



UNDERGRADUATE **HANDBOOK**

Academic Session 2022/2023

FACULTY OF INFORMATICS AND COMPUTING

UNIVERSITI SULTAN ZAINAL ABIDIN

Faculty of Informatics and Computing, Universiti Sultan Zainal
Abidin, Kampus Besut • 2022

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Published in Malaysia by
FACULTY OF INFORMATICS AND COMPUTING
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Kampus Besut
22200 Besut
Terengganu Darul Iman, MALAYSIA.
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Foreword by The Vice Chancellor



Assalamualaikum Warahmatullahi wa Barakatuh, greetings.

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

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

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

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

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

Thank you.

Professor Dr. Fadzli Bin Adam

Vice Chancellor

Universiti Sultan Zainal Abidin

Foreword by The Dean



May peace, mercy, and blessings of Allah, God the Almighty, be upon you

The highest gratitude and praise are due to Allah, God the Almighty. We would like to congratulate all students who chose to continue their studies at UniSZA as a platform to gain knowledge.

In line with UniSZA's goal to be an excellent international university, the faculty always strives to endow students with excellent academic achievements and admirable personalities.

The faculty is also ready to help the students and provide a conducive learning environment to help them achieve academic excellence and develop admirable personalities. In continuing studies, excellence and skills in the field of knowledge can only be obtained through hard work and having clear goals.

Therefore, start planning and setting the right strategies to achieve outstanding success for our faith, nation, and country. Finally, it is very much hoped that all students can take full advantage of the opportunities available as members of the Faculty of Informatics and Computing.

Happy learning and good luck to all of you.

And peace be with 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 2022/2023

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	4 days	8 – 11 August 2022	31 August – National Day 16 September – Malaysia Day 9 October – Maulidur Rasul
LECTURE WEEKS	7 weeks	14 August – 29 September 2022	
REVISION	3 days	30 September – 02 October 2022	
FINAL EXAMINATION	4 days	03 – 06 October 2022	
SEMESTER BREAK	1 week	07 – 15 October 2022	

BACHELOR AND DIPLOMA NEW COHORT SEMESTER I

PROGRAM	DURATION	DATE	PUBLIC HOLIDAY
REGISTRATION AND ORIENTATION FOR NEW STUDENTS BACHELOR PROGRAMME	4 days	10 - 13 October 2022	24 October – Deepavali 25 December – Christmas 22 – 23 January – Chinese New Year 19 February – Israk Mikraj 4 March – Installation of Sultan Terengganu
LECTURE WEEKS I	7 weeks	16 October – 1 December 2022	
MID SEMESTER BREAK	1 week	02 - 10 December 2022	
LECTURE WEEKS II	7 weeks	11 December – 26 January 2023	
REVISION	1 week	27 January – 05 February 2023	
FINAL EXAMINATION	2 weeks	05 – 18 February 2023	
SEMESTER BREAK	2 weeks	19 February – 11 March 2023	

SEMESTER II

PROGRAM	DURATION	DATE	PUBLIC HOLIDAY
LECTURE WEEKS I	7 weeks	12 March – 27 April 2023	9 April – Nuzul Al-Quran
MID SEMESTER BREAK	1 weeks	28 April – 06 May 2023	23 – 24 April – Hari Raya Aidilfitri
LECTURE WEEKS II	7 weeks	07 May – 22 June 2023	26 April – Sultan of Terengganu's Birthday
REVISION	5 days	23 June – 1 July 2023	1 May – Labour Day
FINAL EXAMINATION	2 weeks	2 – 20 July 2023	4 May – Wesak Day
SEMESTER BREAK	2 weeks	21 July - Oktober 2023	5 June –YDP Agong's Birthday 27 June – Arafah Day 29 – 30 June – Hari Raya Haji 19 July – Awal Muharram 31 August – National Day 17 September – Malaysia Day

*Subject to change

Universiti Sultan Zainal Abidin at a Glance

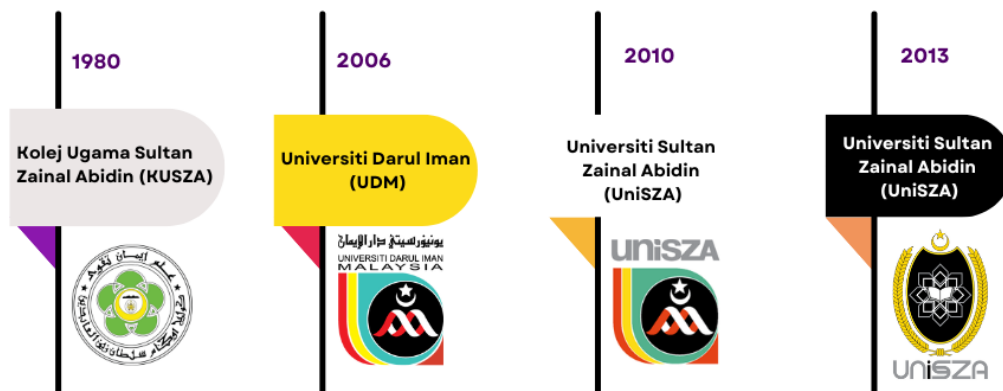
Universiti Sultan Zainal Abidin (UniSZA) started as Kolej Ugama Sultan Zainal Abidin (KUSZA). KUSZA commenced operation on 1 January 1980 at Batu Burok before moving to Hajah Wook Building in Pulau Kambing in 1981.

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

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



HISTORY OF UniSZA



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

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.



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

P.S.D



Background of the Faculty

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

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

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

FIK is now headed by a Dean, assisted by three Deputy Deans and three Heads of School. There are three centres of study in the FIK; Computer Science, Information Technology, and Multimedia. The core activities of the faculty consist of teaching and learning, research and development, consultation and community service. The faculty has a total of 55 lecturers and 13 supporting staffs.

As of 2021, more than 2,011 graduates have been produced by the Faculty of Informatics and Computing. Currently, the faculty offers 12 academics programme including 6 undergraduate programmes and 6 (six) postgraduate programmes.

Vision, Mission, and Objectives of the Faculty

Vision

Leading Informatics through University's Vision in Education and Research

Mission

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

Objectives

1. To offer academic programmes that is aligned to human capital needs to realize the country's aspiration.
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

Assoc. Prof. Dr. Ahmad Nazari Mohd Rose



Deputy Dean (Academic and Postgraduate)

Dr. Wan Suryani Wan Awang



Deputy Dean (Research and Development)

Assoc. Prof. Dr. Engku Fadzli Hasan Syed Abdullah



Deputy Dean (Student Affairs and Alumni)

Dr. Wan Mohd Rizhan Wan Idris



Head of Information Technology School

Dr. Siti Sabariah Abas



Head of Multimedia School

Dr. Hasni Hasan

NA

Head of Computer Science School



Coordinator of Postgraduate Programme

Dr. Wan Nor Shuhadah Wan Nik



Head of UniSZA Digital Hub

Dr. Wan Mohd Amir Fazamin Wan Hamzah



Coordinator of Quality Assurance and E-Learning

Assoc. Prof. Dr. Zahrahtul Amani Zakaria



Coordinator of Industry – Academia and Entrepreneurship

Dr. Julaily Aida Jusoh



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

Dr. Elissa Nadia Madi



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

Dr. Abd. Rasid Mamat



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



**Coordinator of Academic Programme
(DCS & BCS-SD)**
Raja Hasyifah Raja Bongsu



**Coordinator of Academic
Programme (DIT & BIT-MI)**
Azilawati Rozaimie



Assistant Registrar (Administration)
Noor Hafizal Abdul Azis



Assistant Registrar (Academic)
Latifah Ilyana Ibrahim

Academic Members of Faculty

Centre of Computer Sciences Studies

Professor

Shukor Bin Abdul Razak

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

Mohd Nordin Abdul Rahman

PhD (UMT), MSc, BIT (UKM)

Mokhairi Makhtar

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

Associate Professor

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)

Mohd Khalid Awang

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

Mumtazimah Mohamad

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

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)

Wan Aezwani Wan Abu Bakar

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

Muhammad Danial Zakaria

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

Mohd Kamir Yusof

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

Rohana Ismail

MSc, BSc (UPM)

Ahmad Faisal Amri Abidin @ Bharun

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

Azwa Abdul Aziz

PhD (AU, Scotland), MSc. (UMT), BSc., Dip. Comp. Sc (UiTM)

Norlina Udin @ Kamaruddin

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

Lecturer

Fatimah Ghazali

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

Nazirah Abd Hamid

MSc. (UTM), BIT (UUM)

Centre of Information Technology Studies

Associate Professor

Fatma Susilawati Mohamad

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

Engku Fadzli Hasan Syed Abdullah

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

Mohd Hafiz Yusof @ Che Abdullah

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

Mohd Fadzil Abdul Kadir

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

Yousef Abubaker Mohamed Ahmed El-Ebiary

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

Zahrahtul Amani Zakaria

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

Suhailan Safei

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

Senior Lecturer

Nurnadiah Zamri

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

Siti Sabariah Abas

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

Elissa Nadia Madi

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

Wan Mohd Amir Fazamin Wan Hamzah

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

Julaily Aida Jusoh

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

Hasni Hasan

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

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

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

Lecturer

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

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

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

Centre of Multimedia Studies

Associate Professor

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)

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

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

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

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

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

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

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

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

Lecturer

Azilawati Rozaimiee
MSc., BSc (UPM)

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

Undergraduate Programmes

List of Undergraduate Programmes

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

Programmes Entry Requirement

Diploma in Computer Science/ Diploma in Information Technology

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

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

STPM (CATEGORY A AND S)	MATRICULATION/ FOUNDATION (CATEGORY N, K AND J)	STAM (CATEGORY T)	DIPLOMA (CATEGORY E AND G)
University Requirements			
1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia			
2. A pass in the Sijil Tinggi Persekolahan Malaysia (STPM) with a minimum of CGPA 2.50	2. A pass in Matriculation/ Foundation programme with a minimum of CGPA 2.50	2. A pass in Sijil Tinggi Agama Malaysia (STAM) with at least grade of Jayyid Jiddan	2. Graduated with a Diploma or other equivalent qualification recognized by the Malaysian Government and approved by University Senate
AND	AND	AND	
Programme Requirements			
3. Obtained a minimum of Grade C in TWO (2) subjects EXCLUDING Pengajian Am at STPM Level	3. Obtained a minimum of Grade C in Mathematics at Matriculation/ Foundation Level	3. Obtained a minimum of Grade C at of the following subjects at SPM Level:	3. Obtained at least CGPA 2.50 at Diploma level; Diploma Level in related fields:
AND	OR	<ul style="list-style-type: none"> Additional Mathematics Mathematics AND Science / Engineering Drawing / Mechanical Engineering Studies / Civil Engineering Studies / Electrical and Electronics Engineering Studies / Design / Computer Science / Graphic Communication Technology / Physics / Chemistry / Biology / Additional Science / Multimedia Production / Computer Graphics 	<ul style="list-style-type: none"> 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
4. Obtain a minimum of Grade C (2.00) at of the following subjects at STPM level:	Obtained a minimum of Grade C at of the following subjects at SPM Level:	<ul style="list-style-type: none"> Additional Mathematics Mathematics AND Science / Engineering Drawing / Mechanical Engineering Studies / Civil Engineering Studies / Electrical and Electronics Engineering Studies / Design / Computer Science / Graphic Communication Technology / Physics / Chemistry / Biology / Additional Science / Multimedia Production / Computer Graphics 	OR
<ul style="list-style-type: none"> Mathematics (T) / Mathematics (M) Information and Communication Technology (ICT) / Physics / Chemistry / Biology 	<ul style="list-style-type: none"> Additional Mathematics Mathematics AND Science / Engineering Drawing / Mechanical Engineering Studies / Civil Engineering Studies / Electrical and Electronics Engineering Studies / Design / Computer Science / Graphic Communication Technology / Physics / Chemistry / Biology / Additional Science / Multimedia Production / Computer Graphics 	<ul style="list-style-type: none"> Additional Mathematics Mathematics AND Science / Engineering Drawing / Mechanical Engineering Studies / Civil Engineering Studies / Electrical and Electronics Engineering Studies / Design / Computer Science / Graphic Communication Technology / Physics / Chemistry / Biology / Additional Science / Multimedia Production / Computer Graphics 	Obtained at least CGPA 3.00 at Diploma Vokasional Malaysia (DVM) level in related fields:
OR			<ul style="list-style-type: none"> Computer and Network Systems Technology Creative Multimedia (Animation) Industrial Graphic Design (Print Media) Database Management System and Web Applications
Obtained a minimum of Grade C at of the following subjects at SPM level:			AND
<ul style="list-style-type: none"> Additional Mathematics Mathematics AND Science / Engineering Drawing / Mechanical Engineering Studies / Civil Engineering Studies / Electrical and Electronics Engineering Studies / Design / Computer Science / Graphic Communication Technology / Physics / Chemistry / Biology / Additional Science / Multimedia Production / Computer Graphics 			4. Obtained a minimum of Grade C in Mathematics at Diploma Vokasional Malaysia (DVM) Level
			OR
			Obtained a minimum of Grade C in Mathematics at SPM level
A minimum score of Band 2 in MUET			

Bachelor of Information Technology (Media Informatics)

STPM (CATEGORY A AND S)	MATRICULATION/ FOUNDATION (CATEGORY N, K AND J)	STAM (CATEGORY T)	DIPLOMA (CATEGORY E AND G)
University Requirements			
1. A pass in the Sijil Pelajaran Malaysia (SPM)/ equivalent qualification with honours in Bahasa Melayu/ Bahasa Malaysia			
2. A pass in the Sijil Tinggi Persekolahan Malaysia (STPM) with a minimum of CGPA 2.50	2. A pass in Matriculation/ Foundation programme with a minimum of CGPA 2.50	2. A pass in Sijil Tinggi Agama Malaysia (STAM) with at least grade of Jayyid Jiddan	2. Graduated with a Diploma or other equivalent qualification recognized by the Malaysian Government and approved by University Senate
AND	AND	AND	
Programme Requirements			
3. Obtain a minimum of Grade C (2.00) at of the following subjects at STPM level: • Mathematics (T) / • Mathematics (M) OR Obtained a minimum of Grade C in Mathematics at SPM level AND	3. Obtained a minimum of Grade C in Mathematics at Matriculation/ Foundation Level OR Obtained a minimum of Grade C at of the following subjects at SPM Level: • Additional Mathematics OR Mathematics	3. Obtained a minimum of Grade C at of the following subjects at SPM Level: • Additional Mathematics OR Mathematics	3. Obtained at least CGPA 2.50 at Diploma level; Diploma Level in related fields. OR Obtained at least CGPA 3.00 at Diploma Vokasional Malaysia (DVM) level in related fields: • 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 TWO (2) subjects EXCLUDING Pengajian Am at STPM Level			4. Obtained a minimum of Grade C in Mathematics at Diploma Vokasional Malaysia (DVM) Level OR Obtained a minimum of Grade C in Mathematics at SPM level
A minimum score of Band 2 in MUET			

Undergraduate Programmes of Study

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

Bachelor of Computer Science (Software Development) with honours first offered in session July 2006/2007. The programme has been verified to fully accredited by Malaysian Qualification Agency (MQA/FA 9641) starting 19 September 2017.

This programme is a full-time study. The programme duration is three and half years covering seven (7) semester consisting of six (6) regular semesters and six (6) months of industrial training. Teaching and learning methods for each course 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

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	19	15
2	Core Courses	42	34
3	Specialization & 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 2: University Courses (19 credit hours)

No	Courses Code	Course Name	Credit Hours
1	MPU31062	Falsafah dan Isu Semasa	2
2	MPU33012/	Ilmu Wahyu dan Sains (Islam) /	2
	MPU33022	Moral dan Etika II (Bukan Islam)	
3	MPU33032 /	Ilmu Wahyu dan Kemasyarakatan (Islam)/	2
	MPU33042	Perbandingan Agama II (Bukan Islam)	
4	MPU31072	Penghayatan Etika dan Peradaban	2
5	MPU32092	Asas Pembudayaan Keusahawanan	2

6	PBI10102	English For Communication I	2
7	PBI10202	English For Communication II	2
8	PBI 1**02	Bahasa Asing	2
9	K** ****	Kokurikulum	3
Total			19

**Pre requisite: PBI10202 is passed PBI10102*

Core Courses

Table 3: Core courses (42 credit hours)

No	Courses Code	Course Name	Credit Hours
1	CSF11103	Problem Solving and Computer Programming	3
2	CSF11203	Computer Organization and Architecture	3
3	CSF11303	Human Machine Interaction	3
4	CSF11403	Software Engineering Methods	3
5	CSF11503	Social and Professional Ethics	3
6	CSF11603	Discrete Mathematics	3
7	CSF11703	Operating Systems	3
8	CSF11803	Object Oriented Programming*	3
9	CSF11903	Network and Security Fundamentals	3
10	CSF21103	Probability and Statistical Data Analysis	3
11	CSF21203	System Analysis and Design	3
12	CSF21303	Database	3
13	CSF21403	Data Structures and Algorithms	3
14	CSF31103	Artificial Intelligence	3
Total			42

**Pre-requisite: CSF11803 is passed CSF11103*

Specialization Courses & Programme Elective Courses (BSC-SD)

Table 4: Specialization courses (24 credit hours)

Student are required to complete all of specialization courses.

No	Courses Code	Course Name	Credit Hours
1	CSD23103	Web Application Development	3
2	CSD23203	Requirements Engineering and Software Design	3
3	CSD23303	Software Project Management	3
4	CSD33103	Software Testing and Analysis	3
5	CSD33203	Software Development Workshop	3
6	CSD33303	Compiler Development	3
7	CSD33403	Formal Methods	3
8	CSD33503	Data Mining	3
Total			24

Table 5: Programme Elective courses (6 credit hours)

Student are needed to complete any elective course offered that total up to 6 credits only.

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

The free module courses are to be enrolled and passed for at least 12 credits. The course is not limited to the list of options offered by this program only, it can be taken from any 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 (12 credit hours)

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

Final Year Project

Table 7: Final Year Project (8 credit hours)

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

Pre requisite:

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

Industrial Training

Table 8: Industrial Training (12 Credit Hours)

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

Pre requisite:

- CSF47112 is passed all courses

Curriculum Structure according Semester

Table 9: First Semester (17 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF11103	Problem Solving and Computer Programming	3
2	CSF11203	Computer Organization and Architecture	3
3	CSF11303	Human Machine Interaction	3
4	CSF11403	Software Engineering Methods	3
5	CSF11503	Social and Professional Ethics	3
6	PBI10102	English for Communication I	2
Total			17

Pre requisite:

- PBI10202 is passed PBI10102

Table 10: Second Semester (20 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF11603	Discrete Mathematics	3
2	CSF11703	Operating Systems	3
3	CSF11803	Object Oriented Programming*	3
4	CSF11903	Network and Security Fundamentals	3
5	PBI10202	English For Communication II*	2
6	MPU31072	Penghayatan Etika dan Peradaban	2
7	MPU33012/	Ilmu Wahyu dan Sains /	2
	MPU33022	Moral & Etika II (Bukan Islam)	
8	PBI10***	Bahasa Asing	2
Total			20

*Pre requisite: CSF11803 is passed CSF11103

Table 11: Third Semester (20 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF21103	Probability and Statistical Data Analysis	3
2	CSF21203	System Analysis and Design	3
3	CSF21303	Database	3
4	CSD23103	Web Application Development	3
5		Free Module Elective I	3
6	MPU31062	Falsafah dan Isu Semasa	2
7	*****	Kokurikulum	3
Total			20

Table 12: Fourth Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF21403	Data Structures and Algorithms	3
2	CSD23203	Requirements Engineering and Software Design	3
3		Programme Elective I	3
4	CSD23303	Software Project Management	3
5	MPU32092	Asas Pembudayaan Keusahawanan	2
6	MPU33032 /	Ilmu Wahyu dan Kemasyarakatan (Islam) /	2
	MPU33042	Perbandingan Agama II (Bukan Islam)	
7		Free Module Elective II	3
Total			19

Table 13: Fifth Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSD33103	Software Testing and Analysis	3
2	CSD33203	Software Development Workshop	3
3	CSD33303	Compiler Development	3
4	CSF31103	Artificial Intelligence	3
5		Free Module Elective III	3
6	CSF35104	Final Year Project I*	4
Total			19

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

Table 14: Sixth Semester (16 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSD33403	Formal Methods	3
2	CSD33503	Data Mining	3
3		Programme Elective II	3
4	CSF35204	Final Year Project II*	4
5		Free Module Elective IV	3
Total			16

**Pre requisite : CSF35204 is passed CSF35104*

Table 15: 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*

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 been awarded a full accreditation by Malaysian Qualifications Agency with reference number MQA/FA0516 starting 9 June 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 (7) 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

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 & 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 (19 credit hours)

No	Courses Code	Course Name	Credit Hours
1	MPU31062	Falsafah dan Isu Semasa	2
2	MPU33012/	Ilmu Wahyu dan Sains (Islam) /	2
	MPU33022	Moral dan Etika II (Bukan Islam)	
3	MPU33032 /	Ilmu Wahyu dan Kemasyarakatan (Islam)/	2
	MPU33042	Perbandingan Agama II (Bukan Islam)	
4	MPU31072	Penghayatan Etika dan Peradaban	2

5	MPU32092	Asas Pembudayaan Keusahawanan	2
6	PBI10102	English For Communication I	2
7	PBI10202	English For Communication II	2
8	PBI 1**02	Bahasa Asing	2
9	K** ****	Kokurikulum	3
Total			19

**Pre requisite: PBI 10202 is passed PBI 10102*

Core Courses

Table 18: Core courses (42 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF11103	Problem Solving and Computer Programming	3
2	CSF11203	Computer Organization and Architecture	3
3	CSF11303	Human Machine Interaction	3
4	CSF11403	Software Engineering Methods	3
5	CSF11503	Social and Professional Ethics	3
6	CSF11603	Discrete Mathematics	3
7	CSF11703	Operating Systems	3
8	CSF11803	Object Oriented Programming*	3
9	CSF11903	Network and Security Fundamentals	3
10	CSF21103	Probability and Statistical Data Analysis	3
11	CSF21203	System Analysis and Design	3
12	CSF21303	Database	3
13	CSF21403	Data Structures and Algorithms	3
14	CSF31103	Artificial Intelligence	3
Total			42

**Pre requisite : CSF11803 is passed CSF11103*

Specialization Courses & Programme Elective Courses (BSC-CNS)

Table 19: Specialization courses (24 credit hours)

Student are required to complete all of courses.

No	Course Code	Course Name	Credit Hours
1	CSA23103	Security Management	3
2	CSA23203	Network Technology Security and Communications	3
3	CSA23303	Data Communication Workshop	3
4	CSA33103	Network Analysis and Design	3
5	CSA33203	Penetration Testing	3
6	CSA33303	Cryptography*	3
7	CSA33403	Parallel and Distributed Computing	3
8	CSA33503	Computer Forensics	3
Total			24

**Pre requisite : CSA 33303 is passed CSF 11603*

Table 20: Programme Elective courses (6 credit hours)

Students are needed to complete any elective course offered that total up to 6 credits only.

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 UniSA.

Table 21: Free Module courses (12 credit hours)

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

Final Year Project

Table 22: 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 23: 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 24: First Semester (17 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF11103	Problem Solving and Computer Programming	3
2	CSF11203	Computer Organization and Architecture	3
3	CSF11303	Human Machine Interaction	3
4	CSF11403	Software Engineering Methods	3
5	CSF11503	Social and Professional Ethics	3
6	PBI10102	English for Communication I	2
Total			17

*Pre requisite : PBI10202 is passed PBI10102

Table 25: Second Semester (20 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF11603	Discrete Mathematics	3
2	CSF11703	Operating Systems	3
3	CSF11803	Object Oriented Programming*	3
4	CSF11903	Network and Security Fundamentals	3
5	PBI10202	English For Communication II*	2
6	MPU31072	Penghayatan Etika dan Peradaban	2
7	MPU33012/	Ilmu Wahyu dan Sains /	2
	MPU33022	Moral & Etika II (Bukan Islam)	
8	PBI10***	Bahasa Asing	2
Total			20

*Pre requisite : CSF 11803 is passed CSF 11103

Table 26: Third Semester (20 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF21103	Probability and Statistical Data Analysis	3
2	CSF21203	System Analysis and Design	3
3	CSF21303	Database	3
4	CSA23103	Security Management	3
5		Free Module Elective I	3
6	MPU31062	Falsafah dan Isu Semasa	2
7	*****	Kokurikulum	3
Total			20

Table 27: Fourth Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF21403	Data Structures and Algorithms	3
2	CSA 23203	Network Technology Security and Communications	3
3		Programme Elective I	3
4	CSA 23303	Data Communication Workshop	3
5	MPU32092	Asas Pembudayaan Keusahawanan	2
6	MPU33032 /	Ilmu Wahyu dan Kemasyarakatan (Islam) /	2
	MPU33042	Perbandingan Agama II (Bukan Islam)	
7		Free Module Elective II	3
Total			19

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 III	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 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 been awarded a full accreditation by 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 (7) semester 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

Curriculum Details and Structure

Curriculum Structure according to Course Classification

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

Table 31: Curriculum structure according to course classification

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

University Courses

Table 32: University courses (19 credit hours)

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

Total	19
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**Pre requisite : PBI 10202 is passed PBI 10102*

Core Courses

Table 33: Core courses (42 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF11103	Problem Solving and Computer Programming	3
2	CSF11203	Computer Organization and Architecture	3
3	CSF11303	Human Machine Interaction	3
4	CSF11403	Software Engineering Methods	3
5	CSF11503	Social and Professional Ethics	3
6	CSF11603	Discrete Mathematics	3
7	CSF11703	Operating Systems	3
8	CSF11803	Object Oriented Programming*	3
9	CSF11903	Network and Security Fundamentals	3
10	CSF21103	Probability and Statistical Data Analysis	3
11	CSF21203	System Analysis and Design	3
12	CSF21303	Database	3
13	CSF21403	Data Structures and Algorithms	3
14	CSF31103	Artificial Intelligence	3
Total			42

**Pre requisite : CSF 11803 is passed CSF 11103*

Specialization Courses & Programme Elective Courses (BSC-IC)

Table 34: Specialization courses (24 credit hours)

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

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 35: 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 36: Free Module Courses (12 credit hours)

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

Final Year Project

Table 37: 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 38: Industrial Training (12 credit hours)

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

**Pre requisite : CSF 47112 is passed all courses*

Curriculum Structure according Semester

Table 39: First Semester (17 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF11103	Problem Solving and Computer Programming	3
2	CSF11203	Computer Organization and Architecture	3
3	CSF11303	Human Machine Interaction	3
4	CSF11403	Software Engineering Methods	3
5	CSF11503	Social and Professional Ethics	3
6	PBI10102	English for Communication I	2
Total			17

**Pre requisite : PBI10202 is passed PBI10102*

Table 40: Second Semester (20 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF11603	Discrete Mathematics	3
2	CSF11703	Operating Systems	3
3	CSF11803	Object Oriented Programming*	3
4	CSF11903	Network and Security Fundamentals	3
5	PBI10202	English For Communication II*	2
6	MPU31072	Penghayatan Etika dan Peradaban	2
7	MPU33012/ MPU33022	Ilmu Wahyu dan Sains / Moral & Etika II (Bukan Islam)	2
8	PBI10***	Bahasa Asing	2
Total			20

**Pre requisite : CSF 11803 is passed CSF 11103*

Table 41: Third Semester (20 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF21103	Probability and Statistical Data Analysis	3
2	CSF21203	System Analysis and Design	3
3	CSF21303	Database	3
4	CSD23103	Web Application Development	3
5		Free Module Elective I	3
6	MPU31062	Falsafah dan Isu Semasa	2
7	*****	Kokurikulum	3
Total			20

Table 42: Fourth Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF21403	Data Structures and Algorithms	3
2	CSW23103	Network Technology Security and Programming	3
3		Programme Elective I	3
4	CSW23203	Mobile Computing	3
5	MPU32092	Asas Pembudayaan Keusahawanan	2
6	MPU33032 /	Ilmu Wahyu dan Kemasyarakatan (Islam) /	2
	MPU33042	Perbandingan Agama II (Bukan Islam)	
7		Free Module Elective II	3
Total			19

Table 43: 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 III	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 44: 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
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 : CSF 47112 is passed all courses

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

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

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

Programme Aims

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

Programme Educational Outcomes

- PEO 1 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

Curriculum Details and Structure

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

Table 45: Curriculum structure according to course classification

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

University Courses

Table 46: University courses (19 credit hours)

No	Courses Code	Course Name	Credit Hours
1	MPU31062	Falsafah dan Isu Semasa	2
2	MPU33012/	Ilmu Wahyu dan Sains (Islam) /	2
	MPU33022	Moral dan Etika II (Bukan Islam)	
3	MPU33032 /	Ilmu Wahyu dan Kemasyarakatan (Islam)/	2
	MPU33042	Perbandingan Agama II (Bukan Islam)	
4	MPU31072	Penghayatan Etika dan Peradaban	2

5	MPU32092	Asas Pembudayaan Keusahawanan	2
6	PBI10102	English For Communication I	2
7	PBI10202	English For Communication II	2
8	PBI 1**02	Bahasa Asing	2
9	K** ****	Kokurikulum	3
Total			19

**Pre requisite : PBI10202 is passed PBI10102*

Core Courses

Table 47: Core courses (42 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF11103	Problem Solving and Computer Programming	3
2	CSF11203	Computer Organization and Architecture	3
3	CSF11303	Human Machine Interaction	3
4	CSF11403	Software Engineering Methods	3
5	CSF11503	Social and Professional Ethics	3
6	CSF11603	Discrete Mathematics	3
7	CSF11703	Operating Systems	3
8	CSF11803	Object Oriented Programming*	3
9	CSF11903	Network and Security Fundamentals	3
10	CSF21103	Probability and Statistical Data Analysis	3
11	CSF21203	System Analysis and Design	3
12	CSF21303	Database	3
13	CSF21403	Data Structures and Algorithms	3
14	CSF31103	Artificial Intelligence	3
Total			42

**Pre requisite : CSF11803 is passed CSF11103*

Specialization Courses / Programme Elective Courses (BIT – IM)

Table 48: Specialization courses (24 credit hours)

Student are required to complete all of specialization courses.

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
Total			24

**Pre requisite : ITM 33203 is passed ITM23303*

Table 49: Programme Elective courses (6 credit hours)

Students are needed to complete any elective course offered that total up to 6 credits only.

No	Course Code	Course Name	Credit Hours
1	ITM23403	Photography Techniques and Technology	3
2	ITM23503	Virtual Reality Technology	3
3	ITM23603	Interactive Media in Industry	3
4	ITM23703	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 combination courses that add up to at least 12 credits of non-specialization courses offered by other academic programme by the faculty or other faculties.	12
Total			12

Final Year Project

Table 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	CSF47112	Industrial Training*	12
Total			12

*Pre-requisite : CSF47112 is passed all courses

Curriculum Structure according Semester

Table 53: First Semester (17 credit hours)

No	Course Code	Course Name	Credit Hours
1	PBI 10102	English for Communication I	2
2	CSF 11103	Problem Solving and Computer Programming	3
3	CSF 11203	Computer Organization and Architecture	3
4	CSF 11303	Human Machine Interaction	3
5	CSF 11503	Social and Professional Ethics	3
6	ITM 13103	Art and Design	3
Total			17

**Pre requisite : PBI10202 is passed PBI10102*

Table 54: Second Semester (20 credit hours)

No	Course Code	Course Name	Credit Hours
1	PBI 10***	Bahasa Asing	2
2	PBI 10202	English For Communication II*	2
3	MPU31072	Penghayatan Etika dan Peradaban	2
4	MPU33012/	Ilmu Wahyu dan Sains /	2
	MPU33022	Moral & Etika II (Bukan Islam)	
5	ITF 11103	Information Technology and Its Applications	3
6	ITF 11203	Data Communication and Networking	3
7	CSF 11603	Discrete Mathematics	3
8	CSF 11803	Object Oriented Programming*	3
Total			20

**Pre requisite : CSF 11803 is passed CSF 11103*

Table 55: Third Semester (20 credit hours)

No	Course Code	Course Name	Credit Hours
1	MPU31062	Falsafah dan Isu Semasa	2
2	CSF 21103	Probability and Statistical Data Analysis	3
3	CSF 21203	System Analysis and Design	3
4	CSF 21303	Database	3
5	ITF 21103	Information Security	3
6	CSD 23103	Web Application Development	3
7	*****	Kokurikulum	3
Total			20

Table 56: Fourth Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	MPU32092	Asas Pembudayaan Keusahawanan	2
2	MPU33032 /	Ilmu Wahyu dan Kemasyarakatan (Islam) /	2
	MPU33042	Perbandingan Agama II (Bukan Islam)	
3	CSD 23303	Software Project Management	3

4	ITM 23103	Storytelling and Storyboard	3
5	ITM 23203	Image Editing	3
6	ITM 23303	2D and 3D Modeling	3
7		Programme Elective I	3
Total			19

Table 57: Fifth Semester (19 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF35104	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 I	3
6		Free Module II	3
Total			19

**Pre requisite :*

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

Table 58: Sixth Semester (16 credit hours)

No	Course Code	Course Name	Credit Hours
1	CSF35204	Final Year Project II*	4
2	ITM 33403	Multimedia Application Development	3
3		Free Module III	3
4		Free Module IV	3
5		Programme Elective II	3
Total			16

**Pre requisite : CSF35204 is passed CSF35104*

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 Computer Science (DCS)

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

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

Programme Aims

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

Programme Educational Outcomes

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

Programme Learning Outcomes

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

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

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

Career Prospects

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

Curriculum Details and Structure

Curriculum Structure according to Course Classification

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

Table 60: Curriculum structure according to course classification

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

University Courses

Table 61: University courses (17 credit hours)

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

9	PID23010	Kursus FlexS	0
		Total	17

**Pre requisite : PBD 10202 is passed PBD 10102*

Core Courses

Table 62: Core courses (29 credit hours)

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

Specialization Courses

Table 63: Specialization courses (27 credit hours)

Student are required to complete all of specialization courses.

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

**Pre requisite*

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

Elective courses

Table 64: Elective courses (9 credit hours)

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

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

Industrial Training

Table 65: Industrial Training (12 credit hours)

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

**Pre requisite:*

- ITD30100 is passed all courses

Curriculum Structure according Semester

Table 66: First Semester (5 credit hours)

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

Table 67: Second Semester (19 credit hours)

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

Table 68: Third Semester (19 credit hours)

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

**Pre requisite : PBD10202 is passed PBD10102*

Table 69: Fourth Semester (19 credit hours)

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

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

**Pre requisite:*

- ITD20203 is passed ITD21304
- ITD20204 is passed ITD11303

Table 70: Fifth Semester (19 credit hours)

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

Table 71: Sixth Semester (12 credit hours)

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

**Pre requisite : ITD30110 is passed all courses*

Diploma in Information Technology (DIT)

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

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

Programme Aims

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

Programme Educational Outcomes

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

Programme Learning Outcomes

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

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

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

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

Career Prospects

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

Curriculum Details and Structure

Curriculum Structure according to Course Classification

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

Table 72: Curriculum structure according to course classification

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

University Courses

Table 73: University courses (17 credit hours)

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

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

**Pre requisite : PBD10202 is passed PBD10102*

Core Courses

Table 74: Core courses (29 credit hours)

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

Specialization Courses

Table 75: Specialization courses (24 credit hours)

Student are required to complete all of specialization courses.

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

**Pre requisite : MMD13403 is passed MMD13203*

Elective courses

Table 76: Elective courses (12 credit hours)

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

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

Industrial Training

Table 77: Industrial Training (12 credit hours)

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

**Pre requisite : IT30110 is passed all courses*

Curriculum Structure according Semester

Table 78: First Semester (5 credit hours)

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

Table 79: Second Semester (19 credit hours)

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

Table 80: Third Semester (18 credit hours)

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

**Pre requisite : MMD13403 is passed MMD13203*

Table 81: Fourth Semester (20 credit hours)

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

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

**Pre requisite : PBD 10202 is passed PBD 10102*

Table 82: Fifth Semester (20 credit hours)

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

Table 83: Sixth Semester (12 credit hours)

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

**Pre requisite : ITD30110 is passed all courses*

Courses Synopsis – Degree Programme

University Courses

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

Kursus ini mempersiapkan pelajar untuk menghayati etika dan peradaban yang wujud dalam masyarakat kepelbagaian etnik di Malaysia untuk memperteguhkan pemikiran kritikal dan analitikal mereka bagi menangani kehidupan yang lebih mencabar. Pengisian kursus ini memfokuskan kepada penghayatan etika dan peradaban dalam acuan Malaysia. Pelajar akan didedahkan dengan dinamika konsep etika dan peradaban yang menjadi kekuatan kepada pembentukan negara Malaysia berdasarkan susur masa evolusi sejarahnya dari era pra-kolonial sehingga ke pasca-kolonial. Kefahaman tentang pembentukan etika dan peradaban dalam masyarakat kepelbagaian dibincangkan bagi meningkatkan penghayatan etika dan peradaban ke arah pemantapan kesepaduan nasional dan bangsa Malaysia. Peradaban acuan Malaysia perlu dikupas serta diperdebatan dalam aktiviti akademik 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
MPU31062	Falsafah dan Isu Semasa	2

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

Course Code	Course Name	Credit hours
MPU32092	Asas Pembudayaan Keusahawanan	2

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.

Course Code	Course Name	Credit hours
PBD10102	English I	2

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

Course Code	Course Name	Credit hours
PBD10202	English II	2

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

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

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

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

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

Course Code	Course Name	Credit hours
CSF11303	Human Machine Interaction	3

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

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

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

Course Code	Course Name	Credit hours
CSF11603	Discrete Mathematics	3

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

Course Code	Course Name	Credit hours
CSF11703	Operating Systems	3

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

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

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

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

Course Code	Course Name	Credit hours
CSF11403	Software Engineering Methods	3

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

Course Code	Course Name	Credit hours
CSF11803	Object Oriented Programming	3

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

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

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

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

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

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

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

Course Code	Course Name	Credit hours
CSF21303	Database	3

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

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

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

Course Code	Course Name	Credit hours
CSF31103	Artificial Intelligence	3

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

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

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

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

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

Course Code	Course Name	Credit hours
CSF47112	Industrial Training	12

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

Core Course (BIT-IM)

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

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

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

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

Course Code	Course Name	Credit hours
ITF 21103	Information Security	3

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

Course Code	Course Name	Credit hours
CSD23103	Web Application Development	3

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

Course Code	Course Name	Credit hours
CSD23303	Software Project Management	3

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

Specialization Courses (BCS-SD)

Course Code	Course Name	Credit hours
CSD23103	Web Application Development	3

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

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

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

Course Code	Course Name	Credit hours
CSD23303	Software Project Management	3

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

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

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

Course Code	Course Name	Credit hours
CSD33203	Software Development Workshop	3

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

Course Code	Course Name	Credit hours
CSD33303	Compiler Development	3

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

Course Code	Course Name	Credit hours
CSD33403	Formal Methods	3

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

Course Code	Course Name	Credit hours
CSD33503	Data Mining	3

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

Elective Courses (BCS-SD)

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

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

Course Code	Course Name	Credit hours
CSD33703	Digital Image Processing	3

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

Course Code	Course Name	Credit hours
CSD33803	Advanced Database	3

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

Course Code	Course Name	Credit hours
CSD33903	Artificial Neural Networks	3

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

Specialization Courses (BCS-CNS)

Course Code	Course Name	Credit hours
CSA23103	Security Management	3

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

Course Synopsis – Diploma Programme

University Courses

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Course Code	Course Name	Credit hours
PID23010	FlexS	0

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

Course Code	Course Name	Credit hours
PBD10102	English I	2

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

Course Code	Course Name	Credit hours
PBD10202	English II	2

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

Core Courses (DCS & DIT)

Course Code	Course Name	Credit hours
ITD11204	Computer Programming	4

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

Course Code	Course Name	Credit hours
ITD10503	Database	3

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

Course Code	Course Name	Credit hours
ITD20103	Discrete Mathematics	3

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

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

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

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

Course Code	Course Name	Credit hours
ITD10403	Computer Architecture	3

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

Course Code	Course Name	Credit hours
ITD10603	Operating System	3

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

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

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

Course Code	Course Name	Credit hours
ITD20404	Project	4

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

Course Code	Course Name	Credit hours
ITD30110	Industrial Training	10

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

Specialization Courses (DCS)

Course Code	Course Name	Credit hours
ITD20203	Data Structure	3

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

Course Code	Course Name	Credit hours
ITD20204	Web Programming	4

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

Course Code	Course Name	Credit hours
ITD20803	Advanced Application Workshop	3

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

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

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

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

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

Course Code	Course Name	Credit hours
ITD20304	Mobile Application Development	4

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

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

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

Course Code	Course Name	Credit hours
ITD20603	Web Programming Framework	3

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

Elective Courses (DCS)

UNIVERSITY

Course Code	Course Name	Credit hours
PBD10302	Bahasa Arab Kebangsaan	2

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

Course Code	Course Name	Credit hours
PBD10302	Bahasa Arab Agama	2

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

Course Code	Course Name	Credit hours
PBD10502	Bahasa Mandarin	2

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

Course Code	Course Name	Credit hours
PBD10602	Bahasa Jepun	2

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

Course Code	Course Name	Credit hours
PBD10702	Bahasa Thai	2

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

PROGRAMME

Course Code	Course Name	Credit hours
ITD12003	Informatics and Communication	3

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

Course Code	Course Name	Credit hours
ITD20703	Information Security	3

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

Course Code	Course Name	Credit hours
MMD10103	Human Machine Interaction	3

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

Course Code	Course Name	Credit hours
ITD20503	Fundamentals of Linux	3

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

Course Code	Course Name	Credit hours
MMD20403	Web Authoring	3

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

Course Code	Course Name	Credit hours
ITD21003	Statistics and Probability	3

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

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

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

Specialization Courses (DIT)

Course Code	Course Name	Credit hours
MMD13103	Graphic Design I	3

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

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

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

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

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

Course Code	Course Name	Credit hours
MMD21104	Multimedia Application Development	4

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

Course Code	Course Name	Credit hours
MMD20203	Graphic Design II	3

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

Course Code	Course Name	Credit hours
ITD20204	Web Programming	4

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

Course Code	Course Name	Credit hours
ITD20304	Mobile Application Development	4

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

Elective Courses (DIT)

UNIVERSITY

Course Code	Course Name	Credit hours
PBD10302	Bahasa Arab Kebangsaan	2

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

Course Code	Course Name	Credit hours
PBD10302	Bahasa Arab Agama	2

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

Course Code	Course Name	Credit hours
PBD10502	Bahasa Mandarin	2

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

Course Code	Course Name	Credit hours
PBD10602	Bahasa Jepun	2

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

Course Code	Course Name	Credit hours
PBD10702	Bahasa Thai	2

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

PROGRAMME

Course Code	Course Name	Credit hours
MMD20403	Web Authoring	2

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

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

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

Course Code	Course Name	Credit hours
MMD20103	Digital Photography	3

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

Course Code	Course Name	Credit hours
MMD21303	Computer Games Development	3

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

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

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

Course Code	Course Name	Credit hours
ITD20703	Information Security	3

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

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

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

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

Course Code	Course Name	Credit hours
ITD12003	Informatics and Communication	3

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

Course Code	Course Name	Credit hours
MMD21103	Augmented Reality Technology	3

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

Marking Scheme

Students are compulsory to pass minimum **40%** for both components of course assessments (continuous assessments and final assessment). Grade details and regulations are as below :

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

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

This book must be read together with Buku Peraturan Akademik Prasiswazah Sesi 2022/2023

Committee of Undergraduate Handbook for Academic Session 2022/2023

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