

UNDERGRADUATE HANDBOOK

ACADEMIC SESSION 2020/2021



UNDERGRADUATE HANDBOOK

Academic Session 2020/2021

Faculty of Informatics and Computing

Faculty of Informatics and Computing, Universiti Sultan Zainal
Abidin, Kampus Besut • 2020

© Copyright Faculty of Informatics and Computing, 2020

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	5
Foreword by The Dean	6
Academic Calendar Bachelor & Diploma Programmes Session 2020/2021	7
Universiti Sultan Zainal Abidin at a Glance	9
UniSZA's Vision, Mission, Core Values, Niche and Motto	10
University Authorities and Officers	11
Background of the Faculty	13
Vision, Mission and Objectives of The Faculty	15
Faculty Management	16
Members of the Faculty	18
Study Programmes	
Bachelor of Computer Science (Software Development) with honours (BCS-SD)	23
Bachelor of Computer Science (Computer Network Security) with Honours (BCS-CNS)	32
Bachelor of Computer Science (Internet Computing) with Honours (BCS-IC)	42
Bachelor of Information Technology (Informatics Media) with Honours (BIT-IM)	51
Diploma in Information Technology (DTM)	59
Diploma in Information Technology (Multimedia) (DTMM)	65
Course Synopsis	71
Undergraduate Handbook Committee	105

LOGO DESIGN RATIONALE



USE OF RICE FLOWER DESIGN

Circle of rice flower in yellow
Symbolizes the richness of basic malay culture and potrays an institutional of knowledge under the patron of a sovereign king who is abide by at all times.

THE THREE KNOTS HOLDING THE RICE FLOWER

Symbolizes the binding of 3 main races in Malaysia.

COLOURS

BLACK

Symbolizes strengthen and steadfast. It is the official national colour of Terengganu.

WHITE

Symbolizes honesty and transparency. It is the official national colour of Terengganu.

YELLOW

Symbolizes regal, pride and wisdom.

GREY

Symbolizes balance.

Foreword by The Vice Chancellor



Assalamualaikum Warahmatullahi wa Barakatuh, greetings.

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.

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.

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. It aims to build the mind from philosophical, conceptual, and spiritual aspects as well as strengthen confidence and commitment to fully serve the country.

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.

Profesor Dato' Dr. Hassan Basri bin Awang Mat Dahan
Vice Chancellor

Foreword by The Dean



Praise be to GOD, the Most Gracious and the Most Merciful. Peace and blessings be upon Prophet Muhammad and his family.

Assalamualaikum Warahmatullah and greetings.

Praise be to Allah. Congratulations to all students who have successfully entered UniSZA as a platform to continue your studies. Along with UniSZA's goal to become an excellent internationally ranked university, the faculty strives to empower and equip students with academic achievement as well as outstanding and admirable character.

The faculty is always ready to assist students in achieving academic excellence and develop a commendable personality. Excellence and expertise in the academic field can only be achieved through hard work and it is important to have a clear goal as you step into the ivory tower.

Therefore, set the pace and set the strategy for to achieve success for the sake of our religion, race and country. Finally, we hope students can take full advantage of the opportunities that exist as members of the Faculty of Informatics and Computing.

Best Wishes.

Thank you.

Prof. Madya Dr. Ahmad Nazari bin Mohd Rose

Dean, Faculty of Informatics and Computing
Universiti Sultan Zainal Abidin

Academic Calendar Bachelor & Diploma Programmes Session 2020/2021

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

PROGRAM	DURATION	DATE	PUBLIC HOLIDAY
REGISTRATION AND ORIENTATION FOR NEW STUDENTS DIPLOMA PROGRAMME	3 days	9 – 11 August 2020	1-2 August 2020 – Hari Raya Aidiladha 20 August 2020 – Awal Muharram
LECTURES WEEKS	7 weeks	12 August – 29 September 2020	31 August 2020 – National Day
REVISION	5 days	30 September – 3 October 2020	
FINAL EXAMINATION	1 week	4 – 10 October 2020	
SHORT / SPECIAL SEMESTER BREAK	1 week	11 – 17 October 2020	16 September 2020 – Malaysia Day

BACHELOR AND DIPLOMA NEW COHORT SEMESTER I

PROGRAM	DURATION	DATE	PUBLIC HOLIDAY
REGISTRATION AND ORIENTATION FOR NEW STUDENTS BACHELOR PROGRAMME	3 days	18 – 20 October 2020	29 October – Maulidur Rasul
LECTURES WEEKS I	7 weeks	21 October – 8 December 2020	14 – 15 November – Deepavali
MID SEMESTER BREAK	4 days	9 – 12 December 2020	25 December – Christmas
LECTURES WEEKS II	7 weeks	13 December – 30 January 2021	12 – 13 February – Chinese New Year
REVISION	3 days	31 January – 2 February 2021	
FINAL EXAMINATION FOR SEMESTER I	2 weeks	3 – 20 February 2021	4 March – Installation of Sultan Terengganu
SEMESTER BREAK FOR SEMESTER I	2 weeks	21 February – 6 March 2021	

SEMESTER II

PROGRAM	DURATION	DATE	PUBLIC HOLIDAY
LECTURES WEEKS I	7 weeks	7 March – 24 April 2021	26 April – Sultan of Terengganu's Birthday 29 April – Nuzul Al-Quran 1 May – Labour Day 13 – 14 May – Hari Raya Aidilfitri 26 May – Wesak Day 7 June – YDP Agong's Birthday 19 July – Arafah Day 20 – 21 – Hari Raya Haji 10 August – Awal Muharram 31 August – National Day
MID SEMESTER BREAK	1 weeks	25 April – 1 May 2021	
LECTURES WEEKS II	7 weeks	2 May – 19 June 2021	
REVISION	3 days	20 June 2021	
FINAL EXAMINATION FOR SEMESTER II	2 weeks	23 June – 10 July 2021	
SEMESTER BREAK FOR SEMESTER II FOR DIPLOMA	2 weeks	11 – 24 July 2021	
SEMESTER BREAK FOR SEMESTER II FOR BACHELOR		11 July – September**	

*Senate approval and subject to change

Universiti Sultan Zainal Abidin at a Glance

The knowledge tradition in Terengganu comes alive with the role of umara' which puts the ulama as advisers at the palace. Looking back through the Islamic history in Terengganu, ulama has been advisers, royal guests, teachers, muftis, and syeikhul ulama since the days of Sultan Zainal Abidin I. Whatever the title given, the close relationship between rulers and ulama sparked the growth of Islam in Terengganu. The height of this growth is during the reign of Sultan Zainal Abidin III, where the palace is used to disseminate religious knowledge. Ulama such as Ku Paloh Tok and Tok Sheikh Duyong shape and paint the Islamic tapestry of Terengganu. The Sultan himself is said to join the knowledge sessions at ulamas' homes and frequents Paloh to study with Tok Ku Paloh.

A number of ulamas and scholars admitted that Sultan Zainal Abidin III was among the most devout Sultan in his day. Sheikh Muhammad bin Ismail al-Fathani (Sheikh Nik Mat Kecik) and Sheikh Ahmad bin Muhammad Zain al Fathani were two scholars from the Malay world, residing in Mecca, who became the point of reference for various problems for the Sultan.

Growth and development of Islam in Terengganu give way to many 'pondok' institutions founded by Tok Pulau Manis during the reign of Sultan Zainal Abidin I (1726-1733M) as a centre of Islamic studies which led to the establishment of religious schools or Arabic madrasah.

In 1925, al-Arabiah madrasah was established in Kuala Terengganu and changed its name to Madrasah Sultan Zainal Abidin in 1933. The establishment of this school received support and encouragement from the Sultan at the time, Sultan Zainal Abidin, the 13th Sultan of Terengganu named after the late Sultan Zainal Abidin III who was known for his piety and strong faith in the the teachings of Islam.

In 1980, the state government under the leadership of YAB Dato' Seri Amar Diraja Tan Sri Haji Wan Mokhtar Ahmad as the Menteri Besar of Terengganu at the time established Sultan Zainal Abidin Religious College (KUSZA) in Gong Badak, Kuala Terengganu. Establishing KUSZA has upheld the Islamic-oriented education in Terengganu and Malaysia. KUSZA has produced many scholars who have contributed significantly to the country, especially in the development of human capital.

In 2006, KUSZA was replaced by Universiti Darul Iman Malaysia (UDM) before it changed its name to Universiti Sultan Zainal Abidin on May 13, 2010 by order of Universiti Darul Iman Malaysia (Incorporation) (Amendment) Act, 2010. With this proclamation, it once again perpetuates the name Sultan Zainal Abidin as a pious, noble, and a people's person. May Sultan Zainal Abidin III's legacy and leadership be an example to everyone in UniSZA and puts UniSZA in the international arena.

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

VISSION

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-entreprenurship

MOTTO

Knowledge for the Benefit of Humanity

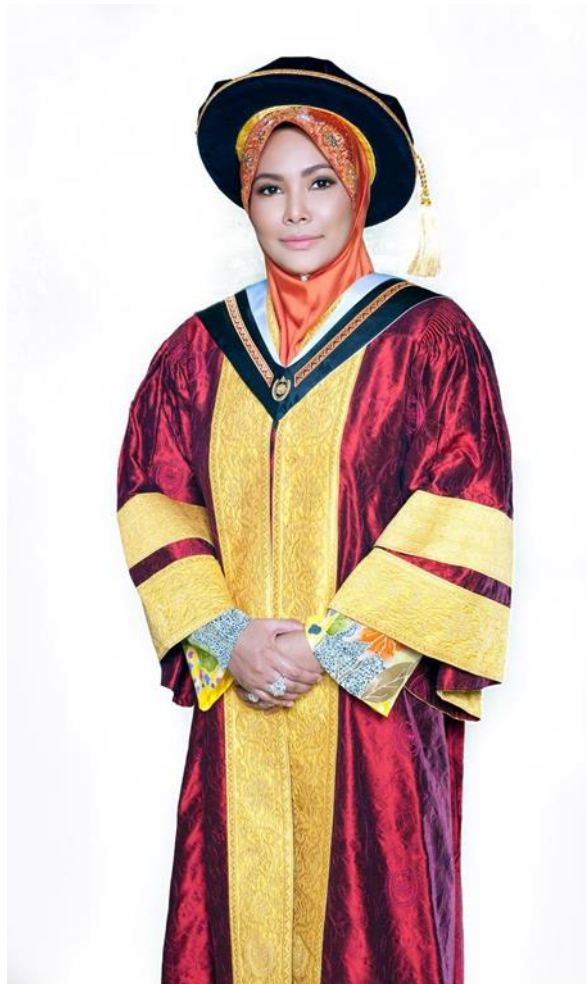
University Authorities and Officers

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),

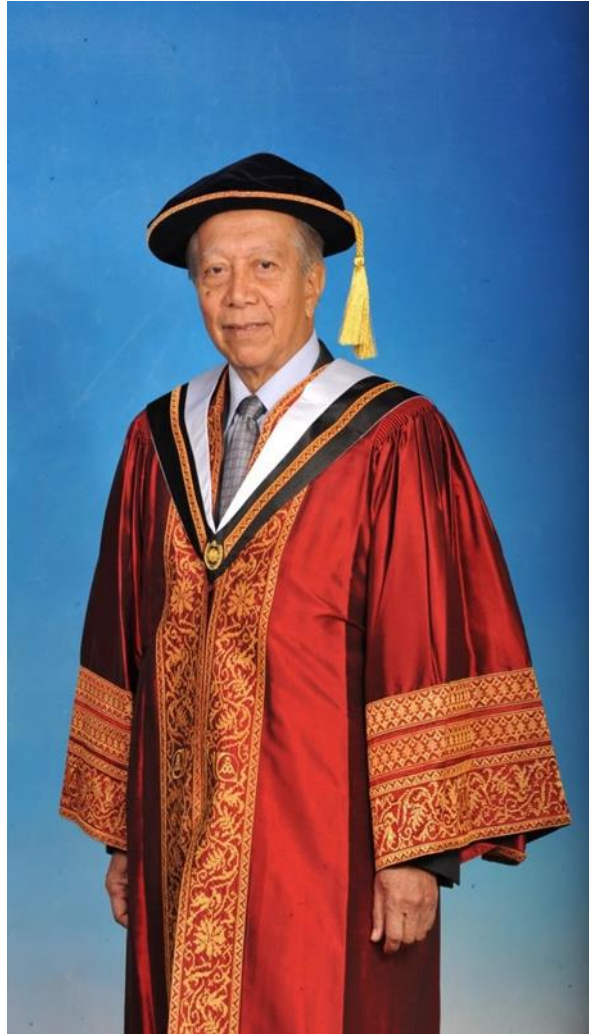
Knight Grand Cross (First Class) of the Most Illustrious Order of Chula Com Klao (Thailand)



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.



Background of the Faculty

In 1st June 1997, Information Technology Centre (ITC) 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:

1. Certificate in Information Technology
2. Certificate in Multimedia Technology
3. Certificate in Computer Programming
4. Diploma in Information Technology
5. Diploma in Information Technology (Multimedia)
6. Bachelor of Information Technology (Collaboration with Universiti Malaya)
7. Bachelor of Science in Business Information Systems (Collaboration with the University of East London)

Then, in June 2006, the ITC was upgraded as Faculty of Informatics (FIT) to be registered under Universiti Darul Iman Malaysia (UDM). UDM was officially established by 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). The change inspired the changes of the FIT name 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 and community service. The faculty has a total of 49 lecturers and 13 supporting staffs.

Presently, our faculty offers nine academic programmes related to the field of informatics:

1. Postgraduate
 - a) Doctor of Philosophy (PhD) in Computer Science
 - b) Doctor of Philosophy (PhD) in Mathematics
 - c) Doctor of Philosophy (PhD) in Statistics
 - d) Master of Science in Computer Science
 - e) Master of Mathematical Science
 - f) Master of Information Technology (Informatics Management)
2. Bachelor's Degree with Honours
 - a) Bachelor of Computer Science (Software Development) with Honours
 - b) Bachelor of Computer Science (Computer Network Security) with Honours
 - c) Bachelor of Computer Science (Internet Computing) with Honours
 - d) Bachelor of Information Technology (Media Informatics) with Honours
3. Diploma
 - a) Diploma in Information Technology
 - b) Diploma in Information Technology (Multimedia)

As of 2019, more than 1,564 graduates have been produced by the Faculty of Informatics and Computing which comprised of 487 graduates from Diploma in Information Technology, 393 graduates from Diploma in Information Technology (Multimedia), 446 graduates from Bachelor of Computer Science (Software Development) with Honours, 162 graduates from Bachelor of Computer Science (Computer Network Security) with Honours and 76 graduates from Bachelor of Computer Science (Internet Computing) with Honours.

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 meet the human capital needs to realize the country's policies.
2. To produce graduates who has 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 milestone.

Faculty Management

Dean

Ahmad Nazari Mohd Rose

PhD (UTHM), MSc (Brunel Univ), BSc (Ohio Univ)

Deputy Dean (Academic and Postgraduate)

Mumtazimah Mohamad

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

Deputy Dean (Research and Development)

Mohamad Afendee Mohamed

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

Deputy Dean (Student Affairs and Alumni)

Mohd Fadzil Abdul Kadir

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

Head of Computer Science School

Nor Aida Mahiddin

PhD (Auckland University of Technology, New Zealand), MSc (UPM), BSc, (UKM), Dip. IT (SAL College)

Head of Information Technology School

Zahrahtul Amani Zakaria

PhD (UTM), B.Sc (UTM)

Head of Multimedia School

Ismahafezi Ismail

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

Coordinator of Facilities and Technical Management

Wan Mohd Amir Fazamin Wan Hamzah

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

Coordinator of Data and Industrial Training

Azim Zaliha Abd. Aziz

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

Coordinator of Quality Assurance and E-Learning

Siti Sabariah Abas

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

Coordinator of Postgraduate Programme

Elissa Nadia Madi

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

Coordinator of Master Information Technology (Informatics Management)

Wan Aezwani Wan Abu Bakar

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

Coordinator of Computer Science Programme

Nur Saadah Mohd Shapri

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

Coordinator of Information Technology Programme

Nur Farraliza Mansor

PhD(UTeM), MSc (UTeM), B.Eng (UiTM), Dip. Eng (UiTM)

Coordinator of Multimedia Programme

Wan Mohd Rizhan Wan Idris

PhD (MMU), MSc (UMT), BIT (UKM), Dip. IT (KUSZA)

Coordinator of Mobility and Industry

Julaily Aida Jusoh

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

Coordinator of Promotion and Community

Syarilla Iryani Ahmad Sany

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

Assistant Registrar

Nurul Liyana Mohamad Yusof

BBA (UniSZA), Dip. Ins (UDM)

Assistant Registrar

Latifah Ilyana Ibrahim

BACR Hons. (USIM), Fdn. Acc (USIM)

Members of Faculty

Computer Sciences School

Professor

Mohd Nordin Abdul Rahman
PhD (UMT), MSc, BIT (UKM)

Associate Professor

Mokhairi Makhtar
PhD (UK), MIT (UKM), BIT (UKM), Dip. IT (KUSZA)

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

Ahmad Nazari Mohd Rose
PhD (UTHM), MSc (Brunel Univ), BSc (Ohio Univ)

Mohamad Afendee Mohamed
PhD (UPM), MSc (Glamorgan Univ), BSc (UMIST)

Syarilla Iryani Ahmad Sany
PhD (UPM), MIT (UKM), BSc (California State Univ)

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)

Nur Farraliza Mansor
PhD(UTeM), MSc (UTeM), B.Eng (UiTM), Dip. Eng (UiTM)

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

Nor Aida Mahiddin

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

Mohd Khalid Awang

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

Nur Saadah Mohd Shapri

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

Wan Aezwani Wan Abu Bakar

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

Muhammad Danial Zakaria

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

Mohd Isa Awang

MIT (UKM), Pg Dip System Eng (UWCC), BSc (USM)

Mohd Kamir Yusof

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)

Nazirah Abd Hamid

MSc. (UTM), BIT (UUM)

Azwa Abdul Aziz

MSc. (UMT), BSc., Dip. Comp. Sc (UiTM)

Lecturer

Norlina Udin @ Kamaruddin

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

Information Technology School

Professor

Mustafa Mamat

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

Associate Professor

Fatma Susilawati Mohamad

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

Engku Fadzli Hasan Syed Abdullah

PhD (Cardiff Univ,UK), MSc. (UTM), BMIS (UIAM)

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)

Senior Lecturer

Mumtazimah Mohamad

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

Nurnadiah Zamri

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

Zahrahtul Amani Zakaria

PhD (UTM), BSc. (UTM)

Siti Sabariah Abas

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

Suhailan Safei

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

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
MSc. (UiTM), BEng (South Australia)

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

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

Lecturer

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

Multimedia School

Associate Professor

Syadiah 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)

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)

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

Lecturer

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

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

Wan Malini Wan Isa
MSc., BSc (UPM)

Resident Artist

Tolahah Muda
BA (Hons) Art and Design Textile (UiTM)

Study Leave

Azilawati Rozaimiee
MSc., BSc (UPM)

Fatimah Ghazali
MSc. (UPM), B.IT (UKM), Dip. IT (KUSZA)

Roslinda Muda
MSc., BSc., Dip. Comp. Sc (UTM)

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

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

loaned as Registrar at Al-Bukhary University
Mohd Hafiz Yusof @ Che Abdullah
PhD (Newcastle University,UK), MSc. (USM), BIT (UUM)

Study Programme

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

Bachelor of Computer Science (Software Development) with honours first offered in session July 2006/2007. The programme has received the quality certificate from the Malaysian Qualifications Agency (MQA/PA 9641). Bachelor of Computer Science (Software Development) with Honours is a full-time study. The programme duration is three and half years covering SEVEN SEMESTERS consisting of six (6) regular semesters and six (6) months of industrial training. Teaching and learning methods for each course are conducted through lectures, tutorials, practical, presentations, projects and industrial training.

Programme Aims

The program aims to foster talented, resilient and responsible software technocrats who will promote universal responsibility through software development. An a honour degree in supporting the national and global aspirations of the Digital Economy.

Programme Educational Outcomes

- PEO 1 Computer practitioners who synthesize and apply the knowledge and understanding to provide technical solutions for the software development industries locally and globally.
- PEO 2 Computer technocrats who ethically and professionally provide computer solutions to fulfil social responsibilities of the diverse Malaysian community
- PEO 3 Computer practitioners who lead and collaborate in teams through effective communication in solving problems scientifically.
- PEO 4 Computer practitioners who continually enhance personal and professional know-how and venturing new business opportunities.

Programme Learning Outcomes

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

- PLO 1 Acquire and apply knowledge of essential facts, concepts, principles, and theories of Computer Science, focusing on software development
- PLO 2 Applying computing skills in analyzing, modelling, designing, developing, programming and evaluating efficient computing solutions in software development
- PLO 3 Fulfill obligations and social responsibilities using appropriate social skills

- PLO 4 Practice the value, attitude and professionalism in line with the related code of conduct
- PLO 5 Communicate effectively with peers, clients, superiors and society at large; with appropriate leadership and team work skills
- PLO 6 Utilize scientific skills to analyze algorithms as well as designing optimal solution to software development problems
- PLO 7 Manage information and engage in lifelong learning for academic and career development
- PLO 8 Possess managerial and entrepreneurship skills in business and real-world perspectives

Career Prospects

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

Entry Requirements

i. STPM CATEGORY

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;
- AND**
2. A pass the Sijil Tinggi Persekolahan Malaysia (STPM) with a minimum of **CGPA 2.50**;

Programme Requirement

3. Obtain a minimum of **Grade C (2.00)** at of the following subjects at STPM Level:
 - Mathematics (T) / Mathematics (M)
 - Information and Communication Technology / Physics / Chemistry / Biology
- OR**
- Obtained a minimum of **Grade C** in **Additional Mathematics** at SPM Level

OR

Obtained a minimum of **Grade C** at of the following subjects at SPM Level:

- Mathematics
- 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

AND

4. Obtained a minimum of **Grade C** in TWO (2) subjects **EXCLUDING Pengajian Am** at STPM Level

AND

5. A minimum score of **Band 2** in **MUET**.

ii. MATRICULATION / FOUNDATION CATEGORY

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;

AND

2. A pass in Matriculation/ Foundation programme with a minimum of **CGPA 2.50**;

Programme Requirement

3. Obtained a minimum of **CGPA 2.50** at Matriculation/ Foundation Level

AND

4. Obtained a minimum of **Grade C** in **Mathematics** at Matriculation/ Foundation Level

OR

Obtained a minimum of **Grade C** in **Additional Mathematics** at SPM Level

OR

Obtained a minimum of **Grade C** at of the following subjects at SPM Level:

- Mathematics
- 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

AND

5. A minimum score of **Band 2** in **MUET**

iii. **DIPLOMA / EQUIVALENT CATEGORY**

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;
AND
2. Graduated with a Diploma or other equivalent qualification recognized by the Malaysian Government and approved by University Senate;

Programme Requirement

3. Obtained at least **CGPA 2.50** at Diploma level; Diploma Level in related fields:

- Computer science
- Software engineering
- Information technology
- Information system
- Computer network
- Programming
- Internet computing
- Software development
- Data Science
- Electrical / Electronic Engineering
- Computer Engineering
- Mathematics
- Computer Mathematics
- Engineering
- Diploma in related field

OR

Obtained at least **CGPA 3.00** at **Diploma Vokasional Malaysia (DVM)** level in related fields:

- Computer and Network Systems Technology
- Creative Multimedia (Animation)
- Industrial Graphic Design (Print Media)
- Database Management System and Web Applications

AND

4. Obtained a minimum of **Grade C** in **Mathematics** at **Diploma Vokasional Malaysia (DVM)** Level

AND

5. A minimum score of **Band 2** in **MUET**

iv. STAM CATEGORY

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;
AND
2. A pass in Sijil Tinggi Agama Malaysia (STAM) with at least grade of Jayyid Jiddan;

Programme Requirement

3. Obtained a minimum grade of Jayyid Jiddan
AND
4. Obtained a minimum Grade C in **Additional Mathematics** at SPM level
OR
Obtained a minimum of **Grade C** at of the following subjects at SPM Level:
 - Mathematics
 - 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**AND**
5. A minimum score of **Band 2** in **MUET**

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 Science (Software Development) with honours. These courses are classified into 6 sections as follows:

Table 1: Curriculum structure according to course classification

No	Components	Credit Hours	Percentage (%)
1	University Courses	13	11
2	Core Courses	42	34
3	Specialization & Programme Elective Courses	30	24
4	Free Module Courses	18	14
5	Final year Project	8	7
6	Industrial Training	12	10
Total		123	100

University Courses

Table 2: University Courses (13 credit hours)

No	Courses Code	Course Name	Credit Hours
1	MPU31072	Penghayatan Etika dan Peradaban	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	MPU31062	Falsafah dan Isu Semasa	2
5	MPU32092	Asas Pembudayaan Keusahawanan	2
6	K** ****	Kokurikulum	3
Total			13

Core Courses

Table 3: Core courses (42 credit hours)

No	Courses Code	Course Name	Credit Hours
1	CSF 11103	Problem Solving and Computer Programming	3
2	CSF 11203	Computer Organization and Architecture	3
3	CSF 11303	Human Machine Interaction	3
4	CSF 11403	Software Engineering Methods	3
5	CSF 11503	Social and Professional Ethics	3
6	CSF 11603	Discrete Mathematics	3
7	CSF 11703	Operating Systems	3
8	CSF 11803	Object Oriented Programming*	3
9	CSF 11903	Network and Security Fundamentals	3
10	CSF 21103	Probability and Statistical Data Analysis	3
11	CSF 21203	System Analysis and Design	3
12	CSF 21303	Database	3
13	CSF 21403	Data Structures and Algorithms	3
14	CSF 31103	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)

No	Courses Code	Course Name	Credit Hours
1	CSD 23103	Web Application Development	3
2	CSD 23203	Requirements Engineering and Software Design	3
3	CSD 23303	Software Project Management	3
4	CSD 33103	Software Testing and Analysis	3
5	CSD 33203	Software Development Workshop	3
6	CSD 33303	Compiler Development	3
7	CSD 33403	Formal Methods	3

8	CSD 33503	Data Mining	3
Total			24

Table 5: Programme Elective courses (6 credit hours)

No	Courses Code	Course Name	Credit Hours
1	CSD 33603	Special Topics in Software Development	3
2	CSD 33703	Digital Image Processing	3
3	CSD 33803	Advanced Database	3
4	CSD 33903	Artificial Neural Networks	3
Total			6

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 6: Free Module courses (18 credit hours)

No	Courses Code	Course Name	Credit Hours
1		Choose any four non-specialization courses of three credit hours of courses offered by other academic programs either from FIK as well as from other faculties in UniSZA.	12
2	PBI10***	Bahasa Asing	2
3	PBI10102	English for Communication I	2
4	PBI10202	English for Communication II	2
Total			18

Final Year Project

Table 7: 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 8: 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 9: First Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	MPU31072	Penghayatan Etika Dan Peradaban	2
	MPU31042	Bahasa Melayu Asas 1 (Pelajar A'bangsa)	
2	MPU32092	Asas Pembudayaan Keusahawanan	2
3	MPU33012	Ilmu Wahyu & Sains	2
	MPU33022	Moral & Etika II (Pelajar Bukan Islam)	
4	PBI10102	English For Communication I	2
5	MPU31062	Falsafah Dan Isu Semasa	2
6	MPU33032	Ilmu Wahyu & Kemasyarakatan	2
	MPU33042	Perbandingan Agama II (Pelajar Bukan Islam)	
7	PBI10202	English For Communication II	2
8	PBI ****2	Bahasa Asing	2
9	*** ****3	Kokurikulum	3
Total			19

Table 10: Second Semester (18 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF 11603	Discrete Mathematics	3
2	CSF 11403	Software Engineering Methods	3
3	CSF 11103	Problem Solving and Computer Programming	3
4	CSF 11903	Network and Security Fundamentals	3
5	CSF 11203	Computer Organization and Architecture	3
6	CSF 11303	Human Machine Interaction	3
Total			18

Table 11: Third Semester (18 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF 21103	Probability and Statistical Data Analysis	3
2	CSF 21203	System Analysis and Design	3
3	CSF 21303	Database	3
4	CSD 23103	Web Application Development	3
5	CSF 11803	Object Oriented Programming*	3
6	CSF 11703	Operating Systems	3
Total			18

Pre requisite:

- CSF 11803 is passed CSF 11103

Table 12: Forth Semester (18 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF 21403	Data Structures and Algorithms	3
2	CSD 23203	Requirements Engineering and Software Design	3
3	CSF 11503	Social and Professional Ethics	3
4		Free Module Elective I	3
5		Programme Elective I	3
	CSD 23303	Software Project Management	3
Total			18

Table 13: Fifth Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSD 33103	Software Testing and Analysis	3
2	CSD 33203	Software Development Workshop	3
3	CSD 33303	Compiler Development	3
4	CSF 31103	Artificial Intelligence	3
5		Free Module Elective II	3
6	CSF 35104	Final Year Project I*	4
Total			19

Pre requisite:

- CSF 35104 has take all the core and specialization courses until Year 2

Table 14: Sixth Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSD 33403	Formal Methods	3
2	CSD 33503	Data Mining	3
3		Programme Elective II	3
4	CSF 35204	Final Year Project II*	4
5		Free Module Elective III	3
		Free Module Elective IV	3
Total			19

Pre requisite:

- CSF35204 is passed CSF35104

Table 15: Seventh Semester (12 credit hours)

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

Pre requisite:

- CSF47112 is passed all courses

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

Bachelor of Computer Sciences (Computer Network Security) with honours first offered in Semester 1 Session 2012/2013. The programme has received the quality certificate from the Malaysian Qualifications Agency with reference number MQA/FA0516 starting 25 October 2016.

Bachelor of Computer Sciences (Computer Network Security) with Honours is a full-time study. The programme duration is three and half years covering SEVEN SEMESTERS consisting of six (6) regular semester 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 foster talented, resilient and responsible network assurance technocrats who will promote universal responsibility through computer network security, in supporting the national and global aspirations of the Digital Economy.

Programme Educational Outcomes

- PEO 1 Computer practitioners who synthesize and apply the knowledge and understanding to provide technical solutions for the computer network security industries locally and globally.
- PEO 2 Computer technocrats who ethically and professionally provide computer solutions to fulfil social responsibilities of the diverse Malaysian community.
- PEO 3 Computer practitioners who lead and collaborate in teams through effective communication in solving problems scientifically.
- PEO 4 Computer practitioners who continually enhance personal and professional know-how, and venturing new business opportunities.

Programme Learning Outcomes

- PLO 1 Acquire and apply knowledge of essential facts, concepts, principles, and theories of Computer Science, focusing on computer network security
- PLO 2 Applying computing skills in analyzing, modelling, designing, developing, programming and evaluating efficient computing solutions in computer network security
- PLO 3 Fulfill obligations and social responsibilities using appropriate social skills
- PLO 4 Practice the value, attitude and professionalism in line with the related code of conduct

- PLO 5 Communicate effectively with peers, clients, superiors and society at large; with appropriate leadership and team work skills
- PLO 6 Utilize scientific skills to analyze algorithms as well as designing optimal solution to computer network security problems
- PLO 7 Manage information and engage in lifelong learning for academic and career development
- PLO 8 Possess managerial and entrepreneurship skills in business and real-world perspectives

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 technocrats

Entry Requirements

i. STPM CATEGORY

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;

AND

2. A pass the Sijil Tinggi Persekolahan Malaysia (STPM) with a minimum of **CGPA 2.50**;

Programme Requirement

3. Obtain a minimum of **Grade C (2.00)** at of the following subjects at STPM Level:
 - Mathematics (T) / Mathematics (M)
 - Information and Communication Technology / Physics / Chemistry / Biology

OR

Obtained a minimum of **Grade C** in **Additional Mathematics** at SPM Level

OR

Obtained a minimum of **Grade C** at of the following subjects at SPM Level:

- Mathematics
- 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

AND

4. Obtained a minimum of **Grade C** in TWO (2) subjects **EXCLUDING Pengajian Am** at STPM Level

AND

5. A minimum score of **Band 2** in **MUET**.

ii. MATRICULATION / FOUNDATION CATEGORY

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;

AND

2. A pass in Matriculation/ Foundation programme with a minimum of **CGPA 2.50**;

Programme Requirement

3. Obtained a minimum of **CGPA 2.50** at Matriculation/ Foundation Level

AND

4. Obtained a minimum of **Grade C** in **Mathematics** at Matriculation/ Foundation Level

OR

Obtained a minimum of **Grade C** in **Additional Mathematics** at SPM Level

OR

Obtained a minimum of **Grade C** at of the following subjects at SPM Level:

- Mathematics
- 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

AND

5. A minimum score of **Band 2** in **MUET**

iii. **DIPLOMA / EQUIVALENT CATEGORY**

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;
AND
2. Graduated with a Diploma or other equivalent qualification recognized by the Malaysian Government and approved by University Senate;

Programme Requirement

3. Obtained at least **CGPA 2.50** at Diploma level; Diploma Level in related fields:

- Computer science
- Software engineering
- Information technology
- Information system
- Computer network
- Programming
- Internet computing
- Software development
- Data Science
- Electrical / Electronic Engineering
- Computer Engineering
- Mathematics
- Computer Mathematics
- Engineering
- Diploma in related field

OR

Obtained at least **CGPA 3.00** at **Diploma Vokasional Malaysia (DVM)** level in related fields:

- Computer and Network Systems Technology
- Creative Multimedia (Animation)
- Industrial Graphic Design (Print Media)
- Database Management System and Web Applications

AND

4. Obtained a minimum of **Grade C** in **Mathematics** at **Diploma Vokasional Malaysia (DVM)** Level

AND

5. A minimum score of **Band 2** in **MUET**

iv. STAM CATEGORY

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;
AND
2. A pass in Sijil Tinggi Agama Malaysia (STAM) with at least grade of Jayyid Jiddan;

Programme Requirement

3. Obtained a minimum grade of Jayyid Jiddan
AND
4. Obtained a minimum Grade C in **Additional Mathematics** at SPM level
OR
Obtained a minimum of **Grade C** at of the following subjects at SPM Level:
 - Mathematics
 - 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**AND**
5. A minimum score of **Band 2** in **MUET**

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 (Computer Network Security) with honours. These courses are classified into 6 sections as follows:

Table 16: Curriculum structure according to course classification

No	Components	Credit Hours	Percentage (%)
1	University Courses	19	15
2	Core Courses	42	34
3	Specialization Courses & 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 17: University courses (13 credit hours)

No	Course Code	Course Name	Credit Hours
1	MPU31072	Penghayatan Etika dan Peradaban	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	MPU31062	Falsafah dan Isu Semasa	2
5	MPU32092	Asas Pembudayaan Keusahawanan	2
6	K** ****	Kokurikulum	3
Total			13

Core Courses

Table 18: Core courses (42 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF 11103	Problem Solving and Computer Programming	3
2	CSF 11203	Computer Organization and Architecture	3
3	CSF 11303	Human Machine Interaction	3
4	CSF 11403	Software Engineering Methods	3
5	CSF 11503	Social and Professional Ethics	3
6	CSF 11603	Discrete Mathematics	3
7	CSF 11703	Operating Systems	3
8	CSF 11803	Object Oriented Programming*	3
9	CSF 11903	Network and Security Fundamentals	3
10	CSF 21103	Probability and Statistical Data Analysis	3
11	CSF 21203	System Analysis and Design	3
12	CSF 21303	Database	3
13	CSF 21403	Data Structures and Algorithms	3
14	CSF 31103	Artificial Intelligence	3
Total			42

Pre requisite:

- CSF 11803 is passed CSF 11103

Specialization Courses / Programme Elective Courses (BSC-CNS)

Table 19: Specialization courses (24 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSA 23103	Security Management	3
2	CSA 23203	Network Technology Security and Communications	3
3	CSA 23303	Data Communication Workshop	3

4	CSA 33103	Network Analysis and Design	3
5	CSA 33203	Penetration Testing	3
6	CSA 33303	Cryptography*	3
7	CSA 33403	Parallel and Distributed Computing	3
8	CSA 33503	Computer Forensics	3
Total			24

Pre requisite:

- CSA 33303 is passed CSF 11603

Table 20: Programme Elective courses (6 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSA 23403	Data Compression	3
2	CSA 33603	Network Simulation and performance Modelling	3
3	CSA 33703	Digital Logic	3
4	CSA 33803	Network Management	3
5	CSA 33903	Intrusion Detection and Prevention System	3
6	CSA 43103	Network Operating System*	3
7	CSA 43203	Network Programming	3
8	CSA 43303	Wireless Communication and Mobile Network	3
Total			6

Pre requisite

- CSA 43103 is passed CSF 11703

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 21: Free Module courses (12 credit hours)

No	Course Code	Course Name	Credit Hours
1		Choose any four non-specialization courses of three credit hours of courses offered by other academic programs either from FIK as well as from other faculties in UniSZA.	12
2	PBI10***	Bahasa Asing	2
3	PBI10102	English for Communication I	2
4	PBI10202	English for Communication II	2
Total			12

Final Year Project

Table 22: Final Year Project (8 credit hours)

No	Course 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:

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

Industrial Training

Table 23: Industrial Training (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

Curriculum Structure according Semester

Table 24: First Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	MPU31072	Penghayatan Etika Dan Peradaban	2
	MPU31042	Bahasa Melayu Asas 1 (Pelajar A'bangsa)	
2	MPU32092	Asas Pembudayaan Keusahawanan	2
3	MPU33012	Ilmu Wahyu & Sains	2
	MPU33022	Moral & Etika II (Pelajar Bukan Islam)	
4	PBI10102	English For Communication I	2
5	MPU31062	Falsafah Dan Isu Semasa	2
6	MPU33032	Ilmu Wahyu & Kemasyarakatan	2
	MPU33042	Perbandingan Agama II (Pelajar Bukan Islam)	
7	PBI10202	English For Communication II	2
8	PBI ****2	Bahasa Asing	2
9	*** ****3	Kokurikulum	3
Total			19

Table 25: Second Semester (18 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF 11603	Discrete Mathematics	3
2	CSF 11403	Software Engineering Methods	3
3	CSF 11103	Problem Solving and Computer Programming	3
4	CSF 11903	Network and Security Fundamentals	3
5	CSF 11203	Computer Organization and Architecture	3
6	CSF 11303	Human Machine Interaction	3
Total			18

Table 26: Third Semester (18 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF 21103	Probability and Statistical Data Analysis	3
2	CSF 21203	System Analysis and Design	3
3	CSF 21303	Database	3
4	CSA 23103	Security Management	3
5	CSF 11803	Object Oriented Programming*	3
6	CSF 11703	Operating Systems	3
Total			18

Pre requisite:

- CSF 11803 is passed CSF 11103

Table 27: Fourth Semester (18 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF 21403	Data Structures and Algorithms	3
2	CSA 23203	Network Technology Security and Communications	3
3	CSF 11503	Social and Professional Ethics	3
4		Free Module Elective I	3
5		Programme Elective I	3
6	CSA 23303	Data Communication Workshop	3
Total			18

Table 28: Fifth Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSA 33103	Network Analysis and Design	3
2	CSA 33203	Penetration Testing	3
3	CSA 33303	Cryptography*	3
4	CSF 31103	Artificial Intelligence	3
5		Free Module Elective II	3
6	CSF 35104	Final Year Project I*	4
Total			19

Pre requisite :

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

Table 29 : Sixth Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSA 33403	Parallel and Distributed Computing	3
2	CSA 33503	Computer Forensics	3
3		Programme Elective II	3
4	CSF 35204	Final Year Project II*	4
5		Free Module Elective III	3
6		Free Module Elective IV	3
Total			19

Pre requisite :

- CSF 35204 is passed CSF 35104

Table 30: 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)

Bachelor of Computer Sciences (Internet Computing) with honours first offered in Semester 1 Session 2014/2015. The programme has received the quality certificate from the Malaysian Qualifications Agency with reference number MQA/FA2934 starting 10 January 2018. Bachelor of Computer Sciences (Internet Computing) with Honours is a full-time study. The programme duration is three and half years covering SEVEN SEMESTERS consisting of six (6) regular semesters and six (6) months of industrial training. Teaching and learning methods for each course is conducted through lectures, tutorials, practical, presentations, projects and industrial training.

Programme Aims

The program aims to foster talented, resilient and responsible internet technocrats who will promote universal responsibility through internet computing, in supporting the national and global aspirations of the Digital Economy.

Programme Educational Outcomes

- PEO 1 Computer practitioners who synthesize and apply the knowledge and understanding to provide technical solutions for the internet computing industries locally and globally.
- PEO 2 Computer technocrats who ethically and professionally provide computer solutions to fulfil social responsibilities of the diverse Malaysian community.
- PEO 3 Computer practitioners who lead and collaborate in teams through effective communication in solving problems scientifically.
- PEO 4 Computer practitioners who continually enhance personal and professional know-how, and venturing new business opportunities.

Programme Learning Outcomes

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

- PLO 1 Acquire and apply knowledge of essential facts, concepts, principles, and theories of Computer Science, focusing on internet computing
- PLO 2 Applying computing skills in analyzing, modelling, designing, developing, programming and evaluating efficient computing solutions in internet computing
- PLO 3 Fulfill obligations and social responsibilities using appropriate social skills
- PLO 4 Practice the value, attitude and professionalism in line with the related code of conduct
- PLO 5 Communicate effectively with peers, clients, superiors and society at large; with appropriate leadership and team work skills
- PLO 6 Utilize scientific skills to analyze algorithms as well as designing optimal solution to internet computing problems
- PLO 7 Manage information and engage in lifelong learning for academic and career development

PLO 8 Possess managerial and entrepreneurship skills in business and real world perspectives

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

Entry Requirements

i. STPM CATEGORY

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;

AND

2. A pass the Sijil Tinggi Persekolahan Malaysia (STPM) with a minimum of **CGPA 2.50**;

Programme Requirement

3. Obtain a minimum of **Grade C (2.00)** at of the following subjects at STPM Level:

- Mathematics (T) / Mathematics (M)
- Information and Communication Technology / Physics / Chemistry / Biology

OR

Obtained a minimum of **Grade C** in **Additional Mathematics** at SPM Level

OR

Obtained a minimum of **Grade C** at of the following subjects at SPM Level:

- Mathematics
- 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

AND

4. Obtained a minimum of **Grade C** in TWO (2) subjects **EXCLUDING Pengajian Am** at STPM Level

AND

5. A minimum score of **Band 2** in **MUET**.

ii. MATRICULATION / FOUNDATION CATEGORY

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;

AND

2. A pass in Matriculation/ Foundation programme with a minimum of **CGPA 2.50**;

Programme Requirement

3. Obtained a minimum of **CGPA 2.50** at Matriculation/ Foundation Level

AND

4. Obtained a minimum of **Grade C** in **Mathematics** at Matriculation/ Foundation Level

OR

Obtained a minimum of **Grade C** in **Additional Mathematics** at SPM Level

OR

Obtained a minimum of **Grade C** at of the following subjects at SPM Level:

- Mathematics
- 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

AND

5. A minimum score of **Band 2** in **MUET**

iii. DIPLOMA / EQUIVALENT CATEGORY

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;

AND

2. Graduated with a Diploma or other equivalent qualification recognized by the Malaysian Government and approved by University Senate;

Programme Requirement

3. Obtained at least **CGPA 2.50** at Diploma level; Diploma Level in related fields:

- Computer science
- Software engineering
- Information technology
- Information system
- Computer network
- Programming
- Internet computing
- Software development
- Data Science
- Electrical / Electronic Engineering
- Computer Engineering
- Mathematics
- Computer Mathematics
- Engineering
- Diploma in related field

OR

Obtained at least **CGPA 3.00** at **Diploma Vokasional Malaysia (DVM)** level in related fields:

- Computer and Network Systems Technology
- Creative Multimedia (Animation)
- Industrial Graphic Design (Print Media)
- Database Management System and Web Applications

AND

4. Obtained a minimum of **Grade C** in **Mathematics** at **Diploma Vokasional Malaysia (DVM)** Level

AND

5. A minimum score of **Band 2** in **MUET**

iv. STAM CATEGORY

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;

AND

2. A pass in Sijil Tinggi Agama Malaysia (STAM) with at least grade of Jayyid Jiddan;

Programme Requirement

3. Obtained a minimum grade of Jayyid Jiddan

AND

4. Obtained a minimum Grade C in **Additional Mathematics** at SPM level
OR
 Obtained a minimum of **Grade C** at of the following subjects at SPM Level:
- Mathematics
 - 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
- AND**
5. A minimum score of **Band 2** in **MUET**

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 (Computer Network Security) with honours. These courses are classified into 6 sections as follows:

Table 30: Curriculum structure according to course classification

No	Components	Credit Hours	Percentage (%)
1	University Courses	13	11
2	Core Courses	42	34
3	Specialization Courses & Programme Elective Courses	30	24
4	Free Module Courses	18	14
5	Final Year Project	8	7
6	Industrial Training	12	10
	Total	123	100%

University Courses

Table 31: University courses (13 credits hours)

No	Course code	Course Name	Credit Hours
1	MPU31072	Penghayatan Etika dan Peradaban	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	MPU31062	Falsafah dan Isu Semasa	2
5	MPU32092	Asas Pembudayaan Keusahawanan	2
6	K** ****	Kokurikulum	3
Total			13

Core Courses

Table 32: Core courses (42 credit hours)

No	Course code	Course Name	Credit Hours
1	CSF 11103	Problem Solving and Computer Programming	3
2	CSF 11203	Computer Organization and Architecture	3
3	CSF 11303	Human Machine Interaction	3
4	CSF 11403	Software Engineering Methods	3
5	CSF 11503	Social and Professional Ethics	3
6	CSF 11603	Discrete Mathematics	3
7	CSF 11703	Operating Systems	3
8	CSF 11803	Object Oriented Programming*	3
9	CSF 11903	Network and Security Fundamentals	3
10	CSF 21103	Probability and Statistical Data Analysis	3
11	CSF 21203	System Analysis and Design	3
12	CSF 21303	Database	3
13	CSF 21403	Data Structures and Algorithms	3
14	CSF 31103	Artificial Intelligence	3
Total			42

Pre requisite

- CSF 11803 is passed CSF 11103

Specialization Courses & Programme Elective Courses (BSC-IC)

Table 33: Specialization courses (24 credit hours)

No	Course code	Course Name	Credit Hours
1	CSD 23103	Web Application Development	3
2	CSW 23103	Internet Architecture and Programming	3
3	CSW 23203	Mobile Computing	3
4	CSW 33103	Web Services	3
5	CSW 33203	Distributed Computing System	3
6	CSW 33303	Cloud Computing	3
7	CSW 33403	e-Commerce	3
8	CSW 33503	Business Intelligence	3
Total			24

Table 34: Elective Courses (6 credit hours)

No	Course code	Course Name	Credit Hours
1	CSW 33803	Internet Based System Development Methodology	3
2	CSW 33603	Online Multimedia Technologies	3
3	CSW 33703	Internet of Things	3
Total			6

Free Module Courses

Table 35: Free Module Courses (18 credit hours)

No	Course code	Course Name	Credit Hours
1		Choose any four non-specialization courses of three credit hours of courses offered by other academic programs either from FIK as well as from other faculties in UniSZA.	12

2	PBI10***	Bahasa Asing	2
3	PBI10102	English for Communication I	2
4	PBI10202	English for Communication II*	2
Total			18

Final Year Project

Table 36: 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 37: Industrial Training (12 credit hours)

No	Course code	Course Name	Credit Hours
1	CSF 47112	Industrial Training*	12
Jumlah			12

Pre requisite

- CSF 47112 is passed all courses

Curriculum Structure according Semester

Table 38: First Semester (19 credit hours)

No	Course code	Course Name	Credit Hours
1	MPU31072	Penghayatan Etika Dan Peradaban	2
	MPU31042	Bahasa Melayu Asas 1 (Pelajar A'bangsa)	
2	MPU32092	Asas Pembudayaan Keusahawanan	2
3	MPU33012	Ilmu Wahyu & Sains	2
	MPU33022	Moral & Etika II (Pelajar Bukan Islam)	
4	PBI10102	English For Communication I	2
5	MPU31062	Falsafah Dan Isu Semasa	2
6	MPU33032	Ilmu Wahyu & Kemasyarakatan	2
	MPU33042	Perbandingan Agama II (Pelajar Bukan Islam)	
7	PBI10202	English For Communication II	2
8	PBI ****2	Bahasa Asing	2
9	*** ****3	Kokurikulum	3
Total			19

Table 39: Second Semester (18 credit hours)

No	Course code	Course Name	Credit Hours
1	CSF 11103	Problem Solving and Computer Programming	3
2	CSF 11203	Computer Organization and Architecture	3
3	CSF 11303	Human Machine Interaction	3
4	CSF 11903	Network and Security Fundamentals	3
5	CSF 11603	Discrete Mathematics	3
6	CSF 11403	Software Engineering Methods	3
Total			18

Table 40: Third Semester (18 credit hours)

No	Course code	Course Name	Credit Hours
1	CSF 21103	Probability and Statistical Data Analysis	3
2	CSF 21203	System Analysis and Design	3
3	CSF 21303	Database	3
4	CSD 23103	Web Application Development	3
5	CSF 11703	Operating Systems	3
6	CSF 11803	Object Oriented Programming*	3
Total			18

Pre requisite

- CS11803 is passed CSF11103

Table 41: Fourth Semester (18 credit hours)

No	Course code	Course Name	Credit Hours
1	CSF 21403	Data Structures and Algorithms	3
2	CSW 23103	Internet Architecture and Programming	3
3		Programme Elective I	3
4	CSW 23203	Mobile Computing	3
5	CSF 11503	Social and Professional Ethics	3
6		Free Module Elective I	3
Total			18

Table 42: Fifth Semester (19 credit hours)

No	Course code	Course Name	Credit Hours
1	CSW 33103	Web Services	3
2	CSW 33203	Distributed Computing System	3
3	CSW 33303	Cloud Computing	3
4	CSF 31103	Artificial Intelligence	3
5		Free Module Elective II	3
6	CSF 35104	Final Year Project I*	4
Total			19

Pre requisite

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

Table 43: Sixth Semester (19 credit hours)

No	Course code	Course Name	Credit Hours
1	CSW 33403	e-Commerce	3
2	CSW 33503	Business Intelligence	3
3		Programme Elective II	3
4	CSF 35204	Final Year Project II*	4
5		Free Module Elective III	3
6		Free Module Elective IV	3
Total			19

Pre requisite

- CSF35204 is passed CSF35104

Table 44: Seventh Semester (12 credit hours)

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

Pre requisite

- CSF47112 is passed all course

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 received the quality certificate from the Malaysian Qualifications Agency with reference number (MQA / PA 5123) starting October 19, 2014. Bachelor of Information Technology (Informatics Media) with Honours is a full-time study. The programme duration is three and half years covering SEVEN SEMESTERS 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 Information technology professionals who synthesize, apply the knowledge and understanding to solve information technology and creative technology problems critically and innovatively, through sustainable approach in the informatics media profession.
- PEO 2 Information technology professionals who ethically and professionally provide computer solutions to fulfil social responsibilities of the diverse Malaysian community.
- PEO 3 Information technology professionals who lead and collaborate in teams through effective communication in solving problems scientifically.
- PEO 4 Information technology professionals who continually enhance personal and professional know-how, and venturing new business opportunities

Programme Learning Outcomes

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

- PLO 1 Acquire and apply knowledge of essential facts, concepts, principles, and theories of Information Technology, focusing on media informatics

- PLO 2 Applying computing skills in analyzing, modelling, designing, developing, programming and evaluating efficient computing solutions in media informatics
- PLO 3 Fulfill obligations and social responsibilities using appropriate social skills
- PLO 4 Practice the value, attitude and professionalism in line with the related code of conduct
- PLO 5 Communicate effectively with peers, clients, superiors and society at large; with appropriate leadership and team work skills
- PLO 6 Utilize scientific skills to analyze algorithms as well as designing optimal solution to problems in media informatics
- PLO 7 Manage information and engage in lifelong learning for academic and career development
- PLO 8 Possess managerial and entrepreneurship skills in business and real-world perspectives

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

Entry Requirements

i. STPM CATEGORY

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;

AND

2. A pass the Sijil Tinggi Persekolahan Malaysia (STPM) with a minimum of **CGPA 2.50**;

Programme Requirement

3. Obtain a minimum of **Grade C (2.00)** in ONE of the following subjects at STPM Level:

- Mathematics (T)
- Mathematics (M)

OR

Obtained a minimum of **Grade C** in **Mathematics** at SPM Level

AND

4. Obtained a minimum of **Grade C** in TWO (2) subjects **EXCLUDING Pengajian Am** at STPM Level

AND

5. A minimum score of **Band 2** in **MUET**.

ii. MATRICULATION / FOUNDATION CATEGORY

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;

AND

2. A pass in Matriculation/ Foundation programme with a minimum of **CGPA 2.50**;

Programme Requirement

3. Obtained a minimum of **Grade C** in **Mathematics** at Matriculation/ Foundation Level

OR

Obtained a minimum of **Grade C** in **Mathematics** at SPM Level

AND

4. A minimum score of **Band 2** in **MUET**

iii. DIPLOMA / EQUIVALENT CATEGORY

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;

AND

2. Graduated with a Diploma or other equivalent qualification recognized by the Malaysian Government and approved by University Senate;

Programme Requirement

3. Obtained at least **CGPA 2.50** at Diploma level; Diploma in related fields.

AND

4. Obtained a minimum of **Grade C** in **Mathematics** at SPM Level

OR

Obtained at least **CGPA 3.00** at **Diploma Vokasional Malaysia (DVM)** level in related fields:

- Computer and Network Systems Technology
- Creative Multimedia (Animation)
- Industrial Graphic Design (Print Media)

- Database Management System and Web Applications

AND

5. Obtained a minimum of **Grade C** in **Mathematics** at **Diploma Vokasional Malaysia (DVM)** Level

AND

6. A minimum score of **Band 2** in **MUET**

iv. **STAM CATEGORY**

University Requirement

1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia or honours in Bahasa Melayu/ Bahasa Malaysia Paper July;

AND

2. A pass in Sijil Tinggi Agama Malaysia (STAM) with at least grade of Jayyid Jiddan;

Programme Requirement

3. Obtained a minimum grade of Jayyid Jiddan

AND

4. Obtained a minimum Grade C in **Mathematics** at SPM level

AND

5. A minimum score of **Band 2** in **MUET**

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 Computer Sciences (Computer Network Security) with honours. These courses are classified into 6 sections as follows:

Table 45: Curriculum structure according to course classification

No	Components	Credit Hours	Percentage (%)
1	University Courses	13	11
2	Core Courses	42	34
3	Specialization Courses & Programme Elective Courses	30	24
4	Free Module Courses	18	14
5	Final Year Project	8	7
6	Industrial Training	12	10
	Total	123	100%

University Courses

Table 46: University courses (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	MPU31072	Penghayatan Etika dan Peradaban	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	MPU31062	Falsafah dan Isu Semasa	2
5	MPU32092	Asas Pembudayaan Keusahawanan	2
6	K** ****	Kokurikulum	3
Total			13

Core Courses

Table 47: Core courses (42 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF 11103	Problem Solving and Computer Programming	3
2	CSF 11203	Computer Organization and Architecture	3
3	CSF 11303	Human Machine Interaction	3
4	CSF 11503	Social and Professional Ethics	3
5	CSF 11603	Discrete Mathematics	3
6	CSF 11803	Object Oriented Programming*	3
7	CSF 21103	Probability and Statistical Data Analysis	3
8	CSF 21203	System Analysis and Design	3
9	CSF 21303	Database	3
10	ITF 11103	Information Technology and Its Applications	3
11	ITF 11203	Data Communication and Networking	3
12	ITF 21103	Information Security	3
13	CSD 23103	Web Application Development	3
14	CSD 23303	Software Project Management	3
Total			42

Pre requisite:

- CSF 11803 is passed CSF 11103

Specialization Courses / Programme Elective Courses (BIT-IM)

Table 48: Specialization courses (24 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITM 13103	Art and Design	3
2	ITM 23103	Storytelling and Storyboard	3
3	ITM 23203	Image Editing	3
4	ITM 23303	2D and 3D Modeling	3
5	ITM 33103	Digital Media Publishing	3
6	ITM 33203	2D and 3D Animation*	3
7	ITM 33303	Digital Audio and Video Technology	3
8	ITM 33403	Multimedia Application Development	3
Jumlah			24

Pre requisite:

- ITM 33203 is passed ITM 23303

Table 49: Programme Elective courses (6 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITM 23403	Photography Techniques and Technology	3
2	ITM 23503	Virtual Reality Technology	3
3	ITM 23603	Interactive Media in Industry	3
4	ITM 23703	Computer Games Development	3
Total			6

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 50: Free Module courses (12 credit hours)

No	Course Code	Course Name	Credit Hours
1		Choose any four non-specialization courses of three credit hours of courses offered by other academic programs either from FIK as well as from other faculties in UniSZA.	12
2	PBI10***	Bahasa Asing	2
3	PBI10102	English for Communication I	2
4	PBI10202	English for Communication II*	2
Total			18

Final Year Project

Table 51: 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 52: Industrial Training (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

Curriculum Structure according Semester

Table 53: First Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	MPU31072	Penghayatan Etika dan Peradaban	2
	MPU31042	Bahasa Melayu Asas 1 (Pelajar A'bangsa)	
2	MPU32092	Asas Pembudayaan Keusahawanan	2
3	MPU33012	Ilmu Wahyu & Sains	2
	MPU33022	Moral & Etika II (Pelajar Bukan Islam)	
4	PBI10102	English For Communication I	2
5	MPU31062	Falsafah Dan Isu Semasa	2
6	MPU33032	Ilmu Wahyu & Kemasyarakatan	2
	MPU33042	Perbandingan Agama II (Pelajar Bukan Islam)	
7	PBI10202	English For Communication II	2
8	PBI ****2	Bahasa Asing	2
9	*** ****3	Kokurikulum	3
Total			19

Table 54: Second Semester (18 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF 11103	Problem Solving and Computer Programming	3
2	CSF 11203	Computer Organization and Architecture	3
3	CSF 11303	Human Machine Interaction	3
4	ITF 11203	Data Communication and Networking	3
5	CSF 11603	Discrete Mathematics	3
6	ITM 13103	Art and Design	3
Total			18

Table 55: Third Semester (18 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF 11803	Object Oriented Programming*	3
2	CSF 21103	Probability and Statistical Data Analysis	3
3	CSF 21203	System Analysis and Design	3
4	CSF 21303	Database	3
5	CSD 23103	Web Application Development	3
6	ITF 11103	Information Technology and Its Applications	3
Total			18

Pre requisite:

- CSF 11803 is passed CSF 11103

Table 56: Fourth Semester (18 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF 11503	Social and Professional Ethics	3
2	CSD 23303	Software Project Management	3
3	ITM 23103	Storytelling and Storyboard	3
4	ITM 23203	Image Editing	3
5	ITM 23303	2D and 3D Modeling	3
6		Programme Elective I	3
Total			18

Table 57: Fifth Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF 35104	Final Year Project I*	4
2	ITM 33103	Digital Media Publishing	3
3	ITM 33203	2D and 3D Animation *	3
4	ITM 33303	Digital Audio and Video Technology	3
5		Free Module Elective I	3
6		Free Module Elective II	3
Total			19

Pre requisite :

- CSF35104 has taken all the core and specialization courses until Year 2
- ITM 33203 is passed ITM 23303

Table 58: Sixth Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF 35204	Final Year Project II*	4
2	ITM 33403	Multimedia Application Development	3
3		Free Module Elective III	3
4		Free Module Elective IV	3
5		Programme Elective II	3
	ITF 21103	Information Security	3
Total			19

Pre requisite

- CSF 35204 is passed CSF 35104

Table 59: 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 Information Technology (DTM)

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 received the quality certificate from the Malaysian Qualifications Agency with reference number MQA/PA 9642 starting 10th July 2017. Diploma in Information Technology is a full-time study. The programme duration is two years covering SIX SEMESTERS consisting of three (3) regular semesters, two (2) 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 foster competent and dynamic talents in promoting global responsibility via information technology industries. The programme is supporting the national and global aspirations of the Digital Economy based on the vision and mission of the university. The program whilst providing educational opportunities at a higher level.

Programme Educational Outcomes

- PEO 1 Knowledgeable and technically competent in Information Technology discipline in-line with the industry requirement
- PEO 2 Effective in communication and working in a team as well as demonstrate good leadership quality in an organization
- PEO 3 Capable to solve Information Technology problems innovatively, creatively and ethically through sustainable approach
- PEO 4 Able to demonstrate entrepreneurship skills and recognize the need of lifelong learning for successful career advancement

Programme Learning Outcomes

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

- PLO 1 Acquire and apply knowledge of essential facts, concepts, principles, and theories of Information Technology
- PLO 2 Apply computing skills in analysing, designing, developing, programming, deploying and maintaining computing solutions in Information Technology
- PLO 3 Fulfill obligations and social responsibilities using appropriate social skills
- PLO 4 Practice the values, attitude and professionalism in accordance with ethical and legal principles
- PLO 5 Communicate effectively with peers, clients, superiors and society at large with appropriate leadership and team work skills
- PLO 6 Utilize scientific skills to analyse algorithms as well as designing and managing solution to problem in Information Technology

PLO 7 Manage information and engage in lifelong learning for academic and career development

PLO 8 Possess managerial and entrepreneurship skills in business and organizations

Career Prospects

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

Entry Requirements

i. SPM CATEGORY

University Requirements

1. Malaysian

AND

2. A pass with minimum of FIVE (5) credits in Sijil Pelajaran Malaysia (SPM) including Bahasa Melayu;

AND

3. Pass in History subject in SPM 2019;

Programme Requirements

4. Obtained a minimum of Grade C in ONE of the following subjects at SPM Level:

- Mathematics
- Additional Mathematics

AND

5. Obtained a minimum of Grade C in **ONE** of the following subjects at SPM Level:

- 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.

Curriculum Details and Structure

Curriculum Structure according to Course Classification

Each student is required to pass at least 90 credit hours of courses to be awarded the Diploma in Information Technology. These courses are classified into six sections as follows:

Table 60: Curriculum structure according to course classification

No	Components	Credit Hours	Percentage (%)
1	University Courses	11	12
2	Core Courses	30	34
3	Specialization Courses	18	20
4	Programme Elective Courses	15	17
5	Final Year Project	4	4
6	Industrial Training	12	13
	Total	90	100%

University Courses

Table 61: University courses (11 credit hours)

No	Course Code	Course Name	Credit Hours
1	MPU 21022	Penghayatan Etika dan Peradaban	2
2	MPU 23012/ MPU 23022	Aqidah dan Akhlak (Islam)/ Moral dan Etika I (Bukan Islam)	2
3	MPU 23032/ MPU 23042	Fiqh Ibadat (Islam)/ Perbandingan Agama I (Bukan Islam)	2
4	MPU 23052/ MPU 23062	Tajwid Al- Quran (Islam) / Etiket Sosial dan Penampilan Diri (Bukan Islam)	2
5	KK*****	Kokurikulum	3
		Total	11

Core Courses

Table 62: Core courses (30 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITD 11103	Algebra dan Kalkulus	3

2	ITD 11203	Pengaturacaraan Komputer	3
3	ITD 11303	Pangkalan Data	3
4	ITD 11403	Matematik Diskret	3
5	ITD 21103	Statistik dan Kebarangkalian	3
6	ITD 13103	Komunikasi Data	3
7	MMD 11103	Interaksi Mesin-Manusia	3
8	ITD 13203	Analisis dan Rekabentuk Sistem	3
9	ITD 11703	Senibina Komputer	3
10	ITD 11803	Sistem Pengoperasian	3
		Total	30

Specialization Courses

Table 63: Specialization courses (18 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITD 11503	Struktur Data*	3
2	ITD 11603	Pengaturcaraan Web*	3
3	ITD 13403	Bengkel Komunikasi Data I	3
4	ITD 21303	Pengaturcaraan Berorientasikan Objek*	3
5	ITD 23103	Bengkel Aplikasi Lanjutan	3
6	ITD 23203	Bengkel Komunikasi Data II	3
		Total	18

Pre requisite

- ITD11503 is passed ITD11203
- ITD21303 is passed ITD11203
- ITD11603 is passed ITD11303

Elective courses

Table 64: Elective courses (15 credit hours)

No	Course Code	Course Name	Credit Hours
1. University (6 Credit Hours)			
1	PBD 10102	English I	2
2	PBD 10202	English II*	2
3	PBD 10***	Bahasa Asing	2
2. Programme (9 Credit Hours)			
1	ITD 13503	Penyelenggaraan Komputer	3
2	ITD 23303	Pengaturcaraan Pangkalan Data	3
3	MMD 13103	Seni Lukis dan Seni Reka	3
4	MMD 13203	Penulisan Skrip dan Penghasilan Papan Cerita	3
5	MMD 13303	Animasi 3 Dimensi	3
6	MMD 23103	Fotografi Digital	3
7	ITD 21203	Komputer, Etika dan Sosial	3
		Total	15

Pre requisite:

- PBD 10202 is passed PBD 10102

Final Year Project

Table 65: Final Year Project (4 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITD 21404	Projek	4
Total			4

Industrial Training

Table 66: Industrial Training (12 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITD 27112	Latihan Industri*	12
Total			12

Curriculum Structure according Semester

Table 67: First Semester (11 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	MPU23102	Aqidah dan Akhlak (Islam)	2
	MPU23022	Moral dan Etika I (Bukan Islam)	
	*** *****3	Ko-Kurikulum	3
Total			11

Table 68: Second Semester (18 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITD11103	Algebra dan Kalkulus	3
2	ITD11203	Pengaturcaraan Komputer	3
3	ITD11303	Pangkalan Data	3
4	MMD11103	Interaksi Mesin-Manusia	3
5	ITD13103	Komunikasi Data	3
6	*** ****	Pilihan I	3
Total			18

Table 69: Third Semester (21 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITD11403	Matematik Diskret	3
2	ITD21303	Pengaturcaraan Berorientasikan Objek*	3
3	ITD11603	Pengaturcaraan Web*	3
4	ITD13203	Analisis dan Rekabentuk Sistem	3
5	ITD11703	Senibina Komputer	3
6	ITD13403	Bengkel Komunikasi Data I	3
7	*****	Pilihan II	3
Total			21

Pre requisite

- ITD21303 is passed ITD11203
- ITD11603 is passed ITD11303

Table 70: Forth Semester (9 credit hours)

No	Course Code	Course Name	Credit Hours
1	MPU23052/	Tajwid Al-Quran (Islam)/	2
2	MPU23062	Etiket Sosial dan Penampilan Diri (Bukan Islam)	
3	PBD10202	English II*	2
4	PBD****2	Bahasa Asing	2
5	*****	Pilihan III	3
Total			9

Pre requisite:

- PBD 10202 is passed PBD 10102

Table 71: Fifth Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITD21103	Statistik dan Kebarangkalian	3
2	ITD11803	Sistem Pengoperasian	3
3	ITD11503	Struktur Data*	3
4	ITD23103	Bengkel Aplikasi Lanjutan	3
5	ITD23203	Bengkel Komunikasi Data II	3
6	ITD21404	Projek	4
Total			19

Pre requisite:

- ITD11503 is passed ITD11203

Table 72: Sixth Semester (12 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITD27112	Latihan Industri*	12
Total			12

Pre requisite

- ITD27112 is passed all courses.

Diploma in Information Technology (Multimedia) (DTMM)

Diploma in Information Technology (Multimedia) first offered in Session May 1999. The programme has received the quality certificate from the Malaysian Qualifications Agency with reference number MQA/PA 9643 starting 10th July 2017. Diploma in Information Technology (Multimedia) is a full-time study. The programme duration is two years covering SIX SEMESTERS consisting of three (3) regular semesters, two (2) 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 foster competent and dynamic talents in promoting global responsibility via information technology industries. The programme is supporting the national and global aspirations of the Digital Economy based on the vision and mission of the university. The program whilst providing educational opportunities at a higher level.

Programme Educational Outcomes

- PEO 1 Knowledgeable and technically competent in Information Technology and Multimedia discipline in-line with the industry requirement
- PEO 2 Effective in communication and working in a team as well as demonstrate good leadership quality in an organization
- PEO 3 Capable to solve Information Technology and Multimedia problems innovatively, creatively and ethically through sustainable approach
- PEO 4 Able to demonstrate entrepreneurship skills and recognize the need of lifelong learning for successful career advancement

Programme Learning Outcomes

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

- PLO 1 Acquire and apply knowledge of essential facts, concepts, principles, and theories of Information Technology, focusing on creative technology
- PLO 2 Apply computing skills in analyzing, designing, developing, programming, deploying and maintaining computing solutions in Information Technology and Multimedia
- PLO 3 Fulfill obligations and social responsibilities using appropriate social skills
- PLO 4 Practice the values, attitude and professionalism in accordance with ethical and legal principles
- PLO 5 Communicate effectively with peers, clients, superiors and society at large; with appropriate leadership and team work skills
- PLO 6 Utilize scientific skills to analyze algorithms as well as designing and managing solution to problems in Information Technology and Multimedia

PLO 7 Manage information and engage in lifelong learning for academic and career development

PLO 8 Possess managerial and entrepreneurship skills in business and organizations

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

Entry Requirements

ii. SPM CATEGORY

University Requirements

1. Malaysian.

AND

2. A pass with minimum of FIVE (5) credits in Sijil Pelajaran Malaysia (SPM) including Bahasa Melayu;

AND

3. Pass in History subject in SPM 2019;

Programme Requirements

4. Obtained a minimum of Grade C in ONE of the following subjects at SPM Level:

- Mathematics
- Additional Mathematics

AND

5. Obtained a minimum of Grade C in ONE of the following subjects at SPM Level:

- 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.

Curriculum Details and Structure

Curriculum Structure according to Course Classification

Each student is required to pass at least 90 credit hours of courses to be awarded the Diploma in Information Technology (Multimedia). These courses are classified into six sections as follows:

Table 73: Curriculum structure according to course classification

No	Components	Credit Hours	Percentage (%)
1	University Courses	11	12
2	Core Courses	30	34
3	Specialization Courses	18	20
4	Programme Elective Courses	15	17
5	Final Year Project	4	4
6	Industrial Training	12	13
	Total	90	100%

University Courses

Table 74: University courses (11 credit hours)

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

5	KK*****	Kokurikulum	3
		Total	11

Core Courses

Table 75: Core courses (30 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITD 11103	Algebra dan Kalkulus	3
2	ITD 11203	Pengaturcaraan Komputer	3
3	ITD 11303	Pangkalan Data	3
4	ITD 11403	Matematik Diskret	3
5	ITD 21103	Statistik dan Kebarangkalian	3
6	ITD 13103	Komunikasi Data	3
7	MMD 11103	Interaksi Mesin-Manusia	3
8	ITD 13203	Analisis dan Rekabentuk Sistem	3
9	ITD 11703	Senibina Komputer	3
10	ITD 11803	Sistem Pengoperasian	3
		Total	30

Specialization Courses

Table 76: Specialization courses (18 credit hours)

No	Course Code	Course Name	Credit Hours
1	MMD 13103	Seni Lukis dan Seni Reka	3
2	MMD 13203	Penulisan Skrip dan Penulisan Papan Cerita	3
3	MMD 13303	Animasi 3 Dimensi	3
4	MMD 13403	Teknologi Audio dan Video Digital*	3
5	MMD 13503	Pengarangan Multimedia	3
6	ITD 21303	Pengaturcaraan Berorientasikan Objek*	3
		Total	18

Pre requisite

- ITD 21303 is passed ITD 11203
- MMD 13403 is passed MMD 13203

Elective courses

Table 76: Elective courses (15 credit hours)

No	Course Code	Course Name	Credit Hours
3. University (6 Credit Hours)			
1	PBD 10102	English I	2
2	PBD 10202	English II*	2
3	PBD 10***	Bahasa Asing	2
4. Programme (9 Credit Hours)			
1	MMD 23203	Graphic Design	3
2	MMD 23303	Games Programming	3
3	MMD 23403	Web Authoring	3
4	MMD 23103	Digital Photography	3
5	ITD 11503	Struktur Data*	3
6	ITD 21203	Computer, Ethics and Social	3
7	ITD 11603	Pengaturcaraan Web	3

8	ITD 13503	Computer Maintenance	3
9	ITD 13403	Bengkel Komunikasi Data 1	3
Total			15

Pre requisite:

- PBD 10202 is passed PBD 10102
- ITD 11503 is passed ITD 11203

Final Year Project

Table 77: Final Year Project (4 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITD 21404	Projek	4
Total			4

Industrial Training

Table 78: Industrial Training (12 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITD 27112	Latihan Industri*	12
Total			12

Pre requisite:

- ITD 27112 is passed all courses.

Curriculum Structure according Semester

Table 79: First Semester (11 credit hours)

No	Course Code	Course Name	Credit Hours
1	MPU21022	Penghayatan Etika Dan Peradaban	2
2	MPU23032	Fiqh Ibadah	2
3	MPU23042	Perbandingan Agama I (Pelajar Bukan Islam)	
4	PBD10102	English I	2
5	MPU23012	Aqidah dan Akhlak (Islam)	2
	MPU23022	Moral dan Etika I (Bukan Islam)	
6	*** *****3	Kokurikulum	3
Total			11

Table 80: Second Semester (18 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITD11103	Algebra dan Kalkulus	3
2	ITD11203	Pengaturcaraan Komputer	3
3	ITD11303	Pangkalan Data	3
4	MMD11103	Interaksi Mesin-Manusia	3
5	ITD13103	Komunikasi Data	3
6	MMD 13103	Seni Lukis dan Seni Reka	3
Total			18

Table 81: Third Semester (21 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITD11403	Matematik Diskret	3
2	ITD21303	Pengaturcaraan Berorientasikan Objek*	3
3	MMD13203	Penulisan Skrip dan Penghasilan Papan Cerita	3
4	ITD13203	Analisis dan Rekabentuk Sistem	3
5	ITD11703	Senibina Komputer	3
6	MMD13503	Pengarangan Multimedia	3
7	*****	Pilihan I	3
Total			21

Pre requisite

- ITD 21303 is passed ITD 11203

Table 82: Fourth Semester (9 credit hours)

No	Course Code	Course Name	Credit Hours
1	MPU23052/ MPU23062	Tajwid Al-Quran (Islam)/ Etiket Sosial dan Penampilan Diri (Bukan Islam)	2
2	PBD10202	English II*	2
3	PBD****2	Bahasa Asing	2
4	*****	Pilihan II	3
Total			9

Pre requisite

- PBD 10202 is passed PBD 10102

Table 83: Fifth Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITD21103	Statistik dan Kebarangkalian	3
2	ITD11803	Sistem Pengoperasian	3
3	MMD 13303	Animasi 3 Dimensi	3
4	MMD13403	Teknologi Audio dan Video Digital*	3
5	*** ****	Pilihan III	3
6	ITD21404	Projek	4
Total			19

Pre requisite:

- MMD 13403 is passed MMD 13203

Table 84: Sixth Semester (12 credit hours)

No	Course Code	Course Name	Credit Hours
1	ITD27112	Latihan Industri*	12
Total			12

Pre requisite

- ITD 27112 is passed all courses

Courses Synopsis – Degree Programme

University Courses

Course Code	Course Name	Credit hours
MPU 31072	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 diperdebatkan 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
MPU 31062	Falsafah dan Isu Semasa	2

Kursus merangkumi ilmu falsafah dan Falsafah Pendidikan Kebangsaan dan Rukunegara. Penggunaan 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. Penekanan diberi kepada falsafah sebagai asas bagi menjalin dialog antara budaya serta memupuk nilai seponya. 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

This course exposes students to the study of entrepreneurship. It covers the concept and development of entrepreneurship, self-analytical entrepreneurial competence, entrepreneurship ethics, and the importance of creativity and innovation in entrepreneurship. It also discusses business opportunities, the ability to start a business, business planning and business project management skills. Students have to undergo practical entrepreneurship by organizing seminars / entrepreneurial forum involving known entrepreneurs and entrepreneurial support agencies. Entrepreneurship practicum students continue to do business as a group on campus or run entrepreneurial work with entrepreneurs of choice. The course ends with the presentation of practical reports, group presentations and reports of individual coursework.

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.

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	4

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 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 modeling tools in order to conduct basic performance modeling 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
CSW33103	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
CSW33303	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.

Free Module Courses – Degree Programme

Course Code	Course Name	Credit hours
PBI10102	English for Communication 1	2

The subject examines a variety of skills needed to perform academic tasks, such as reading strategies and taking notes from written and oral-aural texts. Students are assigned to produce academic assignments and make oral presentations. They will use the skills of looking for and extracting information from various sources and also develop the skills of making notes, paraphrasing, summarizing and integrating information, and presenting information as well as viewpoints in an oral presentation. In order to accomplish these goals, class discussions, group work, in-class writing, and out-of-class assignments will be used as tools for learning. Apart from these, they will develop the skills in time management, team work and group interaction.

Course Code	Course Name	Credit hours
PBI10202	English for Communication II	2

The subject is designed to introduce students to a variety of communicational skills in the workplace to meet professional needs. Students will work with a variety of the genres of professional communication, such as memos and reports. They will also be taught the skills of making oral presentation. Projects assigned to the students will require them to collect data on topics related to their career. The assignments will require students to put into practice the various skills developed earlier such as collecting, integrating and presenting information, time management, team work and group interaction. Students will also be taught job-hunting skills, that include writing enquiry and job application letters and curriculum vitae as well as preparing for and attending job interviews. Students are also taught to conduct meetings.

Course Code	Course Name	Credit hours
MPU32032	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
MPU32042	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 Synopsis –Diploma Programme

University Courses

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

Kursus ini mendedahkan kepada pelajar tentang akidah dan akhlak Islam dan kepentingannya sebagai benteng mempertahankan iman daripada sebarang unsur-unsur negatif yang boleh merosakkan. Kerana itu, kursus ini membincangkan tentang pengertian ilmu tauhid yang merangkumi tiga perkara utama, iaitu ketuhanan, kenabian dan perkara-perkara ghaib. Pelajar juga diajar tentang akhlak merangkumi sifat-sifat mahmudah dan sifat-sifat mazmumah dalam kehidupan seharian. Sementara itu, isu-isu semasa akan dijadikan rujukan dalam memahami aspek aspek akidah dan akhlak yang telah dipelajari.

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 memberi kefahaman kepada pelajar tentang fiqh ibadah yang meliputi perkara-perkara yang berkaitan dengan taharah, solat, puasa, zakat, haji dan umrah. Perbincangan tajuk-tajuk tersebut akan melibatkan dalil-dalil pensyariatan, rukun dan syarat, pelaksanaan dan seumpamanya. Selain daripada itu pelajar juga akan didedahkan dengan isu-isu semasa berkenaan ibadah dan cara berinteraksi dengannya sebaik mungkin.

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 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.

Core Courses (DTM & DTMM)

Course Code	Course Name	Credit hours
ITD11103	Algebra And Calculus	3

This course covers two areas: algebra and calculus. In algebra, students will learn fundamentals of algebra, functions, and systems of linear equations. Topics that are covered under calculus are limits and continuity, differentiation and integration.

Course Code	Course Name	Credit hours
ITD11203	Pengaturcaraan Komputer	3

This course will develop the logical thinking required for students in creating applications for solving problems. The students will be exposed to the techniques of building pseudocodes, flowcharts, determining the errors and solving them and writing efficient comments. The students will be taught 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, students will be assigned in groups to develop a program to solve a selected case study.

Course Code	Course Name	Credit hours
ITD11303	Pangkalan Data	3

Students are presented in the theory of database which includes the file system, relational model, normalization and entity relationship diagram. The database skills in developing an information system such as analyzing, designing, modelling and implementing the database are introduced. Formation rules of relational databases and structured query language are also discussed in depth. 4GL programming language and issues in the database are discussed during the lectures.

Course Code	Course Name	Credit hours
ITD11403	Matematik Diskret	3

Students will be introduced to the fundamentals and concepts of set theory, logic, 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
ITD11703	Senibina Komputer	3

This course covers the essential of computer architecture, data representation and manipulation, registers, and memory organization and bus configurations. In addition, this course also focuses on timing issues and pipelining and introduction to multi processors. Further explanation is given regarding operation of each component in multilevel machine of viewpoint in one computer system. Assembly language is introduced in describing instruction set, instruction format and modes of addressing.

Course Code	Course Name	Credit hours
ITD11803	Sistem Operasi	3

This course discusses the basic of operating systems. Topics discussed include operating systems architecture and their functions. It also includes the basic memory management, processing and control input / output, CPU scheduling, process management and file management.

Course Code	Course Name	Credit hours
ITD13103	Komunikasi Data	3

This course equips students with the communication theory, telecommunication facilities, and terminology. Basic concept: host, terminal, networking software, code character, transmission. Media transmission: media transmission, type of signal, modulation/demodulation, multiplexing. Data security: approach and method, importance, measurement. Architecture & protocol: OSI, TCP/IP, SNA. LAN. WAN. Inter/Intra Networking: intranet web.

Course Code	Course Name	Credit hours
ITD13203	Analisa dan Rebutuk Sistem	3

This course covers the review towards the environment of analysis and design (problems, the need for systematic methodology and system development life cycle). The focus is on feasibility studies and analysis system for identifying requirements, system architecture and requirements modeling techniques, modeling of physical/ logical and normalization. Review are also conducted in the design of the system either through physical and logical data structures, input/ output, interfaces, files and databases as well as the implementation. Students are also required to develop a prototype system that combines all the elements that have been learned.

Course Code	Course Name	Credit hours
ITD21103	Statistik dan kebarangkalian	3

This course covers 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 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
MMD11103	Interaksi Manusia-Mesin	3

This course gives exposure to the students on the principles, concepts, methodologies, models and importance of human computer interaction. Topics discussed include human factors such as cognitive and mental model. It also introduces technology aspects such as input devices, output devices, design tools and software engineering tools. Students also will be given comprehensive understanding on testing and executing techniques as well as to develop a prototype that combining all elements in human computer interaction.

Course Code	Course Name	Credit hours
ITD21404	Projek	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
ITD27112	Latihan Industri	12

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 (DTM)

Course Code	Course Name	Credit hours
ITD 11503	Struktur Data	3

This course will teach and expose students on how to represent and apply data structures in a computer program. The study will be emphasized on data organization and representation management techniques such as stack, queue, linked lists and trees. This will also include sorting, searching and digraphs techniques.

Course Code	Course Name	Credit hours
ITD11603	Pengaturcaraan Web	3

This course introduce programming language for client side and server side. Student will be introduced to basic requirement in web application. Student will learn online form, form validation at client side and form processing at servers side. Student also will learn to manipulate sql in server programming language to store data. At the end, student will develop a web application in the group.

Course Code	Course Name	Credit hours
ITD13403	Data Communication Workshop I	3

This course focuses on network terminology and protocols, LAN, WAN, OSI model, cabling, routers, router configuration, Ethernet, IP addressing, and network standards.

Course Code	Course Name	Credit hours
ITD21303	Object-Oriented Programming	3

This course equips students with the techniques used in object oriented programming. Students are exposed to the differences and the advantages of object-oriented programming method compared to the structured programming method. Method reuse of objects and event driven, and development of applet also introduced. Students are also introduced to the method of application connection to the database.

Course Code	Course Name	Credit hours
ITD23103	Advances Application Workshop	3

Student in this course will work in a group to develop software project based on their prior knowledge in information technology. Student will be supervised by the lecturer continuously. All activities within the group must be documented. At the end of this course, the group must submit full report and present the software project.

Course Code	Course Name	Credit hours
ITD23203	Data Communication Workshop II	3

This course focused on router, router's configuration, design and IP addressing scheme and routing protocols.

Elective Courses (DTM)

University

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.

Programme

Course Code	Course Name	Credit hours
ITD13503	Personal Computer (PC) Maintenance	3

This course focuses on laboratory/practical approach. It introduces students to PC components in order to upgrade, repair, and maintain a PC. In this course, students will be able to open, inspect, replace, and upgrade certain components of a PC, such as motherboard, I/O cards, CPU and memory.

Course Code	Course Name	Credit hours
ITD23303	Database Programming	3

This course explains the method and technique writing a code using PL/SQL in Database Management System (DBMS). In this course, student will know the components involved in PL/SQL and also learn the concept of PL/SQL such as PL/SQL Control, PL/SQL Intertive Processing, Cursor, Record, Procedure & Function and Trigger. This course provides the knowledge and suitable technique to store, retrieve, update and delete data. PL/SQL also provides a security element in order to protect the data from unauthorized person. The end of this course, student should be able to develop an application using PL/SQL.

Course Code	Course Name	Credit hours
MMD13103	Art And Design	3

Student can understand about the principles of Art and Design is the main of the objective on this courses. Student will be also taught about the basic of cartoon drawing so they can create their own illustrations creatively. At the end of the course, student will be able to produce creative visual illustrations by using the graphics software.

Course Code	Course Name	Credit hours
MMD13203	Script Writing And Story Boarding	3

This course will expose students to the concepts and methods of writing scripts and storyboards in multimedia production. Students will be trained to follow all the steps in writing a complete script. The focus is to comprehend the theory and concepts of the scriptwriting and storyboarding for a multimedia production. Topics discussed include basic, steps, continuity in writing script and storyboarding.

Course Code	Course Name	Credit hours
MMD13303	3D 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 modelling three-dimensional objects, textures, lighting and the use of the camera in animation software. At the end of this course, students are able to produce three-dimensional objects better and animation production.

Course Code	Course Name	Credit hours
MMD23103	Digital Photography	3

This course will be to introduce the concepts, principles and techniques of digital photography to produce photos that meet the criteria. With this knowledge, students can master the skills to take pictures with the correct use of sophisticated tools of digital photography with professional methods. Next, students will be given the knowledge of the quality of the image quality in media production, adaptation and arrangement, how the translation method to different types of image files, standards and other technical publications. Apart from the printing and publishing techniques to suit the needs of a publication will also be briefed. Appropriate software will be used for image editing and publication purposes.

Course Code	Course Name	Credit hours
ITD21203	Computer, Ethics And Social	3

The Social and Professional Ethics is solely based on lectures which will provide a framework of concepts for social and profesional 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.

Specialization Courses (DTMM)

Course Code	Course Name	Credit hours
ITD21303	Object-Oriented Programming	3

This course equips students with the techniques used in object oriented programming. Students are exposed to the differences and the advantages of object-oriented programming method compared to the structured programming method. Method reuse of objects and event driven, and development of applet also introduced. Students are also introduced to the method of application connection to the database.

Course Code	Course Name	Credit hours
MMD13203	Script Writing And Story Boarding	3

This course will expose students to the concepts and methods of writing scripts and storyboards in multimedia production. Students will be trained to follow all the steps in writing a complete script. The focus is to comprehend the theory and concepts of the scriptwriting and storyboarding for a multimedia production. Topics discussed include basic, steps, continuity in writing script and storyboarding.

Course Code	Course Name	Credit hours
MMD13303	3D 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 modelling three-dimensional objects, textures, lighting and the use of the camera in animation software. At the end of this course, students are able to produce three-dimensional objects better and animation production.

Course Code	Course Name	Credit hours
MMD13403	Digital Audio And Video Technology	3

This course will develop students' understanding of audio technology such as sampling, audio file formats as well as sound design techniques and then use audio editing software. It also gives an understanding and exposure to audio and video digital technology, including equipment, data representation, shooting techniques video production process. At the end of the course, students should be able to implement audio and video digital technology in multimedia production.

Course Code	Course Name	Credit hours
MMD13103	Art And Design	3

Student can understand about the principles of Art and Design is the main of the objective on this courses. Student will be also taught about the basic of cartoon drawing so they can create their own illustrations creatively. At the end of the course, student will be able to produce creative visual illustrations by using the graphics software.

Course Code	Course Name	Credit hours
MMD13503	Multimedia Authoring	3

This course trains the students to produce a multimedia package beginning from the provision of storyboard, the authoring using the main software and the manipulation of multimedia elements using other relevant supporting software. Animation production,

manipulation of files from external sources, the construction of interactivity between the user and the software and special effects are also emphasized. In addition, the technique of writing the script authoring, compiling and merging files in authoring software to create executable files (executables) are also given.

Elective Courses (DTMM)

University

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.

Programme

Course Code	Course Name	Credit hours
ITD11503	Data Structure	3

This course will teach and expose students on how to represent and apply data structures in a computer program. The study will be emphasized on data organization and representation management techniques such as stack, queue, linked lists and trees. This will also include sorting, searching and digraphs techniques.

Course Code	Course Name	Credit hours
ITD13503	Personal Computer (Pc) Maintenance	3

This course focuses on laboratory/practical approach. It introduces students to PC components in order to upgrade, repair, and maintain a PC. In this course, students will be able to open, inspect, replace, and upgrade certain components of a PC, such as motherboard, I/O cards, CPU and memory.

Course Code	Course Name	Credit hours
ITD13403	Data Communication Workshop I	3

This course focuses on network terminology and protocols, LAN, WAN, OSI model, cabling, routers, router configuration, Ethernet, IP addressing, and network standards.

Course Code	Course Name	Credit hours
ITD21203	Computer, Ethics And Social	3

The Social and Professional Ethics is solely based on lectures which will provide a framework of concepts for social and profesional 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
MMD23103	Digital Photography	3

This course will be to introduce the concepts, principles and techniques of digital photography to produce photos that meet the criteria. With this knowledge, students can master the skills to take pictures with the correct use of sophisticated tools of digital photography with professional methods. Next, students will be given the knowledge of the quality of the image quality in media production, adaptation and arrangement, how the translation method to different types of image files, standards and other technical publications. Apart from the printing and publishing techniques to suit the needs of a publication will also be briefed. Appropriate software will be used for image editing and publication purposes.

Course Code	Course Name	Credit hours
MMD23303	Game Programming	3

This course will expose students to the concepts of authoring in game development. Students also will be revealed to technology and tools used in game development. Game authoring will enables the students to design and develop a computer game application using scripting language and integrating multimedia elements. Topics discussed include game concepts, phases in game development, game genre etc.

Course Code	Course Name	Credit hours
MMD23203	Graphic Design	3

This course emphasizes the graphic elements in the design of the display of a multimedia project. In addition, students are exposed to create the concept, selection of photographs, selection of the title, brainstorming, sketching, and typography and how they can manipulate graphic elements for quality display. The students will be focused on analytical and communication skills in this course. At the end of this course, students will be able to produce more creative graphics artwork based on fundamental and principle of the graphic design.

Course Code	Course Name	Credit hours
MMD23403	Web Authoring	3

This course will discuss the implementation concept in internet, world wide web (WWW) and multimedia technologies. This course covers Internet technology and services, web authoring, incorporating multimedia technology in web and web development.

Course Code	Course Name	Credit hours
ITD11603	Web Programming	3

This course introduce programming language for client side and server side. Student will be introduced to basic requirement in web application. Student will learn online form, form validation at client side and form processing at servers side. Student also will learn to manipulate sql in server programming language to store data. At the end, student will develop a web application in the group.

Committee of Undergraduate Handbook for Academic Session 2020/2021

Chairman

Prof. Madya Dr. Ahmad Nazari Mohd Rose

Committee Member

Prof. Madya Ts. Dr. Mumtazimah Mohamad
Prof. Madya Dr. Mohamad Afendee Mohamed
Prof. Madya Dr. Mohd Fadzil Abdul Kadir
Ts. Dr. Ismahafezi Ismail
Dr. Zahrahtul Amani Zakaria
Dr. Nor Aida Mahiddin
Dr. Nur Saadah Mohd Shapri
Dr. Wan Mohd Rizhan Wan Idris
Dr. Nur Farraliza Mansor
Dr. Siti Sabariah Abas
Datin Dr. Azim Zaliha Abd Aziz
Pn. Nurul Liyana Mohamad Yusof