 February 2024 | <ul style="list-style-type: none"> 8 February 2024 – Isra Mikraj 10 & 11 February 2024 – Chinese New Year |
| SEMESTER BREAK | 15 Days | 23 February – 8 Mac 2024 | 4 Mac 2024 – Coronation of Sultan Terengganu |

SEMESTER II

| PROGRAM | DURATION | DATE | PUBLIC HOLIDAYS |
|--------------------|----------|--------------------------|---|
| LECTURE WEEKS | 7 weeks | 9 Mac – 29 April 2024 | <ul style="list-style-type: none"> • 28 Mac 2024 – Nuzul Quran • 10 – 11 April 2024 – Aidilfitri • 26 April 2024 – Birthday of Sultan Terengganu |
| MID SEMESTER BREAK | 5 Days | 30 April – 4 May 2024 | 1 May 2024 – Labor Day |
| LECTURE WEEKS | 7 weeks | 5 May – 25 June 2024 | <ul style="list-style-type: none"> • 22 May 2024 – Wesak Day • 3 June 2024 – YDP Agong Birthday • 16 June 2024 – Arafah Day • 17 – 18 June 2024 - Aidiladha |
| REVISION | 4 Days | 26 – 29 June 2024 | |
| FINAL EXAMINATION | 18 Days | 30 June – 25 July 2024 | 7 July 2024 – Awal Muharram |
| SEMESTER BREAK | | 26 July – October 2024** | |

*Subject to change

Universiti Sultan Zainal Abidin at a Glance

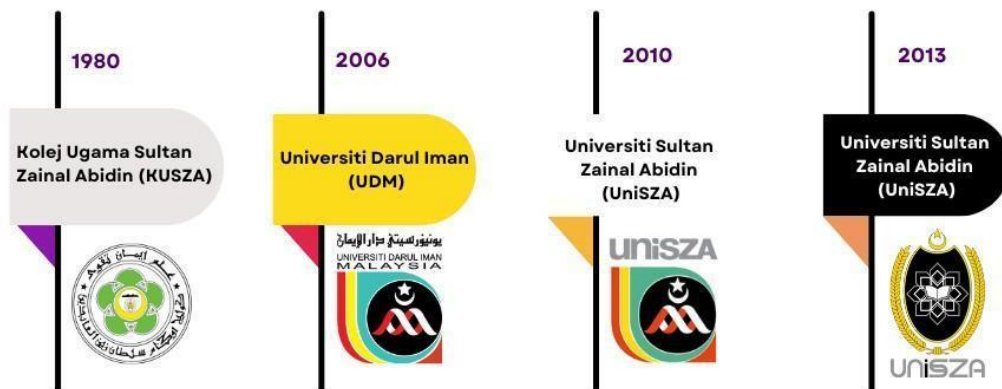
Universiti Sultan Zainal Abidin (UniSZA) started as Kolej Ugama Sultan Zainal Abidin (KUSZA). KUSZA commenced operation on 1 January 1980 at Batu Burok before moving to Hajah Wook Building in Pulau Kambing in 1981.

KUSZA was upgraded to a university status and became Universiti Darul Iman (UDM). UDM underwent a rebranding process on 14 May 2010 and became known as Universiti Sultan Zainal Abidin (UniSZA). The name of the late Sultan Zainal Abidin III Muazzam Shah ibni Almarhum Sultan Ahmad Muazzam Shah II, Sultan The 11th Terengganu is adopted to honour the services of His Majesty in spreading knowledge and religion in the state of Terengganu.

On November 29, 2013, a new UniSZA logo was introduced. UniSZA currently operates in three campuses, namely the Gong Badak Campus (Kuala Nerus) as the main campus, Medical Campus (Kuala Terengganu) and Besut Campus as well as operating a satellite office in Putrajaya.



HISTORY OF UniSZA



UniSZA's Vision, Mission, Basic Values, Niche and Motto

VISION

Contemporary Integrated Islamic University (CIIU)

MISSION

To produce holistic individuals with Naseem values through educational excellence and high impact research towards empowering society

CORE VALUES

i. Knowledge

An action oriented maverick who conducts research led teaching armed with contemporary knowledge to solve current and relevant issues which lead to commercialization.

ii. Faith & Akhlak

A visionary and value oriented person of high moral standing.

iii. Deeds

An accountable and transparent individual who cares and contributes to society.

iv. Leadership

A dynamic pragmatic leader who is bold enough to make a difference and manages from the heart.

v. Collaboration

A team player with excellent communication and global networking skills.

vi. Entrepreneurship

A persistent and successful entrepreneur.

vii. Transformation

An individual who embraces culture and is armed with a transformational mindset leading to autonomy and financial independence.

viii. Innovation

An individual who embraces creative thinking, leveraging on digital and disruptive technology.

NICHE

Human Civilizational, medicinal, accuracy, science technology., management and techno-entrepreneurship

MOTTO

Knowledge for the Benefit of Humanity

University Authorities and Officers

CHANCELLOR

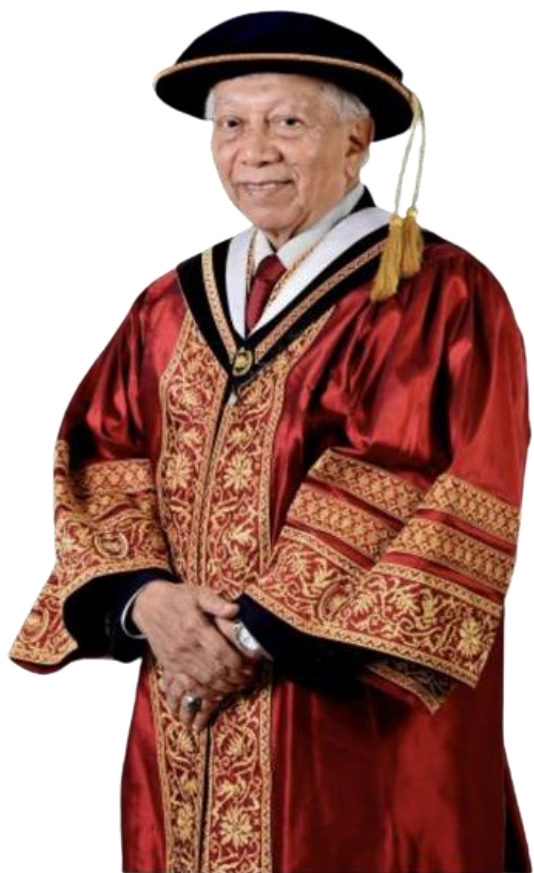
KEBAWAH DULI YANG MAHA MULIA SULTANAH TERENGGANU SULTANAH NUR ZAHIRAH

D.M.N., D.K.(Terengganu), S.S.M.Z., S.S.M.T.(Terengganu),

Knight Grand Cross (First Class) of the Most Illustrious Order of Chula Com Klao (Thailand)



PRO CHANCELLOR
YBHG TAN SRI DATO' DR. MOHAMAD YUSOF BIN HAJI MOHAMED NOR
P.S.M., S.P.M.T., D.S.S.A., J.M.N., P.P.T.



**PRO CHANCELLOR
Y.M. TUNKU DATUK NOORUDDIN TUNKU DATO' SERI SHAHABUDDIN**

P.S.D



Background of the Faculty

On 1st June 1997, KUSZA Information Technology Centre (KITC) was officially established in Sultan Zainal Abidin Religious College (KUSZA). The academic programmes related to the field of Information and Communication Technology (ICT) conducted at the time include:

- a. Certificate in Information Technology
- b. Certificate in Multimedia Technology
- c. Certificate in Computer Programming
- d. Diploma in Information Technology
- e. Diploma in Information Technology (Multimedia)
- f. Bachelor of Information Technology (Collaboration with Universiti Malaya)
- g. Bachelor of Science in Business Information Systems (Collaboration with the University of East London)

Then, in June 2006, the KITC was upgraded as Faculty of Informatics (FIT) to be registered under Universiti Darul Iman Malaysia (UDM). UDM was officially established by the Ministry of Higher Education Malaysia as the 18th public university of Malaysia. Later in May 2010, UDM was recognized as Universiti Sultan Zainal Abidin (UniSZA). FIT was then renamed to Faculty of Informatics and Computing (FIK).

FIK is now headed by a Dean, assisted by three Deputy Deans and three Heads of School. There are three centres of study in the FIK; Computer Science, Information Technology, and Multimedia. The core activities of the faculty consist of teaching and learning, research and development, consultation and community service. The faculty has a total of 55 lecturers and 16 supporting staff.

As of 2022, more than 2,236 graduates have been produced by the Faculty of Informatics and Computing. Currently, the faculty offers 12 academic programmes including 6 undergraduate programmes and 6 (six) postgraduate programmes.

Vision, Mission, and Objectives of the Faculty

Vision

Leading Informatics through University's Vision in Education and Research

Mission

Committed to Being a Global Institution in Developing Informatics Specialists for Holistic Empowerment

Objectives

1. To offer academic programmes that is aligned to human capital needs to realise the country's aspiration.
2. To produce graduates who have integrity and characteristics of a quality leader and who are competitive and competent.
3. To implement high quality research and innovation that benefit the local community and country.
4. To adopt effective governance and professional management of academic and research development.
5. To provide quality infrastructure and info-structure to support service milestones.

Faculty Management



Dean

Assoc. Prof. Ts. Dr. Mohd Khalid Awang



Deputy Dean (Academic and Postgraduate)

Dr. Wan Suryani Wan Awang



Deputy Dean (Research and Development)

Assoc. Prof. Dr. Mohamad Afendee Mohamed



Deputy Dean (Student Affairs and Alumni)

Dr. Wan Mohd Rizhan Wan Idris



Head of Information Technology School

Dr. Siti Sabariah Abas



Head of Multimedia School

Dr. Elissa Nadia Madi



Head of Computer Science School

Dr. Julaily Aida Jusoh



Coordinator of Postgraduate Programme

Dr. Wan Nor Shuhadah Wan Nik



Head of UniSZA Digital Hub

Dr. Wan Mohd Amir Fazamin Wan Hamzah



Coordinator of Quality Assurance and E-Learning

Assoc. Prof. Dr. Zahrahtul Amani Zakaria



Coordinator of Industry – Academia and Entrepreneurship

Dr. Raja Hasyifah Raja Bongsu



Coordinator of Academic Programme (MSc & PhD Math, MSc Statistic)

Assoc. Prof. Dr. Nurnadiah Zamri



Coordinator of Academic Programme (MSc. & PhD Comp. Science, MIT-IP)

Dr. Abd. Rasid Mamat



**Coordinator of Academic Programme
(BCS-CNS & BCS-IC)**
Dr. Muhammad Danial Zakaria



**Coordinator of Academic Programme
(DCS & BCS-SD)**
Norlina Udin @ Kamarudin



**Coordinator of Academic
Programme (DIT & BIT-MI)**
Maizan Mat Amin



Coordinator of Internalisation
Dr. Azim Zaliha Abd Aziz



**Assistant Registrar
(Administration)**
Nora Ismail



**Assistant Registrar
(Academic)**
Latifah Ilyana Ibrahim

Academic Members of Faculty

Centre of Computer Sciences Studies

Professor

Shukor Abdul Razak

PhD (University of Plymouth, UK), BSc (UTM)

Mohd Nordin Abdul Rahman

PhD (UMT), MSc, BIT (UKM)

Mokhairi Makhtar

PhD (Univ. of Bradford, UK), MIT (UKM), BIT (UKM), Dip. IT(KUSZA)

Associate Professor

Zarina Mohamad

PhD (UTHM), MSc (UMT), BSc (UPM), Dip. Comp. Sc (UiTM)

Mohamad Afendee Mohamed

PhD (UPM), MSc (Glamorgan Univ), BSc (UMIST)

Syarilla Iryani Ahmad Sany

PhD (UPM), MIT (UKM), BSc (California State Univ)

Mohd Khalid Awang

PhD (UniSZA), MSc (UUM), BSc (IU Bloomington)

Mumtazimah Mohamad

PhD (UMT), MSc (UPM), BSc (UKM), Dip. IT (KUSZA)

Azwa Abdul Aziz

PhD (University of Aberdeen, Scotland, UK, MSc. (UMT), BSc., Dip. Comp. Sc (UiTM)

Senior Lecturer

Aznida Hayati Zakaria @ Mohamad

PhD (UMT), MSc (KUSTEM), BIT(UUM)

Azrul Amri Jamal

PhD (Bangor Univ, UK), M.Eng Electronics & Information Science, B.Eng Computer Science (Takushoku Univ)

Wan Nor Shuhadah Wan Nik

PhD (Sydney Univ), MSc (UMT), BSc (UKM)

Wan Suryani Wan Awang

PhD (Cardiff Univ,UK), MSc (UMT), BSc (Sheffield Hallam Univ, UK), Pg. Dip Adv. Comp. (Bristol Univ)

Nor Aida Mahiddin

PhD (AUT, New Zealand), MSc (UPM), BSc, (UKM), Dip. IT (SAL College)

Wan Aezwani Wan Abu Bakar

PhD (UMT), MSc. (UTM), BSc. (UPM)

Muhammad Danial Zakaria

PhD (Uni. Of York, UK), BEng (UPM)

Mohd Kamir Yusof

PhD (UMT), MSc (UTM), BSc (UTM), Dip. Comp. Sc (UTM)

Rohana Ismail

MSc, BSc (UPM)

Ahmad Faisal Amri Abidin @ Bharun

MSc (UPM), BSc. (UPM), Dip. Comp. Sc (UPM)

Norlina Udin @ Kamaruddin

MIT (UKM), BIT (UKM), Dip. IT (KUSZA)

Lecturer

Fatimah Ghazali

MSc. (UPM), BIT (UKM), Dip. IT (KUSZA)

Nazirah Abd Hamid

PhD (UTM), MSc. (UTM), BIT (UUM)

Centre of Information Technology Studies

Associate Professor

Fatma Susilawati Mohamad

PhD (UTM), MIT (UKM), BSc (Oklahoma Cit Univ), Dip. Marketing (KUSZA)

Mohd Hafiz Yusof @ Che Abdullah

PhD (Newcastle University,UK) MSc. (USM), BIT (UUM)

Mohd Fadzil Abdul Kadir

PhD (Mie University, Japan), MSc. (UUM), BEng (Mie Univ)

Yousef Abubaker Mohamed Ahmed El-Ebiary

PhD (Cairo Univ, Egypt), MIT (Cairo Univ, Egypt), MBA (WB Univ, USA), Bsc. (Cairo Univ, Egypt)

Zahrahtul Amani Zakaria

PhD (UTM), MSc., BSc. (UTM)

Suhailan Safei

PhD (UTeM), MSc., BSc., Dip. Comp. Sc (UTM)

Nurnadiah Zamri

PhD (UMT), MSc (UMT), BSc (UMT)

Senior Lecturer

Siti Sabariah Abas

PhD (USM), MSc, (USM), BSc, (USM)

Elissa Nadia Madi

PhD (Nottingham), MSc., BSc. Mathematics (UMT)

Wan Mohd Amir Fazamin Wan Hamzah

PhD (UMT), MSc. (UMT), BIT (KUSTEM), Dip. Edu. (IPDA)

Julaily Aida Jusoh

PhD (UMT), MSc. (UMT), BSc. (UPM)

Hasni Hasan

PhD (UniSZA), MSc. (UiTM), BEng (South Australia)

Abd. Rasid Mamat
PhD (UniSZA), MSc. (UUM), BIT (UKM)

Aceng Sambas
PhD (UniSZA), MSc. (UniSZA), BSc (UIN Indonesia)

Fauziah Ab. Wahab
MSc. (UPM), BIT (UUM), Dip. IT (KUSZA)

Lecturer

Raja Hasyifah Raja Bongsu
MSc. (UPM), BSc (UKM)

Siti Dhalila Mohd Satar
MSc. (UTM), BIT (UKM)

Nor Surayati Mohamad Usop
MSc. (UPM), BSc. (UPM), Dip. Comp. Sc (UPM)

Centre of Multimedia Studies

Associate Professor

Syariah Nor Wan Shamsuddin
PhD (Bradford University,UK), MIT, BIT (UKM), Dip. IT (KUSZA)

Senior Lecturer

Ismahafezi Ismail
PhD (UTM), MSc (UTM), B.Eng (UTM)

Azim Zaliha Abd. Aziz
PhD (University of Reading, UK), BSc (UTM)

Wan Mohd Rizhan Wan Idris
PhD (MMU), MSc (UMT), BIT (UKM), Dip. IT (KUSZA)

Normala Rahim
PhD (UKM), MSc. (UKM), BA In Photography And Creative Imagine (UiTM)

Wan Malini Wan Isa
PhD (UKM), MSc., BSc (UPM)

Nur Saadah Mohd Shapri
PhD (UKM), MSc., BSc., Dip. Comp. Sc. (UTM)

Maizan Mat Amin
MSc. (UPM), BIT (UKM), Dip. IT (KUSZA)

Norkhairani Abdul Rawi
MIT (UKM), BIT (UKM), Dip. IT (KUSZA)

Mat Atar Mat Amin
MSc. (UTM), BIT (UKM), Dip. IT (KUSZA)

Mohd Sufian Mat Deris
MEd , BSc., Dip. Comp. Sc (UTM)

Lecturer

Azilawati Rozaimiee
MSc., BSc (UPM)

Irma Shayana Samaden
MSc. (UKM), BA (Hons) Art And Design Graphic, BA Art And Design In Graphic (UiTM)

Undergraduate Programmes

List of Undergraduate Programmes

6. Diploma
 - i. Diploma in Information Technology (DIT)
 - ii. Diploma in Information Technology (Multimedia) (DITM)
 - iii. Diploma in Computer Science – Starting 2022/2023 Session (DCS)
 - iv. Diploma in Information Technology - Starting 2022/2023 Session (DIT)
7. Bachelor's Degree with Honours
 - i. Bachelor of Computer Science (Software Development) with Honours (BCS-SD)
 - ii. Bachelor of Computer Science (Computer Network Security) with Honours (BCS-CNS)
 - iii. Bachelor of Computer Science (Internet Computing) with Honours (BCS-IC)
 - iv. Bachelor of Information Technology (Media Informatics) with Honours (BIT-IM)

Programmes Entry Requirement

Diploma in Computer Science / Diploma in Information Technology

| University Requirements | |
|---|---|
| 1. Malaysian | |
| 2. A pass with minimum of FIVE (5) credits in Sijil Pelajaran Malaysia (SPM) 2020 including Bahasa Melayu | |
| 3. A pass in Sejarah subject | |
| Programme Requirements | |
| DIPLOMA | APEL A |
| 4. Obtained a minimum of Grade C in ONE of the following subjects at SPM Level: <ul style="list-style-type: none"> • Mathematics • Additional Mathematics AND | Pass the accreditation assessment learning based on prior experience for admission purposes (APEL A) by MQA |
| 5. Obtained a minimum of Grade C in ONE of the following subjects at SPM Level: <ul style="list-style-type: none"> • Pendidikan Islam • Pendidikan Syariah Islamiah • Pendidikan Al-Quran dan Al-Sunnah • Tasawwur Islam • Bahasa Arab • Usul Al-Din • Al-Syariah • Manahij Al-Ulum Al-Islamiah • Al-Adab wa Al-Balaghah • Hifz Al-Quran • Maharat Al-Quran • Al-Lughah Al-Arabiah Al-Mu'asirah AND | |
| 6. Obtained a minimum of Grade C in TWO (2) other subjects EXCLUDING Bahasa Melayu at SPM level AND | |
| 7. A pass (Minimum Grade D) in English subject. | |

Bachelor of Computer Science (Software Development)/Bachelor of Computer Science
(Computer Network Security)/ Bachelor of Computer Science (Internet Computing)

| STPM (CATEGORY A AND S) | MATRICULATION / FOUNDATION (CATEGORY N, K AND J) | STAM (CATEGORY T) | DIPLOMA (CATEGORY E AND G) | APEL A |
|---|--|--|--|---|
| University Requirements | | | | Pass the accreditation assessment learning based on prior experience for admission purposes (APEL A) by MQA |
| 1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia | | | | |
| 2. A pass in the Sijil Tinggi Persekolahan Malaysia (STPM) with a minimum of CGPA 2.50 AND | 2. A pass in Matriculation/ Foundation programme with a minimum of CGPA 2.50 AND | 2. A pass in Sijil Tinggi Agama Malaysia (STAM) with at least grade of Jayyid Jiddan AND | 2. Graduated with a Diploma or other equivalent qualification recognized by the Malaysian Government and approved by University Senate | |
| Programme Requirements | | | | |
| 3. Obtained a minimum of Grade C in TWO (2) subjects EXCLUDING Pengajian Am at STPM Level AND | 3. Obtained a minimum of Grade C in Mathematics at Matriculation/ Foundation Level OR | 3. Obtained a minimum of Grade C at of the following subjects at SPM Level: <ul style="list-style-type: none">Additional MathematicsORMathematics AND Science / Engineering Drawing / Mechanical Engineering Studies / Civil Engineering Studies / Electrical and Electronics Engineering Studies / Design / Computer Science / Graphic Communication Technology / Physics / Chemistry / Biology / Additional Science / Multimedia Production / Computer Graphics (*Candidates need to takes Fundamental Mathematics at the beginning of the study) | 3. Obtained at least CGPA 2.50 at Diploma level; Diploma Level in related fields: <ul style="list-style-type: none">Computer scienceSoftware engineeringInformation technologyInformation systemComputer networkProgrammingInternet computingSoftware developmentData ScienceElectrical / Electronic EngineeringComputer EngineeringMathematicsComputer MathematicsEngineeringDiploma in related field OR | |
| 4. Obtain a minimum of Grade C (2.00) at of the following subjects at STPM level: <ul style="list-style-type: none">Mathematics (T) / Mathematics (M)Information and Communication Technology (ICT) / Physics / Chemistry / Biology OR Obtained a minimum of Grade C at of the following subjects at SPM level: <ul style="list-style-type: none">Additional MathematicsORMathematics AND Science / Engineering Drawing / Mechanical Engineering Studies / Civil Engineering Studies / Electrical and Electronics Engineering Studies / Design / Computer Science / Graphic Communication Technology / Physics / Chemistry / Biology / Additional Science / Multimedia Production / | | | Obtained at least CGPA 3.00 at Diploma Vokasional Malaysia (DVM) level in related fields: <ul style="list-style-type: none">Computer and Network Systems TechnologyCreative Multimedia (AnimatiIndustrial Graphic Design (Print Media)Database Management Syste and Web Applications AND | |

| | | | | |
|---|--|--|--|--|
| Computer Graphics (*Candidates need to take Fundamental Mathematics at the beginning of the study) | | Mathematics at the beginning of the study) | 4. Obtained a minimum of Grade C in Mathematics at Diploma Vokasional Malaysia (DVM) Level OR Obtained a minimum of Grade C in Mathematics at SPM level | |
| A minimum score of Band 2 in MUET | | | | |

Bachelor of Information Technology (Media Informatics)

| STPM (CATEGORY A AND S) | MATRICULATION/ FOUNDATION (CATEGORY N, K AND J) | STAM (CATEGORY T) | DIPLOMA (CATEGORY E AND G) | APEL A |
|---|--|--|--|---|
| University Requirements | | | | Pass the accreditation assessment learning based on prior experience for admission purposes (APEL A) by MQA |
| 1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia | | | | |
| 2. A pass in the Sijil Tinggi Persekolahan Malaysia (STPM) with a minimum of CGPA 2.50 | 2. A pass in Matriculation/ Foundation programme with a minimum of CGPA 2.50 | 2. A pass in Sijil Tinggi Agama Malaysia (STAM) with at least grade of Jayyid Jiddan | 2. Graduated with a Diploma or other equivalent qualification recognized by the Malaysian Government and approved by University Senate | |
| AND | AND | AND | | |
| Programme Requirements | | | | |
| 3. Obtain a minimum of Grade C (2.00) at of the following subjects at STPM level: <ul style="list-style-type: none">Mathematics (T) /Mathematics (M) OR Obtained a minimum of Grade C in Mathematics at SPM level | 3. Obtained a minimum of Grade C in Mathematics at Matriculation/ Foundation Level OR Obtained a minimum of Grade C at of the following subjects at SPM Level: <ul style="list-style-type: none">Additional Mathematics OR Mathematics | 3.Obtained a minimum of Grade C at of the following subjects at SPM Level: <ul style="list-style-type: none">Additional Mathematics OR Mathematics | 3. Obtained at least CGPA 2.50 at Diploma level; Diploma Level in related fields. OR Obtained at least CGPA 3.00 at Diploma Vokasional Malaysia (DVM) level in related fields: <ul style="list-style-type: none">Computer and Network Systems TechnologyCreative Multimedia (AnimatioIndustrial Graphic Design (Print Media)Database Management System and Web Applications | |
| 4. Obtained a minimum of Grade C in TWO (2) subjects EXCLUDING Pengajian Am at STPM Level | | | AND 4. Obtained a minimum of Grade C in Mathematics at Diploma Vokasional Malaysia (DVM) Level OR Obtained a minimum of Grade C in Mathematics at SPM level | |
| A minimum score of Band 2 in MUET | | | | |

Undergraduate Programmes of Study

Bachelor of Computer Science (Software Development) with Honours (BCS-SD)

The Bachelor of Computer Science (Software Development) program with honors was initially introduced in July 2006/2007. Subsequently, the program obtained full accreditation from the Malaysian Qualification Agency (MQA/FA 9641), starting from September 19, 2017.

This program is a full-time study program with a duration of three and a half years, spanning seven semesters. It includes six regular semesters and a six-month industrial training period. The teaching and learning methods for each course include lectures, tutorials, practical exercises, presentations, projects, and industrial training

Programme Aims

The program aims to nurture skilled, adaptable, and responsible software professionals who will advocate for global responsibility through software development. This honors degree program supports the national and global ambitions of the Digital Economy.

Programme Educational Outcomes

- PEO 1 Computing practitioners who are able to solve global issues using knowledge and skills in the field of software development in line with requirements from industries
- PEO 2 Computing practitioners who are able to demonstrate positive attitudes and practising ethical and professional values whilst maintaining self and professional integrity
- PEO 3 Computing practitioners who are able to demonstrate leadership skills, autonomy, responsibility and able to communicate effectively with software development-related stakeholders
- PEO 4 Computing practitioners with commitment for lifelong learning and entrepreneurial mind-set within software development industry for self and career progressions)

Programme Learning Outcomes

Upon completion of this programme, student should be able to:

- PLO 1 Apply knowledge, facts, concepts and theories of computer science in the field of software development
- PLO 2 Analyse algorithms and techniques to design and optimise computing solutions in the field software development
- PLO 3 Utilise appropriate methodologies and techniques in modelling, designing, developing and evaluating computing solutions
- PLO 4 Demonstrate effective interactions and noble values with various stakeholders
- PLO 5 Practise effective communications with various stakeholders
- PLO 6 Utilise digital skills for problem solving in the field of software development
- PLO 7 Demonstrate numerical skills for problem solving in the field software development
- PLO 8 Exhibit leadership, teamwork, accountability and responsibility in delivering services and tasks related to the field of software development
- PLO 9 Demonstrate the commitment of lifelong learning in academic and career progressions
- PLO 10 Demonstrate entrepreneurial mind set in delivering solutions in accordance to changes of industrial landscapes.
- PLO 11 Adhere to professional and ethical values in the delivery of services and tasks related to the field of software development

Career Prospects

- Software Engineer / Systems Engineer / System Analyst/ Computer Network Engineer
- Computer Programmer / Web Programmer
- Database Administrator
- Entrepreneurs ICT technocrats
- Researchers

Curriculum Details and Structure

Curriculum Structure according to Course Classification

Each student must successfully complete a minimum of 126 credit hours of courses in order to earn the Bachelor of Computer Science (Software Development) degree with honors. These courses are categorized into six sections as follows :

Table 1: Curriculum structure according to course classification

| No | Components | Credit Hours | Percentage (%) |
|--------------|---|--------------|----------------|
| 1 | University Courses | 19 | 15 |
| 2 | Core Courses | 42 | 34 |
| 3 | Specialization & Programme Elective Courses | 33 | 24 |
| 4 | Free Module Courses | 12 | 10 |
| 5 | Final Year Project | 8 | 7 |
| 6 | Industrial Training | 12 | 10 |
| Total | | 126 | 100 |

University Courses

Table 2: University Courses (19 credit hours)

| No | Courses Code | Course Name | Credit Hours |
|--------------|--------------|--|--------------|
| 1 | MPU31062 | Falsafah dan Isu Semasa | 2 |
| 2 | MPU33012/ | Ilmu Wahyu dan Sains (Islam) / | 2 |
| | MPU33022 | Moral dan Etika II (Bukan Islam) | |
| 3 | MPU33032 / | Ilmu Wahyu dan Kemasyarakatan (Islam)/ | 2 |
| | MPU33042 | Perbandingan Agama II (Bukan Islam) | |
| 4 | MPU31072 | Penghayatan Etika dan Peradaban | 2 |
| 5 | MPU32092 | Asas Pembudayaan Keusahawanan | 2 |
| 6 | PBI10102 | English For Communication I | 2 |
| 7 | PBI10202 | English For Communication II | 2 |
| 8 | PBI 10*** | Bahasa Asing | 2 |
| 9 | KK* **** | Kokurikulum | 3 |
| Total | | | 19 |

*Pre requisite: PBI10202 is passed PBI10102

Core Courses

Table 3: Core courses (42 credit hours)

| No | Courses Code | Course Name | Credit Hours |
|--------------|--------------|--|--------------|
| 1 | CSF 10103 | Mathematics for Computer Science | 3 |
| 2 | CSF 10203 | Fundamentals of Computer Systems | 3 |
| 3 | CSF 12003 | Problem Solving and Computer Programming | 3 |
| 4 | CSF 12103 | Computer Organization and Architecture | 3 |
| 5 | CSF 12203 | Human Machine Interaction | 3 |
| 6 | CSF 12303 | Software Engineering Methods | 3 |
| 7 | CSF 12403 | Object Oriented Programming | 3 |
| 8 | CSF 20103 | Discrete Structure and Application | 3 |
| 9 | CSF 20203 | Algorithms Design and Analysis | 3 |
| 10 | CSF 20303 | Operating Systems | 3 |
| 11 | CSF 20403 | Network and Security Fundamentals | 3 |
| 12 | CSF 21503 | Database | 3 |
| 13 | CSF 30103 | Social and Professional Ethics | 3 |
| 14 | CSF 35503 | Artificial Intelligence | 3 |
| Total | | | 42 |

*Pre-requisite: CSF11803 is passed CSF11103

Specialization Courses & Programme Elective Courses (BSC-SD)

Table 4: Specialization courses (24 credit hours)

Student are required to complete all of specialization courses.

| No | Courses Code | Course Name | Credit Hours |
|--------------|--------------|--|--------------|
| 1 | CSD 20103 | Mobile Application Framework | 3 |
| 2 | CSD 23403 | System Analysis and Design | 3 |
| 3 | CSD 23503 | Web Application Development | 3 |
| 4 | CSD 23603 | Software Project Management | 3 |
| 5 | CSD 23703 | Data Analytics | 3 |
| 6 | CSD 34003 | Software Testing and Analysis | 3 |
| 7 | CSD 34103 | Software Development Workshop | 3 |
| 8 | CSD 34203 | Special Topics in Software Development | 3 |
| 9 | CSD 34303 | Data Mining | 3 |
| 10 | CSD 34403 | Advanced Database | 3 |
| 11 | ITF 30103 | Information Security | 3 |
| Total | | | 33 |

Free Module Courses

Students are required to register for and successfully complete a minimum of 12 credits in free module courses. These courses are not restricted to the list of options provided by this program alone; students have the flexibility to choose from courses offered by other academic programs, including those from the Faculty of Informatics and Computing, as well as from other faculties within UniSZA

Table 5: Free Module courses (12 credit hours)

| No | Courses Code | Course Name | Credit Hours |
|--------------|--------------|--|--------------|
| 1 | | Choose any combination courses that add up to at least 12 credits of non-specialization courses offered by other academic programme by the faculty or other faculties. | 12 |
| Total | | | 12 |

Final Year Project

Table 6: Final Year Project (8 credit hours)

| No | Courses Code | Course Name | Credit Hours |
|--------------|--------------|-----------------------|--------------|
| 1 | CSF35104 | Final Year Project I | 4 |
| 2 | CSF35204 | Final Year Project II | 4 |
| Total | | | 8 |

Pre requisite:

- CSF35104 has taken all the core and specialization courses until Year 2
- CSF35204 is passed CSF35104

Industrial Training

Table 7: Industrial Training (12 Credit Hours)

| No | Courses Code | Course Name | Credit Hours |
|--------------|--------------|---------------------|--------------|
| 1 | CSF47112 | Industrial Training | 12 |
| Total | | | 12 |

Pre requisite:

- CSF47112 is passed all courses

Curriculum Structure according to Semester

Table 8: First Semester (18 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|---|--------------|
| 1 | MPU31072 / | Penghayatan Etika dan Peradaban | 2 |
| | MPU31042 | Bahasa Melayu Asas 1 (Pelajar Antarabangsa) | |
| 2 | MPU33012/ | Ilmu Wahyu dan Sains (Islam) / | 2 |
| | MPU33022 | Moral dan Etika II (Bukan Islam) | |
| 3 | PBI10102 | English for Communication I | 2 |
| 4 | CSF 12003 | Problem Solving and Computer Programming | 3 |
| 5 | CSF 12103 | Computer Organization and Architecture | 3 |
| 6 | CSF 12203 | Human Machine Interaction | 3 |
| 7 | CSF 12303 | Software Engineering Methods | 3 |
| Total | | | 18 |

Pre requisite:

- PBI10202 is passed PBI10102

Table 9: Second Semester (20 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--|--------------|
| 1 | MPU33032 / | Ilmu Wahyu dan Kemasyarakatan (Islam)/ | 2 |
| | MPU33042 | Perbandingan Agama II (Bukan Islam) | |
| 2 | MPU31062 | Falsafah dan Isu Semasa | 2 |
| 3 | MPU32092 | Asas Pembudayaan Keusahawanan | 2 |
| 4 | PBI10202 | English for Communication II* | 2 |
| 5 | CSF 10103 | Mathematics for Computer Science | 3 |
| 6 | CSF 10203 | Fundamentals of Computer Systems | 3 |
| 7 | CSF 12403 | Object Oriented Programming | 3 |
| 8 | KK* **** | Kokurikulum | 3 |
| Total | | | 20 |

*Pre requisite:CSF11803 is passed CSF11103

Table 10: Third Semester (18 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|------------------------------------|--------------|
| 1 | CSF 20403 | Network and Security Fundamentals | 3 |
| 2 | CSF 20303 | Operating Systems | 3 |
| 3 | CSF 20103 | Discrete Structure and Application | 3 |
| 4 | CSD 23403 | System Analysis and Design | 3 |
| 5 | CSF 21503 | Database | 3 |
| 6 | CSD 23703 | Data Analytics | 3 |
| Total | | | 18 |

Table 11: Fourth Semester (20 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--------------------------------|--------------|
| 1 | CSF 20203 | Algorithms Design and Analysis | 3 |
| 2 | ITF 30103 | Information Security | 3 |
| 3 | CSD 23603 | Software Project Management | 3 |
| 4 | CSD 20103 | Mobile Application Framework | 3 |
| 5 | CSD 23503 | Web Application Development | 3 |
| 6 | PBI10*** | Bahasa Asing | 2 |
| 7 | | Free Module I | 3 |
| Total | | | 20 |

Table 12: Fifth Semester (19 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--------------------------------|--------------|
| 1 | CSF 30103 | Social and Professional Ethics | 3 |
| 2 | CSF 35304 | Final Year Project I* | 4 |
| 3 | CSD 34003 | Software Testing and Analysis | 3 |
| 4 | CSD 34103 | Software Development Workshop | 3 |
| 5 | | Free Module II | 3 |
| 6 | | Free Module III | 3 |
| Total | | | 19 |

*Pre requisite:CSF 35104 has taken all the core and specialization courses until Year 2

Table 13: Sixth Semester (19 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--|--------------|
| 1 | CSF 35503 | Artificial Intelligence | 3 |
| 2 | CSF 35404 | Final Year Project II* | 4 |
| 3 | CSD 34303 | Data Mining | 3 |
| 4 | CSD 34203 | Special Topics in Software Development | 3 |
| 5 | CSD 34403 | Advanced Database | 3 |
| 6 | | Free Module IV | 3 |
| Total | | | 19 |

*Pre requisite : CSF35204 is passed CSF35104

Table 14: Seventh Semester (12 credit hours)

| No | Course code | Course Name | Credit Hours |
|--------------|-------------|-----------------------|--------------|
| 1 | CSF47112 | Industrial Trainning* | 12 |
| Total | | | 12 |

*Pre requisite : CSF47112 is passed all courses

Bachelor of Computer Science (Computer Network Security) With Honours (BCS-CNS)

The Bachelor of Computer Sciences (Computer Network Security) with Honours program was first offered in Semester 1 of the 2012/2013 academic session. The program received full accreditation from the Malaysian Qualifications Agency with reference number MQA/FA0516, starting on 9 June 2016

The Bachelor of Computer Sciences (Computer Network Security) with Honours is a full-time program. The program has a duration of three and a half years, spanning seven semesters. This includes six regular semesters and a six-month industrial training period. Teaching and learning methods for each course include lectures, tutorials, practical sessions, presentations, projects, and industrial training

Programme Aims

The program's objective is to cultivate skilled, adaptable, and accountable network assurance professionals who will advance the cause of global responsibility in the field of computer network security. This is in alignment with the national and international goals of the Digital Economy.

Programme Educational Outcomes

- PEO 1 Computing practitioners who are able to solve global issues using knowledge and skills in the field of computer network security in line with requirements from industries
- PEO 2 Computing practitioners who are able to demonstrate positive attitudes and practicing ethical and professional values whilst maintaining self and professional integrity.
- PEO 3 Computing practitioners who are able to demonstrate leadership skills, autonomy, responsibility and able to communicate effectively with computer network security-related stakeholders
- PEO 4 Computing practitioners with commitment for lifelong learning and entrepreneurial mind-set within computer network security industry for self and career progressions.

Programme Learning Outcomes

- PLO 1 Apply knowledge, facts, concepts and theories of computer science in the field of computer network security
- PLO 2 Analyse algorithms and techniques to design and optimize computing solutions in the field of computer network security.
- PLO 3 Utilize appropriate methodologies and techniques in modelling, designing, developing and evaluating computing solutions.
- PLO 4 Demonstrate effective interactions and noble values with various stakeholders
- PLO 5 Practice effective communications with various stakeholders
- PLO 6 Utilise digital skills for problem solving in the field of computer network security.
- PLO 7 Demonstrate numerical skills for problem solving in the field of computer network security
- PLO 8 Exhibit leadership, teamwork, accountability and responsibility in delivering services and tasks related to the field of computer network security.
- PLO 9 Demonstrate the commitment of lifelong learning in academic and career progressions.
- PLO 10 Demonstrate entrepreneurial mind set in delivering solutions in accordance to changes of industrial landscapes.
- PLO 11 Adhere to professional and ethical values in the delivery of services and tasks related to the field of computer network security.

Career Prospects

- Computer Network Engineer
- Information Systems Officer
- Computer Programmer / Web / Networking
- Computer Network Engineer
- System Analyst
- Computer Forensics Officer
- Computer Security Officer
- Cryptanalyst
- Analysts Network System
- Researchers
- Entrepreneurs ICT technocra

Curriculum Details and Structure

Curriculum Structure according to Course Classification

Each student is required to pass at least 126 credit hours of courses to be awarded the degree of Bachelor of Computer Sciences (Computer Network Security) with honours. These courses are classified into 6 sections as follows:

Table 15: Curriculum structure according to course classification

| No | Components | Credit Hours | Percentage (%) |
|--------------|---|--------------|----------------|
| 1 | University Courses | 19 | 15 |
| 2 | Core Courses | 42 | 34 |
| 3 | Specialization & Programme Elective Courses | 33 | 24 |
| 4 | Free Module Courses | 12 | 10 |
| 5 | Final year Project | 8 | 7 |
| 6 | Industrial Training | 12 | 10 |
| Total | | 126 | 100 |

University Courses

Table 16: University courses (19 credit hours)

| No | Courses Code | Course Name | Credit Hours |
|--------------|------------------------|---|--------------|
| 1 | MPU31062 | Falsafah dan Isu Semasa | 2 |
| 2 | MPU33012/ MPU33022 | Ilmu Wahyu dan Sains (Islam) / Moral dan Etika II (Bukan Islam) | 2 |
| 3 | MPU33032 / MPU33042 | Ilmu Wahyu dan Kemasyarakatan (Islam)/ Perbandingan Agama II (Bukan Islam) | 2 |
| 4 | MPU31072 | Penghayatan Etika dan Peradaban | 2 |
| 5 | MPU32092 | Asas Pembudayaan Keusahawanan | 2 |
| 6 | PBI10102 | English For Communication I | 2 |
| 7 | PBI10202 | English For Communication II | 2 |
| 8 | PBI 10*** | Bahasa Asing | 2 |
| 9 | KK* **** | Kokurikulum | 3 |
| Total | | | 19 |

*Pre requisite: PBI 10202 is passed PBI 10102

Core Courses

Table 17: Core courses (42 credit hours)

| No | Course Code | Course Name | Credit Hours |
|----|-------------|--|--------------|
| 1 | CSF 10103 | Mathematics for Computer Science | 3 |
| 2 | CSF 10203 | Fundamentals of Computer Systems | 3 |
| 3 | CSF 12003 | Problem Solving and Computer Programming | 3 |
| 4 | CSF 12103 | Computer Organization and Architecture | 3 |
| 5 | CSF 12203 | Human Machine Interaction | 3 |
| 6 | CSF 12303 | Software Engineering Methods | 3 |
| 7 | CSF 12403 | Object Oriented Programming | 3 |
| 8 | CSF 20103 | Discrete Structure and Application | 3 |
| 9 | CSF 20203 | Algorithms Design and Analysis | 3 |
| 10 | CSF 20303 | Operating Systems | 3 |
| 11 | CSF 20403 | Network and Security Fundamentals | 3 |

| | | | |
|--------------|-----------|--------------------------------|-----------|
| 12 | CSF 21503 | Database | 3 |
| 13 | CSF 30103 | Social and Professional Ethics | 3 |
| 14 | CSF 35503 | Artificial Intelligence | 3 |
| Total | | | 42 |

*Pre requisite : CSF11803 is passed CSF11103

Specialization Courses (BSC-CNS)

Table 18: Specialization courses (33 credit hours)

Student are required to complete all of courses.

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--|--------------|
| 1 | CSA 20103 | Wireless Communication and Mobile Network | 3 |
| 2 | CSA 20203 | Network Analysis and Design | 3 |
| 3 | CSA 20303 | Network Simulation and performance Modelling | 3 |
| 4 | CSA 23503 | Security Management | 3 |
| 5 | CSA 23603 | Data Communication Workshop | 3 |
| 6 | CSA 30103 | Network Technology Security and Communications | 3 |
| 7 | CSA 30203 | Special Topics in Computer Network Security | 3 |
| 8 | CSA 34003 | Penetration Testing | 3 |
| 9 | CSA 34103 | Cryptography | 3 |
| 10 | CSA 34203 | Computer Forensics | 3 |
| 11 | CSW 20103 | Distributed Computing System | 3 |
| Total | | | 33 |

*Pre requisite : CSA 33303 is passed CSF 11603

Free Module Courses

At least 12 credits must be taken to make up the free module courses. The course is not limited to the list of options offered by this program only, it can be taken from any of three credit hours of courses offered by other academic programs either from the Faculty of Informatics and Computing as well as from other faculties in UniSZA.

Table 19: Free Module courses (12 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--|--------------|
| 1 | | Choose any combination courses that add up to at least 12 credits of non-specialization courses offered by other academic programme by the faculty or other faculties. | 12 |
| Total | | | 12 |

Final Year Project

Table 20: Final Year Project (8 credit hours)

| No | Courses Code | Course Name | Credit Hours |
|--------------|--------------|-----------------------|--------------|
| 1 | CSF 35104 | Final Year Project I | 4 |
| 2 | CSF 35204 | Final Year Project II | 4 |
| Total | | | 8 |

*Pre requisite:

- CSF35104 has taken all the core and specialization courses until Year 2
- CSF35204 is passed CSF35104

Industrial Training

Table 21: Industrial Training (12 Credit Hours)

| No | Courses Code | Course Name | Credit Hours |
|--------------|--------------|---------------------|--------------|
| 1 | CSF 47112 | Industrial Training | 12 |
| Total | | | 12 |

*Pre requisite : CSF47112 is passed all courses.

Curriculum Structure according Semester

Table 22: First Semester (18 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|---|--------------|
| 1 | MPU31072 / | Penghayatan Etika dan Peradaban/ | 2 |
| | MPU31042 | Bahasa Melayu Asas 1 (Pelajar Antarabangsa) | |
| 2 | MPU33012/ | Ilmu Wahyu dan Sains (Islam) / | 2 |
| | MPU33022 | Moral dan Etika II (Bukan Islam) | |
| 3 | PBI 10102 | English for Communication I | 2 |
| 4 | CSF 12003 | Problem Solving and Computer Programming | 3 |
| 5 | CSF 12103 | Computer Organization and Architecture | 3 |
| 6 | CSF 12203 | Human Machine Interaction | 3 |
| 7 | CSF 12303 | Software Engineering Methods | 3 |
| Total | | | 18 |

*Pre requisite : PBI10202 is passed PBI10102

Table 23: Second Semester (20 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--|--------------|
| 1 | MPU33032 / | Ilmu Wahyu dan Kemasyarakatan (Islam)/ | 2 |
| | MPU33042 | Perbandingan Agama II (Bukan Islam) | |
| 2 | MPU31062 | Falsafah dan Isu Semasa | 2 |
| 3 | MPU32092 | Asas Pembudayaan Keusahawanan | 2 |
| 4 | PBI 10202 | English for Communication II* | 2 |
| 5 | CSF 10103 | Mathematics for Computer Science | 3 |
| 6 | CSF 10203 | Fundamentals of Computer Systems | 3 |
| 7 | CSF 12403 | Object Oriented Programming | 3 |
| 8 | KK* **** | Kokurikulum | 3 |
| Total | | | 20 |

*Pre requisite : CSF 11803 is passed CSF 11103

Table 24: Third Semester (18 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|------------------------------------|--------------|
| 1 | CSF 20403 | Network and Security Fundamentals | 3 |
| 2 | CSF 20303 | Operating Systems | 3 |
| 3 | CSF 20103 | Discrete Structure and Application | 3 |
| 4 | CSA 23503 | Security Management | 3 |
| 5 | CSF 21503 | Database | 3 |
| 6 | CSW 20103 | Distributed Computing System | 3 |
| Total | | | 18 |

Table 25: Fourth Semester (20 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--|--------------|
| 1 | CSF 20203 | Algorithms Design and Analysis | 3 |
| 2 | CSA 20103 | Wireless Communication and Mobile Network | 3 |
| 3 | CSA 20203 | Network Analysis and Design | 3 |
| 4 | CSA 20303 | Network Simulation and performance Modelling | 3 |
| 5 | CSA 23603 | Data Communication Workshop | 3 |
| 6 | PBI 10*** | Bahasa Asing | 2 |
| 7 | | Free Module I | 3 |
| Total | | | 20 |

Table 26: Fifth Semester (19 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--|--------------|
| 1 | CSF 30103 | Social and Professional Ethics | 3 |
| 2 | CSF 35304 | Final Year Project I* | 4 |
| 3 | CSA 34003 | Penetration Testing | 3 |
| 4 | CSA 34103 | Cryptography | 3 |
| 5 | CSA 30103 | Network Technology Security and Communications | 3 |
| 6 | | Free Module II | 3 |
| Total | | | 19 |

*Pre requisite :

- CSF35104 has taken all the core and specialization courses until Year 2.
- CSA33303 is passed CSF11603

Table 27 : Sixth Semester (19 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|---|--------------|
| 1 | CSF 35503 | Artificial Intelligence | 3 |
| 2 | CSF 35404 | Final Year Project II* | 4 |
| 3 | CSA 34203 | Computer Forensics | 3 |
| 4 | CSA 30203 | Special Topics in Computer Network Security | 3 |
| 5 | | Free Module III | 3 |
| 6 | | Free Module IV | 3 |
| Total | | | 19 |

*Pre requisite : CSF 35204 is passed CSF 35104

Table 28: Seventh Semester (12 credit hours)

| No | Course code | Course Name | Credit Hours |
|--------------|-------------|------------------|--------------|
| 1 | CSF 47112 | Latihan Industri | 12 |
| Total | | | 12 |

*Pre requisite : CSF47112 is passed all courses.

Bachelor of Computer Science (Internet Computing) With Honours (BCS-IC)

The Bachelor of Computer Sciences (Internet Computing) with Honours program was first introduced in Semester 1 of the 2014/2015 academic session. The program received full accreditation from the Malaysian Qualifications Agency with reference number MQA/FA2934, starting on 10 January 2018.

The Bachelor of Computer Sciences (Internet Computing) with Honours is a full-time program. The program has a duration of three and a half years, spanning seven semesters, which includes six(6) regular semesters and a six-month industrial training period. Teaching and learning methods for each course are delivered through lectures, tutorials, practical exercises, presentations, projects, and industrial training.

Programme Aims

The program seeks to cultivate skilled, adaptable, and accountable internet professionals who will advance the cause of global responsibility through internet computing. This aligns with the national and international goals of the Digital Economy..

Programme Educational Outcomes

- PEO 1 Computing practitioners who are able to solve global issues using knowledge and skills in the field of internet computing in line with requirements from industries
- PEO 2 Computing practitioners who are able to demonstrate positive attitudes and practice ethical and professional values whilst maintaining self and professional integrity
- PEO 3 Computing practitioners who are able to demonstrate leadership skills, autonomy, responsibility and able to communicate effectively with internet computing-related stakeholders
- PEO 4 Computing practitioners with commitment for lifelong learning and entrepreneurial mind-set within internet computing industry for self and career progressions

Programme Learning Outcomes

Upon completion of this programme, student should be able to :

- PLO 1 Apply knowledge, facts, concepts and theories of computer science in the field of internet computing
- PLO 2 Analyse algorithms and techniques to design and optimise computing solutions in the field of internet computing
- PLO 3 Utilise appropriate methodologies and techniques in modelling, designing, developing and evaluating computing solutions
- PLO 4 Demonstrate effective interactions and noble values with various stakeholders
- PLO 5 Practice effective communications with various stakeholders
- PLO 6 Utilise digital skills for problem solving in the field of internet computing
- PLO 7 Demonstrate numerical skills for problem solving in the field of internet

- computing
- PLO 8 Exhibit leadership, teamwork, accountability and responsibility in delivering services and tasks related to the field of internet computing
- PLO 9 Demonstrate the commitment of lifelong learning in academic and career progressions
- PLO 10 Demonstrate entrepreneurial mind set in delivering solutions in accordance to changes of industrial landscapes
- PLO 11 Adhere to professional and ethical values in the delivery of services and tasks related to the field of internet computing

Career Prospects

- Developers of web / information systems / e-commerce / mobile application
- e-Business Analyst
- Database engineer / Computer Security Engineer
- System Analyst
- Entrepreneurs ICT technocrats
- Researchers

Curriculum Details and Structure

Curriculum Structure according to Course Classification

Each student is required to pass at least 123 credit hours of courses to be awarded the degree of Bachelor of Computer Sciences (Internet Computing) with honours. These courses are classified into 6 sections as follows:

Table 29: Curriculum structure according to course classification

| No | Components | Credit Hours | Percentage (%) |
|--------------|----------------------------|--------------|----------------|
| 1 | University Courses | 19 | 15 |
| 2 | Core Courses | 42 | 34 |
| 3 | Programme Elective Courses | 30 | 24 |
| 4 | Free Module Courses | 12 | 10 |
| 5 | Final year Project | 8 | 7 |
| 6 | Industrial Training | 12 | 10 |
| Total | | 123 | 100 |

University Courses

Table 30: University courses (19 credit hours)

| No | Courses Code | Course Name | Credit Hours |
|--------------|--------------|--|--------------|
| 1 | MPU31062 | Falsafah dan Isu Semasa | 2 |
| 2 | MPU33012/ | Ilmu Wahyu dan Sains (Islam) / | 2 |
| | MPU33022 | Moral dan Etika II (Bukan Islam) | |
| 3 | MPU33032 / | Ilmu Wahyu dan Kemasyarakatan (Islam)/ | 2 |
| | MPU33042 | Perbandingan Agama II (Bukan Islam) | |
| 4 | MPU31072 | Penghayatan Etika dan Peradaban | 2 |
| 5 | MPU32092 | Asas Pembudayaan Keusahawanan | 2 |
| 6 | PBI10102 | English For Communication I | 2 |
| 7 | PBI10202 | English For Communication II | 2 |
| 8 | PBI 1**02 | Bahasa Asing | 2 |
| 9 | K** **** | Kokurikulum | 3 |
| Total | | | 19 |

*Pre requisite : PBI 10202 is passed PBI 10102

Core Courses

Table 31: Core courses (42 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--|--------------|
| 1 | CSF12003 | Problem Solving and Computer Programming | 3 |
| 2 | CSF12103 | Computer Organization and Architecture | 3 |
| 3 | CSF12203 | Human Machine Interaction | 3 |
| 4 | CSF12303 | Software Engineering Methods | 3 |
| 5 | CSF30103 | Social and Professional Ethics | 3 |
| 6 | CSF10103 | Mathematics for Computer Science | 3 |
| 7 | CSF20303 | Operating Systems | 3 |
| 8 | CSF12403 | Object Oriented Programming | 3 |
| 9 | CSF20403 | Network and Security Fundamentals | 3 |
| 10 | CSF10203 | Fundamentals of Computer Systems | 3 |
| 11 | CSF20203 | Algorithms Design and Analysis | 3 |
| 12 | CSF21503 | Database | 3 |
| 13 | CSF20103 | Discrete Structure and Application | 3 |
| 14 | CSF35503 | Artificial Intelligence | 3 |
| Total | | | 42 |

*Pre requisite : CSF 11803 is passed CSF 11103

Specialization Courses (BSC-IC)

Table 32: Specialization courses (30 credit hours)

Student are required to complete all of courses at Table 34 and 35.

| No | Course code | Course Name | Credit Hours |
|--------------|-------------|--------------------------------------|--------------|
| 1 | CSD23503 | Web Application Development | 3 |
| 2 | CSW30303 | Internet Programming Framework | 3 |
| 3 | CSW23303 | Mobile Computing | 3 |
| 4 | CSW33903 | Web Services | 3 |
| 5 | CSW20103 | Distributed Computing System | 3 |
| 6 | CSW34003 | Cloud Computing | 3 |
| 7 | CSW34103 | Business Intelligence | 3 |
| 8 | CSW20403 | Internet of Things | 3 |
| 9 | CSW30203 | Special Topics in Internet Computing | 3 |
| 10 | CSD23403 | System Analysis and Design | 3 |
| Total | | | 30 |

Free Module Courses

Table 33: Free Module Courses (12 credit hours)

| No | Course code | Course Name | Credit Hours |
|--------------|-------------|--|--------------|
| 1 | | Choose any combination courses that add up to at least 12 credits of non-specialization courses offered by other academic programme by the faculty or other faculties. | 12 |
| Total | | | 12 |

Final Year Project

Table 34: Final Year Project (8 credit hours)

| No | Course code | Course Name | Credit Hours |
|--------------|-------------|------------------------|--------------|
| 1 | CSF35104 | Final Year Project I* | 4 |
| 2 | CSF35204 | Final Year Project II* | 4 |
| Total | | | 8 |

*Pre requisite

- CSF 35104 has taken all the core and specialization courses until Year 2
- CSF 35204 is passed CSF 35104

Industrial Training

Table 35: Industrial Training (12 credit hours)

| No | Course code | Course Name | Credit Hours |
|--------------|-------------|----------------------|--------------|
| 1 | CSF47112 | Industrial Training* | 12 |
| Total | | | 12 |

*Pre requisite : CSF 47112 is passed all courses

Curriculum Structure according Semester

Table 36: First Semester (18 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|---|--------------|
| 1 | MPU31072 / | Penghayatan Etika dan Peradaban | 2 |
| | MPU31042 | Bahasa Melayu Asas 1 (Pelajar Antarabangsa) | |
| 2 | MPU33012/ | Ilmu Wahyu dan Sains (Islam) / | 2 |
| | MPU33022 | Moral dan Etika II (Bukan Islam) | |
| 3 | PBI10102 | English for Communication I | 2 |
| 4 | CSF12003 | Problem Solving and Computer Programming | 3 |
| 5 | CSF12103 | Computer Organization and Architecture | 3 |
| 6 | CSF12203 | Human Machine Interaction | 3 |
| 7 | CSF12303 | Software Engineering Methods | 3 |
| Total | | | 18 |

*Pre requisite : PBI10202 is passed PBI10102

Table 37: Second Semester (19 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--|--------------|
| 1 | MPU33032 / | Ilmu Wahyu dan Kemasyarakatan (Islam)/ | 2 |
| | MPU33042 | Perbandingan Agama II (Bukan Islam) | |
| 2 | MPU31062 | Falsafah dan Isu Semasa | 2 |
| 3 | MPU32092 | Asas Pembudayaan Keusahawanan | 2 |
| 4 | PBI10202 | English for Communication II* | 2 |
| 5 | PBI10*** | Bahasa Asing | 2 |
| 6 | KK* **** | Kokurikulum | 3 |
| 7 | CSF12403 | Object Oriented Programming | 3 |
| 8 | CSF10203 | Fundamentals of Computer Systems | 3 |
| Total | | | 19 |

*Pre requisite : CSF 11803 is passed CSF 11103

Table 38: Third Semester (18 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|------------------------------------|--------------|
| 1 | CSF20403 | Network and Security Fundamentals | 3 |
| 2 | CSF20303 | Operating Systems | 3 |
| 3 | CSF20103 | Discrete Structure and Application | 3 |
| 4 | CSD23403 | System Analysis and Design | 3 |
| 5 | CSF21503 | Database | 3 |
| 6 | CSF10103 | Mathematics for Computer Science | 3 |
| Total | | | 18 |

Table 39: Fourth Semester (19 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--------------------------------|--------------|
| 1 | CSF20203 | Algorithms Design and Analysis | 3 |
| 2 | CSD23503 | Web Application Development | 3 |
| 3 | CSW20403 | Internet of Things | 3 |
| 4 | CSW20103 | Distributed Computing System | 3 |
| 5 | CSW23303 | Mobile Computing | 3 |
| 6 | | Free Module I | 3 |
| Total | | | 19 |

Table 40: Fifth Semester (19 credit hours)

| No | Course code | Course Name | Credit Hours |
|--------------|-------------|--------------------------------|--------------|
| 1 | CSF30103 | Social and Professional Ethics | 3 |
| 2 | CSF35304 | Final Year Project I* | 4 |
| 3 | CSW33903 | Web Services | 3 |
| 4 | CSW34003 | Cloud Computing | 3 |
| 5 | CSW30303 | Internet Programming Framework | 3 |
| 6 | | Free Module II | 4 |
| Total | | | 19 |

*Pre requisite : CSF35104 has taken all the core and specialization courses until Year 2

Table 41: Sixth Semester (19 credit hours)

| No | Course code | Course Name | Credit Hours |
|--------------|-------------|--------------------------------------|--------------|
| 1 | CSF35503 | Artificial Intelligence | 3 |
| 2 | CSF35404 | Final Year Project II* | 4 |
| 3 | CSW34103 | Business Intelligence | 3 |
| 4 | CSW30203 | Special Topics in Internet Computing | 3 |
| 5 | | Free Module III | 3 |
| 6 | | Free Module IV | 3 |
| Total | | | 19 |

*Pre requisite : CSF35204 is passed CSF35104

Table 42: Seventh Semester (12 credit hours)

| No | Course code | Course Name | Credit Hours |
|--------------|-------------|----------------------|--------------|
| 1 | CSF 47112 | Industrial Training* | 12 |
| Total | | | 12 |

*Pre requisite : CSF 47112 is passed all courses

Bachelor of Information Technology (Informatics Media) With Honours (BIT-IM)

Bachelor of Information Technology (Informatics Media) with Honours first offered in Semester I Session 2016/2017. The programme aims to produce professionals in the field of information technology, innovative and critical and creative thinking to lead the information technology industry and has a high culture and high moral character. The programme has been awarded a full accreditation by Malaysian Qualifications Agency with reference number (MQA/FA5123) starting 29 January 2020.

Bachelor of Information Technology (Informatics Media) with Honours is a full-time study. The programme duration is three and half years covering seven (7) semester consisting of six (6) regular semesters and six (6) months of industrial training. Teaching and learning methods for each course is through lectures, tutorials, practical, presentations, projects and industrial training.

Programme Aims

The programme aims to foster talented, resilient and responsible information technology professionals who will promote universal responsibility through creative industries in supporting the national and global aspirations of the Digital Economy.

Programme Educational Outcomes

- PEO 1 Computing practitioners who are able to solve global issues using knowledge and skills in the field of media informatics in line with requirements from industries.
- PEO 2 Computing practitioners who are able to demonstrate positive attitudes and practicing ethical and professional values whilst maintaining self and professional integrity.
- PEO 3 Computing practitioners who are able to demonstrate leadership skills, autonomy, responsibility and able to communicate effectively with media informatics-related stakeholders
- PEO 4 Computing practitioners with commitment for lifelong learning and entrepreneurial mind-set within media informatics industry for self and career progressions.

Programme Learning Outcomes

Upon completion of this programme, student should be able to:

- PLO 1 Apply knowledge, facts, concepts and theories related to information technology.
- PLO 2 Analyse theories and principles of information technology in managing information technology and media informatics resources.
- PLO 3 Utilize appropriate methodologies and techniques to propose, design, implement and manage information technology solutions.

PLO 4 Demonstrate effective interactions and noble values with various stakeholders.

PLO 5 Practice effective communications with various stakeholders.

PLO 6 Utilise digital skills for problem solving in the field of media informatics studies.

PLO 7 Demonstrate numerical skills for problem solving in the field media informatics.

PLO 8 Exhibit leadership, teamwork, accountability and responsibility in delivering services and tasks related to the field of media informatics.

PLO 9 Demonstrate the commitment of lifelong learning in academic and career progressions.

PLO 10 Demonstrate entrepreneurial mind set in delivering solutions in accordance to changes of industrial landscapes

PLO 11 Adhere to professional and ethical values in the delivery of services and tasks related to the field of media informatics.

Career Prospects

- Multimedia system analysis
- Graphic programmer
- Illustrator designer
- Content/ Storyboard/Character Designer
- 2D & 3D Animator
- Video game engineer
- Multimedia Developer
- Web system analyst
- Researcher

Curriculum Details and Structure

Each student is required to pass at least 123 credit hours of courses to be awarded the degree of Bachelor of Information Technology (Informatics Media) with Honours. These courses are classified into 6 sections as follows:

Table 43: Curriculum structure according to course classification

| No | Components | Credit Hours | Percentage (%) |
|--------------|------------------------|--------------|----------------|
| 1 | University Courses | 19 | 15 |
| 2 | Core Courses | 42 | 34 |
| 3 | Specialization Courses | 30 | 24 |
| 4 | Free Module Courses | 12 | 10 |
| 5 | Final year Project | 8 | 7 |
| 6 | Industrial Training | 12 | 10 |
| Total | | 123 | 100 |

University Courses

Table 44: University courses (19 credit hours)

| No | Courses Code | Course Name | Credit Hours |
|--------------|--------------|--|--------------|
| 1 | MPU31062 | Falsafah dan Isu Semasa | 2 |
| 2 | MPU33012/ | Ilmu Wahyu dan Sains (Islam) / | 2 |
| | MPU33022 | Moral dan Etika II (Bukan Islam) | |
| 3 | MPU33032 / | Ilmu Wahyu dan Kemasyarakatan (Islam)/ | 2 |
| | MPU33042 | Perbandingan Agama II (Bukan Islam) | |
| 4 | MPU31072 | Penghayatan Etika dan Peradaban | 2 |
| 5 | MPU32092 | Asas Pembudayaan Keusahawanan | 2 |
| 6 | PBI10102 | English For Communication I | 2 |
| 7 | PBI10202 | English For Communication II | 2 |
| 8 | PBI 1**02 | Bahasa Asing | 2 |
| 9 | K** **** | Kokurikulum | 3 |
| Total | | | 19 |

*Pre requisite : PBI10202 is passed PBI10102

Core Courses

Table 45: Core courses (42 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|---|--------------|
| 1 | CSF 12003 | Problem Solving and Computer Programming | 3 |
| 2 | CSF 12203 | Human Machine Interaction | 3 |
| 3 | ITF 23903 | Discrete Mathematics | 3 |
| 4 | CSF 12403 | Object Oriented Programming | 3 |
| 5 | ITF 23803 | Probability and Statistical Data Analysis | 3 |
| 6 | CSD 23403 | System Analysis and Design | 3 |
| 7 | CSF 21503 | Database | 3 |
| 8 | CSF 30103 | Social and Professional Ethics | 3 |
| 9 | ITF 10103 | Computer Operations and Organization | 3 |
| 10 | ITF 13203 | Information Technology and Its Applications | 3 |
| 11 | ITF 33603 | Data Communication and Networking | 3 |
| 12 | ITF 30103 | Information Security | 3 |
| 13 | CSD 23503 | Web Application Development | 3 |
| 14 | CSD 23603 | Software Project Management | 3 |
| Total | | | 42 |

*Pre requisite : CSF11803 is passed CSF11103

Specialization Courses (BIT – IM)

Table 46: Specialization courses (24 credit hours)

Student are required to complete all of specialization courses.

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|---|--------------|
| 1 | ITM 13203 | Art and Design | 3 |
| 2 | ITM 23803 | Storytelling and Storyboard | 3 |
| 3 | ITM 20203 | Multimedia Application Development | 3 |
| 4 | ITM 20303 | 3D Modeling | 3 |
| 5 | ITM 30303 | 3D Animation | 3 |
| 6 | ITM 33503 | Digital Audio and Video Technology | 3 |
| 7 | ITM 23903 | Photography Techniques and Technology | 3 |
| 8 | ITM 24003 | Virtual Reality Technology | 3 |
| 9 | ITM 30103 | Information Technology Entrepreneurship | 3 |
| 10 | ITM 30203 | Computer Games Development | 3 |
| Total | | | 24 |

*Pre requisite : ITM 33203 is passed ITM23303

Free Module Courses

At least 12 credits must be taken to make up the free module courses. The course is not limited to the list of options offered by this program only, it can be taken from any of three credit hours of courses offered by other academic programs either from the Faculty of Informatics and Computing as well as from other faculties in UniSZA.

Table 47: Free Module courses (12 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--|--------------|
| 1 | | Choose any combination courses that add up to at least 12 credits of non-specialization courses offered by other academic programme by the faculty or other faculties. | 12 |
| Total | | | 12 |

Final Year Project

Table 48: Final Year Project (8 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|------------------------|--------------|
| 1 | CSF35104 | Final Year Project I* | 4 |
| 2 | CSF35204 | Final Year Project II* | 4 |
| Total | | | 8 |

*Pre-requisite:

- CSF 35104 has taken all the core and specialization courses until Year 2
- CSF 35204 is passed CSF 35104

Industrial Training

Table 49: Industrial Training (12 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|----------------------|--------------|
| 1 | CSF47112 | Industrial Training* | 12 |
| Total | | | 12 |

*Pre-requisite : CSF47112 is passed all courses

Curriculum Structure according Semester

Table 50: First Semester (18 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|---|--------------|
| 1 | MPU31072 / | Penghayatan Etika dan Peradaban/ | 2 |
| | MPU31042 | Bahasa Melayu Asas 1 (Pelajar Antarabangsa) | |
| 2 | MPU33012/ | Ilmu Wahyu dan Sains (Islam) / | 2 |
| | MPU33022 | Moral dan Etika II (Bukan Islam) | |
| 3 | PBI10102 | English for Communication I | 2 |
| 4 | CSF 12003 | Problem Solving and Computer Programming | 3 |
| 5 | CSF 12203 | Human Machine Interaction | 3 |
| 6 | ITF 10103 | Computer Operations and Organization | 3 |
| 7 | ITF 13203 | Information Technology and Its Applications | 3 |
| Total | | | 18 |

Table 51: Second Semester (19 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--|--------------|
| 1 | MPU33032 / | Ilmu Wahyu dan Kemasyarakatan (Islam)/ | 2 |
| | MPU33042 | Perbandingan Agama II (Bukan Islam) | |
| 2 | MPU31062 | Falsafah dan Isu Semasa | 2 |
| 3 | MPU32092 | Asas Pembudayaan Keusahawanan | 3 |
| 4 | PBI10202 | English for Communication II* | 3 |
| 5 | PBI10*** | Bahasa Asing | 3 |
| 6 | KK* **** | Kokurikulum | 3 |
| 7 | CSF 11803 | Object Oriented Programming | 3 |
| | ITM 13103 | Art and Design | 3 |
| Total | | | 19 |

*Pre requisite : CSF 11803 is passed CSF 11103

Table 52: Third Semester (18 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|---|--------------|
| 1 | ITF 23803 | Probability and Statistical Data Analysis | 2 |
| 2 | CSD 23403 | System Analysis and Design | 3 |
| 3 | CSF 21503 | Database | 3 |
| 4 | ITM 23803 | Storytelling and Storyboard | 3 |
| 5 | ITM 23903 | Photography Techniques and Technology | 3 |
| 6 | ITF 23903 | Discrete Mathematics | 3 |
| Total | | | 18 |

Table 53: Fourth Semester (19 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|------------------------------------|--------------|
| 1 | | Web Application Development | 3 |
| 2 | | Software Project Management | 3 |
| 3 | | Virtual Reality Technology | 3 |
| 4 | ITM 20203 | Multimedia Application Development | 3 |
| 5 | ITM 20303 | 3D Modeling | 3 |
| 6 | | Free Module I | 3 |
| Total | | | 18 |

Table 54: Fifth Semester (19 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|---|--------------|
| 1 | CSF 35304 | Final Year Project I* | 4 |
| 2 | ITM 30103 | Information Technology Entrepreneurship | 3 |
| 3 | ITM 30203 | Computer Games Development | 3 |
| 4 | ITM 30303 | 3D Animation * | 3 |
| 5 | | Digital Audio and Video Technology | 3 |
| 6 | CSF 30103 | Social and Professional Ethics | 3 |
| Total | | | 19 |

*Pre requisite :

- CSF35104 has taken all the core and specialization courses until Year 2
- ITM33203 is passed ITM23303

Table 55: Sixth Semester (19 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|-----------------------------------|--------------|
| 1 | ITF 20103 | Data Communication and Networking | 3 |
| 2 | ITF 30103 | Information Security | 3 |
| 3 | CSF 35404 | Final Year Project II* | 4 |
| 4 | | Free Module II | 3 |
| 5 | | Free Module III | 3 |
| | | Free Module IV | |
| Total | | | 19 |

*Pre requisite : CSF35204 is passed CSF35104

Table 56: Seventh Semester (12 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|----------------------|--------------|
| 1 | CSF47112 | Industrial Training* | 12 |
| Total | | | 12 |

*Pre requisite : CSF47112 is passed all courses.

Diploma in Computer Science (DCS)

Diploma in Information Technology first offered in Session July 1992/1993 before Kolej Sultan Zainal Abidin (KUSZA) were upgrade to be University. The programme has been awarded a full accreditation by Malaysian Qualifications Agency with reference number MQA/FA9642 starting 23rd October 2017.

In 2021, Diploma in Information Technology has been renamed as Diploma in Computer Science. Diploma in Computer Science is a full-time study within two and a half year covering six (6) semester consisting of five (5) regular semesters, one (1) short semesters and six (6) months of industrial training . Teaching and learning methods for each course is through lectures, tutorials, practical, presentations, projects and industrial training.

Programme Aims

This program aims to produce graduates who master advanced knowledge, understanding and various skills in the field of information technology management and who are able to develop new ideas and solve problems in various disciplines during their application and constantly search for everything new and access knowledge in a clear, systematic, responsible and ethical manner.

Programme Educational Outcomes

- PEO 1 Solve computing problems based on knowledge and technical skills in the field of computer science
- PEO 2 Demonstrate the use of acquired skills in conjunction with ethical and professional values to fulfill social responsibilities
- PEO 3 Exhibit effective leadership attributes, responsibilities and cooperation with stakeholders via efficient communication in the domain of computer science
- PEO 4 Integrate numeracy and digital skills when conducting innovations and entrepreneurship in the field of computer science

Programme Learning Outcomes

Upon completion of this programme, student should be able to:

- PLO 1 To apply the knowledge of computer science in providing solutions to computing issues
- PLO 2 To identify appropriate solutions for computing problems based on the fundamental concepts, theories and principles in computer science
- PLO 3 To apply practical skills using appropriate methods and tools to manage, configure and develop computer-based systems
- PLO 4 To demonstrate good personality traits when dealing with the stakeholders
- PLO 5 To continually practice effective and sublime communication skills
- PLO 6 To demonstrate the use of digital skills during the development of applications in the field of computer science

- PLO 7 To utilize numeracy skills during the development of applications in the field of computer science
- PLO 8 To demonstrate good leadership skills and accountability in performing assigned tasks
- PLO 9 To demonstrate acquired skills in improving competencies in the field of computer science
- PLO 10 To exhibit management skills and technopreneur ship based on the domain of computer science
- PLO 11 To adhere to ethics, noble values and professionalism in computer science ecosystem

Career Prospects

- Assistant Information Technology Officer
- System analyst Assistant
- Computer/Web Programmer
- Database/Computer Network Assistant Administrator
- ICT entrepreneur

Curriculum Details and Structure

Curriculum Structure according to Course Classification

Each student is required to pass at least 92 credit hours of courses to be awarded the Diploma in Computer Science. These courses are classified into six sections as follows:

Table 57: Curriculum structure according to course classification

| No | Components | Credit Hours | Percentage (%) |
|----|-------------------------|--------------|----------------|
| 1 | University Courses | 17 | 19 |
| 2 | Core Courses | 29 | 32 |
| 3 | Specialization Courses | 27 | 29 |
| 4 | Module Elective Courses | 9 | 10 |
| 5 | Industrial Training | 10 | 11 |
| | Total | 92 | 100% |

University Courses

Table 58: University courses (17 credit hours)

| No | Course Code | Course Name | Credit Hours |
|----|-------------|--|--------------|
| 1 | MPU21022 | Penghayatan Etika dan Peradaban | 2 |
| 2 | MPU23012/ | Aqidah dan Akhlak (Muslim)/ | 2 |
| | MPU23022 | Moral dan Etika I (Non Muslim) | |
| 3 | MPU23032/ | Fiqh Ibadat (Muslim)/ | 2 |
| | MPU23042 | Perbandingan Agama I (Non Muslim) | |
| 4 | MPU23052/ | Tajwid Al-Quran (Muslim)/ | 2 |
| | MPU23062 | Etiket Sosial dan Penampilan Diri (Non Muslim) | |
| 5 | KK***** | Ko-kurikulum | 3 |
| 6 | PBD10102 | English I | 2 |
| 7 | PBD10202 | English II | 2 |
| 8 | PBD **** | Bahasa Asing 2 | 2 |

| | | | |
|---|----------|--------------|-----------|
| 9 | PID23010 | Kursus FlexS | 0 |
| | | Total | 17 |

*Pre requisite : PBD 10202 is passed PBD 10102

Core Courses

Table 59: Core courses (29 credit hours)

| No | Course Code | Course Name | Credit Hours |
|----|-------------|-------------------------------|--------------|
| 1 | ITD10303 | Algebra and Calculus | 3 |
| 2 | ITD11204 | Computer Programming | 4 |
| 3 | ITD10503 | Database | 3 |
| 4 | ITD20103 | Discrete Mathematics | 3 |
| 5 | ITD20303 | System Analysis and Design | 3 |
| 6 | ITD10403 | Computer Architecture | 3 |
| 7 | ITD10603 | Operating Systems | 3 |
| 8 | ITD20404 | Project | 4 |
| 9 | ITD21403 | Data Communication Workshop I | 3 |
| | | Total | 29 |

Specialization Courses

Table 60: Specialization courses (27 credit hours)

Student are required to complete all of specialization courses.

| No | Course Code | Course Name | Credit Hours |
|----|-------------|------------------------------------|--------------|
| 1 | ITD20203 | Data Structures | 3 |
| 2 | ITD20204 | Web Programming* | 4 |
| 3 | ITD20803 | Advanced Applications Workshop | 3 |
| 4 | ITD21803 | Data Communications Workshop II | 3 |
| 5 | ITD21304 | Object Oriented Programming* | 4 |
| 6 | ITD20304 | Mobile Application Development | 4 |
| 7 | ITD20403 | Introduction to Internet of Things | 3 |
| 8 | ITD20603 | Web Programming Framework | 3 |
| | | Total | 27 |

*Pre requisite

- ITD20203 is passed ITD11204
- ITD21304 is passed ITD11204
- ITD20204 is passed ITD11303

Elective courses

Table 61: Elective courses (9 credit hours)

Student are needed to complete any elective course offered that total up to 9 credits only.

| No | Course Code | Course Name | Credit Hours |
|----|-------------|-------------------------------|--------------|
| 1 | ITD12003 | Informatics and Communication | 3 |
| 2 | ITD20703 | Information Security | 3 |
| 3 | MMD10103 | Human Machine Interaction | 3 |
| 4 | ITD20903 | Computer, Ethics and Social | 3 |
| 5 | ITD20503 | Fundamentals of Linux | 3 |
| 6 | MMD20403 | Web Authoring | 3 |
| 7 | ITD21003 | Statistics and Probability | 3 |
| | | Total | 9 |

Industrial Training

Table 62: Industrial Training (12 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|---------------------|--------------|
| 1 | ITD30110 | Industrial Training | 10 |
| Total | | | 10 |

*Pre requisite:

- ITD30100 is passed all courses

Curriculum Structure according Semester

Table 63: First Semester (5 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--------------|--------------|
| 1 | *** ***** | Elective I | 3 |
| 2 | PBD10*** | Bahasa Asing | 2 |
| 3 | PID23010 | Kursus FlexS | 0 |
| Total | | | 5 |

Table 64: Second Semester (19 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|------------------------------------|--------------|
| 1 | MPU21022 | Penghayatan Etika dan Peradaban | 2 |
| 2 | MPU23032 | Fiqh Ibadat (Islam) | 2 |
| 3 | MPU23042 | Perbandingan Agama I (Bukan Islam) | |
| 4 | PBD10102 | English I | 2 |
| 5 | K** **** | Ko-Kurikulum | 3 |
| 6 | ITD10303 | Algebra and Calculus | 3 |
| 7 | ITD11204 | Computer Programming | 4 |
| 8 | ITD10403 | Computer Architecture | 3 |
| Total | | | 19 |

Table 65: Third Semester (19 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|---|--------------|
| 1 | MPU23012 | Akidah dan Akhlak (Islam) | 2 |
| 2 | MPU23022 | Moral dan Etika I (Bukan Islam) | |
| 3 | MPU23052 | Tajwid Al-Quran (Islam) | 2 |
| 4 | MPU23062 | Etiket Sosial dan Penampilan Diri (Bukan Islam) | |
| 5 | PBD10202 | English II* | 3 |
| 6 | ITD21304 | Object Oriented Programming | 3 |
| 7 | ***** | Elective II | 3 |
| 8 | ITD10603 | Operating Systems | 3 |
| 9 | ITD10503 | Database | 3 |
| Total | | | 19 |

*Pre requisite : PBD10202 is passed PBD10102

Table 66: Fourth Semester (19 credit hours)

| No | Course Code | Course Name | Credit Hours |
|----|-------------|-------------------------------|--------------|
| 1 | ITD20203 | Data Structures | 3 |
| 2 | ITD20803 | Advanced Application Workshop | 3 |
| 3 | ITD20303 | System Analysis and Design | 3 |
| 4 | ITD21403 | Data Communication Workshop I | 3 |

| | | | |
|--------------|----------|---------------------------|-----------|
| 5 | ITD20204 | Web Programming | 4 |
| 6 | ITD20603 | Web Programming Framework | 3 |
| Total | | | 19 |

*Pre requisite:

- ITD20203 is passed ITD21304
- ITD20204 is passed ITD11303

Table 67: Fifth Semester (19 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|------------------------------------|--------------|
| 1 | ITD20404 | Project | 4 |
| 2 | ITD21803 | Data Communication Workshop II | 3 |
| 3 | ITD20304 | Mobile Application Development | 4 |
| 4 | ITD20403 | Introduction to Internet of Things | 3 |
| 5 | ITD20103 | Discrete Mathematics | 3 |
| 6 | *** ***** | Pilihan III | 3 |
| Total | | | 20 |

Table 68: Sixth Semester (12 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|---------------------|--------------|
| 1 | ITD30110 | Industrial Training | 10 |
| Total | | | 10 |

*Pre requisite : ITD30110 is passed all courses

Diploma in Information Technology (DIT)

Diploma in Information Technology (Multimedia) first offered in Session May 1999. The programme has been awarded full accredited by Malaysian Qualifications Agency with reference number MQA/FA9643 starting 16th November 2017.

In 2021, Diploma in Information Technology (Multimedia) has been renamed as Diploma in Information Technology. This program is a full-time study within two and a half year covering six (6) semester consisting of five (5) regular semesters, one (1) short semesters and six (6) months of industrial training . Teaching and learning methods for each course is through lectures, tutorials, practical, presentations, projects and industrial training.

Programme Aims

The program aims to produce skilled multimedia employees who are inclusive, creative and innovative and able to contribute to local and global social and economic development in line with the aspirations of the university and the state.

Programme Educational Outcomes

- PEO 1 Solve issues related to information technology problems based on knowledge and technical skills in the field of computing
- PEO 2 Apply ethical and professional values to fulfil professional and social responsibilities.
- PEO 3 Foster leadership qualities and collaboration with the stakeholders through effective communication skills in the field of information technology
- PEO 4 Apply numeracy and digital skills when conducting innovations and entrepreneurship in the field of information technology)

Programme Learning Outcomes

Upon completion of this programme, student should be able to:

- PLO 1 To apply the knowledge of information technology in solving issues in computing
- PLO 2 To analyze solutions for computing issues based on knowledge in information technology
- PLO 3 To implement information technology skills in the development of computing products and services
- PLO 4 To demonstrate good personality traits when dealing with the stakeholders
- PLO 5 To continually practice effective and excellent communication skills
- PLO 6 To apply digital skills during the development of applications in the field of Information Technology
- PLO 7 To use the numeracy expertise during the analysis of data and information
- PLO 8 To demonstrate good leadership skills and teamwork in performing assigned tasks
- PLO 9 To demonstrate personal skills in self and professional development

PLO 10 To exhibit entrepreneurship skills in the commercialization of information technology products

PLO 11 To adhere to ethics, noble values and professionalism in the information technology ecosystem

Career Prospects

- Storyboard designer
- Instructional designer
- Graphic, Animation and Multimedia designer
- Assistant Information Technology Officer
- Computer Programmer
- Web programmer
- Computer Network Assistant Administrator
- ICT and multimedia entrepreneur
- Multimedia Content Developer
- Animators

Curriculum Details and Structure

Curriculum Structure according to Course Classification

Each student is required to pass at least 92 credit hours of courses to be awarded the Diploma in Information Technology. These courses are classified into six sections as follows:

Table 69: Curriculum structure according to course classification

| No | Components | Credit Hours | Percentage (%) |
|----|----------------------------|--------------|----------------|
| 1 | University Courses | 17 | 19 |
| 2 | Core Courses | 29 | 32 |
| 3 | Specialization Courses | 24 | 29 |
| 4 | Programme Elective Courses | 12 | 10 |
| 5 | Industrial Training | 10 | 11 |
| | Total | 92 | 100% |

University Courses

Table 70: University courses (17 credit hours)

| No | Course Code | Course Name | Credit Hours |
|----|-------------|--|--------------|
| 1 | MPU21022 | Penghayatan Etika dan Peradaban | 2 |
| 2 | MPU 23012/ | Aqidah dan Akhlak (Muslim)/ | 2 |
| | MPU 23022 | Moral dan Etika I (Non Muslim) | |
| 3 | MPU 23032/ | Fiqh Ibadat (Muslim)/ | 2 |
| | MPU 23042 | Perbandingan Agama I (Non Muslim) | |
| 4 | MPU 23052/ | Tajwid Al-Quran (Muslim)/ | 2 |
| | MPU 23062 | Etiket Sosial dan Penampilan Diri (Non Muslim) | |
| 5 | KK***** | Ko-kurikulum | 3 |
| 6 | PBD 10102 | English I | 2 |

| | | | |
|--------------|-----------|--------------|-----------|
| 7 | PBD 10202 | English II | 2 |
| 8 | PBD **** | Bahasa Asing | 2 |
| 9 | PID***** | Kursus FlexS | 0 |
| Total | | | 17 |

*Pre requisite : PBD10202 is passed PBD10102

Core Courses

Table 71: Core courses (29 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|-------------------------------|--------------|
| 1 | ITD 11204 | Computer Programming | 4 |
| 2 | ITD 10503 | Database | 3 |
| 3 | ITD 20103 | Discrete Mathematics | 3 |
| 4 | ITD 20303 | System Analysis and Design | 3 |
| 5 | ITD 10403 | Computer Architecture | 3 |
| 6 | ITD 10603 | Operating Systems | 3 |
| 7 | ITD 20404 | Project | 4 |
| 8 | MMD 10103 | Human Machine Interaction | 3 |
| 9 | ITD 21403 | Data Communication Workshop I | 3 |
| Total | | | 29 |

Specialization Courses

Table 72: Specialization courses (24 credit hours)

Student are required to complete all of specialization courses.

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|------------------------------------|--------------|
| 1 | MMD 11203 | Graphic Design I | 3 |
| 2 | MMD 21203 | 3D Modeling and Animation | 3 |
| 3 | MMD 10403 | Audio and Video Digital Technology | 3 |
| 4 | MMD 21104 | Multimedia Application Development | 4 |
| 5 | MMD 20203 | Graphics Design II | 3 |
| 6 | ITD 20204 | Web Programming | 4 |
| 7 | ITD 20304 | Mobile Application Development | 4 |
| Total | | | 24 |

*Pre requisite : MMD13403 is passed MMD13203

Elective courses

Table 73: Elective courses (12 credit hours)

Student are needed to complete any elective course offered that total up to 12 credits only.

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|------------------------------------|--------------|
| 1 | MMD 21303 | Computer Games Development | 3 |
| 2 | MMD 20403 | Web Authoring | 3 |
| 3 | MMD 20103 | Digital Photography | 3 |
| 4 | ITD 20903 | Computer, Ethics and Social | 3 |
| 5 | MMD 10203 | Script Writing and Storyboarding | 3 |
| 6 | ITD 20403 | Introduction to Internet of Things | 3 |
| 7 | ITD 20703 | Information Security | 3 |
| 8 | ITD 12003 | Informatics and Communication | 3 |
| 9 | MMD 21103 | Augmented Reality Technology | 3 |
| | MMD 13203 | Script Writing and Storyboarding | |
| Total | | | 12 |

Industrial Training

Table 74: Industrial Training (12 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|---------------------|--------------|
| 1 | ITD30110 | Industrial Training | 10 |
| Total | | | 10 |

*Pre requisite : IT30110 is passed all courses

Curriculum Structure according Semester

Table 75: First Semester (5 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--------------|--------------|
| 1 | *** ***** | Elective I | 3 |
| 2 | PBD 10*** | Bahasa Asing | 2 |
| 3 | PID***** | Kursus FlexS | 0 |
| Total | | | 5 |

Table 76: Second Semester (19 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|------------------------------------|--------------|
| 1 | MPU 21022 | Penghayatan Etika dan Peradaban | 2 |
| 2 | MPU 23032 | Fiqh Ibadat (Islam) | 2 |
| | MPU 23042 | Perbandingan Agama I (Bukan Islam) | |
| 3 | PBD 10102 | English I | 2 |
| 4 | ITD 11204 | Computer Programming | 4 |
| 5 | K** **** | Ko-Kurikulum | 3 |
| 6 | MMD 10103 | Human Machine Interaction | 3 |
| 7 | ITD 10403 | Computer Architecture | 3 |
| Total | | | 19 |

Table 77: Third Semester (18 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|---|--------------|
| 1 | MPU 23012 | Akidah & Akhlak (Islam) | 2 |
| 2 | MPU 23022 | Moral dan Etika I (Bukan Islam) | |
| 3 | MPU 23052 | Tajwid Al-Quran (Islam) | |
| 4 | MPU 23062 | Etiket Sosial dan Penampilan Diri (Bukan Islam) | 2 |
| 5 | PBD 10202 | English II | 2 |
| 6 | ITD 10603 | Operating Systems | 3 |
| | MMD 11203 | Graphic Design I | 3 |
| | MMD 10403 | Audio and Video Digital Technology | 3 |
| 7 | *** ***** | Elective II | 3 |
| Total | | | 18 |

*Pre requisite : MMD13403 is passed MMD13203

Table 78: Fourth Semester (20 credit hours)

| No | Course Code | Course Name | Credit Hours |
|----|-------------|--------------|--------------|
| 1 | *** ***** | Elective III | 3 |
| 2 | ITD 10503 | Database | 3 |

| | | | |
|--------------|-----------|------------------------------------|-----------|
| 3 | ITD 20204 | Web Programming | 4 |
| 4 | ITD 20303 | System Analysis and Design | 3 |
| 5 | MMD 21104 | Multimedia Application Development | 4 |
| 6 | MMD 20203 | Graphics Design II | 3 |
| Total | | | 20 |

*Pre requisite : PBD 10202 is passed PBD 10102

Table 79: Fifth Semester (20 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|--------------------------------|--------------|
| 1 | ITD 20404 | Project | 4 |
| 2 | ITD 20103 | Discrete Mathematics | 3 |
| 3 | ITD 21403 | Data Communication Workshop I | 3 |
| 4 | ITD 20304 | Mobile Application Development | 4 |
| 5 | MMD 21203 | 3D Modelling and Animation | 3 |
| 6 | *** ***** | Elective IV | 3 |
| Total | | | 20 |

Table 80: Sixth Semester (12 credit hours)

| No | Course Code | Course Name | Credit Hours |
|--------------|-------------|---------------------|--------------|
| 1 | ITD30110 | Industrial Training | 10 |
| Total | | | 10 |

*Pre requisite : ITD30110 is passed all courses

Courses Synopsis – Degree Programme

University Courses

| Course Code | Course Name | Credit hours |
|-------------|---------------------------------|--------------|
| MPU31072 | Penghayatan Etika dan Peradaban | 2 |

Kursus ini mempersiapkan pelajar untuk menghayati etika dan peradaban yang wujud dalam masyarakat kepelbagaian etnik di Malaysia untuk memperteguhkan pemikiran kritikal dan analitikal mereka bagi menangani kehidupan yang lebih mencabar. Pengisian kursus ini memfokuskan kepada penghayatan etika dan peradaban dalam acuan Malaysia. Pelajar akan didedahkan dengan dinamika konsep etika dan peradaban yang menjadi kekuatan kepada pembentukan negara Malaysia berdasarkan susur masa evolusi sejarahnya dari era pra-kolonial sehingga ke pasca-kolonial. Kefahaman tentang pembentukan etika dan peradaban dalam masyarakat kepelbagaian dibincangkan bagi meningkatkan penghayatan etika dan peradaban ke arah pemantapan kesepaduan nasional dan bangsa Malaysia. Peradaban acuan Malaysia perlu dikupas serta diperdebatan dalam aktiviti akademik berpandukan Perlembagaan Persekutuan sebagai tapak integrasi dan wahana etika dan peradaban. Pembinaan kesepaduan nasional amat dipengaruhi oleh globalisasi dan perkembangan teknologi maklumat dan komunikasi yang kompleks. Oleh kerana itu, penghayatan etika dan peradaban menzahirkan perilaku tanggungjawab sosial dan digerakkan pada peringkat individu, keluarga, komuniti, masyarakat dan negara. Justeru, perubahan yang berlaku dalam masyarakat dan pembangunan langsung ekonomi telah membawa cabaran baru dalam mengukuhkan kelestarian etika dan peradaban di Malaysia. Amalan Pendidikan Berimpak Tinggi (HIEPs) dipraktikkan dalam pengajaran dan pembelajaran bagi mendalami kursus ini (Pengajaran & Pembelajaran)

| Course Code | Course Name | Credit hours |
|-------------|-------------------------|--------------|
| MPU31062 | Falsafah dan Isu Semasa | 2 |

Kursus ini merangkumi hubungan ilmu falsafah dengan Falsafah Pendidikan Kebangsaan dan Rukun Negara. Tujuan pembelajaran ilmu falsafah sebagai alat untuk memurnikan budaya pemikiran dalam kehidupan melalui seni dan kaedah berfikir serta konsep insan. Topik utama dalam falsafah iaitu epistemologi, metafizik dan etika dibincangkan dalam konteks isu semasa dengan memberi penekanan terhadap dialog antara budaya serta memupuk nilai seponya. Pengajaran akan memfokuskan kepada pembelajaran secara bersemuka dan penilaian subjek ini terbahagi kepada ujian dan tugas berkumpulan. Di hujung kursus ini pelajar akan mampu melihat disiplin- disiplin ilmu sebagai satu badan ilmu yang komprehensif dan terkait antara satu sama lain.

| Course Code | Course Name | Credit hours |
|-------------|-------------------------------|--------------|
| MPU32092 | Asas Pembudayaan Keusahawanan | 2 |

Kursus ini memberi pendedahan kepada pelajar berkaitan konsep, kreativiti dan etika dalam menjalankan aktiviti keusahawanan. Ia juga melibatkan perancangan dan pelaksanaan aktiviti perniagaan seperti pengurusan pemasaran, operasi dan kewangan secara berkumpulan di mana pelajar akan mempraktikkan pendekatan Kanvas Model Perniagaan dan platform digital. Pelajar akan dinilai melalui ujian, laporan dan penilaian rakan sebaya. Pada akhir pembelajaran kursus, pelajar dijangka dapat membentuk kemahiran asas keusahawanan dan mempamerkan aktiviti perniagaan dengan mengintegrasikan platform digital secara kreatif. Amalan HIEPS yang diaplikasi dalam kursus ini adalah Collaborative Assignments and ProjectS (CAS). Kaedah penyampaian kursus ini adalah melalui kuliah interaktif, e-pembelajaran, perbincangan berkumpulan dan projek.

| Course Code | Course Name | Credit hours |
|-------------|----------------------|--------------|
| MPU33012 | Ilmu Wahyu dan Sains | 2 |

This course is offered to students to provide exposure to scientific issues found in Qur'an and Hadith (al-i'jaz al-'Ilm). It focuses on the concept of revelation and science, prominent Islamic scholars, Physical Sciences, Life Sciences, Food Technology, Engineering, Medicine, Architecture, Arts and Architecture, and Geology. Discussion will be on aspects of similarities and differences between scientific discoveries and facts found in the Quran and Hadith as well as related Islamic laws. In addition, students will also explore Islamic scholars who pioneered the field of science and their contributions.

| Course Code | Course Name | Credit hours |
|-------------|--------------------------------|--------------|
| MPU33022 | Moral & Etika II (Bukan Islam) | 2 |

(For non Muslim students who do not take the faith and morals course)

This course discusses the concept of moral and ethical theories and system of values, religious values and beliefs so that it can be applied in everyday life. The basic concept of values, definitions, functions and types of value will be discussed. The concepts of kindness, happiness, truth, moral status and errors will also be discussed. The question of rights and moral knowledge as well as ethical issues will be examined in greater depth. Religious values and beliefs in society as well as local and universal moral issues will also be emphasized. Some practical issues such as rights of minorities and majority, use of stimulants, promiscuity and such will be fine-tuned with the use of moral principles based on the various ethical theories. The teachings of each religion's moral and ethics will also be discussed. Moral and ethics course not only covers the important aspects in shaping the personality of the individual but also to establish the values of a plural society in Malaysia.

| Course Code | Course Name | Credit hours |
|-------------|-------------------------------|--------------|
| MPU33032 | Ilmu Wahyu dan Kemasyarakatan | 2 |

This course discusses the social issues found in Quran and Hadith. Students will be exposed to aspects of science and society, the establishment of the Basic Principles of an Islamic Society based on revelation, Element of Establishing an Islamic Society, the Institution of an Islamic Society, Control and Monitoring Elements in an Islamic Society, as well as Issues and Challenges in an Islamic Society. Discussions will focus on guidelines provided in Quran and Hadith and its role in addressing current social issues.

| Course Code | Course Name | Credit hours |
|-------------|-------------------------------------|--------------|
| MPU33042 | Perbandingan Agama II (Bukan Islam) | 2 |

(For the non-Muslim students who do not take the course Fiqh of Worship)

The discussion in this course is to cover various aspects of religion in the world like Hindu, Buddha, Confucianism, Judaism, Christianity and Islam.

| Course Code | Course Name | Credit hours |
|-------------|-------------|--------------|
| PBD10102 | English I | 2 |

This course is offered as university subject; to guide students into acquiring basic English proficiency skills that include reading, writing, listening and speaking for academic purposes.

| Course Code | Course Name | Credit hours |
|-------------|-------------|--------------|
| PBD10202 | English II | 2 |

This course is a continuation of MPU 22012 and is designed to provide students with sufficient input and practice in oral and written English communication so that they would be able to undertake and perform similar tasks effectively in their real life and academic settings. This course will incorporate reading skills through in-class learning activities and self-study, essay writing skill

and train them to write clearly, coherently and cohesively and necessary key language to actively participate in discussion, where the four language skills namely listening, speaking, reading and writing are integrated. In this course also, students are exposed to IT skills and soft skills in completing their assignments. There will also be activities to make the students aware and familiar with appropriate English language structures so that they will become more proficient in the language. The students will be given ample opportunities to listen, talk, write, read and participate in task-based activities that will maximise their participation in the class.

Core Courses (BCS-SD, BCS-CNS & BCS-IC)

| Course Code | Course Name | Credit hours |
|-------------|--|--------------|
| CSF11203 | Computer Organisation And Architecture | 3 |

This course discusses the basic concepts of numbering system and logic in a computer system. Further explanation is given regarding the operations of each component and how they are assembled into one computer system. Computer design that contains instruction sets, instruction format, addressing modes, and input output mechanisms will also be covered including organisation of multiprocessor computers.

| Course Code | Course Name | Credit hours |
|-------------|---------------------------|--------------|
| CSF11303 | Human Machine Interaction | 3 |

This course introduces the fundamentals of Human Computer Interaction (HCI) by taking into account the aspects on human factors, equipments and the environment. Guidelines, principles, theories, cognitive models, and task analysis are also emphasized. Students will apply these features by evaluating existing interfaces in order to develop a new system. The system being developed will then be evaluated to justify the design.

| Course Code | Course Name | Credit hours |
|-------------|--------------------------------|--------------|
| CSF11503 | Social And Professional Ethics | 3 |

The Social and Professional Ethics is solely based on lectures which will provide a framework of concepts for social and professional values, and ethics. This course discusses social values and professional ethics of computing and the elements of intellectual property to enable a person to act in relation to specific code of conducts in society and working environment. Specific issues will be discussed in order to propose appropriate solutions to the problems.

| Course Code | Course Name | Credit hours |
|-------------|----------------------|--------------|
| CSF11603 | Discrete Mathematics | 3 |

In this course, students will be introduced to the fundamentals and concepts in logic, algorithm, problem solving, truth table and boolean algebra. Other topics include propositional calculus, propositional logic, quantifiers, predicate calculus (logic of quantifiers), mathematical induction, recursive relations and counting techniques. The topic of graphs includes directed and undirected graphs, isomorphism, and weighted graphs. Topic on trees will cover Spanning Tree and Minimum Spanning Tree (MST), Kruskal's Algorithm, Rooted tree and Depth-First Search Algorithm.

| Course Code | Course Name | Credit hours |
|-------------|-------------------|--------------|
| CSF11703 | Operating Systems | 3 |

This course examines the important problems in operating system design and implementation. The operating system provides an established, convenient, and efficient interface between user programs and the bare hardware of the computer on which they run. The operating system is responsible for sharing resources (e.g., disks, networks, and processors), providing common

services needed by many different programs, and protecting individual programs from interfering with one another. This course will focus on three major OS subsystems: process management (processes, threads, CPU scheduling, synchronization, and deadlock), memory management (segmentation, paging, swapping), and file systems.

| Course Code | Course Name | Credit hours |
|-------------|--|--------------|
| CSF11103 | Problem Solving And Computer Programming | 3 |

This course aims to develop logic understanding and to design algorithms for problem solving in computer science. It is also intended to explain the techniques for building algorithms, flowcharts and programs in providing solutions to computing problems. Students will be introduced to types of error testing and program documentation using appropriate syntax, variables, data types, conditional statements, repetition statements, functions, arrays, records, files management text and pointer. At the end of the course, students will be assigned to develop a program to solve a selected case study.

| Course Code | Course Name | Credit hours |
|-------------|------------------------------|--------------|
| CSF11403 | Software Engineering Methods | 3 |

This course introduces the concepts, processes and models in software engineering that include software process, agile software development, requirements engineering, system modeling, architecture design, design and implementation, software testing and software evolution. At the end of this course, students will be able to apply an appropriate technique to design a model and architecture of a computer system.

| Course Code | Course Name | Credit hours |
|-------------|-----------------------------|--------------|
| CSF11803 | Object Oriented Programming | 3 |

This course provides an overview of the techniques used in object oriented programming by discussing the concepts of object-oriented analysis and design. Students will be introduced to the advantages and differences of object oriented programming language in comparison to structured programming languages. Concepts such as class definitions, inheritance, exceptions and multi-threading; and the design and use of graphical user interface will also be covered.

| Course Code | Course Name | Credit hours |
|-------------|-----------------------------------|--------------|
| CSF11903 | Network And Security Fundamentals | 3 |

This course offers an introduction to the fundamentals of computer network and the basic principles of computer network security by emphasizing on the relationship between network and security. Among the topics are introduction to networking, protocols and standard where students will be able to identify network applications and Local Area Network (LAN). Other topics include interfacing and communication in networks, views on security, principles of a secure design, and identification of identifying threats and attacks to network security. Students will also be introduced to examples of defensive programming and encryption.

| Course Code | Course Name | Credit hours |
|-------------|---|--------------|
| CSF21103 | Probability And Statistical Data Analysis | 3 |

This course offers an introduction to the basic concepts of statistics along with data presentation and description. The course also emphasizes on probability theory and properties of probability distributions. Introduction to sampling distribution, point and interval estimation of parameters and hypothesis testing are also covered. Data analysis techniques such as correlation, simple linear regression and one-way analysis of variance (ANOVA) are also taught in this course.

| Course Code | Course Name | Credit hours |
|--------------------|----------------------------|---------------------|
| CSF21203 | System Analysis and Design | 3 |

This course introduces the principles and methods in the analysis and design of information systems. The focus is on system development activities that include analysis and modelling, process design, databases, input and output, and programmable user interface. The process of system implementation and maintenance are reviewed by taking into account important activities in the development life cycle. Emphasis will be placed on object-oriented analysis and design implementation.

| Course Code | Course Name | Credit hours |
|--------------------|--------------------|---------------------|
| CSF21303 | Database | 3 |

This course encompasses the theory of database which includes the file system, relational model, normalization and entity relationship diagram. The database skills in developing information system such as analyzing, designing, modelling and implementing the database will be introduced. Other topics to be covered are formation rules of relational databases, structured query language, 4GL programming language, and related issues in database.

| Course Code | Course Name | Credit hours |
|--------------------|--------------------------------|---------------------|
| CSF21403 | Data Structures And Algorithms | 3 |

This course covers the fundamental of data structure in order to perform analysis and design of a computing problem that will cope with the complexity of actual applications. The topics covered are basic and essential topics in data structures, array-based lists, linked lists, recursion, binary trees, trees, sorting and searching algorithms, and graphs.

| Course Code | Course Name | Credit hours |
|--------------------|-------------------------|---------------------|
| CSF31103 | Artificial Intelligence | 3 |

This course presents the fundamental concepts of artificial intelligence which include representation of knowledge and computational methods for reasoning. Comparisons among various computational methods of artificial intelligence are covered in order to discover the best system performance. Appropriate artificial intelligence learning algorithms in classification and prediction of specific data will be demonstrated to the students. The development of artificial intelligence models in solving real world problems is also emphasized in this course.

| Course Code | Course Name | Credit hours |
|--------------------|----------------------|---------------------|
| CSF35104 | Final Year Project I | 4 |

This course introduces the concept of the research, focusing on developing research skills and standardized documentations such as research proposal for selected problems. Appropriate research methodology that consists of literature review, design, data gathering techniques, and data analysis will be covered. Emphasis will also be given to the guidelines and tips on the preparation of research proposal and appropriate report, taking into account the ethical elements related to the specific code of conducts.

| Course Code | Course Name | Credit hours |
|--------------------|-----------------------|---------------------|
| CSF35204 | Final Year Project II | 4 |

This course requires students to work individually on project/research under the supervision of a supervisor. The project should be based on the research proposal that has been proposed in Final Year Project I. Supervisors will provide coaching and guidance to students on various aspects such as the references and research skills required during the development stages. At the end of this course, students will produce reports and present the complete projects to a group of assessors during the Final Presentation.

| Course Code | Course Name | Credit hours |
|-------------|---------------------|--------------|
| CSF47112 | Industrial Training | 12 |

All students are required to undergo industrial training for a period of six (6) months. Normally, the industrial training is carried out during the final semester of their studies. Placement of students at various companies will be supervised and coordinated by the Industrial Training Committee set up by the Faculty. It is anticipated that the training at the various companies will provide students with adequate exposure to a real working environment including the companies' organization structures, business operations and administrative functions. The hands-on experience in the training will reinforce what has been taught at the University

Core Course (BIT-IM)

| Course Code | Course Name | Credit hours |
|-------------|---|--------------|
| ITF11103 | Information Technology And Its Applications | 3 |

This course is designed to provide an overview of these main aspects: discipline of Information Technology (IT) and how it relates to the other computing disciplines. The goal is to help students understand the diverse contexts in which IT is used and the challenges inherent in the diffusion of innovative technology.

| Course Code | Course Name | Credit hours |
|-------------|------------------------------------|--------------|
| ITF11203 | Data Communications And Networking | 3 |

This course provides a fundamental concept in data communication and network models, focusing on communication protocols and standards that used in computer networks; identify the conversion of data and signal at the physical layer; describe bandwidth utilization using multiplexing and spreading; explore about the transmission media for computer networks; identify techniques Data Link Control; classify network topology; describe network addressing and management.

| Course Code | Course Name | Credit hours |
|-------------|----------------------|--------------|
| ITF 21103 | Information Security | 3 |

This course gives a broad overview of essential concepts in information security management. Information risk, information security framework, procedural and technical security control, security in software development and other technical aspect are also covered. The knowledge about this course is strengthen by conducting a group project.

| Course Code | Course Name | Credit hours |
|-------------|-----------------------------|--------------|
| CSD23103 | Web Application Development | 3 |

The web uses complex applications that run on heterogeneous browsers that may be built using the latest programming technologies. This course covers how core web technologies work; common security vulnerabilities; and how to build secure web applications that avoid them. Students will be required to build multiple webpages and implement website design that interacts with a database, which will include server-side applications.

| Course Code | Course Name | Credit hours |
|-------------|-----------------------------|--------------|
| CSD23303 | Software Project Management | 3 |

This course discusses the roles, responsibilities and methods of project management software from the management perspective. It includes planning, scheduling, budgeting, resource allocation, risk management, monitoring and quality assurance and configuration management of software projects. The uses of CASE tools are required to manage the activities in the project.

Specialization Courses (BCS-SD)

| Course Code | Course Name | Credit hours |
|-------------|-----------------------------|--------------|
| CSD23103 | Web Application Development | 3 |

The web uses complex applications that run on heterogeneous browsers that may be built using the latest programming technologies. This course covers how core web technologies work; common security vulnerabilities; and how to build secure web applications that avoid them. Students will be required to build multiple webpages and implement website design that interacts with a database, which will include server-side applications.

| Course Code | Course Name | Credit hours |
|-------------|--|--------------|
| CSD23203 | Requirements Engineering And Software Design | 3 |

This course covers the software development process, from requirements elicitation and analysis, through specification and design. A variety of concepts, principles, techniques, and tools are presented, encompassing topics such as software processes, software requirements, system models, architectural and detailed design, user interface design. Aspects of the course covers building models of both requirements engineering process and requirements engineering product, concerning both functional and non-functional goals/requirements/specifications, using a systematic decision-making process.

| Course Code | Course Name | Credit hours |
|-------------|-----------------------------|--------------|
| CSD23303 | Software Project Management | 3 |

This course discusses the roles, responsibilities and methods of project management software from the management perspective. It includes planning, scheduling, budgeting, resource allocation, risk management, monitoring and quality assurance and configuration management of software projects. The uses of CASE tools are required to manage the activities in the project.

| Course Code | Course Name | Credit hours |
|-------------|-------------------------------|--------------|
| CSD33103 | Software Testing And Analysis | 3 |

This course is a study of software testing and analysis methodologies for object-oriented, component-based, concurrent, distributed, and web software. Topics include approaches to automatic test case generation, coverage analysis, prioritized testing, construction of tools, regression testing and impact analysis. A primary focus will be on software testing process and documentation.

| Course Code | Course Name | Credit hours |
|-------------|-------------------------------|--------------|
| CSD33203 | Software Development Workshop | 3 |

This course requires students to work in a group to design and develop a functional system using appropriate theories and techniques that have been taught in other classes. This course is supervised by a lecturer that acts as a mentor to each group. Throughout this workshop, students need to do presentations as well as to submit their work progress and final report/documentation.

| Course Code | Course Name | Credit hours |
|-------------|----------------------|--------------|
| CSD33303 | Compiler Development | 3 |

This course discusses the techniques to construct a compiler for programming language. The emphasis is on theoretical analysis of lexical, semantic and syntactic analyses based on the compiler requirements. In addition, students will explore to the tools that can be used in the program development of the compiler. At the end of the course, students will be given a project to develop a functionality that is available in the system compiler.

| Course Code | Course Name | Credit hours |
|-------------|----------------|--------------|
| CSD33403 | Formal Methods | 3 |

This course introduces the elements of formal methods, its syntax and semantics and its supporting tools. The aims of the course are to create awareness on the importance of formal methods in software specification, write formal specifications and use a supporting tool to generate the formal specifications. As more complex computational systems are used within critical applications, it is becoming essential that these systems are formally specified. Such specifications are used to give a precise and unambiguous description of the required system. In addition, as computational systems become more complex, formal specifications allow concise and precise definition of the key characteristics of systems.

| Course Code | Course Name | Credit hours |
|-------------|-------------|--------------|
| CSD33503 | Data Mining | 3 |

This course covers fundamental knowledge and techniques in Data Mining. Data Mining studies algorithms and computational paradigms that allow computers to find patterns and regularities in databases, perform prediction and forecasting, and generally improve their performance through interaction with data. It is currently regarded as the key element of a more general process called Knowledge Discovery that deals with extracting useful knowledge from raw data. The knowledge discovery process includes data selection, cleaning, coding, using different statistical and machine learning techniques, and visualization of the generated structures. The course will cover all these issues and will illustrate the whole process by examples. Special emphasis will be given to the Machine Learning methods as they provide real knowledge discovery tools for the students to understand the subject matter.

Elective Courses (BCS-SD)

| Course Code | Course Name | Credit hours |
|-------------|--|--------------|
| CSD33603 | Special Topics In Software Development | 3 |

This course will discuss the topics concerning the contemporary issues in the field of software development and its integration with other fields. Topics in course contents will always change from time to time in line with development and latest technology in academic germination of various fields.

| Course Code | Course Name | Credit hours |
|-------------|--------------------------|--------------|
| CSD33703 | Digital Image Processing | 3 |

This course covers the fundamental concepts of digital image processing. The topics include sampling theory, image representation, image segmentation, filtering and the processing methods such as morphological processing. The theories will be applied in a group project to emphasize the understanding of the topics.

| Course Code | Course Name | Credit hours |
|-------------|-------------------|--------------|
| CSD33803 | Advanced Database | 3 |

This course introduces the techniques and implementation of advanced database management applications. Advanced data model and database design, database redesign, multiuser database systems, managing SQL server, security, document processing over internet technology, business data analysis and temporal database are the topics to be covered. Students will be required to develop an advanced database system application, especially in the application of business intelligence.

| Course Code | Course Name | Credit hours |
|-------------|----------------------------|--------------|
| CSD33903 | Artificial Neural Networks | 3 |

This course covers Artificial Neural Network (ANN) models. The include biological and artificial neurons, learning theories and their real-world applications including business, medical diagnosis, engineering and information technology domains. The course also includes hands-on experiments for a number of ANN models using commercial and open source tools.

Specialization Courses (BCS-CNS)

| Course Code | Course Name | Credit hours |
|-------------|---------------------|--------------|
| CSA23103 | Security Management | 3 |

The course provides insights into the principles of information security management that are commonly used in real-world. The course covers the principles of applied information security management and delivers an in-depth understanding of security management in medium to large organisations. Students will be introduced to the commonly used frameworks and methods information security management. They will also explore the appropriateness of the methods and frameworks in addressing current security needs in organizations.

| Course Code | Course Name | Credit hours |
|-------------|--|--------------|
| CSA23203 | Network Technology Security And Communications | 3 |

This course focuses on ensuring information confidentiality, integrity and availability. It covers the aspects of information assurance programs, policies, procedures and architecture; utilizing the concepts of security by design. Network security utilizes proactive techniques, including defense-in-depth and layered security to mitigate or eliminate vulnerabilities in information systems and to protect against potential exploitation. This course provides students with the opportunity to synthesize and apply the vital skills and knowledge necessary to succeed in the workforce.

| Course Code | Course Name | Credit hours |
|-------------|-----------------------------|--------------|
| CSA23303 | Data Communication Workshop | 3 |

This course introduces the core concepts, characteristics, evolution, functions, topologies and configurations of switches and routers, and examines the role they play in business network enterprises. It explores the theoretical and practical aspects of constructing and configuring simple networking systems and their associated protocols. It focuses on network and protocols, LAN, WAN, OSI model, cabling, routers, router configuration, Ethernet, IP addressing, network standards, switch and router configurations.

| Course Code | Course Name | Credit hours |
|-------------|-----------------------------|--------------|
| CSA33103 | Network Analysis And Design | 3 |

This course covers systematic approach towards designing computer networks. Activities include collecting and analyzing computer networks requirements, designing logical and physical computer networks, and implementing the designed network onto final computer networks design. Students will be able to practice computer networks design approaches in real-life computer networks.

| Course Code | Course Name | Credit hours |
|-------------|---------------------|--------------|
| CSA33203 | Penetration Testing | 3 |

This course provides the fundamentals of the underlying principles and techniques associated with cybersecurity practice known as penetration testing. Students will learn about the entire penetration testing process that include planning, reconnaissance, scanning, exploitation, post-exploitation, and results reporting. The course will provide insights to fundamental information associated with each of the methods employed and their corresponding vulnerabilities. Students

will develop an understanding of current cybersecurity issues and ways that users, administrators, and programmer errors can lead to exploitable vulnerabilities.

| Course Code | Course Name | Credit hours |
|-------------|--------------|--------------|
| CSA33303 | Cryptography | 3 |

The course provides the fundamentals of cryptography and its associated techniques. In particular, students will be introduced to wide range of security objectives, different levels of security that can be achieved and some available cryptographic techniques that can be used. The new security goals in computers and digital communication such as anonymity, authenticity, non-repudiation, authorized wiretapping (called law enforcement), and traceability will also be covered in this course.

| Course Code | Course Name | Credit hours |
|-------------|------------------------------------|--------------|
| CSA33403 | Parallel And Distributed Computing | 3 |

This course covers the techniques and implementation of parallel computing applications. System architecture, algorithms design, communication techniques, analytical models and message passing paradigms are the key elements in the development of parallel computing systems that will be introduced to the students. To enhance their understanding, students will explore the practical aspects in the development of parallel computing applications especially in the application of dynamic programming, sorting and searching. In addition, students will also be introduced to a specific MPI library.

| Course Code | Course Name | Credit hours |
|-------------|--------------------|--------------|
| CSA33503 | Computer Forensics | 3 |

In this course, students will be introduced to the digital forensics environment that includes the principles and practice of computer forensics. Students will learn best practices for general incidence responses. In addition, they will explore the procedures, methods and tools to conduct computer forensics investigations.

Elective Courses (BCS- CNS)

| Course Code | Course Name | Credit hours |
|-------------|------------------|--------------|
| CSA23403 | Data Compression | 3 |

This course provides an overview of classical, modern techniques and algorithms of various types of data compression. It covers lossless and lossy compression algorithms in graphics, video and audio compression. The course will also covers some issues in current compression technologies.

| Course Code | Course Name | Credit hours |
|-------------|--|--------------|
| CSA33603 | Network Simulation And Performance Modelling | 3 |

This course provides an introduction to the techniques and tools needed to construct and analyze performance models of computer systems and communication networks. Such skills are indispensable for research-related careers. Students also will explore the fundamental theoretical analysis and techniques including probability, stochastic and queuing network techniques. In addition, student will be able to use simulation and modelling tools in order to conduct basic performance modelling and network simulation tasks.

| Course Code | Course Name | Credit hours |
|-------------|---|--------------|
| CSA33903 | Intrusion Detection And Prevention System | 3 |

This course delivers the technical knowledge, insight and theories to defend the computer networks. Students will learn the underlying theory of preventing and detecting malicious activities. The topics cover include overview of intrusions and state of the art of intrusion detection and

prevention system. In addition, students will learn countermeasure techniques to prevent from intrusion into the computer system.

| Course Code | Course Name | Credit hours |
|-------------|--------------------------|--------------|
| CSA43103 | Network Operating System | 3 |

This course introduces students to a broad range of operating system concepts, including installation and maintenance. Topics include operating system concepts, management, maintenance, and resources required. In addition, students will learn to manage users and security groups in an NOS environment. Upon completion of this course, students will have an understanding of OS concepts, installation, management, maintenance, using a variety of operating systems.

| Course Code | Course Name | Credit hours |
|-------------|---------------------|--------------|
| CSA43203 | Network Programming | 3 |

This course is designed to enhance students' knowledge and practice in the analysis and design of computer networks by focusing on computer network programming. In addition, some advanced network topics including IP Multicast and Remote Method Invocation (RMI) will be introduced in this course. The Java programming language will be used throughout the course.

| Course Code | Course Name | Credit hours |
|-------------|---|--------------|
| CSA43303 | Wireless Communication And Mobile Network | 3 |

This course provides an overview on the fundamentals of wireless communication and mobile networks. Among the topics include an introduction to the different protocols, key issues in the network, and its appropriate solutions. Students will explore various wireless networks and mobile wireless networks such as WAN, MAN, LAN and PAN. The course emphasizes on the concepts and importance of the networks, the communication protocols, the importance of networks, network applications, and the corresponding advantages and disadvantages of each network.

| Course Code | Course Name | Credit hours |
|-------------|---------------|--------------|
| CSA33703 | Digital Logic | 3 |

The main goal of this course is to study the processes in digital circuit design. Starting with an introduction to the basics of number system and Boolean algebra, students will be introduced to the concept of binary logic and logical simplification. Students will be introduced to the techniques for analysis and design of combinatorial and sequential circuits as well as combinations of circuits such as adder / subtractor, Encoder, Decoder, and Magnitude Comparator and Multiplexer. Sequence elements such as latches and flops, memory, memory addressing and logic programming will also be discussed.

| Course Code | Course Name | Credit hours |
|-------------|--------------------|--------------|
| CSA33803 | Network Management | 3 |

This course prepares students for the management of the network including the basic concepts and the latest technology. Students will be introduced to the design, operation and management, and analysis of data communications network. This course also provides students with knowledge about the types of communications network management system, its strengths and weaknesses in solving various problems of network management.

Specialization Courses (BCS-IC)

| Course Code | Course Name | Credit hours |
|-------------|-----------------------------|--------------|
| CSD23103 | Web Application Development | 3 |

The web uses complex applications that run on heterogeneous browsers that may be built using the latest programming technologies. This course covers how core web technologies work, common security vulnerabilities and how to build secure web applications that avoid them. Students will be required to build multiple webpages and implement website design that interacts with a database, which will include server-side applications.

| Course Code | Course Name | Credit hours |
|-------------|---------------------------------------|--------------|
| CSW23103 | Internet Architecture And Programming | 3 |

This course will provide students with necessary skills to build structured, maintainable, scalable, and testable web applications using web frameworks, tools, and techniques common to the industry. A web framework is a software framework that is designed to support the development of web applications including web services, web resources and web APIs. Web frameworks aim to alleviate the overhead associated with common activities performed in web development. This course will cover topics that include object oriented programming, the Model-View-Controller (MVC) pattern, Web APIs, Object Relational Mapping (ORM), and application structure. The main focus of the course is on the MVC design pattern employed by modern full-stack web frameworks.

| Course Code | Course Name | Credit hours |
|-------------|------------------|--------------|
| CSW23203 | Mobile Computing | 3 |

This course provides insights into mobile computing principles and their utilisation to fulfil user requirements. It emphasises on the basic design and development of mobile applications. Students will learn the fundamentals of mobile network infrastructure and standards. Related issues regarding mobile computing usage, environment, and the differences against conventional application development will also be discussed.

| Course Code | Course Name | Credit hours |
|-------------|--------------|--------------|
| CSW33903 | Web Services | 3 |

This course provides an overview on the concepts and processes in web services, focusing on both the theoretical and the practical aspects. Students will learn components and processes involved in web services during the lectures while in the practical sessions, they will learn how to develop web services. Among the topics to be covered are overview of web services, the creation/development of web services and database manipulation.

| Course Code | Course Name | Credit hours |
|-------------|------------------------------|--------------|
| CSW33203 | Distributed Computing System | 3 |

This course covers the aspects of designing and maintaining distributed applications. Students will be introduced to models, logical time, algorithms, distribution, and maintenance of distributed computing. Related issues regarding distributed computing systems such as security, failure detection, and file distribution will be discussed.

| Course Code | Course Name | Credit hours |
|-------------|-----------------|--------------|
| CSW34003 | Cloud Computing | 3 |

This course provides insights on cloud computing models, techniques, and architectures. Aspects of cloud computing technologies and current practices will also be discussed. Among the topics to be covered are cloud computing models, Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), Software-as-a-Service (SaaS), virtualization, security, cloud storage, performance and systems issues in cloud computing implementation

| Course Code | Course Name | Credit hours |
|-------------|-------------|--------------|
| CSW33403 | e-Commerce | 3 |

This course focuses on principles of e-commerce from a business perspective. This course provides an overview of business and technology topics, business models, virtual value chain, and innovation and marketing strategies. In addition, some of the major issues associated with e-commerce security, privacy, intellectual property rights, authentication, encryption, acceptable use policies, and legal liabilities will be explored.

| Course Code | Course Name | Credit hours |
|-------------|-----------------------|--------------|
| CSW33503 | Business Intelligence | 3 |

This course focuses on business intelligence, an information technology approach to data collection and data analysis to support a wide variety of management tasks. In this course, students will learn analytical components and technologies used to create dashboards and scorecards, and data/text/Web mining methods for trend and sentiment analysis. In addition, artificial intelligence techniques used to develop intelligent systems for decision support will also be covered.

Elective Courses (BCS- IC)

| Course Code | Course Name | Credit hours |
|-------------|---|--------------|
| CSW33803 | Internet Based System Development Methodology | 3 |

This course provides insights on the principals and methodologies of internet-based system development. Topics to be covered are the aspects of application development activities such as analysis, modelling, architecture, implementation, usability, testing, maintenance, and security. Among the technologies to be discussed will be HTTP, HTTPS, XML, web services, CSS, and internet database.

| Course Code | Course Name | Credit hours |
|-------------|--------------------------------|--------------|
| CSW33603 | Online Multimedia Technologies | 3 |

The rapid growth of multimedia usage over the Internet demands new requirements to the internet architecture and protocols. Web Real-Time Communication (WebRTC) is a new standard and industry effort that extends the web browsing model. For the first time, browsers are able to directly exchange real-time media with other browsers in a peer-to-peer fashion. This course is primarily concerned with the problems that arise when carrying audio/video contents over modern communication networks. The course presents an overview of current multimedia applications (e.g., media-on-demand, Internet Telephony) and discuss deployment problems, and study solutions presented in the literature. The course will also examine emerging technologies and open research problems such as quality of service support for networked multimedia applications and streaming in peer-to-peer networks.

| Course Code | Course Name | Credit hours |
|-------------|--------------------|--------------|
| CSW33703 | Internet of Things | 3 |

The course aims to introduce students to the concepts underlying the Internet of Things (IoT) through a series of lectures on the various topics that are important to understand the state-of-the-art as well as the trends for IoT. The students will be introduced to the history and evolution of IoT, as well as case studies from various industry domains. In addition, students will be required to work in teams to design, build, evaluate and test an innovative IoT system for a specific industry domain, such as sports. The lectures will be focused around industry domains (the verticals where IoT is applicable, or has been applied), platforms (the hardware or software platforms that are applicable for IoT), protocols (the communication protocols that are applicable to IoT) and services (the types of services that can layer over IoT).

Specialization Courses (BIT-IM)

| Course Code | Course Name | Credit hours |
|-------------|----------------|--------------|
| ITM13103 | Art and Design | 3 |

In this course, students will be introduced to the concepts of design. The students will also be taught the techniques and intricacies of designing and preparing digital graphics. Students will be involved with sketches, proliferation of knowledge on design, and typographics. The manipulation of graphic elements in order to enhance the quality of display will be part of the syllabus covered during the course.

| Course Code | Course Name | Credit hours |
|-------------|-----------------------------|--------------|
| ITM23103 | Storytelling and Storyboard | 3 |

This course focuses on storytelling and storyboarding for a multimedia production. Concepts like story structure, composition, visual structure, staging, camera, development of story structure, verbal story telling skills, pitching, story sense and understanding story and character progressions will be covered. Illustrating the narrative, in order to visualize and tell the story, planning shots, drawing panels to demonstrate action and maintain continuity between scenes of an animation requires a thorough understanding of layout, composition, sequential drawing and editing. The aspects that will be addressed in the production of storyboards include format, sketches, character, elements in storyboard and shooting techniques. At the end of the course, it is anticipated that acquired skills during this course would increase the students' marketability in the media industry.

| Course Code | Course Name | Credit hours |
|-------------|---------------|--------------|
| ITM23203 | Image Editing | 3 |

This course focuses on the principle and theory of image manipulation, such as the use of colours, images, shapes and layers. Digital image manipulation techniques will be demonstrated using suitable image manipulation software. Integration of commercialization values in the production of image manipulation will also be discussed.

| Course Code | Course Name | Credit hours |
|-------------|---------------------|--------------|
| ITM23303 | 2D and 3D Modelling | 3 |

This course provides the basic knowledge and principles in the production of 2D and 3D models. Aspects to be emphasized will include texturing, lighting, composition and rendering. Advanced modelling and ethical modelling methods will also be covered. This course also serves as a platform for students to embed commercial values in 2D and 3D modelling.

| Course Code | Course Name | Credit hours |
|-------------|--------------------------|--------------|
| ITM33103 | Digital Media Publishing | 3 |

In this course, the concepts; principles and techniques of digital media publishing will be introduced. The aim of the course is to provide a platform for the students to develop the required skills in digital media publications. Apart from that, students will also be taught on the commercialization aspects of digital media publishing.

| Course Code | Course Name | Credit hours |
|-------------|---------------------|--------------|
| ITM33203 | 2D and 3D Animation | 3 |

This course emphasizes on the delivery of knowledge and skills related to animations in 2-Dimensional (2D) and 3-Dimensional (3D). Based on the knowledge obtained, students will be required to produce animation projects in 2D or 3D. This course also provides the opportunity for the students to be involved in real animations for multimedia productions according to current industrial needs.

| Course Code | Course Name | Credit hours |
|-------------|------------------------------------|--------------|
| ITM33303 | Digital Audio And Video Technology | 3 |

This course provides insights into the fundamentals of digital audio and video technology. Students will be introduced to the audio and video-based project development process that include pre-production, production, and post-production. Strong emphasis will be given on how to produce good quality digital audio and video products based on the format and quality of the compression process, delivery platforms, file type, size and storage hardware. In addition, the students will also be taught on the aspects of professionalism during the production process.

| Course Code | Course Name | Credit hours |
|-------------|------------------------------------|--------------|
| ITM33403 | Multimedia Application Development | 3 |

This course covers the concepts and technology of multimedia application development. Based on the acquired knowledge, students should be able to use a variety of tools and elements found in interactive media to develop multimedia applications. This course also serves as the platform for the students to embed commercial values in the developed applications.

Elective Courses (BIT-IM)

| Course Code | Course Name | Credit hours |
|-------------|---------------------------------------|--------------|
| ITM23403 | Photography Techniques And Technology | 3 |

This course will introduce the concepts, principles and techniques of digital photography to produce photos that meet the required criteria. During the course, students will have the opportunity to lead with appropriate professional skills and take pictures using sophisticated tools of digital photography. In addition, students will also be taught on the commercialization aspects of photography.

| Course Code | Course Name | Credit hours |
|-------------|-------------------------------|--------------|
| ITM23603 | Interactive Media In Industry | 3 |

In this course, students will explore current interactive media usage in various industries. The aspects on technology used by professionals in the field of media design, production, education and marketing in major industries will be covered. Students will be required to develop a project according to industrial needs based on current technologies. In addition, they will also be taught on managerial activities related to interactive media industry.

| Course Code | Course Name | Credit hours |
|-------------|----------------------------|--------------|
| ITM23703 | Computer Games Development | 3 |

In this course, students will be introduced to the concepts and technologies in computer games development. The topics that will be discussed are: the concepts, principles and techniques of computer game. It is anticipated that based on the knowledge obtained from this course, students can acquire appropriate skills in the development of computer games using suitable tools.

| Course Code | Course Name | Credit hours |
|-------------|----------------------------|--------------|
| ITM23503 | Virtual Reality Technology | 3 |

This course aims to provide an overview of the concepts and technologies in Virtual Reality (VR). Students will be involved in developing an interactive virtual environment using suitable software. Among the topics to be discussed are the definition and concepts of VR, technologies of computer graphics in VR systems; software and hardware in the development of VR applications; and VR technologies in various fields.

Course Synopsis – Diploma Programme

University Courses

| Course Code | Course Name | Credit hours |
|-------------|---------------------------------|--------------|
| MPU21022 | Penghayatan Etika dan Peradaban | 2 |

Kursus ini mempersiapkan pelajar untuk menghayati etika dan peradaban yang wujud dalam masyarakat kepelbagaian etnik di Malaysia untuk memperteguhkan pemikiran kritikal dan analitikal mereka bagi menangani kehidupan yang lebih mencabar. Pengisian kursus ini memfokuskan kepada penghayatan etika dan peradaban dalam acuan Malaysia. Pelajar akan didedahkan dengan dinamika konsep etika dan peradaban yang menjadi kekuatan kepada pembentukan negara Malaysia berdasarkan susur masa evolusi sejarahnya dari era pra-kolonial sehingga ke pasca-kolonial. Kefahaman tentang pembentukan etika dan peradaban dalam masyarakat kepelbagaian dibincangkan bagi meningkatkan penghayatan etika dan peradaban ke arah pemantapan kesepaduan nasional dan bangsa Malaysia. Peradaban acuan Malaysia perlu dikupas serta diperdebatan dalam aktiviti akademik berpanduan Perlembagaan Persekutuan sebagai tapak integrasi dan wahana etika dan peradaban. Pembinaan kesepaduan nasional amat dipengaruhi oleh globalisasi dan perkembangan teknologi maklumat dan komunikasi yang kompleks. Oleh kerana itu, penghayatan etika dan peradaban menzahirkan perilaku tanggungjawab sosial dan digerakkan pada peringkat individu, keluarga, komuniti, masyarakat dan negara. Justeru, perubahan yang berlaku dalam masyarakat dan pembangunan langsung ekonomi telah membawa cabaran baru dalam mengukuhkan kelestarian etika dan peradaban di Malaysia. Amalan Pendidikan Berimpak Tinggi (HIEPs) dipraktikkan dalam pengajaran dan pembelajaran bagi mendalami kursus ini (Pengajaran & Pembelajaran)

| Course Code | Course Name | Credit hours |
|-------------|----------------------------|--------------|
| MPU23012 | Akidah dan Akhlak (Muslim) | 2 |

Kursus ini merupakan kursus umum universiti, dua (2) jam kredit, untuk pelajar muslim peringkat diploma. Kursus ini mendedahkan kepada pelajar tentang akidah dan akhlak Islam. Ia membincangkan tentang ilmu Aqidah yang merangkumi tiga perkara utama, iaitu ketuhanan, kenabian dan sam`iyyat (perkara-perkara ghaib), dan juga akhlak yang merangkumi sifat-sifat mahmudah (baik) dan mazmumah (buruk). Kaedah pengajaran dan pembelajaran kursus ini ialah menerusi kuliah dan perbincangan berkumpulan. Menerusi kursus ini, pelajar dapat memilih akidah yang benar dan membentangkan akhlak terpuji dalam kehidupan.

| Course Code | Course Name | Credit hours |
|-------------|---------------------------------|--------------|
| MPU23022 | Moral dan Etika I (bukan Islam) | 2 |

Kursus ini membolehkan para mahasiswa mengetahui nilai-nilai moral dan etika yang akan membentuk keperibadian mahasiswa sebagai modal insan yang diperlukan oleh negara dan antarabangsa. Ia merangkumi perbincangan mengenai istilah moral dan etika, kepentingannya dalam kehidupan manusia, hubungannya dengan agama dan ilmu pengetahuan yang lain. Perbincangan juga merangkumi isu-isu hubungan manusia dengan Tuhan, hubungan manusia dengan manusia dan hubungan manusia dengan alam. Beberapa contoh moral dan etika yang mulia akan didedahkan kepada mahasiswa. Contoh moral dan etika yang perlu di jauhi juga akan didedahkan kepada mahasiswa.

| Course Code | Course Name | Credit hours |
|-------------|---------------------|--------------|
| MPU23032 | Fiqh Ibadat (Islam) | 2 |

Kursus ini merupakan kursus yang mengenengahkan satu daripada cabang ilmu Fiqh Islam yang dikenali sebagai Fiqh Ibadah. Penawaran kursus ini adalah bertujuan memberi pendedahan kepada pelajar terhadap kepentingan mendalami ilmu fardhu ain secara betul bagi memastikan pelaksanaan ibadah berlandaskan syariah. Topik perbincangan kursus ini memfokuskan kepada aspek taharah, solat dan puasa dengan mengupas dalil dan hikmah pensyariaan, rukun dan syarat, bentuk pelaksanaan serta hukum yang berkaitan dengannya. Selain daripada itu, pelajar turut didedahkan dengan isu dan hukum semasa berkenaan ibadah dalam mendepani situasi atau fenomena tertentu. Kaedah pembelajaran dan pengajaran yang digunakan bagi kursus ini adalah berbentuk perbincangan interaktif dan kerja projek. Kursus ini diharapkan berupaya melatih pelajar membina hubungan yang baik dan berkesan sesama manusia di samping menunjukkan nilai moral dan beradab dalam berinteraksi dengan persoalan ibadah yang timbul.

| Course Code | Course Name | Credit hours |
|-------------|------------------------------------|--------------|
| MPU23042 | Perbandingan Agama I (bukan Islam) | 2 |

Kursus ini membincangkan pelbagai aspek agama yang terdapat dalam dunia seperti Yahudi, Kristian, Islam, Hindu, Buddha dan Confusius. Sejarah kemunculan agama, aspek-aspek ketuhanan dan kepercayaan, kitab-kitab yang berkaitan dengan agama-agama turut dibincangkan dalam pembelajaran. Kursus Perbandingan Agama ini bukan hanya membincangkan aspek-aspek penting dalam agama-agama dunia, tetapi juga membentuk nilai-nilai beragama dalam masyarakat majmuk di Malaysia.

| Course Code | Course Name | Credit hours |
|-------------|-------------------------|--------------|
| MPU23052 | Tajwid Al-Quran (Islam) | 2 |

Kursus ini ditawarkan kepada pelajar bertujuan mendedahkan kepada para pelajar Islam mengenai ilmu Tajwid al-Quran merangkumi makhraj huruf dan sifat-sifatnya, hukum-hukum nun sakinah dan tanwin, mim sakinah, mad dan qasar serta waqaf dan ibtida' dan sebagainya. Selain itu, pelajar juga dikehendaki menghafaz surah-surah pilihan.

| Course Code | Course Name | Credit hours |
|-------------|---|--------------|
| MPU23060 | Etiket Sosial dan Penampilan Diri (bukan Islam) | 2 |

Kursus ini mendedahkan kepada para pelajar mengetahui elemen-elemen etiket sosial yang penting dalam pelbagai situasi. Pelajar juga didedahkan dengan ilmu pengetahuan mengenai penampilan diri semasa berhadapan dengan masyarakat dan situasi menghadiri majlis rasmi.

| Course Code | Course Name | Credit hours |
|-------------|-------------|--------------|
| PID23010 | FlexS | 0 |

Gagasan Flexible Education with Soul (FlexS) melatari kewujudan kursus ini dalam usaha mengimbangi transformasi pendidikan berteraskan teknologi dengan pemupukan nilai insani. Kursus ini bertujuan mendukung empat (4) FlexS iaitu akidah yang sahih, sahsiah mulia, pemikiran saintifik dan budaya kerja profesional untuk diterapkan dalam diri pelajar. Kandungan kursus bakal menyentuh elemen penting yang diperlukan dalam pembentukan keperibadian yang mulia meliputi aspek kerohanian, emosi, jasmani dan intelek. Kaedah pembelajaran dan pengajaran adalah melalui penyampaian kuliah sama ada secara bersemuka atau dalam talian dan sesi diskusi bersama pelajar. Kursus ini menggunakan pendekatan Pembelajaran Teradun Gantian. Pada akhir kursus ini pelajar mampu memiliki keperibadian mulia, mempamerkan nilai murni dan berpegang pada matlamat serta prinsip hidup yang jelas.

| Course Code | Course Name | Credit hours |
|-------------|-------------|--------------|
| PBD10102 | English I | 2 |

This course is offered as university subject; to guide students into acquiring basic English proficiency skills that include reading, writing, listening and speaking for academic purposes.

| Course Code | Course Name | Credit hours |
|-------------|-------------|--------------|
| PBD10202 | English II | 2 |

This course is a continuation of MPU 22012 and is designed to provide students with sufficient input and practice in oral and written English communication so that they would be able to undertake and perform similar tasks effectively in their real life and academic settings. This course will incorporate reading skills through in-class learning activities and self-study, essay writing skill and train them to write clearly, coherently and cohesively and necessary key language to actively participate in discussion, where the four language skills namely listening, speaking, reading and writing are integrated. In this course also, students are exposed to IT skills and soft skills in completing their assignments. There will also be activities to make the students aware and familiar with appropriate English language structures so that they will become more proficient in the language. The students will be given ample opportunities to listen, talk, write, read and participate in task-based activities that will maximise their participation in the class.

Core Courses (DCS & DIT)

| Course Code | Course Name | Credit hours |
|-------------|----------------------|--------------|
| ITD11204 | Computer Programming | 4 |

This course provides the fundamentals of logical thinking required for students in creating applications for solving problems. Students will be introduced to the techniques of building pseudo-codes, flowcharts, error detection and corrections, and the techniques to write efficient comments. Students will also learn the concepts of structured programming, program documentation using appropriate syntax, identifiers, data types, control statements, repetition statements, functions, arrays, and GUI. At the end of the course, they will work in groups to develop a program to solve a selected case study.

| Course Code | Course Name | Credit hours |
|-------------|-------------|--------------|
| ITD10503 | Database | 3 |

In this course, students will be introduced to the theory of database that includes the file system, relational model, normalization, and entity-relationship diagram. They will acquire appropriate skills in developing an information system such as analyzing, designing, modeling, and implementing the database. In addition, students will also learn the formation rules of relational databases, structured query language, and issues in databases. At the end of the course, students will be able to construct a relational database for various system development.

| Course Code | Course Name | Credit hours |
|-------------|----------------------|--------------|
| ITD20103 | Discrete Mathematics | 3 |

Students will be introduced to the fundamentals and concepts of set theory, logic, Truth Table and In this course, students will be introduced to the fundamentals and concepts of Set Theory, Logic, Truth Table, Boolean Algebra, Graphs, and Trees. They will also learn other topics that are propositional calculus, propositional logic, quantifiers, predicate calculus (logic of quantifiers), mathematical induction and recursive relations. Other topics that will be covered are graphs that include directed and undirected graphs, isomorphism, and weighted graphs. Students will gain knowledge on the topic of trees that covers Spanning Tree and Minimum Spanning Tree (MST),

Kruskal's Algorithm, Rooted tree, and Depth-First Search Algorithm. In addition, they will also work in groups to perform calculations to solve problems in Discrete Mathematics. At the end of this course, they are expected to be able to apply the basic of discrete mathematics in real applications.

| Course Code | Course Name | Credit hours |
|-------------|----------------------------|--------------|
| ITD20303 | System Analysis and Design | 3 |

This course introduces the principles and methods in the analysis and design of information systems. The focus is on system development activities including analysis and modeling, process design, databases, input and output, and programmable user interfaces. Students will also learn the process of system implementation and maintenance by taking into account important activities in the development life cycle. They will also be taught to put emphasis on object-oriented analysis and design implementations. At the end of the course, they are expected to be able to analyze system requests and consequently produce appropriate system design.

| Course Code | Course Name | Credit hours |
|-------------|-----------------------|--------------|
| ITD10403 | Computer Architecture | 3 |

This course covers the essentials of computer architecture, data representations, and manipulations, registers, memory organization, and bus configurations. In this course, students will also learn about timing issues, pipelining, and introduction to multiprocessors. In addition, students will gain knowledge regarding the operations of each computer component from the viewpoint of a multilevel machine. Assembly language will be introduced in describing instruction sets, instruction formats, and addressing modes. At the end of the course, students will be able to understand the current computer architecture systems.

| Course Code | Course Name | Credit hours |
|-------------|------------------|--------------|
| ITD10603 | Operating System | 3 |

This course introduces the fundamental concepts of operating system design and implementation. Students will learn the fundamentals of operating systems that are operating systems architecture and their functions on basic memory management, processing, and control input/output, CPU scheduling, process management, and file management. At the end of this course, students are expected to exhibit understanding of architecture, structure, functions, execution, and configuration of operating systems and their resource management.

| Course Code | Course Name | Credit hours |
|-------------|-------------------------------|--------------|
| ITD21403 | Data Communication Workshop I | 3 |

This course provides the fundamental concepts to help students understand the basics of data communications and networking, and the protocols used on the Internet. The principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations will be introduced to the students as the foundation for the course. At the end of the course, students will be able to build simple LANs, perform basic configuration for routers and switches, and implement IP addressing schemes.

| Course Code | Course Name | Credit hours |
|-------------|-------------|--------------|
| ITD20404 | Project | 4 |

This course requires students to work individually to create products for projects/research with the help of a supervisor. The project implementation should be based solutions or improvements related problems and utilization of information technology to the community. Supervisors will guide students in the process of implementing projects and producing results. At the end of the course, students are required to present the project to the panel. Students must submit a technical project report after taking into consideration the feedback and suggestions made during the presentation.

| Course Code | Course Name | Credit hours |
|-------------|---------------------|--------------|
| ITD30110 | Industrial Training | 10 |

This course is compulsory for all students enrolled in the Diploma of Information Technology. Duration of industrial training is for 12 months, in the semester 2/ year 2. This course can be performed in any suitable organization. During the period of industrial training, students are required to implement information technology projects agreed by the organization / supervisor / student to apply the knowledge and skills they have learned. Student performance will be monitored and evaluated by the academic supervisor and industrial supervisor.

Specialization Courses (DCS)

| Course Code | Course Name | Credit hours |
|-------------|----------------|--------------|
| ITD20203 | Data Structure | 3 |

This course provides students with the fundamentals and applications of data structures in applications related to computer science. The course emphasizes data organizations together with management techniques for data representation such as stack, queue, linked lists, and trees. Students will also learn data structure algorithms such as sorting and searching. At the end of the course, students are expected to be able to organize and apply the concepts of data structures in computer science applications.

| Course Code | Course Name | Credit hours |
|-------------|-----------------|--------------|
| ITD20204 | Web Programming | 4 |

This course introduces a web programming language for both clients and servers. Students will be introduced to basic requirements in web programming that includes an online form, form validation at the clients' side, and form processing at the servers' side. They will also learn to manipulate SQL in a server programming language to store, retrieve, update and delete data. At the end of the course, they will be required to work in groups to develop a web application.

| Course Code | Course Name | Credit hours |
|-------------|-------------------------------|--------------|
| ITD20803 | Advanced Application Workshop | 3 |

In this course, students will work in a group to propose a system for software project development. Each group is required to build a software project proposal based on software development process knowledge. They will be supervised by the lecturer where all group activities must be documented. At the end of this course, each group must submit a full report and present the software project.

| Course Code | Course Name | Credit hours |
|-------------|-----------------------------|--------------|
| ITD21304 | Object-Oriented Programming | 4 |

This course provides students with the techniques used in object-oriented programming. Students will be introduced to the differences and the advantages of the object-oriented programming method compared to the structured programming method. They will also learn the methods on how to reuse objects and event-driven with applet development. At the end of the course, students are expected to be able to develop a simple application using object-oriented programming concepts.

| Course Code | Course Name | Credit hours |
|-------------|--------------------------------|--------------|
| ITD21803 | Data Communication Workshop II | 3 |

This course focuses on the fundamentals of data communication such as transmission concepts and packet routing by focusing on routers, configurations of routers, routers' designs, IP addressing schemes, and routing protocols. Students will also learn the techniques to choose appropriate devices using current standards and protocols. At the end of the course, students will be able to design suitable network configurations and choose appropriate routing protocols as required.

| Course Code | Course Name | Credit hours |
|-------------|--------------------------------|--------------|
| ITD20304 | Mobile Application Development | 4 |

The course provides the fundamentals of the process to create software applications that run on mobile devices. Students will be involved in creating installable software, implementing and testing the application on target devices. This course emphasizes on basic design and development of mobile applications where students will learn the necessary skill in the development of mobile applications. At the end of the course, students are expected to be able to produce mobile applications on different platforms.

| Course Code | Course Name | Credit hours |
|-------------|------------------------------------|--------------|
| ITD20403 | Introduction to Internet of Things | 3 |

The course provides an introduction to the concepts of Internet of Things (IoT). Students will learn various topics pertaining to the state-of-the-art of the course as well as the current trends. They will be introduced to the history and evolution of IoT, as well as case studies from various industry domains. They will also work in teams to design, build, evaluate and test an innovative IoT system for a specific industry domain, such as home, healthcare, city transportation, and sports. Students will use an open-source electronics platform based on easy-to-use hardware and software to produce the IoT system. At the end of the course, they are expected to be familiar with the platforms, protocols, and services of IoT in industries.

| Course Code | Course Name | Credit hours |
|-------------|---------------------------|--------------|
| ITD20603 | Web Programming Framework | 3 |

This course provides students with necessary skills to build structured, maintainable, scalable, and secured web applications using web programming framework. A web programming framework aims to alleviate overheads associated with common activities performed in web development. This course will cover topics that include web design framework, web routes, web controllers, Object Relational Mapping (ORM), multi-user middleware level authentication, and web template layout. At the end of the course, students will be able to develop their own web-based applications using a secure web framework.

Elective Courses (DCS)

UNIVERSITY

| Course Code | Course Name | Credit hours |
|-------------|------------------------|--------------|
| PBD10302 | Bahasa Arab Kebangsaan | 2 |

This course aims to expose students to learn Arabic. Emphasis is given to the four skills: listening, speaking, reading and writing. In addition, attention is also given to meaning of words, sentence construction and basic Arabic grammar.

| Course Code | Course Name | Credit hours |
|-------------|-------------------|--------------|
| PBD10302 | Bahasa Arab Agama | 2 |

This course aims to expose students to learn Arabic. Emphasis is given to the four skills of listening, speaking, reading and writing. In addition, attention is also given to the meaning of the vocabulary, sentence construction means and methods of basic Arabic grammar.

| Course Code | Course Name | Credit hours |
|-------------|-----------------|--------------|
| PBD10502 | Bahasa Mandarin | 2 |

This course aims to provide exposure to students in learning basic Chinese. Emphasis is given to four skills namely listening, speaking, reading and writing. In addition, focus is also given to the vocabulary, the way the construction of the verse is based on the basic method of Chinese grammar.

| Course Code | Course Name | Credit hours |
|-------------|--------------|--------------|
| PBD10602 | Bahasa Jepun | 2 |

This subject provides students with basic language skills and its culture awareness. Students are trained with the communication skills in order to communicate at the primary level. Moreover, cultural topics will be inserted in the course in order to enhance students' understanding of the country's culture. Therefore, students will be more confident in communicating and performing tasks in the international environment.

| Course Code | Course Name | Credit hours |
|-------------|-------------|--------------|
| PBD10702 | Bahasa Thai | 2 |

This subject provides students with basic Thai language and its culture awareness. Students are trained with the communication skills in order to communicate at the primary level. Moreover, cultural topics will be inserted in the course in order to enhance students' understanding of the country's culture. Therefore, students will be more confident in communicating and performing tasks in the international environment.

PROGRAMME

| Course Code | Course Name | Credit hours |
|-------------|-------------------------------|--------------|
| ITD12003 | Informatics and Communication | 3 |

This course is designed to provide an overview of the following aspects: the discipline of Information Technology (IT) and describes how it relates to the other computing disciplines. The goal is to help students understand the diverse contexts in which IT is used and the challenges inherent in the diffusion of innovative technology. At the end of the course, students will gain experience relating to the current trends in the IT industry.

| Course Code | Course Name | Credit hours |
|-------------|----------------------|--------------|
| ITD20703 | Information Security | 3 |

This course provides the fundamentals of information security. Students will learn information security principles, the history of the discipline, and strategies for managing an information security program. Students will also be required to conduct a group project relating to information security issues. At the end of this course, the students are expected to acquire a balanced introduction of the managerial and technical aspects of information security.

| Course Code | Course Name | Credit hours |
|-------------|---------------------------|--------------|
| MMD10103 | Human Machine Interaction | 3 |

This course covers the principles and theories of human-machine interaction. Students will learn topics that include human factors, emerging technologies, effective interfaces, human-centered software development, and evaluations. In addition, students will gain knowledge on the iterative evaluation-centered UX lifecycle and a broader notion of user experience, including usability. At the end of this course, students will be able to understand the requirements and specifications for the design, producing appropriate prototypes, and develop methods and criteria for evaluation.

| Course Code | Course Name | Credit hours |
|-------------|-----------------------|--------------|
| ITD20503 | Fundamentals of Linux | 3 |

This course introduces the fundamentals of utilities, shell scripts and operating system concepts in Linux. Students will also learn shell commands and a package distribution of software for Linux (distros). Students will practice to install, configure a network and manage administrations in terms of network setups, users and file security. At the end of this course, students will be able to practice necessary skills in the Linux operating systems.

| Course Code | Course Name | Credit hours |
|-------------|---------------|--------------|
| MMD20403 | Web Authoring | 3 |

This course provides the fundamentals of development for a website. Students will learn the concepts, tools, and technologies of the internet and web technology. They are also required to build a website that meets the standard requirements of the Internet and website technologies. At the end of the courses, students will present their group case study by focusing and reflecting the entrepreneur mindset.

| Course Code | Course Name | Credit hours |
|-------------|----------------------------|--------------|
| ITD21003 | Statistics and Probability | 3 |

This course provides the fundamentals to the concepts of statistics along with data representations and descriptions. In this course, students will also learn topics relating to probability theory. In addition, they will gain knowledge on sampling distributions and hypothesis testing, and also data analysis techniques such as correlation, simple linear regression and one-way analysis of variance (ANOVA). At the end of this course, students will be able to solve statistical problems using the concepts in statistics and probability.

| Course Code | Course Name | Credit hours |
|-------------|-----------------------------|--------------|
| ITD20903 | Computer, Ethics And Social | 3 |

This course provides a framework of concepts for social and professional values and ethics. Students will be introduced to social values and professional ethics of computing and the intellectual property to enable a person to act in relation to specific code of conduct in society and working environment. Students will also learn on how to find suitable solutions to the problem. At the end of this course, the students should be able to demonstrate computer ethics for social responsibility towards community.

Specialization Courses (DIT)

| Course Code | Course Name | Credit hours |
|-------------|------------------|--------------|
| MMD13103 | Graphic Design I | 3 |

This course provides the theories and principles of arts and design. Apart from learning the history of art and design, students will also learn how to manipulate the elements based on the principles of arts and design to produce artworks in informatics media applications. At the end of this course, they are expected to be able to produce creative digital product in arts and design.

| Course Code | Course Name | Credit hours |
|-------------|---------------------------|--------------|
| MMD21203 | 3D Modeling and Animation | 3 |

This course emphasizes the use of three-dimensional animation software to produce three-dimensional objects and animation. Students will learn the theory and practice of modeling three-dimensional objects, textures, lighting, and the use of the camera in animation software. At the end of this course, students will be able to produce suitable three-dimensional objects and animation production for various applications

| Course Code | Course Name | Credit hours |
|--------------------|------------------------------------|---------------------|
| MMD10403 | Audio And Video Digital Technology | 3 |

This course provides the fundamentals of audio and video technologies. Students will be introduced to the equipment, data representations and also shooting techniques. In addition, they will practice the processes in video production that include pre production, production and post production. At the end of the course, they will be able to implement audio and video digital technology in multimedia productions.

| Course Code | Course Name | Credit hours |
|--------------------|------------------------------------|---------------------|
| MMD21104 | Multimedia Application Development | 4 |

This course provides the fundamentals of multimedia production techniques beginning with the development of a storyboard, authoring using multimedia software, and manipulation of multimedia elements. Students will learn to produce animations, manipulation of files from external sources, construction of interactivity between the user and the software, and special effects. In addition, they will also apply appropriate tools for script authoring, compiling, and files merging in authoring software to create executable files. At the end of the course, they are expected to be able to produce linear and non-linear multimedia products.

| Course Code | Course Name | Credit hours |
|--------------------|--------------------|---------------------|
| MMD20203 | Graphic Design II | 3 |

This course covers the concepts, principles, and techniques of graphic design for visual communications. It also provides a platform for the students to develop the required skills in graphic design by imitating graphic design elements and principles to graphic communications. At the end of this course, students will be able to produce a graphic design product by integrating the theories, principles, and practices in computer graphics design.

| Course Code | Course Name | Credit hours |
|--------------------|--------------------|---------------------|
| ITD20204 | Web Programming | 4 |

This course introduces a web programming language for both clients and servers. Students will be introduced to basic requirements in web programming that includes an online form, form validation at the clients' side, and form processing at the servers' side. They will also learn to manipulate SQL in a server programming language to store, retrieve, update and delete data. At the end of the course, they will be required to work in groups to develop a web application.

| Course Code | Course Name | Credit hours |
|--------------------|--------------------------------|---------------------|
| ITD20304 | Mobile Application Development | 4 |

The course provides the fundamentals of the process to create software applications that run on mobile devices. Students will be involved in creating installable software, implementing and testing the application on target devices. This course emphasizes on basic design and development of mobile applications where students will learn the necessary skill in the development of mobile applications. At the end of the course, students are expected to be able to produce mobile applications on different platforms.

Elective Courses (DIT)

UNIVERSITY

| Course Code | Course Name | Credit hours |
|-------------|------------------------|--------------|
| PBD10302 | Bahasa Arab Kebangsaan | 2 |

This course aims to expose students to learn Arabic. Emphasis is given to the four skills: listening, speaking, reading and writing. In addition, attention is also given to meaning of words, sentence construction and basic Arabic grammar.

| Course Code | Course Name | Credit hours |
|-------------|-------------------|--------------|
| PBD10302 | Bahasa Arab Agama | 2 |

This course aims to expose students to learn Arabic. Emphasis is given to the four skills of listening, speaking, reading and writing. In addition, attention is also given to the meaning of the vocabulary, sentence construction means and methods of basic Arabic grammar.

| Course Code | Course Name | Credit hours |
|-------------|-----------------|--------------|
| PBD10502 | Bahasa Mandarin | 2 |

This course aims to provide exposure to students in learning basic Chinese. Emphasis is given to four skills namely listening, speaking, reading and writing. In addition, focus is also given to the vocabulary, the way the construction of the verse is based on the basic method of Chinese grammar.

| Course Code | Course Name | Credit hours |
|-------------|--------------|--------------|
| PBD10602 | Bahasa Jepun | 2 |

This subject provides students with basic language skills and its culture awareness. Students are trained with the communication skills in order to communicate at the primary level. Moreover, cultural topics will be inserted in the course in order to enhance students' understanding of the country's culture. Therefore, students will be more confident in communicating and performing tasks in the international environment.

| Course Code | Course Name | Credit hours |
|-------------|-------------|--------------|
| PBD10702 | Bahasa Thai | 2 |

This subject provides students with basic Thai language and its culture awareness. Students are trained with the communication skills in order to communicate at the primary level. Moreover, cultural topics will be inserted in the course in order to enhance students' understanding of the country's culture. Therefore, students will be more confident in communicating and performing tasks in the international environment.

PROGRAMME

| Course Code | Course Name | Credit hours |
|-------------|---------------|--------------|
| MMD20403 | Web Authoring | 2 |

This course provides the fundamentals of development for a website. Students will learn the concepts, tools, and technologies of the internet and web technology. They are also required to build a website that meets the standard requirements of the Internet and website technologies. At the end of the courses, students will present their group case study by focusing and reflecting the entrepreneur mindset.

| Course Code | Course Name | Credit hours |
|--------------------|-----------------------------|---------------------|
| ITD20903 | Computer, Ethics And Social | 3 |

This course provides a framework of concepts for social and professional values and ethics. Students will be introduced to social values and professional ethics of computing and the intellectual property to enable a person to act in relation to specific code of conduct in society and working environment. Students will also learn on how to find suitable solutions to the problem. At the end of this course, the students should be able to demonstrate computer ethics for social responsibility towards community.

| Course Code | Course Name | Credit hours |
|--------------------|---------------------|---------------------|
| MMD20103 | Digital Photography | 3 |

This course introduces the concepts, principles, and techniques of digital photography to produce products that meet the criteria of digital photography. Students will learn the skills to take photos with the correct use of sophisticated digital photography tools. They will gain knowledge of image quality in media productions, adaptation and arrangement, standards and other technical publications. In addition, students will apply suitable printing and publishing techniques using appropriate software for image editing and publication purposes. At the end of this course, they will produce suitable artwork for digital photography.

| Course Code | Course Name | Credit hours |
|--------------------|----------------------------|---------------------|
| MMD21303 | Computer Games Development | 3 |

This course introduces the concepts of authoring in the development of computer games where students will learn appropriate technologies and tools used in game development. In the process of game authoring, students are required to design and develop application of computer games using a suitable scripting language. Other topics that will be learned include game concepts, genre, and phases in games development. At the end of the course, students are expected to be able to develop necessary applications of computer games in corresponding domains.

| Course Code | Course Name | Credit hours |
|--------------------|----------------------------------|---------------------|
| MMD10203 | Script Writing and Storyboarding | 3 |

This course focuses on scriptwriting and the production of storyboards for multimedia productions. Students will learn concepts starting from ideas, story structure, development of script and characters in script writing. They will also learn important entities in the visualization of media elements, storyboard formats, and the perspectives of camera movements. At the end of this course, students will be able to write scripts and produce appropriate storyboards for multimedia productions.

| Course Code | Course Name | Credit hours |
|--------------------|----------------------|---------------------|
| ITD20703 | Information Security | 3 |

This course provides the fundamentals of information security. Students will learn information security principles, the history of the discipline, and strategies for managing an information security program. Students will also be required to conduct a group project relating to information security issues. At the end of this course, the students are expected to acquire a balanced introduction of the managerial and technical aspects of information security.

| Course Code | Course Name | Credit hours |
|--------------------|------------------------------------|---------------------|
| ITD20403 | Introduction to Internet of Things | 3 |

The course provides an introduction to the concepts of Internet of Things (IoT). Students will learn various topics pertaining to the state-of-the-art of the course as well as the current trends. They will be introduced to the history and evolution of IoT, as well as case studies from various industry domains. They will also work in teams to design, build, evaluate and test an innovative IoT system

for a specific industry domain, such as home, healthcare, city transportation, and sports. Students will use an open-source electronics platform based on easy-to-use hardware and software to produce the IoT system. At the end of the course, they are expected to be familiar with the platforms, protocols, and services of IoT in industries.

| Course Code | Course Name | Credit hours |
|-------------|-------------------------------|--------------|
| ITD12003 | Informatics and Communication | 3 |

This course is designed to provide an overview of the following aspects: the discipline of Information Technology (IT) and describes how it relates to the other computing disciplines. The goal is to help students understand the diverse contexts in which IT is used and the challenges inherent in the diffusion of innovative technology. At the end of the course, students will gain experience relating to the current trends in the IT industry.

| Course Code | Course Name | Credit hours |
|-------------|------------------------------|--------------|
| MMD21103 | Augmented Reality Technology | 3 |

This course provides an overview of the concepts and technologies in Augmented Reality (AR). Students will be involved in developing interactive augmented reality applications using suitable software. Students will also learn the definition , techniques, hardware, and technologies in augmented reality. At the end of this course, they are expected to be able to produce mobile-based augmented reality applications

Marking Scheme

Students are compulsory to pass minimum **20%** for both components of course assessments (continuous assessments and final assessment). Grade details and regulations are as below :

| MARK | GRED | VALUE | PERFORMANCE |
|----------|------|-------|---------------------|
| 80 - 100 | A | 4.00 | Excellent |
| 75 - 79 | A- | 3.67 | |
| 70 - 74 | B+ | 3.33 | Good |
| 65 - 69 | B | 3.00 | |
| 60 - 64 | B- | 2.67 | Moderate |
| 55 - 59 | C+ | 2.33 | |
| 50 - 54 | C | 2.00 | |
| 47 - 49 | C- | 1.67 | Minimum Achievement |
| 44 - 46 | D+ | 1.33 | |
| 40 - 43 | D | 1.00 | |
| Below 39 | F | 0.00 | Failed |

Guidelines and regulations for assessments and grading schemes for undergraduate programs in the Faculty of Informatics and Computing are at **Appendix A**.

This book must be read together with Buku Peraturan Akademik Prasiswazah Sesi 2023/2024

Committee of Undergraduate Handbook for Academic Session 2023/2024

Chairman

Assoc. Prof. Dr. Mohd Khalid Awang

Secretary 1

Latifah Ilyana Ibrahim

Secretary 2

Nur Syareena Azmee

Committee Member

Dr. Wan Suryani Wan Awang

Dr. Julaily Aida Jusoh

Dr. Siti Sabariah Abas

Dr. Elissa Nadia Madi

Assoc. Prof. Dr. Zahrahtul Amani Zakaria

Dr. Raja Hasyifah Raja Bongsu

Dr. Muhammad Danial Zakaria

Maizan Mat Amin

Norlina Udin@Kamaruddin