UNIVERSITI TEKNIKAL MALAYSIA MELAKA

UNDERGRADUATE

ACADEMIC HANDBOOK 2025/2026

FOR BACHELOR DEGREE AND DIPLOMA

Faculty of Information and Communication Technology

ACADEMIC HANDBOOK

Bachelor Degree and Diploma Programmes

Session 2025/2026

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

All the information in this Academic Handbook is precise and current at the time of print.

Version October 2025

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Published and Printed in Malaysia by
Penerbit UTeM Press
Aras Bawah, Perpustakaan Laman Hikmah
Universiti Teknikal Malaysia Melaka
Hang Tuah Jaya, 76100 Durian Tunggal, Melaka, Malaysia
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TOP MANAGEMENT

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Universiti Teknikal Malaysia Melaka (UTeM) was established under Section 20 University and University College Act 1971 (Act 30) through "Perintah Universiti Teknikal Malaysia Melaka (Pemerbadanan 2007)" gazetted as P.U. (A) 43 on the 1st of February 2007.
UTeM was initially known as Kolej Universiti Kebangsaan Malaysia (KUTKM), established on the 1st of December 2001.

VISION

To be one of the world's leading **innovative** and **creative technical** universities.

MISSION

UTeM determined to lead and contribute to the wellbeing of the country and the world by:

1. Promoting knowledge through innovative teaching and learning, research and technical scholarship.
2. Developing professional leaders with impeccable moral values.
3. Generating sustainable development through smart partnership with the community and industry.

MOTTO

Excellence through **competency**

EDUCATIONAL GOALS

1) To conduct academic and professional programmes based on relevant needs of the industries.
2) To produce graduates with relevant knowledge, technical competency, soft skills, social responsibility and accountability.
3) To cultivate scientific method, critical thinking, creative and innovative problem solving and autonomy in decision making amongst graduates.
4) To foster research development and innovation activities with industries for the prosperity of the Nation.
5) To equip graduates with leadership and teamwork skills as well as develop communication and life-long learning skills.
6) To develop technopreneurship and managerial skills amongst graduates.
7) To instill an appreciation of the arts and cultural values and awareness of healthy life styles amongst graduates.

Assalamualaikum w.r.t. and greetings,

Welcome to all new diploma, undergraduate, and postgraduate students in the 2025/2026 session. It is expected that the presence of students from various states and countries at the Faculty of Information and Communication Technology (FTMK), UTeM, this year will further enhance the lively atmosphere of the faculty with its teaching, learning, academic activities, and non-academic activities.

We at FTMK warmly welcome students to acquire knowledge and technical skills based on the application-oriented approach that is the strength of FTMK. FTMK students are trained in both theory and application so that their development as FTMK students at UTeM becomes a success for you and the UTeM community.

Therefore, in order to make FTMK students shine at UTeM, FTMK students need to be aware of and understand the academic handbook for 2025/2026, which will accompany them throughout their studies. Students need to plan their academic studies for each semester and understand credit calculations, prerequisite courses, as well as the rules and guidelines outlined in this academic handbook.

Students are expected to fully utilize the academic handbook for 2025/2026. We hope students will continue their high learning momentum by enhancing their knowledge and skills before entering the workforce.

As members of FTMK and UTeM, we will always be with the students and pray for the success of all students.

FTMK Truly World! Thank you.

Faculty Vision

To become a creative, innovative and world class centre of excellence in education, research and services of information and communication technology field.

Faculty Mission

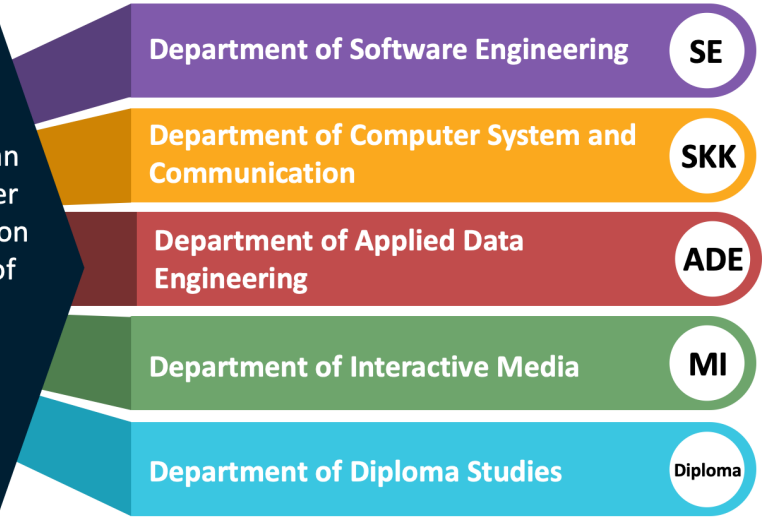
To develop highly competent professionals with outstanding personalities through a world class technical education on the basis of **application-oriented teaching, learning** and **research** with smart partnership with industry and university.

Faculty Objectives

i. To create ethical, competent and skilful ICT professionals of local, international and industry's choice.
ii. To spearhead and develop applied research in the ICT field to produce new knowledge and innovative technology needed by the industry which can be commercialized and recognized internationally.
iii. To improve staff professionalism and competence and contribute to university income through consultation, professional training and continuous quality teaching.
iv. To improve ICT understanding, promote ICT culture in the society and provide social services which leads to social well-being and economic development.
v. To create continuous smart partnership with local and foreign industry and institutions of excellence.
vi. To develop high quality infrastructure and faculty administration system and support programme development to achieve faculty objectives.

FTMK

Faculty of Information and Communication Technology (FTMK) is one of the earliest formed faculty at Kolej Universiti Teknikal Kebangsaan Malaysia (KUTKM) on 1st of December 2000. The Faculty started to operate on **22 June 2001** with its pioneer batch of students of academic session 2001/2002. Since 1st February 2007, Kolej Universiti Teknikal Kebangsaan Malaysia (KUTKM) is known as Universiti Teknikal Malaysia Melaka (UTeM).



FTMK
Fakulti Teknologi Maklumat dan Komunikasi

MANAGEMENT TEAMS

DEAN
PROFESSOR TS. DR. MOHD SANUSI BIN AZMI

DEPUTY DEAN
(ACADEMIC)
TS. DR. AHMAD SHAARIZAN BIN SHAARANI

DEPUTY DEAN
(STUDENT DEVELOPMENT)
ASSOCIATE PROFESSOR TS. DR. MUHAMMAD HAZIQ LIM BIN ABDULLAH

DEPUTY DEAN
(RESEARCH & POSTGRADUATE STUDIES)
TS. DR. MOHD RIZUAN BIN BAHARON

DEPUTY REGISTRAR
MDM. ROZINAH BINTI YAKOP

HOD
(COMPUTER SYSTEM & COMMUNICATION)
TS. DR. ZURINA BINTI SA'AYA

HOD
(INTERACTIVE MEDIA)
TS. DR. MOHAMAD LUTFI BIN DOLHALIT

HOD
(SOFTWARE ENGINEERING)
TS. DR. RAJA RINA BINTI RAJA IKRAM

HOD
(APPLIED DATA ENGINEERING)
ASSOCIATE PROFESSOR TS. DR. NURUL AKMAR BINTI EMRAN

HOD
(DIPLOMA STUDIES)
TS. DR. ZURAINI BINTI OTHMAN

POSTGRADUATE COORDINATOR
TS. DR. LIZAWATI BINTI SALAHUDDIN

UNDER DEPUTY VICE CHANCELLOR (RESEARCH & INNOVATION)

MANAGER
CENTRE FOR ADVANCED COMPUTING TECHNOLOGY
TS. DR. NORHARYATI BINTI HARUM

LAB COORDINATOR
TS. MUHAMMAD HELMY BIN EMRAN

SEN. ASSISTANT REGISTRAR
MR. AHMAD HAFIZ BIN MOHD PUAD

ASSISTANT REGISTRAR
MDM. MAHFUZAH BINTI MD. SHUKOR

List of Programme offered (Undergraduate)
And Its Coordinator

Bachelor's Degree

1. Bachelor of Computer Science (Computer Networking) with Honours, BITC.
   Coordinator: Ts. Dr. Nor Azman Mat Ariff
2. Bachelor of Computer Science (Database Management) with Honours, BITD.
   Coordinator: Dr. Nur Atikah Arbain
3. Bachelor of Technology in Cloud Computing and Application with Honours, BITA.
   Coordinator: Ts. Dr. Mohd Fairuz Iskandar Othman
4. Bachelor of Computer Science (Interactive Media) with Honours, BITM.
   Coordinator: En. Nazreen Abdullasim
5. Bachelor of Computer Science (Software Development) with Honours, BITS.
   Coordinator: Ts. Dr. Nuridawati Mustafa
6. Bachelor of Information Technology (Game Technology) with Honours, BITE.
   Coordinator: Dr. Mohd Khalid Mokhtar

Diploma

1. Diploma in Computer Science, DCS.
   Coordinator: Ts. Dr. Mohd Najwan Md Khambari

Programme Educational Objectives (PEO)

Programme Educational Objectives (PEO) is specific goals describing expected achievements of graduates in their career and professional life after graduation.

PEO for **Bachelor of Computer Science**: 1. Software Development (BITS) 2. Database Management (BITD) 3. Interactive Media (BITM) 4. Computer Networking (BITC)	**PEO 1**	Provide software development solutions (BITS)/ database management solutions (BITD)/ interactive media development solutions (BITM)/ computer networking solutions (BITC) to complex computing problems using knowledge and technical skills that meet industry needs.
	PEO 2	Possess leadership characteristics, communication and interpersonal skill in engaging with industry and community.
	PEO 3	Practice lifelong learning with entrepreneurial mindset to improve professional know-how and career development.
	PEO 4	Uphold professional practices and ethics with integrity principles in fulfilling their responsibilities.

PEO for **Bachelor of Technology**: 1. Cloud Computing and Application (BITA)	**PEO 1**	Produce competent cloud computing technologist that perform Information Technology related work.
	PEO 2	Produce professionals that is ethical and aware of social needs and career development.
	PEO 3	Produce leaders with entrepreneurship in cloud computing field.

PEO for **Bachelor of Information Technology**: 1. Game Technology (BITE)	**PEO 1**	Practice broad knowledge and skills in IT and specialist knowledge in game technology to solve problems through gamification.
	PEO 2	Lead in game industry through innovation and continuous professional development.
	PEO 3	Demonstrate effective communication and technical leadership through involvement in various ICT projects, consultation and entrepreneurial activities.
	PEO 4	Demonstrate moral and professional commitment for the betterment of the society.

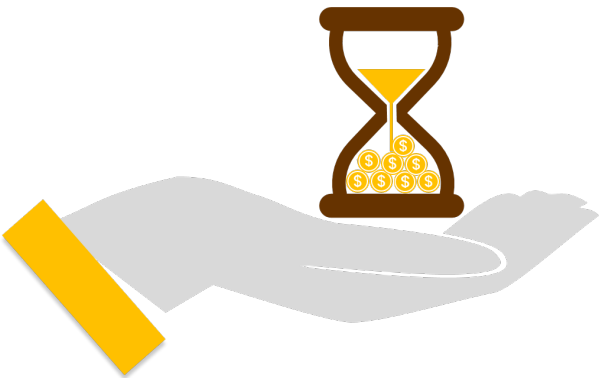
PEO for **Diploma in Computer Science**	**PEO 1**	Provide computer solutions to computing problems using basic knowledge, numeracy and technical skills that meet industry needs.
	PEO 2	Possess supervisory ability, communication and interpersonal skills in engaging within industry and the community.
	PEO 3	Practice lifelong learning and entrepreneurial mindset to improve their self and career development.
	PEO 4	Uphold professional practices and ethics with integrity principles in fulfilling their responsibilities.

Professional Certification Courses

Professional certification courses are designed to enable undergraduate students to obtain professional certificates or at least to prepare themselves for professional certificates. This professional certificate will be an added value and increase the employability amongst graduates.

Listed are the professional certificates scheduled for undergraduate programmes, scheduled in Year 2, Semester 3 (Short Semester). List of courses offered can be changed from time to time in accordance with industry needs.

- BITM 2610 Adobe Professional Certification (Visual Design using Photoshop).
- BITI 3910 Machine Learning Professional Certification.
- BITE 2610 Unity Certified User Professional Certification (Programmer).
- BITP 2620 Oracle Database Foundation Junior Associate Professional Certification.
- BITP 2630 Oracle Java Foundation Junior Associate Professional Certification.
- BITP 2650 IEEE CS Software Development Associate Engineer Professional Certification.
- BITS 2610 CCNA Routing and Switching Professional Certification Preparation.
- BITS 2630 Huawei Certified ICT Associate (Datacom Professional Certification).
- BITS 2640 Digital Forensic First Responder Professional Certification.



Facilities

Lab Facilities

Faculty of Information and Communication Technology (FTMK) has been equipped with the state-of-art computers and software and integrated into UTeM Network. These facilities ease the process of teaching and learning in FTMK.

Averages of 36 computers with latest software are located at each lab and studio to ensure practical teaching and learning is applicable for the students. Server, router, switches, wireless, digital camera, video, biometric machines are also provided for teaching and learning purposes.

Lab Staffs

The labs in FTMK are administered by the Lab Coordinator assisted by Assistant Engineers to ensure smooth teaching and learning processes. The infrastructure committee members are responsible for maintaining and managing respective clients in FTMK environment.

Loan Facilities on Lab Equipment

Students are allowed to use the lab equipment to complete their assignments or projects on time. The equipment that are allowed to be used are wireless equipment, video camera, digital camera, biometric tool, GSM and others.

Lab Operational Hours

During Semester:

Monday to Thursday	8:00 am to 6:00 pm
Friday	8:00 am to 12:15 pm
	2:45 pm to 6:00 pm

During Semester Break:

Monday to Thursday	8:00 am to 5:00 pm
Friday	8:00 am to 12:15 pm
	2:45 pm to 5:00 pm

Saturday-Sunday / Public Holidays Close

NAME OF FACILITY	DESCRIPTION
Seminar Hall	The hall is equipped with audio-visual facility for 250 pax at a time
Lecture Rooms	Rooms No. 1 to 7 with each room for 60 pax Rooms No. 13 to 14 with each room for 120 pax
Recording Capture System (ReCap)	Lecture Hall for interactive learning environment for 114 pax
Collaborative Learning Laboratory (CLeAR)	A collaborative learning laboratory with 120 pax capacity
Mini Theatre	The theatre room for film and animation presentation for 35 pax
Virtual Reality Studio	Laboratory for motion capture and games development
Photography/Recording Studio	Multimedia recording and editing studio
Research Laboratories	1. Innovative Software System & Services (IS3) Laboratory 2. Makmal Penyelidikan Ideal & APIC 3. Advanced Interaction Technology (AdViT) Laboratory 4. Pervasive Computing & Educational Technology (PET) Laboratory 5. Biomedical and Engineering (BIOCORE) Laboratory

Teaching Laboratories	1. Computer Game Laboratory 2. Software Engineering Laboratory 1, 2 and 3 3. Programming Laboratory 1, 2, 3 and 4 4. Database Laboratory 1, 2 and 3 5. Network Laboratory 1 and 2 6. CCNA & CCNP Laboratory 7. Fiber Optic Laboratory 8. System / Hardware Laboratory 9. Wireless Laboratory 10. Virtual Reality Laboratory 11. Multimedia Laboratory 1, 2, 3 and 4 12. Student Workshop Laboratories
Other Facilities	1. Visiting Professor Rooms 2. Executive Laboratory 3. Administration Office – Level 2 & 3 4. Viva Voce Room 5. FICTS Room 6. Student Common Room 7. Surau or Prayer Room 8. Lobby Area 9. Parking Area for students and staffs 10. Lanai Budi Student Seating Area

Lab Usage Regulation

1. Students must display their matric card at all times in the lab.
2. Students are not allowed to bring in their bags into the lab.
3. Students are not allowed to eat/drink or bring in any foods or drinks into the lab.
4. Students are not allowed to wear sandals in the lab except sandals with back straps for female students and covered sandals for male students.
5. Students are not allowed to wear t-shirt without collar in the lab. UTeM's students' dress code is referred.
6. All lab equipment used must be returned in its original condition.
7. Chairs must be arranged neatly after use.
8. Do not leave used papers or litters in the lab. Please throw it into rubbish bin if it is not needed anymore.
9. All equipment must be switched off after used.
10. Students should not enter the lab without lecturers' or tutors' presence.
11. For after-hours lab usage, students must record their details in the lab record book and submit their matric card to Assistant Engineers in duty.
12. Students are prohibited from playing games, chatting or surfing the net for unrelated content in the lab.
13. Students are not allowed to bring out any lab equipment except with permission from the lecturers or Assistant Engineers in duty.
14. Students are not allowed to bring in laptop, CPU, monitor, mouse, CD, VCD or any computer equipment except with permission from the lecturers or Assistant Engineers in duty.
15. Users are not allowed to do any installation on computers in the lab.
16. All requests for software installation into students' laptop will not be entertained.
17. Students must report immediately to lecturer or Assistant Engineers on duty if any lab equipment got lost or broken during their students' usage.

18. Research labs are for post graduates' students ONLY. Post-graduate students can get the access by referring to their supervisor.

Additional Lab Rules Outside Teaching and Learning Allocated Times

1. Total users for a lab must comply with the maximum capacity allowed for a particular lab.
2. Students are allowed to use labs outside teaching and learning allocated times with permission from a lecturer. The lecturer will be responsible for lab for the duration of the usage. Students must record their start and end times of usage in the record book provided in the lab.
3. Studios and Recording room usage are strictly by booking only. Students can use the studios or recording room through their lecturer or Assistant Engineer on duty.

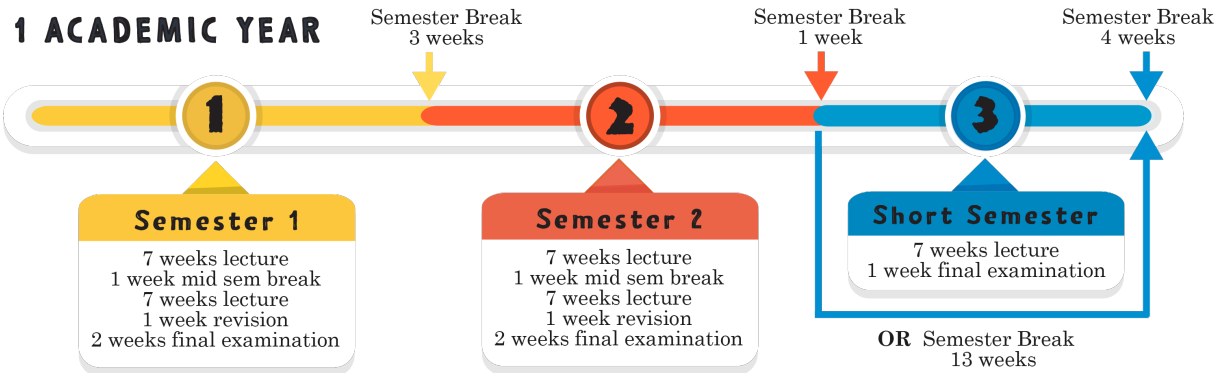
DISCIPLINARY ACTIONS WILL BE TAKEN AGAINST ANY STUDENT WHO IS FOUND BREAKING ANY RULE LISTED ABOVE.

The university has implemented its academic system according to semester system. Every academic year comprises of two semesters and in some instances the faculty also offers a special semester which is arranged during the semester break.

Specifically, there are 18 weeks per semester, which is divided as follows:

- 7 weeks for the first part of lecture.
- 1 week of mid semester break.
- 7 weeks for the second part of lecture.
- 1 week of revision.
- 2 weeks for final examination.

While for the short semester, there are only a total of 8 weeks of implementation, which include 7 weeks of lecture and 1 week of final examination.



Duration of Studies

Full-time mode	Durations of studies	
	Minimum	Maximum
Bachelor's Degree (except BITA)	7 semesters (3 $\frac{1}{2}$ years)	11 semesters (5 $\frac{1}{2}$ years)
Bachelor's Degree (BITA)	6 semesters (3 years)	10 semesters (5 years)
Diploma	5 semesters (2 $\frac{1}{2}$ years)	10 semesters (5 years)

Part-time mode	Durations of studies	
	Minimum	Maximum
Bachelor's Degree (BITS, BITC, BITM, BITA)[1]	14 trimesters (5 years)	29 trimesters (10 years)
Diploma	8 semesters (4 years)	16 semesters (8 years)

[1]Details can be obtained from Centre of Advanced & Continuing Education Services (UTeM ACCESS)

Grading System

The following shows the grading system adopted by the university.

80 – 100	A	4.0	Excellent
75 – 79	A–	3.7	Excellent
70 – 74	B+	3.3	Very Good
65 – 69	B	3.0	Very Good
60 – 64	B–	2.7	Pass
55 – 59	C+	2.3	Pass
50 – 54	C	2.0	Pass
47 – 49	C–	1.7	Marginal Pass
44 – 46	D+	1.3	Marginal Pass
40 – 43	D	1.0	Marginal Pass
0 – 39	E	0.0	Fail

Academic Achievement

Grade Point Average (GPA):

GPA is average points obtained by students at the end of each semester.

$$\begin{aligned} \text{Total Grade Point (TGP)} &= k_1 m_1 + k_2 m_2 + \ldots + k_n m_n \\ \text{Total Calculated Point (TCP)} &= k_1 + k_2 + \ldots + k_n \\ \text{GPA} &= \frac{\text{TGP}}{\text{TCP}} \end{aligned}$$

where
k_n = credit hour for course n,
m = grade point obtained for course n,
n = number of courses registered.

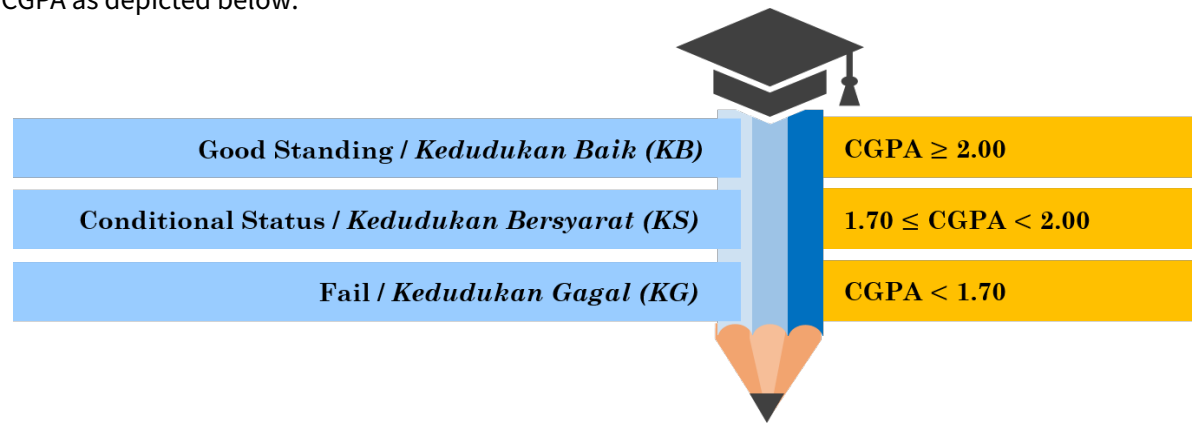
Cumulative Grade Point Average (CGPA):

CGPA refers to cumulative grade point average obtained for all semester studied.

$$\text{CGPA} = \frac{TGP_1 + TGP_2 + \ldots + TGP_n}{TCP_1 + TCP_2 + \ldots + TCP_n}$$

Academic Standing

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



1. With the approval of the Senate, a student who obtains CGPA $\geq$ 2.00 but GPA $<$ 1.00 may;
   i. continue his/her studies with KB; or
   ii. be instructed to defer his studies to the next semester with KB; or
   iii. be terminated from his studies with KG.
2. With the approval of the Senate, a student who obtains 1.70 $\leq$ CGPA $<$ 2.00 but GPA $<$ 1.00 may;
   i. be instructed to defer his/her studies to the next semester with KS; or
   ii. be terminated from his/her studies with KG.
3. The Academic Standing of a student in the Special Semester shall not be determined. Grades obtained in the Special Semester shall be counted when calculating the CGPA of the subsequent semester. For a student who is due to graduate in the Special Semester, the CGPA will be calculated based on the Repeat or Redeem Course.
4. A student who obtains KS for three (3) consecutive semesters shall be given KG.
5. A student who obtains KG shall be terminated from his/her studies.
6. For students with KS, maximum permissible credit for the upcoming semester is 12 credits.

Dean's List Award

A student who obtains a GPA of 3.50 and above will be awarded a Dean's List Certificate. The list will be published at the University board and webpage.

Graduation Requirement

A student shall only be conferred a Bachelor Degree or Diploma subject to the following requirements:

1. The student must obtain a Good Academic Standing (KB) in his/her final semester.
2. The student must pass all Courses required by the curriculum.
3. Any other requirements set by the University.

Degree Classification

Bachelor Degree	CGPA Range	Diploma
First-Class Honours	3.70 – 4.00	First-Class
Upper Second-Class Honours	3.00 – 3.69	Second-Class
Lower Second-Class Honours	2.00 – 2.99	

Academic Advisory System

Responsibility of Academic Advisor

The importance of having an academic advisory system are as follows:

1. The Academic Advisor is required to explain to the students the important information concerning university's policy and procedure, curriculum and syllabus, academic calendar and etc.
2. The Academic Advisor also needs to assess the students' aptitude to ensure credit hours and Courses registered are suitable with their capability.
3. In addition, the Academic Advisor must approve application to add/drop Courses based on student performance.

Responsibility of Student

Students are responsible to consistently meet with their Academic Advisor twice per semester (minimum) to get advice and help in solving any academic problems arise. In general, students are responsible to:

1. meet with the Academic Advisor in the first week of each semester and obtain the general explanation about the Semester System and related issues concerning learning process as well as monitoring students' performance.
2. obtain an assistance from the Academic Advisor in preparing their study plan throughout their study in UTeM, such as Courses to be registered every semester.
3. inform the Faculty's Administration and Academic Advisor concerning their performance and problems.
4. check and verify Courses registered for the examination.
5. seek advice and explanation from their Academic Advisor the effects of registering and dropping Courses.

Student Clubs

The establishment of student club is aimed to encourage active involvement of students with co-curricular activities at the department and faculty level. This is in line with the direction of educational development and talent achievement as outlined in the Malaysia Higher Education Development Plan.

There is one student club in the Faculty, namely FICTS, where all students from the Faculty are welcome to join the Club. Other than that, there are five student clubs represent each department in the Faculty, and students from each programme are welcome to join the respective club based on their programme.

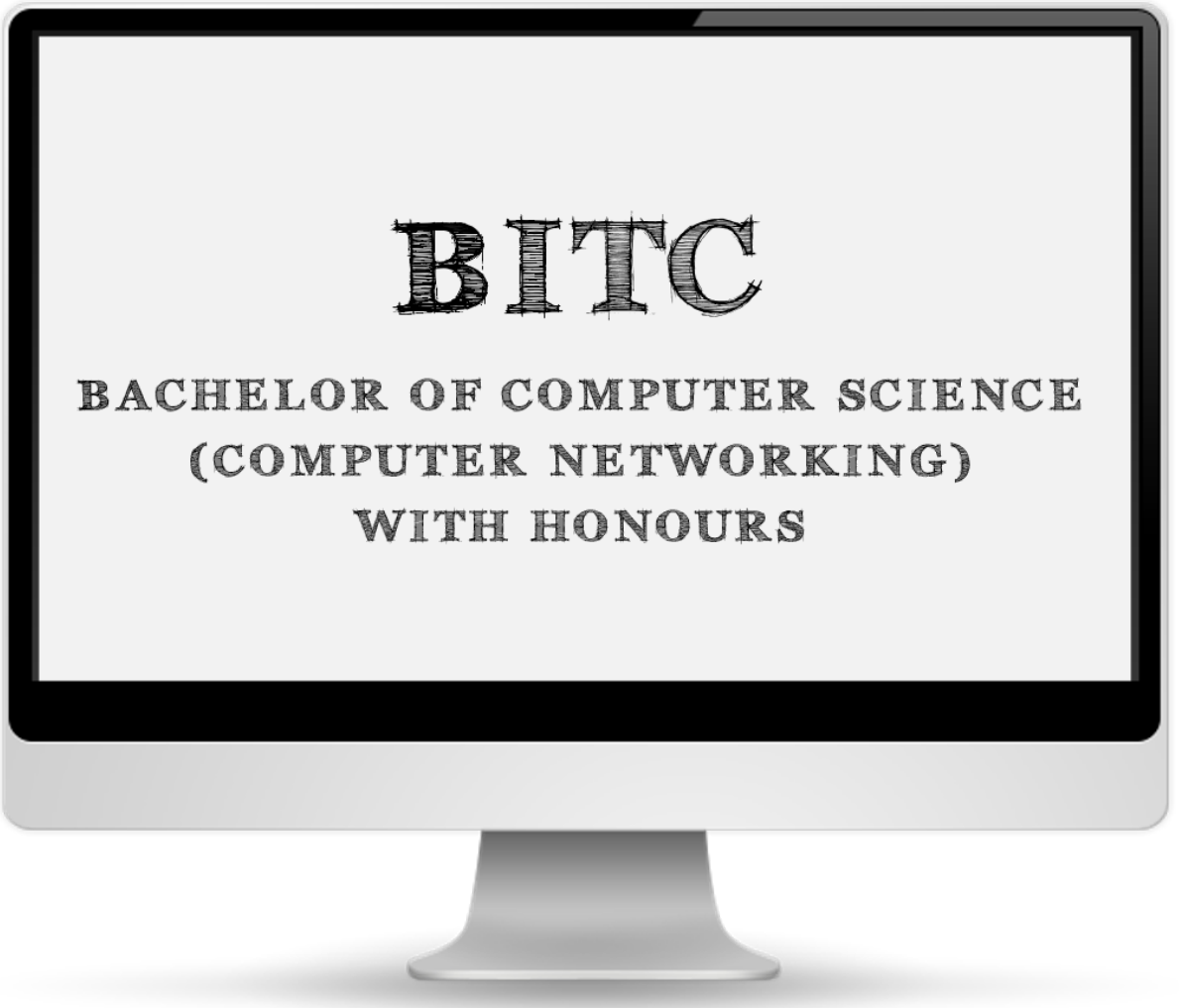
Network and Security Association (NETSA)

FTMK Student Club (FICTS)

Diplomate

Software and Database Club

Interactive Media Club (IMC)


BITC
BACHELOR OF COMPUTER SCIENCE
(COMPUTER NETWORKING)
WITH HONOURS

Bachelor of Computer Science (Computer Networking) with Honours

Programme Details

Bachelor of Computer Science (Computer Networking) is aimed to produce highly knowledgeable and skilful graduates in the field of information technology and communication. Graduates are competent in advanced specialised knowledge and skill in analysing, developing, installing, administrating, servicing and controlling the networking system and communication.

Graduate Competency

With the implementation of TVET curriculum, at the end of this program, all BITC students will gain the following competencies:

1. Demonstrate thorough understanding of switching, routing, network hardware, software, protocols, and services to effectively plan, design, install, configure, troubleshoot, and analyze complex network infrastructures.
2. Develop skills in network administration and security tools to perform traffic analysis, conduct security assessments, monitor networks, and implement cybersecurity measures.
3. Apply project management principles and techniques within networking contexts, including defining scopes, gathering requirements, assessing risks, and utilizing relevant tools to support effective planning and execution of network-related tasks.
4. Communicate technical network concepts clearly and collaboratively by designing presentations and reports that meet industry standards and facilitate teamwork.
5. Build a strong foundation in data structures, algorithms, software engineering, and cybersecurity while demonstrating professionalism, ethical responsibility, adaptability, and effective collaboration within networking environments.

Programme Learning Outcomes (PLO)

The aim of the Bachelor of Computer Science (Computer Networking) programme is to produce students with the following characteristics:

1. Analyse computing problems using computer science knowledge.
2. Apply appropriate computer science solutions for computer networking problems.
3. Construct solutions using appropriate computing methods for complex problems.
4. Demonstrate social skills and responsibilities in engaging with society, community and stakeholders.
5. Exhibit effective communication through oral and written modes in engaging with society, community and stakeholders.
6. Deploy a broad range of software or tools to solve industry computing problems.
7. Apply numeracy skills to solve computing problems.
8. Demonstrate leadership characteristics and contribute independently as individual or member in a team to solve computing problems.
9. Demonstrate capabilities in information management, lifelong learning and independent study.
10. Utilise an entrepreneurial mindset in delivering solutions.
11. Uphold professionalism, attitudes and ethical values in workplace.

Career Prospects

There is a wide range of career opportunities in the field of computer science and information technology available for graduates who are specialised in Computer Networking, either in the government sector or private sector, as well as undertaking business ventures of their own. Among the career opportunities are:

1. Network Analyst
2. Network System Engineer
3. Network Specialist
4. System Analyst
5. Network Manager
6. Information System Executive
7. Software Developer

Other than that, the graduates also have the opportunity to further their studies at postgraduate level.

Curriculum Structure

Students are required to complete a minimum of 120 credits to graduate with a Bachelor of Computer Science (Computer Networking) with Honours. The programme components are as follows:

Bachelor's Degree (Computer Science) Minimum graduating credit - 120		
Component	**Component's Code**	**Credits**
University Compulsory	W	18
Core Computing	P	18
Discipline Core	P	36
Specialization	K	24
Free Module	E	6
Final Year Project	P	6
Industrial Training	P	12
	Total Credits	**120**

Curriculum Structure for Each Semester

Year One : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLHW 1762	Philosophy and Current Issues	W	2	0	2	
BLLW 1142	English for Academic Purposes	W	2	0	2	
BITP 1323	Database	P	2	2	3	
BITP 1113	Programming Technique	P	2	2	3	
BITS 1123	Computer Organisation and Architecture	P	2	2	3	
BITS 1313	Data Communication and Networking	P	2	2	3	
				Total Credits	**16**	

Year One : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLLW 12*2	Third Language[1]	W	2	0	2	
BKK* ***1	Co-Curriculum I[2]	W	0	3	1	
BITS 1213	Operating System	P	2	2	3	
BITP 1223	System Analysis and Design	P	2	2	3	
BITI 1113	Artificial Intelligence	P	2	2	3	
BITP 1123	Data Stucture and Algorithm	P	2	2	3	BITP 1113
BITI 1233	Discrete Structures	P	2	2	3	
				Total Credits	**18**	

[1]For International Students, change to BLLW 1282 Malay 2.
[2]This course can be taken in any semester. Please refer to Co-Curriculum Unit before registering.

Year Two : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLLW 2152	Academic Writing	W	2	0	2	BLLW 1142
BLHW 2772	*Penghayatan Etika dan Peradaban*[1]	W	2	0	2	
BITM 2313	Human Computer Interaction	P	2	2	3	
BITP 3113	Object-oriented Programming	P	2	2	3	
BITM 1213	Graphic Visualization and Computational Modelling	P	2	2	3	
BITS 2313	Local Area Network	K	2	2	3	BITS 1313
BITU 2913	Workshop I	K	1[2]		3	BITP 1113
			Total Credits		**19**	

[1]For International Students, change to BLHW 2752 Malaysian Culture
[2]Average official contact hours per week.

Year Two : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLHW 2792	Kursus Integriti Anti Rasuah	W	2	0	2	
BKK* ***1	Co-Curriculum II[1]	W	0	3	1	
BITP 2223	Software Requirement and Design	P	2	2	3	
BITP 2113	Algorithm Analysis	P	2	2	3	BITP 1113
BITS 3423	Information Technology Security	P	2	2	3	
BITS 2323	Wide Area Network	K	2	2	3	BITS 2313
BITS 2333	Network Analysis and Design	K	2	2	3	BITS 2313
			Total Credits		**18**	

[1]This course can be taken in any semester. Please refer to Co-Curriculum Unit before registering.

Year Three : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLLW 3162	English for Professional Interaction	W	2	0	2	BLLW 2152
BITP 3143	Distributed and Parallel Application Development	P	2	2	3	
BITU 3923	Workshop II	K	1[1]		3	BITU 2913
BITS 3313	Network Administration and Management	K	2	2	3	BITS 2313
BITS 3323	Network Project Management	K	2	2	3	BITS 1313
B*** ***3	Free Module 1	E	2	2	3	
				Total Credits	**17**	

[1]Average official contact hours per week.

Year Three : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BTMW 4012	Technology Entrepreneurship	W	2	0	2	
BITP 3153	Platform Based Development	P	2	2	3	
BITP 3463	Professional Practices in Computing	P	2	2	3	
BITS 3553	Emerging Network Technologies	K	2	2	3	
BITU 3973	Final Year Project I	P	1[1]		3	BITU 3923
B*** ***3	Free Module 2	E	2	2	3	
				Total Credits	**17**	

[1]Average official contact hours per week.

Year Three : Semester 3

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITU 3983	Final Year Project II	P	1[1]		3	BITU 3973
			Total Credits		**3**	

[1]Average official contact hours per week.

Year Four : Semester 1

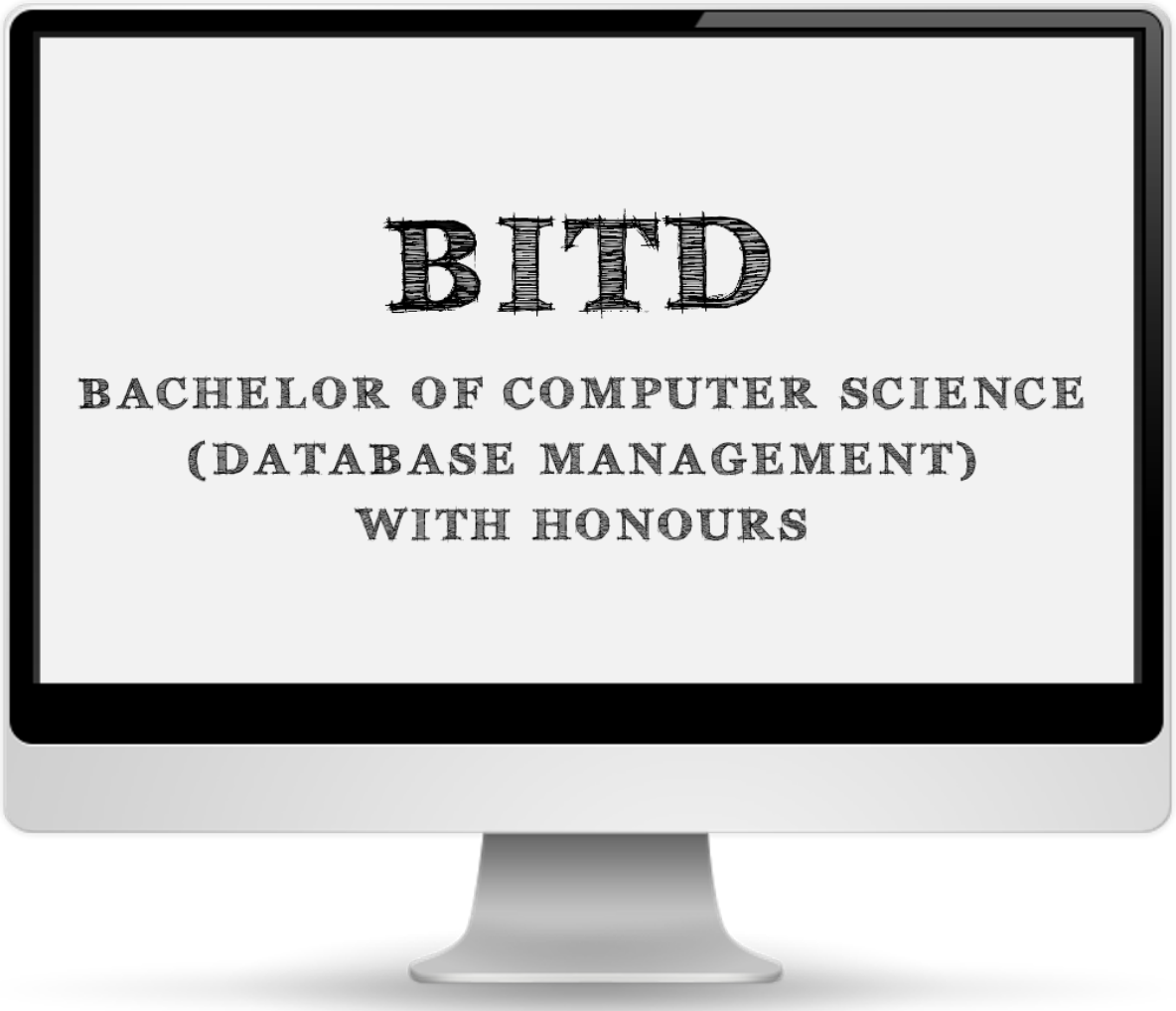
Course Code	Course Name	Comp Code	Duration (weeks)	Crdt	Pre-requisite
BITU 3926	Industrial Training	P	24	6 (Attend & Pass)	BITU 3983[1]
BITU 3946	Industrial Training Report	P	24	6	BITU 3983[1]
			Total Credits	**12**	

[1]Completed all Courses.

List of Courses in Free Module

Students must complete the Free Module (2 courses, 3 credits each). The list of Free Module courses below may change from time to time based on industry needs.

Course Code	Course Name	Contact Hrs		Crdt	Pre- requisite
		Lect	Lab		
List of Third Language Courses (For Local Students)					
BLLW 1212	Arabic 1	2	0	2	
BLLW 1222	Mandarin 1	2	0	2	
BLLW 1232	Japanese 1	2	0	2	
BLLW 1242	Korean 1	2	0	2	
BLLW 1252	German 1	2	0	2	
List of Courses in Free Module					
BITS 3343	Fibre Optic	2	2	3	BITS 1313
BITS 2573	Cloud Computing Foundation	2	2	3	
BITS 3483	Network Security	2	2	3	
BITS 3443	Digital Forensics	2	2	3	
BITM 1123	Interactive Media Authoring	2	2	3	
BITM 2113	Web Application Development	2	2	3	
BITM 2123	Digital Audio and Video Technology	2	2	3	
BMIP 3122	Manufacturing Sustainability	2	2	3	
BTMP 3243	Strategic Innovation Management	2	2	3	
BTMP 3523	Industrial Leadership	2	2	3	
BTMT 3323	Contemporary Business Management	2	2	3	
BTMT 3383	Social Entrepreneurship	2	2	3	
BMTU 1093	Business Statistics	2	2	3	


BITD
BACHELOR OF COMPUTER SCIENCE
(DATABASE MANAGEMENT)
WITH HONOURS

BITD Bachelor of Computer Science (Database Management) with Honours

Programme Details

The Bachelor of Computer Science (Database Management) academic programme aims to produce competent graduates in computer science, especially in the database management field. The graduates will be equipped with an in-depth understanding of database foundation including the analysis, design, development, testing of database applications as well as the administration of database systems with the required standards and policy. The programme also provides key and recent technologies to the graduates making them highly qualified personnel demanded by the industry.

Graduate Competency

With the implementation of TVET curriculum, at the end of this program, all BITD students will gain the following competencies:

1. Apply principles of database design to create, implement, and maintain relational and non-relational database systems.
2. Analyse business requirements to develop logical and physical data models, ensuring data consistency, integrity, and efficiency by minimizing data redundancy.
3. Perform essential database administration tasks, including user management, backup and recovery, and implementing robust security measures.
4. Able to write and optimize complex SQL queries including PL/SQL objects for efficient structured and unstructured data management.
5. Able to design and manage data warehousing solutions and apply business intelligence tools to support data-driven decision-making.

Programme Learning Outcomes (PLO)

The aim of the Bachelor of Computer Science (Database Management) programme is to produce students with the following characteristics:

1. Analyse computing problems using computer science knowledge.
2. Apply appropriate computer science solutions for database management problems.
3. Construct solutions using appropriate computing methods for complex problems.
4. Demonstrate social skills and responsibilities in engaging with society, community and stakeholders.
5. Exhibit effective communication through oral and written modes in engaging with society, community and stakeholders.
6. Deploy a broad range of software or tools to solve industry computing problems.
7. Apply numeracy skills to solve computing problems.
8. Demonstrate leadership characteristics and contribute independently as individual or member in a team to solve computing problems.
9. Demonstrate capabilities in information management, lifelong learning and independent study.
10. Utilise an entrepreneurial mindset in delivering solutions.
11. Uphold professionalism, attitudes and ethical values in workplace.

Career Prospects

There is a wide range of career opportunities in the field of computer science and information technology available for graduates who are specialised in Database Management. Among the career opportunities are:

1. System Analyst
2. System Programmer
3. IT Officer
4. Database Application Developer
5. Database Analyst
6. Database Administrator
7. Database Designer
8. Data Engineer
9. Other careers that require expertise in information technology particularly data analysis and management in diverse disciplines.

The graduates also have the opportunity to further their studies at postgraduate level.

Curriculum Structure

Students are required to complete a minimum of 120 credits to graduate with a Bachelor of Computer Science (Database Management) with Honours. The programme components are as follows:

Bachelor's Degree (Computer Science) Minimum graduating credit - 120		
Component	**Component's Code**	**Credits**
University Compulsory	W	18
Computing Core	P	18
Discipline Core	P	36
Specialization	K	24
Free Module	E	6
Final Year Project	P	6
Industrial Training	P	12
	Total Credits	**120**

Curriculum Structure for Each Semester

Year One : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLHW 1762	Philosophy and Current Issues	W	2	0	2	
BLLW 1142	English for Academic Purposes	W	2	0	2	
BITP 1323	Database	P	2	2	3	
BITP 1113	Programming Technique	P	2	2	3	
BITS 1123	Computer Organisation and Architecture	P	2	2	3	
BITS 1313	Data Communication and Networking	P	2	2	3	
BKK* ***1	Co-Curriculum I[1]	W	0	3	1	
				Total Credits	**17**	

[1]This course can be taken in any semester. Please refer to Co-Curriculum Unit before registering.

Year One : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITS 1213	Operating System	P	2	2	3	
BITP 1223	System Analysis and Design	P	2	2	3	
BITI 1113	Artificial Intelligence	P	2	2	3	
BITP 1123	Data Stucture and Algorithm	P	2	2	3	BITP 1113
BITI 1233	Discrete Structures	P	2	2	3	
BITP 2313	Database Design	K	2	2	3	BITP 1323
BKK* ***1	Co-Curriculum II[1]	W	0	3	1	
				Total Credits	**19**	

[1]This course can be taken in any semester. Please refer to Co-Curriculum Unit before registering.

Year Two : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLHW 2772	*Penghayatan Etika dan Peradaban*[1]	W	2	0	2	
BITP 3113	Object-oriented Programming	P	2	2	3	
BITM 1213	Graphic Visualization and Computational Modelling	P	2	2	3	
BITP 2113	Algorithm Analysis	P	2	2	3	BITP 1113
BITP 2413	Database Administration and Security	K	2	2	3	BITP 1323
BITU 2913	Workshop I	K	1[2]		3	BITP 1113
			Total Credits		**17**	

[1]For International Students, change to BLHW 2752 Malaysian Culture
[2]Average official contact hours per week.

Year Two : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLLW 2152	Academic Writing	W	2	0	2	BLLW 1142
BITM 2313	Human Computer Interaction	P	2	2	3	
BITP 3153	Platform-Based Development	P	2	2	3	
BITP 2303	Database Programming	K	2	2	3	BITP 1323
BITP 3383	Cloud Data Management	K	2	2	3	
B** ***3	Free Module 1	E	2	2	3	
			Total Credits		**17**	

Year Three : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLLW 12*2	Third Language[1]	W	2	0	2	
BITP 2223	Software Requirement and Design	P	2	2	3	
BITP 3143	Distributed and Parallel Application Development	P	2	2	3	
BITU 3923	Workshop II	K	1[2]		3	BITU 2913
BITP 3363	Data Warehousing and Business Intelligence	K	2	2	3	
B** ***3	Free Module 2	E	2	2	3	
				Total Credits	**17**	

[1]For International Students, change to BLLW 1282 Malay 2.
[2]Average official contact hours per week.

Year Three : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BTMW 4012	Technology Entrepreneurship	W	2	0	2	
BLHW 2792	Kursus Integriti Anti Rasuah	W	2	0	2	
BLLW 3162	English for Professional Interaction	W	2	0	2	BLLW 2152
BITP 3463	Professional Practices in Computing	P	2	2	3	
BITS 3423	Information Technology Security	P	2	2	3	
BITP 3393	Special Topics in Database Technology	K	2	2	3	
BITU 3973	Final Year Project I	P	1[1]		3	BITU 3923
				Total Credits	**18**	

[1]Average official contact hours per week.

Year Three : Special Semester

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITU 3983	Final Year Project II	P	1[1]		3	BITU 3973
			Total Credits		**3**	

[1]Average official contact hours per week.

Year Four : Semester 1

Course Code	Course Name	Comp Code	Duration (weeks)	Crdt	Pre-requisite
BITU 3926	Industrial Training	P	24	6 (Attend & Pass)	BITU 3983[1]
BITU 3946	Industrial Training Report	P	24	6	BITU 3983[1]
			Total Credits	**12**	

[1]Completed all Courses.

List of Courses in Free Module

Students must complete the Free Module (2 courses, 3 credits each). The list of Free Module courses below may change from time to time based on industry needs.

Course Code	Course Name	Contact Hrs		Crdt	Pre- requisite
		Lect	Lab		
List of Third Language Courses (For Local Students)					
BLLW 1212	Arabic 1	2	0	2	
BLLW 1222	Mandarin 1	2	0	2	
BLLW 1232	Japanese 1	2	0	2	
BLLW 1242	Korean 1	2	0	2	
BLLW 1252	German 1	2	0	2	
List of Courses in Free Module					
BITP 5703	Data Quality Management	2	2	3	
BITP 5383	Data Governance and Security	2	2	3	
BTMT 3323	Contemporary Business Management	2	2	3	
BTMT 3303	Seminar in Global Issues and New Business Trends	2	2	3	
BTMT 3383	Social Entrepreneurship	2	2	3	
BTMP 3243	Strategic Innovation Management	2	2	3	
BTMU 1093	Business Statistics	2	2	3	
BITM 2113	Web Application Development	2	2	3	
BITS 2573	Cloud Computing Foundation	2	2	3	
BITP 3233	Strategic Information System Planning	2	2	3	
BITP 3253	Software Verification and Validation	2	2	3	
BITP 3423	Special Topic in Software Engineering	2	2	3	
BITI 2223	Machine Learning	2	2	3	BITI 1113
BITS 2313	Local Area Network	2	2	3	BITS 1313
BITP 3523	Advanced Database Administration	2	2	3	BITP 2413
BITP 3513	Advanced Database Programming	2	2	3	BITP 2303
BITP 3483	Geographic Information System	2	2	3	
BITP 3353	Multimedia Database	2	2	3	BITP 1323
BMIP 3122	Manufacturing Sustainability	2	2	3	

BITA
BACHELOR OF TECHNOLOGY
IN CLOUD COMPUTING
AND APPLICATION
WITH HONOURS

BITA Bachelor of Technology in Cloud Computing and Application with Honours

Programme Details

The Bachelor of Technology in Cloud Computing and Application is aimed at producing knowledgeable and highly skilled graduates in the field of information and communications technology (ICT). Graduates pursuing the programme are equipped with the necessary knowledge and specialised skills in cloud computing technology to meet the needs of the industry. Skills include the delivery of computing services, including servers, storage, databases, networking, software, analytics, and intelligence, over the internet ("the cloud").

Programme Learning Outcomes (PLO)

Upon completion of the programme, graduates should be able to:

1. Apply knowledge of technology fundamentals to broadly-defined procedures, processes, systems, and methodologies in cloud computing technology.
2. Propose and employ current tools and techniques to resolve broadly-defined problems.
3. Demonstrate deep investigative and significant thinking abilities to solve broadly-defined problems in Cloud Computing technology.
4. Communicate effectively and flexibly in oral and written language for social, academic and professional purposes.
5. Illustrate the understanding of corresponding issues related to the society and the subsequent responsibilities to the broadly-defined technology practices.
6. Acknowledge the requirement of professional establishment and to employ independent continuing learning in Cloud Computing technology.
7. Illustrate consciousness of management and technopreneurship routine in real perspective.
8. Illustrate ethical awareness and professionalism.

9. Illustrate leadership character, mentoring and work efficiently in diverse teams.

Career Prospects

There is a wide range of career opportunities in the field of information and communication technology available for graduates who are specialised in cloud computing, either in the government or private sector. Among the career opportunities are:

1. Cloud architect
2. Cloud engineer
3. Cloud data scientist
4. Cloud automation engineer
5. Cloud consultant
6. Cloud security analyst
7. Cloud network engineer
8. Cloud administrator

Other than that, graduates also have the opportunity to further their studies at postgraduate level.

Curriculum Structure

Students are required to complete a minimum of 122 credits to graduate with a Bachelor of Technology in Cloud Computing and Application with Honours. The programme component are as follows:

Bachelor's Degree (Technology) Minimum graduating credit - 122		
Component	**Component's Code**	**Credits**
General Module	W	16
Core Module	P	36
Specialization Module	K	40
Final Year Project	P	8
Industrial Training	P	12
Free Module	E	10
	Total Credits	**122**

Curriculum Structure for Each Semester

Year One : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BKK* ***1	Co-Curriculum I[1]	W	0	3	1	
BLHW 1762	Philosophy and Current Issues	W	2	0	2	
BLLW 1142	English for Academic Purposes	W	2	0	2	
BITS 1133	Operating System & Computer Organisation and Architecture	P	2	2	3	
BITP 1323	Database	P	2	2	3	
BITP 1113	Programming Technique	P	2	2	3	
BITS 1225	Windows System Management and Network Services	K	4	4	5	
				Total Credits	**19**	

[1]This course can be taken in any semester. Please refer to Co-Curriculum Unit before registering.

Year One : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITP 1123	Data Stucture and Algorithm	P	2	2	3	BITP 1113
BITS 1323	Cloud Computing Fundamental	P	2	2	3	
BITS 2343	Computer Networks	P	2	2	3	
BITS 1513	Cloud Computing Services	P	2	2	3	
BITI 1213	Linear Algebra and Discrete Mathematics	P	2	2	3	
BITS 1235	Linux System Management and Network Services	K	4	4	5	
				Total Credits	**20**	

Year One : Semester 3

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITU 2913	Workshop I	P	1[1]		3	BITP 1113
BITS 2535	Enterprise Network Technology and Application	K	4	4	5	
			Total Credits		**8**	

[1]Average official contact hours per week.

Year Two : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLHW 2772	*Penghayatan Etika dan Peradaban*[1]	W	2	0	2	
BKK* ***1	Co-Curriculum II[2]	W	0	3	1	
BITU 3923	Workshop II	P	1[3]		3	BITU 2913
BITS 2543	Compilation Technology	P	2	2	3	
BITS 2433	Cloud Security Fundamental	P	2	2	3	
BITS 2135	Storage Technology and Application	K	4	4	5	
			Total Credits		**17**	

[1]For International Students, change to BLHW 2752 Malaysian Culture.
[2]This course can be taken in any semester. Please refer to Co-Curriculum Unit before registering.
[3]Average official contact hours per week.

Year Two : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLLW 2152	Academic Writing	W	2	0	2	BLLW 1142
BLHW 2792	Kursus Integriti Anti Rasuah	W	2	0	2	
BITS 2555	Virtualization Technology	K	4	4	5	
BITS 2565	Python Programming	K	4	4	5	BITP 1113
BIT* ***5	Free Module 1	E	4	4	5	
				Total Credits	**19**	

Year Two : Semester 3

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITS 3565	OpenStack Cloud Platform Technology	K	4	4	5	
BITU 3974	Final Year Project 1	P	1[1]		4	BITU 3923
				Total Credits	**9**	

[1]Average official contact hours per week.

Year Three : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLLW 3162	English for Professional Interaction	W	2	0	2	BLLW 2152
BITS 3575	Automated Operation and Maintenance	K	4	4	5	
BIT* ***5	Free Module 2	E	4	4	5	
BLLW 12*2	Third Language[1]	W	2	0	2	
BITU 3984	Final Year Project 2	P	1[2]		4	BITU 3974
			Total Credits		**18**	

[1]For International Students, change to BLLW 1282 Malay 2.
[2]Average official contact hours per week.

Year Three : Semester 2

Course Code	Course Name	Comp Code	Duration (weeks)	Crdt	Pre-requisite
BITU 3926	Industrial Training	P	24	6 (Attend & Pass)	BITU 3984[1]
BITU 3946	Industrial Training Report	P	24	6	BITU 3984[1]
			Total Credits	**12**	

[1]Completed all Courses.

List of Courses in Free Module

Students must complete the Free Module (2 courses, 5 credits each). The list of Free Module courses below may change from time to time based on industry needs.

Course Code	Course Name	Contact Hrs		Crdt	Pre- requisite
		Lect	Lab		
List of Third Language Courses (For Local Students)					
BLLW 1212	Arabic 1	2	0	2	
BLLW 1222	Mandarin 1	2	0	2	
BLLW 1232	Japanese 1	2	0	2	
BLLW 1242	Korean 1	2	0	2	
BLLW 1252	German 1	2	0	2	
List of Courses in Free Module					
BITS 2355	Network Analysis and Design	4	4	5	
BITS 3375	Network Project Management	4	4	5	
BITS 3535	Wireless Networks and Mobile Computing	4	4	5	

BITM
BACHELOR OF COMPUTER SCIENCE
(INTERACTIVE MEDIA)
WITH HONOURS

Bachelor of Computer Science (Interactive Media) with Honours

Programme Details

Bachelor of Computer Science (Interactive Media) academic programme is offered to prepare graduates with a thorough understanding and superior skills in information technology particularly in the area of multimedia.

The learning outcomes of this programme are to equip the students with the basic knowledge in every aspect of information technology, to provide the students with sufficient theoretical knowledge and skills to apply the knowledge learnt through the practiced concept, enable the students to be able to apply the interactivity concept in the design and development of multimedia-based application, to equip the students with deep understanding and high skills in the development and management of web sites, animation, computer graphics, virtual reality and development of computer games, as well as to produce graduates that are capable to develop high quality interactive media products and multimedia applications which fulfill the industry specifications.

Graduate Competency

With the implementation of a TVET-aligned curriculum, at the end of this program, all Bachelor of Computer Science (Interactive Media) students will gain the following competencies:

1. Apply computing and multimedia principles to analyze, design, and develop interactive systems, applications, and experiences aligned with current industry standards and emerging technologies.
2. Construct, prototype, and evaluate interactive media content and systems using creative coding, real-time rendering, animation, extended reality (XR), and human-computer interaction techniques to ensure functionality, usability, and user engagement.
3. Collaborate effectively in multidisciplinary teams by integrating visual design, programming, narrative, and media production workflows—applying strong communication, project management, and problem-solving skills across development pipelines.

4. Operate, maintain, and integrate interactive media tools and platforms, including industry-standard engines, design software, and hardware interfaces such as motion capture systems, XR devices, and real-time production tools.
5. Produce project documentation, interactive design artefacts, and technical assets while practicing continuous professional development through reflective media practice and adopting future-facing technologies like AI-generated content and immersive storytelling.

Programme Learning Outcomes (PLO)

The aim of the Bachelor of Computer Science (Interactive Media) programme is to produce students with the following characteristics:

1. Analyse computing problems using computer science knowledge.
2. Apply appropriate computer science solutions for interactive media development problems.
3. Construct solutions using appropriate computing methods for complex problems.
4. Demonstrate social skills and responsibilities in engaging with society, community and stakeholders.
5. Exhibit effective communication through oral and written modes in engaging with society, community and stakeholders.
6. Deploy a broad range of software or tools to solve industry computing problems.
7. Apply numeracy skills to solve computing problems.
8. Demonstrate leadership characteristics and contribute independently as individual or member in a team to solve computing problems.
9. Demonstrate capabilities in information management, lifelong learning and independent study.
10. Utilise an entrepreneurial mindset in delivering solutions.
11. Uphold professionalism, attitudes and ethical values in workplace.

Career Prospects

There is a wide range of career opportunities in the field of computer science and information technology available for graduates who are specialised in Interactive Media. Among the career opportunities are:

1. Interactive Media Developer
2. UI/UX Designer
3. Game Developer (Front-end)
4. Multimedia Programmer
5. Visual Effects and Motion Graphics Artist
6. Augmented / Virtual Reality Developer
7. Creative Technologist
8. Digital Content Producer / Editor
9. Web & Front-End Developer (Interactive Web)
10. Technical Artist / Pipeline Technical Director (Game/Animation Studios)

Other than that, the graduates may also choose career based on their basic knowledge in Computer Science and ICT, such as programmer and information system officer or system analyst.

Curriculum Structure

Students are required to complete a minimum of 120 credits to graduate with a Bachelor of Computer Science (Interactive Media) with Honours. The programme components are as follows:

Bachelor's Degree (Computer Science) Minimum graduating credit - 120		
Component	**Component's Code**	**Credits**
University Compulsory	W	18
Core Computing	P	18
Discipline Core	P	36
Specialization	K	24
Free module	E	6
Final Year Project	P	6
Industrial Training	P	12
	Total Credits	**120**

Curriculum Structure for Each Semester

Year One : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLHW 1762	Philosophy and Current Issues	W	2	0	2	
BKK* ***1	Co-Curriculum I[1]	W	0	3	1	
BITI 1233	Discrete Structures	P	2	2	3	
BITP 1323	Database	P	2	2	3	
BITP 1113	Programming Technique	P	2	2	3	
BITS 1123	Computer Organisation and Architecture	P	2	2	3	
BLLW 1142	English for Academic Purposes	W	2	0	2	
				Total Credits	**17**	

[1]This course can be taken in any semester. Please refer to Co-Curriculum Unit before registering.

Year One : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLLW 2152	Academic Writing	W	2	0	2	BLLW 1142
BLHW 2792	Kursus Integriti Anti Rasuah	W	2	0	2	
BKK* ***1	Co-Curriculum II[1]	W	0	3	1	
BITP 1223	System Analysis and Design	P	2	2	3	
BITP 1123	Data Stucture and Algorithm	P	2	2	3	BITP 1113
BITS 1313	Data Communication and Networking	P	2	2	3	
BITM 2123	Digital Audio and Video Technology	K	2	2	3	
				Total Credits	**17**	

[1]This course can be taken in any semester. Please refer to Co-Curriculum Unit before registering.

Year Two : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLHW 2772	*Penghayatan Etika dan Peradaban*[1]	W	2	0	2	
BITU 2913	Workshop I	K	1[2]		3	BITP 1113
BITP 3113	Object-oriented Programming	P	2	2	3	
BITS 1213	Operating System	P	2	2	3	
BITM 1213	Graphic Visualization and Computational Modelling	P	2	2	3	
BITM 2213	Computer Animation	K	2	2	3	
BITM 2313	Human Computer Interaction	P	2	2	3	
			Total Credits		**20**	

[1]For International Students, change to BLHW 2752 Malaysian Culture.
[2]Average official contact hours per week.

Year Two : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITP 2223	Software Requirement and Design	P	2	2	3	
BITI 1113	Artificial Intelligence	P	2	2	3	
BITP 2113	Algorithm Analysis	P	2	2	3	BITP 1113
BITM 3213	Interactive Computer Graphics	K	2	2	3	
BLLW12*2	Third Language[1]	W	2	0	2	
			Total Credits		**14**	

[1]For International Students, change to BLLW 1282 Malay 2.

Year Three : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLLW 3162	English for Professional Interaction	W	2	0	2	BLLW 2152
BITU 3923	Workshop II	K	1[1]		3	BITU 2913
BITP 3153	Platform-Based Development	P	2	2	3	
BITS 3423	Information Technology Security	P	2	2	3	
BITM 2113	Web Application Development	K	2	2	3	
BITM 3113	Interactive Media Project Management	K	2	2	3	
B*** ***3	Free Module 1	E	2	2	3	
				Total Credits	**20**	

[1]Average official contact hours per week.

Year Three : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BTMW 4012	Technology Entrepreneurship	W	2	0	2	
BITU 3973	Final Year Project I	P	1[1]		3	BITU 3923
BITP 3143	Distributed and Parallel Application Development	P	2	2	3	
BITP 3463	Professional Practices in Computing	P	2	2	3	
BITM 3763	Extended Reality Technology	K	2	2	3	
B*** ***3	Free Module 2	E	2	2	3	
				Total Credits	**17**	

[1]Average official contact hours per week.

Year Three : Special Semester

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITU 3983	Final Year Project II	P	1[1]		3	BITU 3973
			Total Credits		**3**	

[1]Average official contact hours per week.

Year Four : Semester 1

Course Code	Course Name	Comp Code	Duration (weeks)	Crdt	Pre-requisite
BITU 3926	Industrial Training	P	24	6 (Attend & Pass)	BITU 3983[1]
BITU 3946	Industrial Training Report	P	24	6	BITU 3983[1]
			Total Credits	**12**	

[1]Completed all Courses.

List of Courses in Free Module

Students must complete the Free Module (2 courses, 3 credits each). The list of Free Module courses below may change from time to time based on industry needs.

Course Code	Course Name	Contact Hrs		Crdt	Pre- requisite
		Lect	Lab		
List of Third Language Courses (For Local Students)					
BLLW 1212	Arabic 1	2	0	2	
BLLW 1222	Mandarin 1	2	0	2	
BLLW 1232	Japanese 1	2	0	2	
BLLW 1242	Korean 1	2	0	2	
BLLW 1252	German 1	2	0	2	
List of Courses in Free Module					
BTMT 3323	Contemporary Business Management	2	2	3	
BTMP 3523	Industrial Leadership	2	2	3	
BTMT 3383	Social Entrepreneurship	2	2	3	
BTMP 3243	Strategic Innovation Management	2	2	3	
BTMT 3303	Seminar in Global Issues and New Business Trends	2	2	3	
BTMT 3303	Risk Management	2	2	3	
BTMP 2083	Franchise and Retail Management	2	2	3	
BITI 2223	Machine Learning	2	2	3	
BITP 3453	Mobile Application Development	2	2	3	
BITS 2573	Cloud Computing Foundation	2	2	3	
BITM 2323	Digital Imaging for Multimedia	2	2	3	
BITE 3623	Motion Graphics	2	2	3	
BITE 3713	Multi-platform Game	2	2	3	
BITP 3353	Multimedia Database	2	2	3	
BITE 3723	Game Mechanics	2	2	3	
BITE 3523	Game Physics	2	2	3	
BITE 3633	Game Play	2	2	3	

BITS
BACHELOR OF COMPUTER SCIENCE
(SOFTWARE DEVELOPMENT)
WITH HONOURS

Bachelor of Computer Science (Software Development) with Honours

Programme Details

The Bachelor in Computer Science (Software Development) degree course is offered in order to produce knowledgeable and highly skilled graduates in the field of information technology and communication (ICT). Graduates pursuing the programme are equipped with the necessary knowledge and specialized skills in engineering and software development which could meet the industrial needs in the field. This includes the ability to analyze, synthesize, design complex systems, maintain, test, control software quality and manage software projects.

Graduate Competency

With the implementation of TVET curriculum, at the end of this program, all BITS students will gain the following competencies:

1. Apply software engineering principles to analyze and develop software solutions by evaluating user and system requirements and designing reliable solutions in line with industry standards.
2. Construct, test, and validate computer software systems using current tools, methodologies, and best practices to ensure functionality and performance.
3. Collaborate effectively in multidisciplinary teams by applying communication, coordination, and problem-solving skills in joint technical projects.
4. Maintain, troubleshoot, and enhance software systems by identifying and correcting errors, adapting to new hardware, and improving overall system performance.
5. Produce technical documentation and engage in lifelong learning through effective documentation practices and continuous professional development in line with evolving technologies.

Programme Learning Outcomes (PLO)

The aim of the Bachelor of Computer Science (Software Development) programme is to produce students with the following characteristics:

1. Analyse computing problems using computer science knowledge.
2. Apply appropriate computer science solutions for software development problems.
3. Construct solutions using appropriate computing methods for complex problems.
4. Demonstrate social skills and responsibilities in engaging with society, community and stakeholders.
5. Exhibit effective communication through oral and written modes in engaging with society, community and stakeholders.
6. Deploy a broad range of software or tools to solve industry computing problems.
7. Apply numeracy skills to solve computing problems.
8. Demonstrate leadership characteristics and contribute independently as individual or member in a team to solve computing problems.
9. Demonstrate capabilities in information management, lifelong learning and independent study.
10. Utilise an entrepreneurial mindset in delivering solutions.
11. Uphold professionalism, attitudes and ethical values in workplace.

Career Prospects

There is a wide range of career opportunities (both in the government sector and private sector) in the field of computer science and information technology available for graduates who are specialised in software development. Among the career opportunities are:

1. Software Developer
2. Computer System Analyst
3. Multimedia and Web Developer
4. Application Programmer
5. Software Tester
6. Application Assurance Engineer
7. IT Auditor
8. Solution Architect
9. ICT Manager

Other than that, the graduates also can further their studies at postgraduate level.

Curriculum Structure

Students are required to complete a minimum of 120 credits to graduate with a Bachelor of Computer Science (Software Development) with Honours. The programme components are as follows:

Bachelor's Degree (Computer Science) Minimum graduating credit - 120		
Component	**Component's Code**	**Credits**
University Compulsory	W	18
Core Computing	P	18
Discipline Core	P	36
Specialization	K	24
Free module	E	6
Final Year Project	P	6
Industrial Training	P	12
	Total Credits	**120**

Curriculum Structure for Each Semester

Year One : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLHW 1762	Philosophy and Current Issues	W	2	0	2	
BLLW 1142	English for Academic Purposes	W	2	0	2	
BITP 1323	Database	P	2	2	3	
BITP 1113	Programming Technique	P	2	2	3	
BITS 1123	Computer Organisation and Architecture	P	2	2	3	
BITS 1313	Data Communication and Networking	P	2	2	3	
BKK* ***1	Co-Curriculum I[1]	W	0	3	1	
				Total Credits	**17**	

[1]This course can be taken in any semester. Please refer to Co-Curriculum Unit before registering.

Year One : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLHW 2792	Kursus Integriti Anti Rasuah	W	2	0	2	
BLHW 2772	*Penghayatan Etika dan Peradaban*[1]	W	2	0	2	
BITS 1213	Operating System	P	2	2	3	
BITP 1223	System Analysis and Design	P	2	2	3	
BITI 1113	Artificial Intelligence	P	2	2	3	
BITP 1123	Data Stucture and Algorithm	P	2	2	3	BITP 1113
BITI 1233	Discrete Structures	P	2	2	3	
				Total Credits	**19**	

[1]For International Students, change to BLHW 2752 Malaysian Culture.

Year Two : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BKK* ***1	Co-Curriculum II[1]	W	0	3	1	
BLLW12*2	Third Language[2]	W	2	0	2	
BITP 2223	Software Requirement and Design	P	2	2	3	
BITP 3113	Object-oriented Programming	P	2	2	3	
BITM 1213	Graphic Visualization and Computational Modelling	P	2	2	3	
BITP 2113	Algorithm Analysis	P	2	2	3	BITP 1113
BITU 2913	Workshop I	K	1[3]		3	BITP 1113
			Total Credits		**18**	

[1]This course can be taken in any semester. Please refer to Co-Curriculum Unit before registering.
[2]For International Students, change to BLLW 1282 Malay 2.
[3]Average official contact hours per week.

Year Two : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLLW 2152	Academic Writing	W	2	0	2	BLLW 1142
BTMW 4012	Technology Entrepreneurship	W	2	0	2	
BITP 3153	Platform-Based Development	P	2	2	3	
BITM 2313	Human Computer Interaction	P	2	2	3	
BITP 3253	Software Verification and Validation	K	2	2	3	
BITP 3173	Internet of Things Development	K	2	2	3	
B*** ***3	Free Module 1	E	2	2	3	
			Total Credits		**19**	

Year Three : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLLW 3162	English for Professional Interaction	W	2	0	2	BLLW 2152
BITP 3423	Special Topic in Software Engineering	K	2	2	3	
BITU 3923	Workshop II	K	1[1]		3	BITU 2913
BITS 3423	Information Technology Security	P	2	2	3	
BITP 3463	Professional Practices in Computing	P	2	2	3	
B*** ***3	Free Module 2	E	2	2	3	
				Total Credits	**17**	

[1]Average official contact hours per week.

Year Three : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITP3143	Distributed and Parallel Application Development	P	2	2	3	
BITP 3453	Mobile Application Development	K	2	2	3	
BITP 3223	Software Project Management	K	2	2	3	
BITP 3163	Software Development and Operations	K	2	2	3	
BITU 3973	Final Year Project I	P	1[1]		3	BITU 3923
				Total Credits	**15**	

[1]Average official contact hours per week.

Year Three : Special Semester

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITU 3983	Final Year Project II	P	1[1]		3	BITU 3973
			Total Credits		**3**	

[1]Average official contact hours per week.

Year Four : Semester 1

Course Code	Course Name	Comp Code	Duration (weeks)	Crdt	Pre-requisite
BITU 3926	Industrial Training	P	24	6 (Attend & Pass)	BITU 3983[1]
BITU 3946	Industrial Training Report	P	24	6	BITU 3983[1]
			Total Credits	**12**	

[1]Completed all Courses.

For 3u1i Mode (Starting Year 3 Semester 2)
The following structure applies to students who have been approved for the 3u1i mode.

Year Three : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITP 3143i	Distributed and Parallel Application Development	P	2	2	3	
BITP 3453i	Mobile Application Development	K	2	2	3	
BITP 3223i	Software Project Management	K	2	2	3	
BITP 3163i	Software Development and Operations	K	2	2	3	
BITU 3973i	Final Year Project I	P	1[1]		3	BITU 3923
			Total Credits		**15**	

[1]Average official contact hours per week.

Year Three : Semester 3

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITU 3983i	Final Year Project II	P	1[1]		3	BITU 3973i
			Total Credits		**3**	

[1]Average official contact hours per week.

Year Four : Semester 1

Course Code	Course Name	Comp Code	Duration (weeks)	Crdt	Pre-requisite
BITU 3926i	Industrial Training	P	24	6 (Attend & Pass)	BITU 3983[1]
BITU 3946i	Industrial Training Report	P	24	6	BITU 3983[1]
			Total Credits	**12**	

[1]Completed all Courses.

List of Courses in Free Module

Students must complete the Free Module (2 courses, 3 credits each). The list of Free Module courses below may change from time to time based on industry needs.

Course Code	Course Name	Contact Hrs		Crdt	Pre- requisite
		Lect	Lab		
List of Third Language Courses (For Local Students)					
BLLW 1212	Arabic 1	2	0	2	
BLLW 1222	Mandarin 1	2	0	2	
BLLW 1232	Japanese 1	2	0	2	
BLLW 1242	Korean 1	2	0	2	
BLLW 1252	German 1	2	0	2	
List of Courses in Free Module					
BITP 2323	Database Administration	2	2	3	BITP 1323
BITP 3233	Strategic Information System Planning	2	2	3	
BITP 3483	Geographic Information System	2	2	3	
BITS 2313	Local Area Network	2	2	3	BITS 1313
BITI 2213	Knowledge-Based System	2	2	3	
BTMT 3343	Technopreneurship Growth Strategy	2	2	3	
BTMT 3323	Contemporary Business Management	2	2	3	
BTMT 3383	Social Entrepreneurship	2	2	3	
BTMP 3243	Strategic Innovation Management	2	2	3	
BITM 1123	Interactive Media Authoring	2	2	3	
BITM 2113	Web Application Development	2	2	3	
BITS 2573	Cloud Computing Foundation	2	2	3	
BMTU 1093	Business Statistic	2	2	3	
BITS 3343	Fiber Optic	2	2	3	

BITE
BACHELOR OF
INFORMATION TECHNOLOGY
(GAME TECHNOLOGY)
WITH HONOURS

BITE Bachelor of Information Technology (Game Technology) with Honours

Programme Details

Bachelor of Information Technology (Game Technology) academic programme is offered to produce knowledgeable and skilful graduates in information technology particularly in the area of computer games technology that includes both entertainment and educational 'serious games' industry.

The learning outcomes of this programme are to equip the students with the basic knowledge in every aspect of computer games technology, to provide the students with sufficient theoretical knowledge and skills to apply the knowledge learnt through the practiced concept, to enable the students to be able to apply the interactivity concept in the design and development of computer games, to equip the students with deep understanding and high skills in the development and management of computer games,as well as to produce graduates that are capable to develop high quality interactive games products and games applications which fulfil the industry specifications.

Programme Learning Outcomes (PLO)

The aim of the Bachelor of Information Technology (Game Technology) programme is to produce students with the following characteristics:

1. Able to apply knowledge of computer science and information technology.
2. Able to analyse, design and develop information and communication technology applications.
3. Able to apply interactivity concept in designing and developing interactive games technique.
4. Able to apply the knowledge and practice of interactive game development process using various software and tools.
5. Able to develop interactive games with the quality that fulfils industry specifications.
6. Able to resolve problems in creative way and able to communicate effectively.
7. Able to contribute individually or in a team in various disciplines and domains.

8. Able to lead with ethics and have entrepreneurship skills.
9. Able to perform continuous self-learning to obtain knowledge and skills.

Career Prospects

This course is offered to produce graduates who are highly knowledgeable and skilled in the field of computer games technology. The graduates are well equipped with knowledge and specific skills such as computer game programming, design and develop various types of computer games, the principle of games, web-based games, project management as well as 2D and 3D game development. Graduates of this course are able to contribute their expertise and skills to the education and entertainment industry such as game-based education and game content development.

Curriculum Structure

Students are required to complete a minimum of 120 credits to graduate with a Bachelor of Information Technology (Game Technology) with Honours. The programme components are as follows:

Bachelor's Degree (Information Technology) Minimum graduating credit - 120		
Component	**Component's Code**	**Credits**
General Module	W	18
Core Module	P	33
Specialisation Module	K	42
Final Year Project	P	6
Industrial Training	P	12
Free Module	E	9
	Total Credits	**120**

Curriculum Structure for Each Semester

Year One : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITE 1513	Programming Fundamentals	P	2	2	3	
BITI 1213	Linear Algebra and Discrete Mathematics	P	2	2	3	
BITS 1123	Computer Organisation and Architecture	P	2	2	3	
BITS 1213	Operating System	P	2	2	3	
BITE 1723	Game Design Principle	K	2	2	3	
BLLW 12*2	Third Language [1]	W	2	0	2	
				Total Credits	**17**	

[1]For International Students, change to BLLW 1282 Malay 2.

Year One : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLHW 1762	Philosophy and Current Issues	W	2	0	2	
BKK* ***1	Co-Curriculum I[1]	W	0	3	1	
BLLW 1142	English for Academic Purposes	W	2	0	2	
BITI 1223	Calculus and Numerical Methods	P	2	2	3	
BITP 1323	Database	P	2	2	3	
BITE 1523	Computer Game Programming	K	2	2	3	
BITE 1613	2D Game Development	K	2	2	3	
				Total Credits	**17**	

[1]This course can be taken in any semester. Please refer to Co-Curriculum Unit before registering.

Year Two : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLHW 2772	*Penghayatan Etika dan Peradaban*[1]	W	2	0	2	
BLLW 2152	Academic Writing	W	2	0	2	BLLW 1142
BKK* ***1	Co-Curriculum II[2]	W	0	3	1	
BITU 2913	Workshop I	P	1[3]		3	BITE 1513
BITS 1313	Data Communication and Networking	P	2	2	3	
BITE 1713	Game Architecture	K	2	2	3	
BITE 2513	Game Engine Development I	K	2	2	3	
			Total Credits		**17**	

[1]For International Students, change to BLHW 2752 Malaysian Culture.
[2]This course can be taken in any semester. Please refer to Co-Curriculum Unit before registering.
[3]Average official contact hours per week.

Year Two : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLHW 2792	Kursus Integriti Anti Rasuah	W	2	0	2	
BITI 2233	Statistics and Probability	P	2	2	3	
BITM 2313	Human Computer Interaction	P	2	2	3	
BITE 2123	Artificial Intelligence for Games	K	2	2	3	
BITE 2613	Interactive 3D Animation	K	2	2	3	
BITE 2633	Audio Video Production for Game	K	2	2	3	
B*** ***3	Free Module 1	E	2	2	3	
			Total Credits		**20**	

Year Three : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLLW 3162	English for Professional Interaction	W	2	0	2	BLLW 2152
BITU 3923	Workshop II	K	1[1]		3	BITU 2913
BITE 2523	Web Game Development	K	2	2	3	
BITE 3513	Game Engine Development II	K	2	2	3	
BITE 3713	Multi-platform Game	K	2	2	3	
B*** ***3	Free Module 2	E	2	2	3	
				Total Credits	**17**	

[1]Average official contact hours per week.

Year Three : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BTMW 4012	Technology Entrepreneurship	W	2	0	2	
BITS 3423	Information Technology Security	P	2	2	3	
BITU 3973	Final Year Project I	P	1[1]		3	BITU 3923
BITE 2623	3D Game Development	K	2	2	3	
BITE 3613	Game Project Management	K	2	2	3	
B*** ***3	Free Module 3	E	2	2	3	
				Total Credits	**17**	

[1]Average official contact hours per week.

Year Three : Special Semester

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITU 3983	Final Year Project II	P	1[1]		3	BITU 3973
			Total Credits		**3**	

[1]Average official contact hours per week.

Year Four : Semester 1

Course Code	Course Name	Comp Code	Duration (weeks)	Crdt	Pre-requisite
BITU 3926	Industrial Training	P	24	6 (Attend & Pass)	BITU 3983[1]
BITU 3946	Industrial Training Report	P	24	6	BITU 3983[1]
			Total Credits	**12**	

[1]Completed all Courses.

List of Courses in Free Module

Students must complete the Free Module (3 courses, 3 credits each). The list of Free Module courses below may change from time to time based on industry needs.

Course Code	Course Name	Contact Hrs		Crdt	Pre- requisite
		Lect	Lab		
List of Third Language Courses (For Local Students)					
BLLW 1212	Arabic 1	2	0	2	
BLLW 1222	Mandarin 1	2	0	2	
BLLW 1232	Japanese 1	2	0	2	
BLLW 1242	Korean 1	2	0	2	
BLLW 1252	German 1	2	0	2	
List of Courses in Free Module (Subject to course availability)					
BITE 3523	Game Physics	2	2	3	
BITE 3623	Motion Graphics	2	2	3	
BITE 3633	Game Play	2	2	3	
BITE 3723	Game Mechanics	2	2	3	
BITS 3333	Multimedia Networking	2	2	3	

DCS
DIPLOMA IN
COMPUTER SCIENCE

DCS Diploma in Computer Science

Programme Details

Diploma in Computer Science - DCS deals with designing innovative methodologies and sophisticated tools for developing software systems. Students are exposed to various techniques of analysing user requirements and specifications, as well as design and implementation of software systems. Some of the core courses include object-oriented programming, database systems, software analysis and design and human computer interaction.

Graduate Competency

The aim of the Diploma in Computer Science programme is to produce students with the following characteristics:

1. Apply programming principles and problem-solving techniques to design, model, and implement software applications. Students will be able to use structured and object-oriented approaches, applying tools such as UML, flowcharts, and low-code solutions to deliver effective programs in line with industry standards.
2. Analyse user requirements and develop system solutions by applying software development life cycle (SDLC) methodologies, structured and object-oriented modelling, and database design principles. Graduates will be able to transform business needs into reliable and functional systems through requirement gathering, process modelling, and systematic documentation.
3. Develop web and mobile applications by integrating front-end and back-end technologies with relevant frameworks. Emphasis is placed on user interface and user experience (UI/UX) principles to ensure applications are user-friendly, adaptable, and aligned with modern industry practices.
4. Install, configure, and secure networks and computer systems by applying knowledge of data communication, network technologies, and computer security services. Students will be able to troubleshoot, monitor, and protect systems using appropriate tools and methods to ensure system reliability and data safety.
5. Communicate and collaborate effectively in multidisciplinary teams, demonstrating professional skills in documentation, report writing, and presentations. Graduates will also embrace

lifelong learning, adaptability, and accountability to remain relevant with evolving ICT technologies and future career opportunities.

Programme Learning Outcomes (PLO)

The aim of the Diploma in Computer Science programme is to produce students with the following characteristics:

1. Explain a broad range of concepts, principles and theories to address issues in Computer Science discipline.
2. Apply appropriate tools and procedures to produce computing solutions for well-defined and routine problems.
3. Perform appropriate skills to support and develop computing solutions for related job functions.
4. Demonstrate effective interaction in engaging with stakeholders and society within an organisation.
5. Exhibit effective communication through oral and written modes in engaging with stakeholders and society within an organisation.
6. Use a range of computing software or tools to solve problems related to job functions.
7. Apply appropriate numerical skills in computing to solve problems related to job functions.
8. Demonstrate supervisory skills to manage teams in performing job functions with autonomy and responsibility.
9. Commit to self-improvement initiatives for independent and lifelong learning in academic and career development.
10. Demonstrate an entrepreneurial mindset in delivering solutions.
11. Commit to professionalism and ethical values in performing job and organisational functions.

Career Prospects

There is a wide range of career opportunities in the field of computer science and information technology available for graduates of Diploma in Computer Science. Among the career opportunities are:

1. Programmers / Analyst Programmers / Multimedia Programmers.
2. Network Administrators.
3. Software Developers.
4. Any Computer Science related positions.

Other than that, the graduates also have the opportunity to further their studies at degree level in UTeM.

Curriculum Structure

Students are required to complete a minimum of 90 credits to graduate with a Diploma in Computer Science. The programme components are as follows:

Diploma in Computer Science Minimum graduating credit - 90		
Component	**Component's Code**	**Credits**
University Compulsory	W	14
Core Computing	P	33
Discipline Core	K	31
Final Year Project	P	4
Industrial Training	P	8
	Total Credits	**90**

Curriculum Structure for Each Semester

Year One : Special Semester

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
DLLW 1112	Foundation English	W	2	0	2	
DLHW 2722	Kursus Integriti Anti Rasuah	W	2	0	2	
DLHW 2772	Appreciation of Ethics and Civilizations	W	2	0	2	
				Total Credits	**6**	

Year One : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
DKK* ***1	Co-Curriculum I[1]	W	0	3	1	
DTMW 1012	Fundamentals of Entrepreneurial Acculturation	W	2	0	2	
DITI 1253	Discrete Mathematics	P	2	2	3	
DITP 1113	Programming 1	P	2	2	3	
DITP 1333	Database	P	2	2	3	
DITM 1413	Ethics in Computing	P	2	2	3	
DITS 1133	Computer Organisation and Architecture	P	2	2	3	
				Total Credits	**18**	

[1]This course can be taken in any semester. Please refer to Co-Curriculum Unit before registering.

Year One : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
DKK* ***1	Co-Curriculum II[1]	W	0	3	1	
DLLW 2122	English for Effective Communication	W	1	2	2	
DITI 1263	Calculus and Algebra	P	2	2	3	
DITP 2213	System Analysis and Design	P	2	2	3	
DITS 2213	Operating System	P	2	2	3	
DITM 1313	Human Computer Interaction	K	2	2	3	
DITP 1123	Programming 2	K	2	2	3	DITP 1113
				Total Credits	**18**	

[1]This course can be taken in any semester. Please refer to Co-Curriculum Unit before registering.

Year One : Semester 3

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
DITS 2313	Data Communication and Networking	P	2	2	3	
DITP 2113	Data Structure and Algorithm	K	2	2	3	DITP 1113 DITP 1123
				Total Credits	**6**	

Year Two : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
DLLW 3132	English for Marketability	W	2	0	2	
DITI 2233	Statistics and Probability	P	2	2	3	
DITS 2413	Computer Security	P	2	2	3	
DITM 2123	Web Programming	K	2	2	3	
DITP 3113	Object-oriented Programming	K	2	2	3	DITP 1113
DITU 3934	System Development Workshop	K	0	8	4	DITP 2213
				Total Credits	**18**	

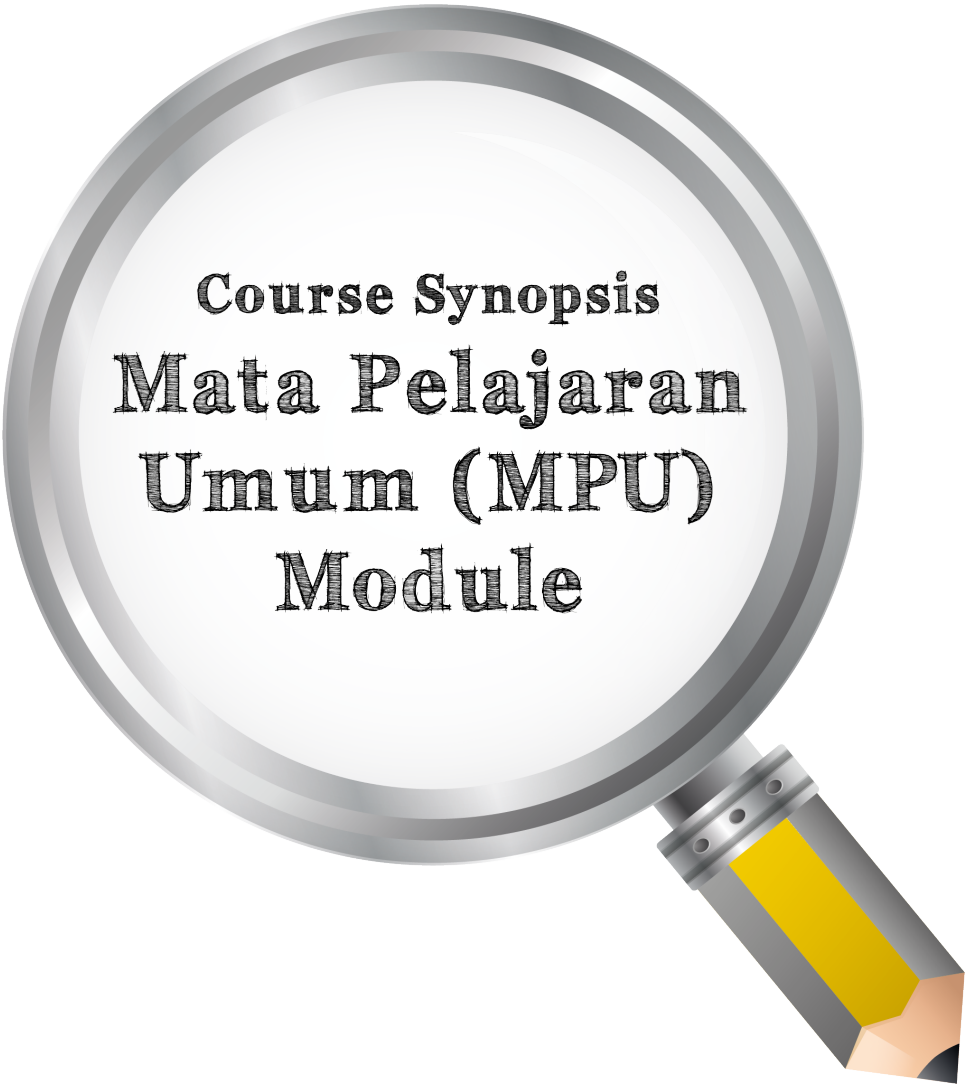
Year Two : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
DITI 3133	Applied Artificial Intelligence	K	2	2	3	
DITP 2133	Platform-based Development	K	2	2	3	
DITP 3123	Distributed and Parallel Application Development	K	2	2	3	
DITS 2223	System Fundamentals	K	2	2	3	
DITU 3964	Diploma Project	P	1[1]		4	DITU 3934
				Total Credits	**16**	

[1]Average official contact hours per week.

Year Three : Semester 1

Course Code	Course Name	Comp Code	Duration (weeks)	Crdt	Pre-requisite
DITU 2346	Industrial Training	P	16	6	
DITU 2362	Industrial Training Report	P	16	2	
			Total Credits	**8**	


Course Synopsis
Mata Pelajaran Umum (MPU) Module

List of University Compulsory Courses

Course Code	Course Name	BITC	BITD	BITA	BITM	BITS	BITE	DCS
BLLW 2152	Academic Writing	√	√	√	√	√	√	
BKK* ***1	Co-Curriculum I	√	√	√	√	√	√	
BKK* ***1	Co-Curriculum II	√	√	√	√	√	√	
BLLW 1142	English for Academic Purposes	√	√	√	√	√	√	
BLLW 3162	English for Professional Interaction	√	√	√	√	√	√	
BLHW 2792	Kursus Integriti Anti Rasuah	√	√	√	√	√	√	
BLHW 2772	Penghayatan Etika dan Peradaban	√	√	√	√	√	√	
BLHW 1762	Philosophy and Current Issues	√	√	√	√	√	√	
BTMW 4012	Technology Entrepreneurship	√	√		√	√	√	
BLLW 12*2	Third Language	√	√	√	√	√	√	
DLLW 1112	Foundation English							√
DLHW 2772	Appreciation of Ethics and Civilizations							√
DKK* ***1	Co-Curriculum I							√
DKK* ***1	Co-Curriculum II							√
DLLW 2122	English for Effective Communication							√
DLLW 3132	English for Marketability							√
DTMW 1012	Fundamentals of Entrepreneurial Acculturation							√
DLHW 2722	Kursus Integriti Anti Rasuah							√
	Total number of courses should be taken	10	10	9	10	10	10	8

BLLW 2152 Academic Writing

This course aims to equip the students with the skills to communicate clear and detailed viewpoints in writing. The students are expected to have a stand on topics of their fields by providing advantages and disadvantages to support their arguments. From time to time, consultations with the students will be conducted throughout the completion of their assignments. This serves as the formative evaluation in the course. Grammar components are embedded in the course to support the required writing skills. Blended learning is incorporated in this course.

BLLW 1142 English for Academic Purposes

This course aims to develop students' reading skills and grammar. A variety of academic reading texts and reading skills are explored to facilitate students' comprehension of the texts. These reading skills are also necessary in assisting students to master study skills. Grammar elements are taught in context to develop students' accuracy in the use of the language. This course also includes elements of blended learning.

BLLW 3162 English for Professional Interaction

This course which is designed based on a blended and student-centred learning approach aims to develop students' listening skills as well as communication skills and strategies. Among the elements covered are professional interactions that include group discussion and public speaking. Students are also required to express ideas with relevant examples in public speaking and online assessments. They are also exposed to the rudiments of grammar implicitly via the communicative activities.

DLHW 2722 Kursus Integriti dan Anti Rasuah

Kursus Integriti dan Anti Rasuah (KIAR) ini bertujuan memperkenalkan kepada para pelajar mengenai amalan integriti dan kepentingan membanteras rasuah dalam kehidupan masyarakat dan organisasi. Tumpuan kursus memfokuskan kepada nilai integriti dan pencegahan rasuah, isu, permasalahan dan cabaran pengurusan jenayah rasuah dalam masyarakat dan organisasi. Aktiviti pembelajaran merangkumi perbincangan dalam kumpulan, pelaporan dan kerja lapangan dalam masyarakat pelbagai sektor (sektor awam, swasta, NGO, politik dan pelajar).

BLHW 2772 *Penghayatan Etika dan Peradaban*

Kursus ini membincangkan tentang konsep ilmu, etika serta peradaban yang berunsurkan perbandingan sistem, kemajuan sosial dan kebudayaan merentas budaya yang pelbagai di Malaysia. Selain itu, kursus ini juga menekankan tentang perbincangan isu kontemporari berkaitan bidang ekonomi, politik, sosial, budaya dan alam sekitar mengikut acuan etika dan peradaban. Pendekatan kursus ini meliputi perbandingan sistem, tahap perkembangan, kemajuan sosial dan kebudayaan merentas budaya bagi melahirkan manusia yang mempunyai nilai-nilai positif.

BLHW 1762 Philosophy and Current Issues

This course will discuss on the concept of knowledge, ethics and civilisation which emphasize on comparative available systems, social development and multicross cultural activities in Malaysia. Besides, this course is stressing on current and contemporary issues discussion related to economy, politic, social, culture and environment based on ethical and civilisational approach. This course will cover the comparative system, developmental phase, social development and cross cultural activities in order to produce a man with positive values.

BTMW 4012 Technology Entrepreneurship

The subject provides students with technological knowledge about entrepreneurship as well as the skills to turn such knowledge into practice. The teaching and learning (T&L) activities include case study and field work with the aim to inculcate entrepreneurship values and entrepreneurship acculturation with a view to successfully launch and subsequently manage their enterprises. Students will be exposed with the support systems available or government agencies in starting new ventures, including the tactics commonly employed by entrepreneurs starting a business. The subject allows students to critically evaluate business in terms of technical feasibility, investment potential and risks.

DLLW 1112 Foundation English

This subject is designed to help students to improve their proficiency in the English Language and to communicate effectively in both spoken and written forms. Five main aspects: listening, speaking, reading, writing and grammar are taught in an integrated approach to build confidence among the learners to become efficient speakers of English in their tertiary education.

DLHW 2772 *Penghayatan Etika dan Peradaban*

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

dan pembangunan langsung ekonomi telah membawa cabaran baru dalam mengukuhkan kelestarian etika dan peradaban di Malaysia. Amalan Pendidikan Berimpak Tinggi (HIEPS) dipraktikkan dalam pengajaran dan pembelajaran bagi mendalami kursus ini.

DLLW 2122 English for Effective Communication

This course is designed to provide students with the necessary communication skills to communicate effectively. The elements of grammar are taught to complement the topics covered in this course. Students demonstrate interpersonal skills through speeches and role-play. The elements of problem-based learning (PBL) are especially exercised during the oral presentation of the product as well as role-play.

DLLW 3132 English for Marketability

This course aims to introduce and expose students to the basic tenets of communication specifically the oral and written communication required at the workplace. Students will be provided with the opportunity to produce a resume, a job-application letter and a letter of inquiry. They will also be able to participate in an interview and a group discussion. Students will be exposed to situations where they learn to function as individuals and team members by communicating in spoken and written forms using appropriate language in a variety of workplace contexts.

DTMW 1012 *Asas Pembudayaan Keusahawanan*

Kursus ini membekalkan pelajar dengan motivasi dan kemahiran utama keusahawanan. Di samping itu, pelajar juga akan mendapat kemahiran tentang prinsip-prinsip dan amalan yang diperlukan untuk memulakan, mengembangkan dan memperkukuhkan sesebuah perniagaan. Aktiviti pengajaran, pembelajaran dan aplikasi yang menerapkan teori dan amalan akan membantu pelajar menguasai kompetensi yang perlu sebelum menceburkan diri dalam bidang perniagaan. Kursus ini juga membantu pelajar membentuk rangkaian perniagaan melalui perbincangan perniagaan, simulasi dan seminar. Pelajar akan didedahkan dengan isu-isu yang berkaitan dengan pemasaran, pengurusan strategi dan risiko. Di samping itu, pelajar akan dibekalkan dengan kemahiran yang perlu untuk menyediakan penyata aliran tunai dan asas dalam membangunkan dan menyediakan perancangan perniagaan.

BLHW 2752 Malaysian Culture

This subject exposes international students to the socio-cultural background of Malaysia which includes ethnic composition, religions, traditions and values. Other elements like music, arts, cuisine, costume, ethnic games, celebrations and national festivals are also highlighted. Student Centered Learning (SCL) methods such as group discussion and presentation will be used in order to assist international students in developing their understanding and appreciation of Malaysian culture.

Course Synopsis
Core Module

List of Core Courses

Course Code	Course Name	BITC	BITD	BITA	BITM	BITS	BITE	DCS
BITP 2113	Algorithm Analysis	√	√		√	√		
BITI 1113	Artificial Intelligence	√	√		√	√		
BITS 1323	Cloud Computing Fundamental			√				
BITS 1513	Cloud Computing Services			√				
BITS 2433	Cloud Security Fundamental			√				
BITS 2543	Compilation Technology			√				
BITS 2343	Computer Networks			√				
BITS 1123	Computer Organisation and Architecture	√	√		√	√	√	
BITS 1313	Data Communication and Networking	√	√		√	√	√	
BITP 1123	Data Structures and Algorithm	√	√	√	√	√		
BITP 1323	Database	√	√	√	√	√	√	
BITI 1233	Discrete Structures	√	√		√	√		
BITP 3143	Distributed and Parallel Application Development	√	√			√		
BITM 1213	Graphic Visualization and Computational Modelling	√	√			√		
BITM 2313	Human Computer Interaction	√	√			√	√	
BITS 3423	Information Technology Security	√	√		√	√	√	
BITM 3213	Interactive Computer Graphics				√			
BITI 1213	Linear Algebra and Discrete Mathematics			√			√	
BITP 3113	Object Oriented Programming	√	√		√	√		
BITS 1213	Operating System	√	√		√	√	√	
BITS 1133	Operating System & Computer Organisation and Architecture			√				
BITP 3153	Platform-Based Development	√	√			√		
BITP 3463	Professional Practices in Computing	√	√			√		
BITE 1513	Programming Fundamentals						√	
BITP 1113	Programming Technique	√	√	√	√	√		

Course Code	Course Name	BITC	BITD	BITA	BITM	BITS	BITE	DCS
BITP 2223	Software Requirement and Design	√	√		√	√		
BITI 2233	Statistics and Probability						√	
BITP 1223	System Analysis and Design	√	√		√	√		
BITU 2913	Workshop I			√	√		√	
BITU 3923	Workshop II			√				
DITI 1253	Discrete Mathematics							√
DITI 1263	Calculus and Algebra							√
DITS 1133	Computer Organization and Architecture							√
DITS 2413	Computer Security							√
DITS 2313	Data Communication and Networking							√
DITP 1333	Database							√
DITM 1413	Ethics in Computing							√
DITS 2213	Operating System							√
DITP 1113	Programming 1							√
DITI 2233	Statistics and Probability							√
DITP 2213	System Analysis and Design							√
	Total number of courses should be taken	18	18	12	14	18	10	11

BITP 2113 Algorithm Analysis

This course gives exposure to the students about the software testing concept and focus on process to develop and implement testing plan, testing strategy, software check, unit testing, integration testing, system testing and acceptance testing. The students will implement software quality assurance activity such as quality requirement, quality criteria, software metrics, software quality model, software evaluation,and review.

BITI 1113 Artificial Intelligence

Students are exposed to the basic and branches of AI such as the various search techniques, knowledge representation and reasoning, inference techniques, learning from experience and planning. Besides, some applications of AI including game playing, expert systems and machine learning will be introduced.

BITI 1223 Calculus and Numerical Methods

This course covers two areas of mathematics namely Elementary Calculus and Introductory Numerical Methods. Topics for first part include Functions, Differentiation, Exponential and Natural Logarithm Functions and Its Applications, Integration and Initial Value Problems. The second part topics consist of Errors, Taylor Polynomials, Root Finding, Interpolation, Numerical Integration and Differentiation and Numerical Solution for Initial Value Problems.

BITS 1323 Cloud Computing Fundamental

This course takes you beyond the definitions of cloud computing and into the realm of architecture-driven practices and principles. It will lead you from start to finish with the essential concepts and technologies of cloud computing, its history, innovation, and business rationale. The course will use informative case studies to illustrate the rich and real-world landscape of organizational decision making as it relates to cloud adoption and implementation. You will be exposed to cloud architectural models, service requirements, infrastructure, and security.

BITS 1513 Cloud Computing Services

Cloud computing is a method of computing using shared resources and delivers computing services over the Internet. It lowers the cost of services to businesses and individuals, highly scalable and eliminating idle resources. Software as a service (SaaS) is one of the cloud service models alongside infrastructure as a service and platform as a service. This course is designed to build knowledge and skills in SaaS. Students will be exposed to the key concepts, principles and practices in SaaS. Topics on technical challenges of SaaS such as scalability, multi-tenancy, connectivity, and monitoring will be covered. Significant examples of SaaS applications will be discussed to strengthen the understanding of this course.

BITS 2433 Cloud Security Fundamental

Cloud computing are key technologies in building large-scale Internet services and have been widely adopted by industry to save capital and operating expenses. However the cloud computing technologies give rise to new security concerns. This course covers

cloud security, the risks and vulnerabilities and designing secure cloud computing. The content of this course cover management, governance, audit, legal issues, and meeting regulatory compliance. Topic related to cloud computing security infrastructure such as secure isolation, application security, data protection, access control, privacy, key management, provisioning, identity and authorization management, high-availability, management, and compliance in a cloud-enabled environment will also be covered in this course.

BITS 2543 Compilation Technology

Know the nature and status of the "Compiling Principles" course, and know the research scope, analytical framework, research methods and application fields of this course. Understand the main concepts, rationale and methods of this course, especially analysis, implementation and code generation. Learn to use some specific lexical and grammatical analysis methods, such as top-down recursive descent and LL analysis, bottom-up priority analysis and LR analysis. Learn semantic analysis and management of the runtime storage environment. Master intermediate code generation, intermediate code optimization, and object code generation. Develop the ability to analyze and implement small and medium compilers.

BITS 2343 Computer Networks

This course is an introduction to the current methods and practices in the use of Local and Wide Area Networks. The emphasis will be placed on LAN hardware and software, installation management and connection to other networks. Topics covered include network architecture, network communication protocols, end-to-end protocol stacks, network components, network management and the Open Systems Interconnection (OSI) reference model. Furthermore, WAN technologies such as Ethernet, Token Ring, ATM and FDDI also will be covered.

BITS 1123 Computer Organisation and Architecture

This subject provides a detail of computer system's functional components, characteristics, performance and interactions including system bus, different types of memory and Input/Output and CPU, as well as practical implementations of the components. Besides that, the architectural issues such as instruction set design and data types are covered. This subject includes digital circuit design and its application in microprocessor architecture.

BITS 1313 Data Communication and Networking

This course introduces the fundamental concepts and terminology of data communication and networking, encompassing both technical and managerial aspects and to help students better understand the challenges and opportunities faced by modern business. Topics will include: fundamentals of telecommunications, data transmission mechanisms, telecommunication media and technologies, considerations for LAN and WAN implementations, the Internet and intranet applications, emerging

telecommunications technologies, and trends in the telecommunications industry. Students will also be able to understand, explain and apply the fundamentals of data communication and network technology concepts and skills in network applications, troubleshooting, and configuring basic computer networks using guided or unguided media.

BITP 1123 Data Structure and Algorithm

This course will expose the students in data structures and algorithms. The basic concept in structure, class, array and pointer is discussed in order to understand the fundamental of data structures and algorithms. The course will focus on data structures such as list, stack, queue, tree, searching and hash while sorting, graph and heaps topics will concentrate on the algorithms. Algorithm efficiency for run time will also be discussed. Pseudo code and C++ programming language will be used for algorithm implementation. Apart from the theory, the students are asked to apply the data structures and algorithms through small application that is developed in a team.

BITP 1323 Database

This course provides a comprehensive introduction to the core concepts and practical skills necessary for effective database management. Students will gain a solid foundation in understanding databases, data modeling, executing SQL queries, and developing simple database systems. At the end of this course, students will have gained a comprehensive understanding of database fundamentals and the practical skills required to design, manage, and interact with databases effectively. The course will prepare students to step into roles as database designers and developers, enabling them to apply their knowledge in diverse professional environments and providing a solid foundation for further studies in advanced database courses.

BITI 1233 Discrete Structures

This course introduces the fundamental concepts and techniques of Discrete Mathematics that are needed for computer science. It includes logics, sets, functions, counting, relations, graphs and trees along with their applications in computer science.

BITP 3143 Distributed And Parallel Application Development

This course introduces the concepts of distributed and parallel computing. Topics covered include architectural patterns, I/O fundamentals, distributed application development with TCP and UDP programming, multithreading, concurrency, the Fork/Join framework, and performance testing of Fork/Join applications. Upon completion of this course, students will be able to understand the fundamental concepts of distributed and parallel computing, apply architectural patterns to design distributed and parallel applications, use I/O effectively in distributed and parallel applications, develop distributed applications using TCP and UDP programming, understand the basics of multithreading, apply concurrency concepts to design and develop parallel applications, use the Fork/Join framework to develop

parallel applications, and perform performance testing of Fork/Join applications.

BITM 1213 Graphic Visualization And Computational Modelling

This course offers an interdisciplinary approach to graphics visualization and computational modeling. Students will learn to create impactful graphics for data representation and explore computational methods for modeling real-world phenomena. Through hands-on projects, they'll gain proficiency in graphic design tools, data visualization techniques, and computational modeling software. By course completion, students will possess the skills to visualize data effectively, analyze models, and communicate insights across various disciplines.

BITM 2313 Human Computer Interaction

This subject introduces the concept of HCI and its relationship in system/application development. It focuses on optimizing user experiences and making technology more accessible as well as user-friendly. The topics include the basic understanding of multidisciplinary aspect of HCI comprises cognitive psychology, user interface design, interaction design, usability, and evaluation. Other current topics such as universal access, assistive technologies and culture-sensitive design are also discussed in this course.

BITS 3423 Information Technology Security

Security in information technology is a very important issue. It is an area that deserves study by computer professionals, students, and even many computer users. Through this course, student will be able to learn security services that covered Confidentiality, Integrity and Availability (CIA) in ICT based system. This course also highlights use of cyberlaw in protecting user rights. Finally, students will be able to learn methods in disaster recovery plan.

BITM 3213 Interactive Computer Graphics

This course is to expose the students to the basic concept and digital graphic technology. This includes understanding and designing aspects by using a computer graphics application. The students will be exposed to the skill of using a computer graphics application such as OpenGL. It also emphasizes on the latest graphics design context which will focus on the 'graphic thinking' and 'creative design process'.

BITI 1213 Linear Algebra and Discrete Mathematics

This course covers selected topics from two disciplines of mathematics (Linear Algebra and Discrete Mathematics) that are important for computer science students. Topics for Linear Algebra includes matrices, determinants, linear equations, vectors, eigenvalues and linear transformation while discrete mathematics covers introduction to logics, integers and algorithms, mathematical reasoning, combinatorics, relations, graphs and trees.

BITP 3113 Object-oriented Programming

This subject will discuss about the concept of object oriented approach by using object oriented pro-

gramming language. The student will be able to apply and construct the object oriented programming basic structures (such as polymorphism, inheritance, encapsulation and abstraction), GUI, event handling, exception handling, and database. The student should be able to develop a complete applications with database.

BITS 1213 Operating System

This course is designed to give an exposure to students about basic concepts, theory and technology used in operating system such as concurrency, kernel, deadlock and multithreading. Student will learn about the fundamental of operating system including process, management of memory, file, I/O and CPU scheduling. In addition, students will be introduced to Linux operating system at basic administrative level.

BITS 1133 Operating System & Computer Organisation and Architecture

This course is designed to give an exposure to students about basic concepts, theory, technology and techniques used in computer organisation, computer architecture, and operating system such as different types of memory, Input / Output, CPU scheduling, process, thread, and concurrency. Besides that, the architectural issues such as instruction set design and data types are also covered. In addition, students will be introduced to Linux operating system at basic administrative level.

BITP 3153 Platform-Based Development

Recent developments in the evolution of computing have addressed diverse social and industry needs requiring the collection of different platforms. This course concentrates on designing and developing software applications for specific platforms, with particular attention to web and mobile platforms. This platform-based development involved working with ecosystems and environments that are resource-constrained, feature-restricted, and energy-efficient. Thus, the skills of developing concerning services, APIs, and hardware are covered within the course curriculum, including programming paradigms, component libraries, and security. This course involves significant practical programming components focusing on different platform concepts with a broad range of theoretical and technical advances.

BITP 3463 Professional Practices In Computing

Recent developments in the evolution of computing have addressed diverse social and industry needs requiring the collection of different platforms. This course concentrates on designing and developing software applications for specific platforms, with particular attention to web and mobile platforms. This platform-based development involved working with ecosystems and environments that are resource-constrained, feature-restricted, and energy-efficient. Thus, the skills of developing concerning services, APIs, and hardware are covered within the course curriculum, including programming paradigms, component libraries, and security. This course involves sig-

nificant practical programming components focusing on different platform concepts with a broad range of theoretical and technical advances.

BITE 1513 Programming Fundamentals

Students are exposed to the basic and branches of Artificial Intelligence such as the various search techniques, knowledge representation and reasoning, inference techniques, learning from experience and planning. Besides, some applications of AI including game playing, expert systems, and machine learning will be introduced.

BITP 1113 Programming Technique

This course covers the introductory topics in programming language. It includes the introduction to computers and programming as well as the fundamentals of programming, problem solving and software development. Data types and operators, selection, repetition, function, array, file, structured data and pointer are among the topics covered in the course.

BITP 2223 Software Requirement and Design

This course introduces the students to the object oriented approach using UML to apply Object Oriented Analysis and Design (OOAD) towards developing software project. The course covers UML modeling to capture requirements in use cases, perform analysis modeling to produce interaction diagrams; static and dynamic, and identifies design elements in classes. The students will be taught to know sources of requirement, major activities in requirement analysis, knowing tools in requirements management and identify classes via use case analysis, defining relationships and outlining attributes and methods. In design phase, the students will be exposed to designing software architecture, high level and detail design which will be realized through refined class diagram, component diagram and deployment diagram.

BITI 2233 Statistics and Probability

This course will provide a comprehensive introductory to statistics and probability for computer science students. Topics that will be covered in this course includes data description and numerical measures, probability, discrete random variables, continuous random variables and sampling distribution. Main topics for inferential statistics will start with estimation and will be followed by hypothesis testing, estimation and hypothesis testing for two populations, simple linear regression and correlation, and one-way ANOVA. In this course, students will be guide to use statistical software to perform descriptive and inferential statistics analysis.

BITP 1223 System Analysis and Design

Students will be introduced to a variety of information systems and system development lifecycles. Then, the system development methodology will be explained with different approaches - structured approach and object-oriented approaches. Next, it discusses the planning phase with a focus on project

identification, selection, initiation, and planning. The analysis phase will emphasize the determination and structuring of user requirements. The design phase then discusses the database, input, output, interface, and dialogue design. The final phase of system development will cover the implementation and software quality assurance. Object-oriented concepts with common UML diagrams are also introduced in general as different approaches to system analysis and design methodology.

BITU 2913 Workshop I

Workshop 1 aims to provide exposure and skills to the students in developing and presenting a project of application/system development individually. Students must use the knowledge that had been learned to solve problems and think creatively to get result that achieved the objective and scope of the proposed project, while upholding the professional ethics and integrity. Students must use the techniques learned in programming technique and database courses to assure that the project built will have a logical process flow and in precise with the system's criteria of robustness, consistent, have an interesting interface and able to handle error in data input/output process. At the end of this Workshop, students must present and defend the project. The process of supervision/evaluation is handled in terms of supervision and progress evaluation by a supervisor within 12 weeks besides the presentation evaluation by an evaluator. This course will also introduce the students to intellectual property rights and infringement to avoid common errors, such as plagiarism.

BITU 3923 Workshop II

This course provides an opportunity to the student to practice their knowledge and experience gained from previous courses. This course also develops the students understanding of problem solving techniques to solve a particular problem based on their respective project scopes. The project scope is based on their programme and they are required to develop their projects in groups of four or five.

DITI 1253 Discrete Mathematics

This course introduces the fundamental concepts and techniques of Discrete Mathematics that are needed for computer science. Topics include Fundamental of Logics, Fundamentals of Proofs, Set Theory, Functions. Algorithms, Integers, Induction, Recursion, Counting, Relation, Graphs, Trees and Boolean Algebra.

DITI 1263 Calculus and Algebra

Students are exposed to the concept of probability and inferential statistics. The course starts with data description and numerical measures, probability, This course covers two areas of mathematics namely Calculus and Algebra. Topics for the first part include Functions, Exponential and Natural Logarithm, Limits, Differentiation and Its Applications, Integration and Its Applications. The second part topics consist of Matrics, Determinant, Systems of Linear Equations and Vectors.

DITS 1133 Computer Organisation and Architecture

This subject provides a detail of computer system's functional components, characteristics, performance and interactions including system bus, different types of memory and Input/Output and CPU, as well as practical implementations of the components. Besides that, the architectural issues such as instruction set design and data types are covered. This subject includes digital circuit design and its application in microprocessor architecture.

DITS 2413 Computer Security

Security in Information Technology is a very important issue. It is an area that deserves study by computer professionals, students, and even many computer users. Through this subject, student will be able to learn security services that covered Confidentiality, Integrity and Availability (CIA) in ICT based system. This subject also highlights use of cyberlaw in protecting user rights. Finally, students will be able to learn methods in disaster recovery plan.

DITS 2313 Data Communication and Networking

This course introduces the fundamental concepts and terminologies of data communication and networking, encompassing both technical and managerial aspects and to help students better understand the challenges and opportunities faced by modern business. Topics will include: fundamentals of telecommunications, data transmission mechanisms, telecommunication media and technologies, considerations for LAN and WAN implementations, the Internet and intranet applications, emerging telecommunications technologies and trends in the telecommunications industry. Students will also be able to understand, explain and apply the fundamentals of data communication and network technology concepts and skills in network applications, troubleshooting, and configuring basic computer networks using guided or unguided media.

DITP 1333 Database

This course provides a comprehensive introduction to the core concepts and practical skills necessary for effective database management. Students will gain a solid foundation in understanding databases, data modeling, executing SQL queries, and developing simple database systems. At the end of this course, students will have gained a comprehensive understanding of database fundamentals, and the practical skills required to design, manage, and interact with databases effectively. The course will prepare students to step into roles as database designers and developers, enabling them to apply their knowledge in diverse professional environments and providing a solid foundation for further studies in advanced database courses.

DITM 1413 Ethics in Computing

This course is an introduction to the ethical issues in the field of computer technology. It will explore a range of topics, including the nature of ethical reasoning and its application to computing; the ethical implications of new technologies, the ethical responsibilities of computer scientists in the workplace; and the social implications of computer technology. The course will use a variety of teaching methods, includ-

ing lectures, class discussions, and case studies. Students are expected to complete a number of assignments, final project and presentations.

DITS 2213 Operating System

This course is designed to give an exposure to students about the fundamental of operating system including process, management of memory, file and I/O and also about CPU scheduling. The introduction part consists of the evolution of operating system since it started until now. Student will also learn about the basic concepts, technology and theory used in operating system such as concurrency, kernel, deadlock and multithreading. In addition, students will be introduced to few types of operating systems at basic administrative level.

DITP 1113 Programming I

This course covers the introductory topics in programming using C++ language. It includes the introduction to computers and programming as well as the fundamentals of programming, problem solving and software development. Data types and operators, selection, repetition, function are among the topics covered in the course.

DITI 2233 Statistics and Probability

Students are exposed to the concept of probability and inferential statistics. The course starts with data description and numerical measures, probability, discrete random variables, continuous random variables and sampling distributions. Main topics for inferential statistics will start with estimation and will be followed by hypothesis testing and simple linear regression. Besides that, this course will give some exposure to statistical software.

DITP 2213 System Analysis and Design

Students will be introduced to a variety of information systems and system development lifecycles. Then, the system development methodology will be explained with different approaches - structured approach and object-oriented approaches. Next, it discusses the planning phase with a focus on project identification, selection, initiation, and planning. The analysis phase will emphasize the determination and structuring of user requirements. The design phase then discusses the database, input, output, interface, and dialogue design. The final phase of system development will cover the implementation and software quality assurance. Object-oriented concepts with common UML diagrams are also introduced in general as different approaches to system analysis and design methodology.

BITU 3973 Final Year Project I

This course joins together all the subjects learnt from year one of the studies including to analyse and to design a specific system, the application of database, algorithm and data structure, web programming, data communication, etc. It is compulsory to the final year students to develop a Final Project and to attend the offered courses.

BITU 3983 Final Year Project II

This course joins together all the subjects learnt from

year one of the studies including to analyse and to design a specific system, the application of database, algorithm and data structure, web programming, data communication, etc. It is compulsory to the final year students to develop a Final Project and to attend the offered courses.

BITU 3974 Final Year Project 1

This course joins together all the subjects learnt from year one of the studies including to analyze and to design a specific system, the application of database, algorithm and data structure, web programming, data communication etc. It is compulsory to the final year students to develop a Final Project and to attend the offered courses.

BITU 3984 Final Year Project 2

This course joins together all the subjects learnt from year one of the studies including to analyze and to design a specific system, the application of database, algorithm and data structure, web programming, data communication etc. It is compulsory to the final year students to develop a Final Project and to attend the offered courses.

BITU 3926 Industrial Training

Students must do the internship no less than 24 weeks in an organisation which they have chosen. Throughout the internship, students are guided and monitored by the industrial supervisor. Students are required to report their internship's activities in their log book. The faculty supervisor will visit the student twice: one after 2 weeks of internship and another will be near the end of the 24 week period. During the second visit, students are required to do a presentation at the organisation in attendance of both Industrial and Faculty supervisor. Students must also submit a copy of Industrial Training Report to the faculty supervisor for evaluation.

BITU 3946 Industrial Training Report

Students must do the internship no less than 24 weeks in an organisation which they have chosen. Throughout the internship, students are guided and monitored by the industrial supervisor. Students are required to report their internship's activities in their log book. The faculty supervisor will visit the student twice: one after 2 weeks of internship and another will be near the end of the 24 week period. During the second visit, students are required to do a presentation at the organisation in attendance of both Industrial and Faculty supervisor. Students must also submit a copy of Industrial Training Report to the faculty supervisor for evaluation.

DITU 3964 Diploma Project

Diploma project trains the students to practice their knowledge by undertaking a project. The students are exposed to real system development environment in which they will have to analyse and solve system related problems, plan and develop the system as well as to meet the design and analysis requirements using appropriate computer programming language.

DITU 2346 Industrial Training

Students must do the internship no less than 16 weeks in an organization that they have chosen. Throughout the internship, students are guided and monitored by the industrial supervisor. Students are required to report their internship activities in their logbooks. The faculty supervisor will visit the student only once and usually, it will be near the end of the 16 weeks. During the visit, students are required to do a presentation at the organization in attendance of both Industrial and Faculty supervisor. Students must also submit a copy of the Industrial Training Report to the faculty supervisor for evaluation.

DITU 2362 Industrial Training Report

This subject is an extension of DITU 2346 where students must do the internship no less than 16 weeks in an organization that they have chosen. Throughout the internship, students are guided and monitored by the industrial supervisor. Students are required to report their internship activities in their logbooks. The faculty supervisor will visit the student only once and usually, it will be near the end of the 16 weeks. During the visit, students are required to do a presentation at the organization in attendance of both Industrial and Faculty supervisor. Students must also submit a copy of the Industrial Training Report to the faculty supervisor for evaluation.

Course Synopsis
Specialisation
Module

List of Specialisation Courses

Course Code	Course Name	BITC	BITD	BITA	BITM	BITS	BITE	DCS
BITU 2913	Workshop I	√	√			√		
BITU 3923	Workshop II	√	√		√	√	√	
BITS 2313	Local Area Network	√						
BITS 2323	Wide Area Network	√						
BITS 2333	Network Analysis and Design	√						
BITS 3313	Network Administration and Management	√						
BITS 3323	Network Project Management	√						
BITS 3553	Emerging Network Technologies	√						
BITP 2313	Database Design		√					
BITP 2413	Database Administration and Security		√					
BITP 2303	Database Programming		√					
BITP 3383	Cloud Data Management		√					
BITP 3363	Data Warehousing and Business Intelligence		√					
BITP 3393	Special Topics in Database Technology		√					
BITS 1225	Windows System Management and Network Services			√				
BITS 1235	Linux System Management and Network Services			√				
BITS 2535	Enterprise Network Technology and Application			√				
BITS 2135	Storage Technology and Application			√				
BITS 2555	Virtualization Technology			√				
BITS 2565	Python Programming			√				
BITS 3565	OpenStack Cloud Platform Technology			√				
BITS 3575	Automated Operation and Maintenance			√				
BITM 2123	Digital Audio and Video Technology				√			

Course Code	Course Name	BITC	BITD	BITA	BITM	BITS	BITE	DCS
BITM 1213	Graphic Visualization and Computational Modelling				√			
BITM 2213	Computer Animation				√			
BITM 2313	Human Computer Interaction				√			
BITP 3153	Platform Based Development				√			
BITM 2113	Web Application Development				√			
BITM 3113	Interactive Media Project Management				√			
BITP 3143	Distributed and Parallel Application Development				√			
BITP 3463	Professional Practices in Computing				√			
BITM 3763	Extended Reality Technology				√			
BITP 3253	Software Verification and Validation					√		
BITP 3173	Internet of Things Development					√		
BITP 3423	Special Topic in Software Engineering					√		
BITP 3453	Mobile Application Development					√		
BITP 3223	Software Project Management					√		
BITP 3163	Software Development and Operations					√		
BITE 1723	Game Design Principle						√	
BITE 1523	Computer Game Programming						√	
BITE 1613	2D Game Development						√	
BITE 1713	Game Architecture						√	
BITE 2513	Game Engine Development I						√	
BITE 2123	Artificial Intelligence for Games						√	
BITE 2613	Interactive 3D Animation						√	
BITE 2633	Audio Video Production for Game						√	
BITE 2523	Web Game Development						√	
BITE 3513	Game Engine Development II						√	
BITE 3713	Multi-platform Game						√	

Course Code	Course Name	BITC	BITD	BITA	BITM	BITS	BITE	DCS
BITE 2623	3D Game Development						√	
BITE 3613	Game Project Management						√	
DITM 1313	Human Computer Interaction							√
DITP 1123	Programming 2							√
DITP 2113	Data Structure and Algorithm							√
DITM 2123	Web Programming							√
DITP 3113	Object-oriented Programming							√
DITU 3934	System Development Workshop							√
DITI 3133	Applied Artificial Intelligence							√
DITP 2133	Platform-based Development							√
DITP 3123	Distributed and Parallel Application Development							√
DITS 2223	System Fundamentals							√
Total number of courses should be taken		8	8	8	11	8	14	10

BITU 2913 Workshop I

Workshop 1 aims to provide exposure and skills to the students in developing and presenting a project of application/system development individually. Students must use the knowledge that had been learned to solve problems and think creatively to get result that achieved the objective and scope of the proposed project, while upholding the professional ethics and integrity. Students must use the techniques learned in programming technique and database courses to assure that the project built will have a logical process flow and in precise with the system's criteria of robustness, consistent, have an interesting interface and able to handle error in data input/output process. At the end of this Workshop, students must present and defend the project. The process of supervision/evaluation is handled in terms of supervision and progress evaluation by a supervisor within 12 weeks besides the presentation evaluation by an evaluator. This course will also introduce the students to intellectual property rights and infringement to avoid common errors, such as plagiarism.

BITU 3923 Workshop II

This course provides an opportunity to the student to practice their knowledge and experience gained from previous courses. This course also develops the students understanding of problem solving techniques to solve a particular problem based on their respective project scopes. The project scope is based on their programme and they are required to develop their projects in groups of four or five.

BITS 2313 Local Area Network

This course is an introduction to the current methods and practices in the use of LANs. The emphasis will be placed on LAN hardware and software, installation management and connection to other networks. Topics covered include network architecture, network communication protocols, end-to-end protocol stacks, network components, network management and the Open Systems Interconnection reference model.

BITS 2323 Wide Area Network

This course introduces the concepts, practices, and technologies used in the design and implementation of WAN. Topics will include; overview of network fundamentals, considerations for Local Area Network, LAN, and WAN implementations, network security requirement, and trends in the carrier network services. Students will also be able to understand, explain and apply the fundamentals of WAN technology concepts and skills in network applications, troubleshooting, and preparing for CCNA examinations.

BITS 2333 Network Analysis and Design

This course covers a systems approach to network design, the concept, guidelines and practice for requirement analysis and flow analysis. The technology choices, interconnection mechanism, network management and security will be covered in logical design. Some issue on network design will be included in physical design, addressing and routing. Software for network analysis and design, namely the Microsoft Visio will be introduced and used to help

in understanding and applying the network analysis and design knowledge areas and processes.

BITS 3313 Network Administration and Management

This course covers the topics in network administration and management, duties as network administrators/managers, host management, infrastructure components, users management, simple network management protocol, management information base, remote monitoring, web-based management and network security management.

BITS 3323 Network Project Management

This course covers project management body of knowledge (project integration management, scope management, time management, cost management, quality management, and human management). It also covers the processes or steps in project management (project initiation, planning, executing, controlling and project closing or termination). Software for project management (Microsoft Project and Microsoft Excel) will be introduced and used to help in understanding and applying the project management knowledge areas and processes.

BITS 3553 Emerging Networks Technologies

This course will provide state-of-art of emerging technologies in networking which covers topics in three main areas: smart networking technologies and application, cloud technologies, and wireless communication. For each topic, students will be introduced to the platform, system architecture, and principle designs. In addition, existing barriers, challenges, and opportunities of emerging internetworking technology and security are presented. This course explores the latest trends and advancements in network technologies. Students will gain an understanding of cutting-edge concepts, protocols, and architectures that are shaping the future of networking. The course will cover both theoretical foundations and practical applications of emerging network technologies.

BITP 2313 Database Design

This course emphasizes the importance of database design and presents the fundamental principles and design issues related to non-relational data models like object oriented and object-relational data model together with the enhanced features of ERD (EERD). A practical database design methodology is used to demonstrate the design process which involves not only constructing the data model but also checking and validating the accuracy of the model in line with the user transaction requirements. NoSQL databases concept and design such as document, key-value, wide-column, and graph will also be included. The introduction on the distributed database design are part of the topics delivered to the students too.

BITP 2413 Database Administration And Security

In this course, students will step into the roles, challenges, and responsibilities of a database administrator, gaining a deep understanding of the critical

tasks involved in managing database systems. They will explore key functions such as optimizing performance, ensuring data integrity, and implementing robust security measures to protect sensitive information. Through hands-on activities, students will apply essential database administration techniques, including backup and recovery, access control, and troubleshooting common issues. By the end of the course, students will be equipped with the practical skills and knowledge needed to effectively administer and secure database systems in various organizational environments.

BITP 2303 Database Programming

This subject introduces the concepts of declarative and procedural language in database applications, using SQL and PL/SQL syntax. This includes the development, implementation and maintenance of database constructs and objects such as variables, cursors, parameters, procedures, functions, packages and database triggers for effective database management in an application. By the end of the course, students will possess valuable skills in PL/SQL programming, vital for careers in database development.

BITP 3363 Data Warehousing and Business Intelligence

This subject focuses on data warehousing fundamentals which includes the importance of data warehousing, multi-dimensional data analysis and factors involved in the analysis, planning, design, loading, maintenance and exploitation of successful data warehouse. It will also cover techniques and tools for business intelligence and data visualization.

BITP 3393 Special Topics In Database Technology

This course explores advanced and specialized topics within the domain of database technologies, covering cutting-edge concepts, frameworks, and methodologies. Students will have a solid foundation of the specialized topics in data engineering, big data analytics, AI applications in databases, data governance, emerging technologies, and gain insights into the future directions and research frontiers in the field. Through hands-on activities and real-world scenarios, students will discover, apply, and present specialized database techniques, preparing them to meet industry standards and solve complex data challenges. The topics covered in this course may vary or change depending on the latest technology trends.

BITS 1225 Windows System Management and Network Services

Windows System Management and Application, a basic course in cloud computing specialty with the subsequent potential courses Enterprise Network Technology and Application, Virtualization Technology and Storage Technology and Application. Mainly targeted at the skills of Windows system configuration, network service construction and system maintenance needed by relevant posts such as Windows system operation and maintenance, through the teaching method of combining theory with practice, it en-

ables students to master the use method of Windows Server 2019 operating system, build enterprise network basic environment, manage network structure and users, allocate network resources reasonably, and provide network services, and monitor and maintain server data resources.

BITS 1235 Linux System Management and Network Services

Linux System Management and Network Services is a core basic course in cloud computing technology and application. Its leading courses are Operating System Principles and Data Structure and subsequent courses are Virtualization Technology and OpenStack Cloud Platform Technology. According to the general design requirements of the cloud computing course system with priority to practical purpose, mainly targeted at the skills of operating system management, common service management and operation system tuning that system administrators, system engineers, system architects and other relevant posts need to master, combined with the characteristics of the practical application of cloud computing, it enables students to learn to analyze the system deployment structure as well as system failure issues and resolve common system issues and improve system tuning and troubleshooting ability in the process of completing project tasks.

BITS 2535 Enterprise Network Technology and Application

Enterprise Network Technology and Application is a core basic course of cloud computing specialty. Its leading courses are Windows System Management and Network Services and Linux System Management and Network Services. According to the overall design requirements of the training programme for cloud computing professionals, mainly targeted at the basic operation and maintenance skills of software and hardware required by relevant posts such as system management and system operation and maintenance, and combined with the characteristics of cloud computing profession, it enables students to learn to use the knowledge they have learnt to deal with the common issues of enterprise network including but not limited to OSI reference model, Ethernet encapsulation, VLAN technology and communication. Switch configuration and management, RIP and OSPF protocol, router configuration and management, network information security, network operation and maintenance under different operating systems and give solutions in the process of completing project tasks so as to enhance the network-related comprehensive processing ability.

BITS 2135 Storage Technology and Application

Storage Technology and Application is a core basic course of cloud computing specialty. Its leading courses are Linux System Management and Network Services, Enterprise Network Technology and Application and subsequent courses are potentially OpenStack Cloud Platform Technology and Automation Operation and Maintenance. According to the overall design requirements of cloud computing profession-

als training programme, mainly targeted at storage equipment, storage system, distributed storage and cloud storage required for cloud platform storage engineers, cloud platform operation and maintenance engineers and other relevant posts, with principles as the groundwork and tasks as the drive, it achieves the design, implementation, operation and maintenance of private cloud storage platform.

BITS 2555 Virtualization Technology

Virtualization Technology is a core course of cloud computing specialty. Its leading courses are Windows System Management and Network Services and Linux System Management and Network Services. According to the overall design requirements of the training programme for cloud computing professionals, mainly targeted at setup and application of cloud platform skills required for positions related to virtualization technology and using virtualization knowledge, combined with the characteristics of cloud computing, it enables students to learn to set up, apply, operate and maintain a platform using virtualization and improve the ability to resolve comprehensive virtualization troubles using this technology in the process of project task completion.

BITS 2565 Python Programming

Python Programming is a core disciplinary course in cloud computing technology and application specialty. Its leading courses are Compilation Technology and Object-Oriented Programming. According to the general design requirements of the cloud computing curriculum system with priority to practical purpose, mainly targeted at the Python language foundation and the Python object-oriented programming skills required for system engineers, cloud platform development engineers and other relevant posts, and combined with the characteristics of cloud computing specialty, it enables students to learn Python operation and maintenance skills in the process of completing project tasks.

BITS 3565 OpenStack Cloud Platform Technology

OpenStack Cloud Platform Technology is a core course of cloud computing specialty. Its leading courses are Linux System Management and Network Services, Enterprise Network Technology and Application, Virtualization Technology and Storage Technology and Application and subsequent potential courses are Automation Operation and Maintenance. According to the overall design requirements of cloud computing professional personnel training programme, mainly targeted at the OpenStack multi-machine setup required for cloud platform system engineers, cloud platform operation and maintenance engineers, cloud platform architects and other relevant posts; OpenStack HA Application; OpenStack command line application and OpenStack operation and maintenance skills, with principles as foundation and tasks as drive, achieves the design, implementation, operation and maintenance of private cloud platform.

BITS 3575 Automated Operation and Maintenance

Automation Operation and Maintenance is a core course of cloud computing specialty. Its leading

courses are Linux System Management and Network Services, Operating System Principles and Enterprise Network Technology and Application. According to the general design requirements of the training programme for cloud computing professionals, mainly targeted at the automatic maintenance skills for production environment servers using puppet and required for automatic operation and maintenance engineers, and combined with the characteristics of cloud computing, it enables students to learn to deploy applications using Puppet tools and get the ability to maintain production environment servers using puppet during project tasks.

BITM 2123 Digital Audio and Video Technology

This course will give details and valuable insight of the wonderful world of digital audio and video. Students will be introduced to topics on audio production, recording techniques, video production tools, video hardware, shooting procedure, special effects, MIDI sequencing, and audio/video production concepts. Besides, various tools for editing, practical as well as composing digital audio and video will be taught during the course.

BITM 1213 Graphic Visualization And Computational Modelling

This course offers an interdisciplinary approach to graphics visualization and computational modeling. Students will learn to create impactful graphics for data representation and explore computational methods for modeling real-world phenomena. Through hands-on projects, they'll gain proficiency in graphic design tools, data visualization techniques, and computational modeling software. By course completion, students will possess the skills to visualize data effectively, analyze models, and communicate insights across various disciplines.

BITM 2213 Computer Animation

This course will introduce the student to the technology and concepts of 2D and 3D computer animation. Emphasis will be placed on developing a working knowledge on the underlying process of 2D and 3D animation. Topics will cover overview of animation production, principles of 2D and 3D animation, modeling concepts and techniques, rendering concepts and techniques, camera, lighting, shading and surface, animation concepts and techniques, retouching and compositing, and output of the animation production. Student will also be exposed to the introduction of character animation the basic techniques in modeling a character. The output should meet the technical in nature as well as its artistic merit. While this may be different than either the typical art or computer science course, it closely resembles the workings of major movie studios where various projects have to meet spefic technical details (in order to fit in the production pipeline and schedule) as well as achieving the artistic goals. The format of the subject is one-hour lecture followed by four hours lab.

Practical exercises will be given on each lab session and to be submitted at the end of the lesson. Student will have to plan their time to achieve the goals given. Individual and group assignment will be given to develop the creative thinking skill among the stu-

dents. Students will also work in groups to complete a project in order to foster ideas sharing and teamwork among themselves. At the end of the course, students will have to present their project in class and defend their ideas professionally. Evaluation will be given on soft skill development as well as practical work.

BITP 3153 Platform-Based Development

Recent developments in the evolution of computing have addressed diverse social and industry needs requiring the collection of different platforms. This course concentrates on designing and developing software applications for specific platforms, with particular attention to web and mobile platforms. This platform-based development involved working with ecosystems and environments that are resource-constrained, feature-restricted, and energy-efficient. Thus, the skills of developing concerning services, APIs, and hardware are covered within the course curriculum, including programming paradigms, component libraries, and security. This course involves significant practical programming components focusing on different platform concepts with a broad range of theoretical and technical advances.

BITM 2113 Web Application Development

The purpose of this course is to provide students with a comprehensive understanding of the tools and problem-solving techniques related to building effective World Wide Web sites. It emphasis 4 components in developing web applications which are: client site technologies: HTML, XHTML, HTML5, CSS, JavaScript, jQuery; server site technologies: PHP; database server: MySQL; and web servers: Apache. This course also brings together all of the elements of web site design, graphics, animation, data storage in the construction of fully functional commercial web site applications.

BITM 3113 Interactive Media Project Management

This course emphasizes on theory, application and practice in managing a multimedia and information technology based projects. Students will gain knowledge and acquire skills in managing interactive media projects such as planning, costing and preparing documentations. Through group activities and case studies, students will practice key competencies that project manager must develop in managing media and multimedia team comprises artists, programmers and analysts. At the end of the course, students must also be able to apply interactive media project management process and use the appropriate tools such as multimedia network analysis and Gantt chart in managing project activities. Students will be introduced to software tools to support project management and they will be encouraged to actively participate and share their ideas through group discussions and presentations.

BITP 3143 Distributed And Parallel Application Development

This course introduces the concepts of distributed and parallel computing. Topics covered include architectural patterns, I/O fundamentals, dis-

tributed application development with TCP and UDP programming, multithreading, concurrency, the Fork/Join framework, and performance testing of Fork/Join applications. Upon completion of this course, students will be able to understand the fundamental concepts of distributed and parallel computing, apply architectural patterns to design distributed and parallel applications, use I/O effectively in distributed and parallel applications, develop distributed applications using TCP and UDP programming, understand the basics of multithreading, apply concurrency concepts to design and develop parallel applications, use the Fork/Join framework to develop parallel applications, and perform performance testing of Fork/Join applications.

BITP 3463 Professional Practices In Computing

Recent developments in the evolution of computing have addressed diverse social and industry needs requiring the collection of different platforms. This course concentrates on designing and developing software applications for specific platforms, with particular attention to web and mobile platforms. This platform-based development involved working with ecosystems and environments that are resource-constrained, feature-restricted, and energy-efficient. Thus, the skills of developing concerning services, APIs, and hardware are covered within the course curriculum, including programming paradigms, component libraries, and security. This course involves significant practical programming components focusing on different platform concepts with a broad range of theoretical and technical advances.

BITM 3763 Extended Reality Technology

This course offers a comprehensive exploration of Extended Reality (XR) technologies, encompassing Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). Students will gain a deep understanding of XR principles, development tools, and design techniques. Practical labs and projects will facilitate hands-on learning, enabling students to create immersive VR environments, interactive AR applications, and spatial MR experiences. By the course's conclusion, students will possess the skills to design, develop, and evaluate XR applications, preparing them for diverse career opportunities in the rapidly expanding XR industry. The culmination of final projects will allow students to showcase their expertise and reflect on their learning journey in the dynamic realm of Extended Reality.

BITP 3253 Software Verification and Validation

This course gives exposure to the students about the software testing concept and focus on process to develop and implement testing plan, testing strategy, software check, unit testing, integration testing, system testing and acceptance testing. The students will implement software quality assurance activity such as quality requirement, quality criteria, software metrics, software quality model, software evaluation,and review.

BITP 3173 Internet of Things Development

The Internet of Things allows billions of devices, sensors, cloud infrastructure and business intelligence tools to come together to enable people to make informed decisions. This subject covers the concepts of the Internet of Things (IoT), its conceptual framework and how the IoT contributes to business and daily life. It will also cover the IoT architecture and gives an overview of the core technologies required for supporting IoT. It also provides knowledge on both the underlying technologies which support IoT and M2M communications, and engages the students in the creative development of simulation scenarios for innovative Internet of Things applications.

BITP 3423 Special Topic in Software Engineering

This course provides the students with the foundation in rationalizing the critical skill sets of the core architectural principles and alignment to the IT Architecture Body of Knowledge. Ultimately, the focus of IT Architecture for Special Topic in Software Engineering this semester underlies the need for a holistic IT Architecture approach, skills requirements and strategically equips individual roles in the enterprise to realize the business values of a sound technology adoption.

BITP 3453 Mobile Application Development

This course exposes the students to the development of mobile application development focusing on Android. Students are to be exposed to the introduction of native and hybrid application development as well as multi-threading programming and client server interaction via web services.

BITP 3223 Software Project Management

This course provides students with fundamental discipline in managing software development project. The course exposes students to a variety of techniques to prepare and manage people, budget, schedule, risks and quality of software project. The course also provides skills to the students how to use software tools in constructing software project plan such as Microsoft Project, MS Excel spreadsheets and MS Words.

BITP 3163 Software Development and Operations

The course exposes the students to the culture and practises of Development and Operation in the software development life cycle. The students will also expose to the best practises in securing the project during development and ensuring the project able to operate continuously after being deployed to the production environment. At the end of the course, the students should gain insight into how a software project can be delivered and what are the post development actions that must be done in regard to agile development methodology.

BITE 1723 Game Design Principle

This course is designed to provide students with a fundamental working knowledge and understanding

of critical concept and historical context for analyzing games, as well as the skills and techniques necessary to incorporate game design in their study. Students will learn how to identify, create and manipulate core game elements such as game philosophy, design process, player objectives, rule systems and the human elements in a game. This course will introduce students to the tools and concepts used to create levels for games. The course will incorporate level design and architecture theory, concepts of the critical path and flow, game balancing, playtesting and storytelling. Using user-friendly toolsets from industry titles, students will build and test levels that reflect design concepts.

BITE 1523 Computer Game Programming

This course covers the topics in fundamental ADT and algorithms which commonly applied in games application development. In this course, the data structures and the algorithms will be implemented using MSVC++ and Simple DirectMedia Layer (SDL) Libraries. ADT such as array, linked-list, stack, queue, tree, hash table and graph will be emphasized during the program development. The algorithms of data operations such as modifying data (insertion, remove, replace etc), recursion, sorting, searching and indexing which are always used to operate data in games will also be covered. This subject requires the students to have a sound background in fundamental C++ programming techniques they have learnt in Game Programming I. For this course, Object Oriented Programming (OOP) techniques will not be emphasized.

BITE 1613 2D Game Development

This course provides students with the concept of digital graphic design, computer graphics 2D, and basic concepts and techniques for the development of a 2D computer games. Students will be introduced to the concept of 2D raster graphics, and geometric 2D graphics. This course also covers the theory of computer games, game design, game logic and game engine development. In addition, students will also be exposed to other important matters related to the development of computer games such as the integration of 2D graphics and content development. At the end of this course, students will develop 2D games based on any given genres.

BITE 1713 Game Architecture

This course provides an introduction to the design aspects of the development of a computer games. The topics include basic technical understanding, game design and programming. Other topics include the game engine and the type of games. Current issues related to game development methods, technologies and trends in computer games is discussed at the end of the course.

BITE 2513 Game Engine Development I

This course provides students with an introduction to the theory and practice of video game programming. Students will participate in individual hands-on lab exercises, and also work together like a real game development team to design and build their own functional game using an existing game engine (e.g.

OPENGL, UNITY, UNREAL, CRY Engine, etc). Concepts learns during this subject is introduction to game engine, math for game engine, engine support systems, game loop and real-time simulation, human interface devices, tools for debugging and development, rendering engine, animation system, collision detection and introduction to gameplay system.

BITE 2123 Artificial Intelligence for Games

This course is for undergraduate and graduate students in Computing and related fields to gain a breadth of understanding of the toolbox of AI approaches employed in digital games. This involves learning some basic topics covered in other AI courses, but with a focus on applied knowledge within the context of digital games. The discipline of (academic) Game AI was launched with a justification of interactive entertainment (i.e., computer games) as a domain of study in AI when they posited that computer games could act as testbeds for achieving human-level intelligence in computers, leveraging the fidelity of their simulations of real world dynamics [c.f. 'Human-Level AI's Killer Application: Interactive Computer Games' by Laird and van Lent]. There is an additional (industry) perspective on AI for games: increasing the engagement and enjoyment of the player.

BITE 2613 Interactive 3D Animation

This course addresses the design and creation of 3D environments using software for modeling and animation and using tools for adding interactivity. Students are invited to explore the unique feeling of being immersed in a virtual world by creating new types of user experiences. Attention is given to the use of physical input devices or interaction regimes in the service of creating the user's feeling of delight in the artificial world.

BITE 2633 Audio Video Production for Game

This course will give details and valuable insights of digital audio and video production in games industry. Throughout the semester, students will be introduced to relevant topics on digital audio and video hardware, the art of audio production, recording techniques, video production, the integration of other media in video product, implementing special effects, and storyboarding. Besides, various tools for editing, practical as well as composing digital audio and video will be taught during the course.

BITE 2523 Web Game Development

This course will expose the student with all necessary technologies into making a web game. The student will learn most of the common web technology and languages that comply with the World Wide Web Consortium (W3C) in order for them to create their initial web application. Moreover, the student will also learn the industry standards by engaging them with industry's best practices to their lab works, assignments and project. Upon understanding the web application development concept, the student will begin to develop their web game using various tools and some game engine. Similar to any software develop-

ment, the student will develop their web game based on current industries framework.

BITE 3513 Game Engine Development II

This course provides students with an in-depth exploration of game engine architecture. Students will learn state-of-the-art software architecture principles in the context of game engine design, investigate the subsystems typically found in a real production game engine, survey some engine architectures from actual shipping games, and explore how the differences between game genres can affect engine design. Students will participate in individual hands-on lab exercises, and also work together like a real game development team to design and build their own functional game engine by designing and implementing engine subsystems and integrating third party components of game engine architecture. The pinnacle of this course is that the student will be able to develop and customize a game on top of their game engine.

BITE 3713 Multi-platform Game

This course provide student with a study of multiplatform development strategy in game development pipeline. Understanding multiplatform concept is an important step to determine business process and goal for the developer. Various architecture of game consoles and other platform such as mobile devices lead towards different performance and expectation toward one game title. Thus the need to understand various game development pipeline across multiple gaming platform is crucial in order to deliver the final game product expectation. Students will participate in individual hands-on lab exercises, and also work together like a real game development team to design and build their own game across several platform.

BITE 2623 3D Game Development

This course provides the student in depth study about 3D game development process. 3D environment has allow gaming to evolve from simple traditional side scrolling game into more sophisticated and realistic experience to the player. Students will participate from conceptual ideation, 3D assets integration, texture and material for 3D games, 3D gameplay, collision detection and many other. Moreover, student will develop a prototype of 3D game for playtesting and refinement phase. It also discuss few case study and current industry standard technique in 3D game development.

BITE 3613 Game Project Management

This course emphasizes on theory, application and practice in managing game projects. Students will gain knowledge and acquire skills in managing game projects such as planning, costing and preparing documentations. Students will demonstrate the key competencies required in managing game assets, resources and team members through group activities and case studies. They will be introduced to the roles as game producer, game artist, game designer, game developer and related supports in game production. At the end of the course, students must be able to

adopt appropriate game project management tools in managing project activities. Students will be encouraged to actively participate and share their ideas through group discussions, presentations and role play.

DITM 1313 Human Computer Interaction

This subject introduces the concept of Human Computer Interaction, HCI, and its relationship in system development. The topics include the basic understanding of cognitive psychology, user interface design, interaction design, usability and evaluation. Other topics such as user-centered design, task analysis and user support design are also covered. The current issues on accessibility and localization are also discussed at the end of this course.

DITP 1123 Programming II

This course is a continuity on fundamental functional programming from previous course, which covers topics such as array, cstring manipulation, structured data, pointer as well as the problem solving resolves around these topics. Some Standard Library – Math/Date/Map library will be applied.

DITP 2113 Data Structure and Algorithm

This course aims to develop students' knowledge of data structures and algorithms. It begins with a review of basic abstract data type (ADT) concepts, which will later be applied to the implementation of data structures. The course then introduces the analysis of algorithm efficiency, followed by problem-solving using recursion. Students will learn about essential data structures such as array-based lists, linked lists, stacks, queues, trees, graphs, and heaps, along with the operations for maintaining them. The course then discusses various searching and sorting algorithms, followed by problem-solving using greedy algorithms. Throughout the semester, students will also be exposed to applying these data structures and algorithms to solve various challenges and problems.

DITM 2123 Web Programming

The purpose of this course is to provide students with a comprehensive understanding of the tools and problem-solving techniques related to building effective World Wide Web sites. It emphasis 4 components in developing web applications which are:

- Client site technologies: HTML, XHTML, HTML5, CSS, XML, and JavaScript.
- Server site technologies: PHP.
- Database server: MySQL.
- Web servers: Apache.

This course also brings together all of the elements of web site design, graphics, animation, data storage in the construction of fully functional commercial web site applications.

DITP 3113 Object-oriented Programming

This course will introduce the fundamentals of object-oriented programming such as encapsulation, polymorphism, and inheritance. Apart from that, the collection framework, exception handling, and

connecting applications to the database will be explained.

DITU 3934 System Development Workshop

This course aims to provide exposure and skills to the students in developing and presenting a project of application/system development in a group. In this course students should be able to integrate subjects learned in earlier semesters such as analysis and design, programming, data structures and algorithms to develop a system.

DITI 3133 Applied Artificial Intelligence

Students are exposed to the basic and branches of Artificial Intelligence, AI, such as the various search techniques, knowledge representation and reasoning, inference techniques, learning from experience and planning. Besides, some applications of AI including game playing, expert systems, and machine learning will be introduced.

DITP 2133 Platform-Based Development

This course concentrates on designing and developing software applications for specific platforms, with particular attention to web and mobile platforms. This platform-based development involved working with ecosystems and environments that are resource-constrained, feature-restricted, and energy-efficient. Thus, the skills of developing concerning services, APIs, and hardware are covered within the course curriculum, including programming paradigms, component libraries, and security. This course involves significant practical programming components focusing on different platform concepts with a broad range of theoretical and technical advances.

DITP 3123 Distributed And Parallel Application Development

This course introduces the concepts of distributed and parallel computing. Topics covered include architectural patterns, I/O fundamentals, distributed application development with TCP and UDP programming, multithreading, concurrency, the Fork/Join framework, and performance testing of Fork/Join applications. Upon completion of this course, students will be able to understand the fundamental concepts of distributed and parallel computing, apply architectural patterns to design distributed and parallel applications, use I/O effectively in distributed and parallel applications, develop distributed applications using TCP and UDP programming, understand the basics of multithreading, apply concurrency concepts to design and develop parallel applications, use the Fork/Join framework to develop parallel applications, and perform performance testing of Fork/Join applications.

DITS 2223 Systems Fundamentals

This subject introduces students to the fundamental concepts of computer systems which comprises of basic knowledge of computer organization and architecture, and operating systems. It provides a thorough understanding of the hardware and the system

software and the relationship between the two. It introduces the concepts of digital logic, assembly language, processor architecture, and memory hierarchy. In addition, this subject explores techniques in scheduling, pipelining and parallelism to achieve high performance.

Course Synopsis
Free Module

List of Free Module Courses

Course Code	Course Name	BITC	BITD	BITA	BITM	BITS	BITE
BITP 3523	Advanced Database Administration		√				
BITP 3513	Advanced Database Programming		√	√			
BTMU 1093	Business Statistics	√	√			√	
BITS 2573	Cloud Computing Foundation	√	√		√	√	
BTMT 3323	Contemporary Business Management	√	√		√	√	
BITP 5383	Data Governance and Security		√				
BITP 5703	Data Quality Management		√				
BITP 2323	Database Administration					√	
BITM 2123	Digital Audio and Video Technology	√					
BITS 3443	Digital Forensics	√					
BITM 2323	Digital Imaging for Multimedia				√		
BITS 3343	Fiber Optic	√				√	
BTMP 2083	Franchise and Retail Management				√		
BITE 3723	Game Mechanics				√		√
BITE 3523	Game Physics				√		√
BITE 3633	Game Play				√		√
BITP 3483	Geographic Information System		√			√	
BTMP 3523	Industrial Leadership	√			√		
BITM 1123	Interactive Media Authoring	√				√	
BITI 2213	Knowledge-based System					√	
BITS 2313	Local Area Network		√			√	
BITI 2223	Machine Learning		√		√		
BMIP 3122	Manufacturing Sustainability	√	√				
BITP 3453	Mobile Application Development				√		
BITE 3623	Motion Graphics				√		√
BITE 3713	Multi-platform Game				√		
BITP 3353	Multimedia Database		√		√		

Course Code	Course Name	BITC	BITD	BITA	BITM	BITS	BITE
BITS 3333	Multimedia Networking						√
BITS 2355	Network Analysis and Design			√			
BITS 3375	Network Project Management			√			
BITS 3483	Network Security	√					
BTMT 4293	Risk Management				√		
BTMT 3303	Seminar in Global Issues and New Business Trends		√		√		
BTMT 3383	Social Entrepreneurship	√	√		√	√	
BITP 3253	Software Validation and Verification		√				
BITP 3423	Special Topic in Software Engineering		√				
BITP 3233	Strategic Information System Planning		√			√	
BTMP 3243	Strategic Innovation Management	√	√		√	√	
BTMT 3343	Technopreneurship Growth Strategy					√	
BITM 2113	Web Application Development	√	√			√	
BITS 3535	Wireless Networks and Mobile Computing			√			
Total number of courses should be taken		2	2	2	2	2	3

Third Language Courses

BLLW 1212 Arabic I

This course is designed for students who do not have prior knowledge in Arabic. It provides students with the foundation of knowledge to enable them to understand and respond in the oral and written forms. This course encompasses the listening, speaking, reading and writing components. This course aims to help students to obtain enough exposure of the Arabic language skills. The basic grammar introduced is related to the language used daily in conversation. Particular care is also taken to ensure the development of verbal communication and written skills in Arabic.

BLLW 1222 Mandarin I

This course is designed for students who do not have prior knowledge in Mandarin. It provides students with the foundation of knowledge to enable them to understand and respond in the oral and written forms. This course encompasses the listening, speaking, reading and writing components. This course aims to help students to obtain enough exposure of the Mandarin phonetics (Han Yu Pin Yin). The basic grammar introduced is related to the language used daily by the Chinese. Particular care is also taken to ensure the development of verbal communication and written skills in Mandarin.

BLLW 1232 Japanese I

This course is designed for students who do not have any background in Japanese. It provides students with the knowledge to enable them to understand and communicate in the oral and written forms. This course encompasses the listening, speaking, reading and writing components. The grammar introduced is related to the language used daily by the Japanese. In addition, two types of Japanese language writing systems; Hiragana and Katakana are also introduced. Students are also exposed to elementary reading materials.

BLLW 1242 Korean 1

This course is designed for students who do not have prior knowledge in Korean. It provides students with the foundation of knowledge to enable them to understand and respond in the oral and written forms. This course encompasses the listening, speaking, reading and writing components. This course aims to help students to obtain basic knowledge about Korean language. The basic grammar introduced is related to the language used daily by the Korean. Particular care is also taken to ensure the development of verbal communication and written skills in Korean.

BLLW 1252 German I

This course is designed for students who do not have prior knowledge in German. It provides students

with the foundation of knowledge to enable them to understand and respond in the oral and written forms. This course encompasses the listening, speaking, reading and writing components. This course aims to help students to obtain basic exposure of the German phonetics. The basic grammar introduced is related to the language used daily by the German. Particular care is also taken to ensure the development of verbal communication and written skills in German.

BLLW 1172 Bahasa Melayu Komunikasi

Kursus ini memperkenalkan susuk tatabahasa bahasa Melayu. Pelajar didedahkan dengan aspek-aspek nahu, klausa, terminologi, binaan ayat, penjodoh bilangan dan unsur sastera. Diharapkan pelajar dapat menguasai pertuturan atau berkomunikasi dengan baik dan mudah berdasarkan kemampuan pelajar asing.

BITP 3523 Advanced Database Administration

This course gives opportunity for the students to develop, test and deploy interactive Internet applications using Oracle forms and Reports Developer software. Working in a GUI environment, student will learn how to create and customise forms with user input items such as check boxes, list items, and radio groups. Student will also learn how to modify data access by creating event-related triggers and display forms elements and data in multiple canvases and windows. This course is designed to prepare the students for the corresponding Oracle Certified Professional, OCP, certification.

BITP 3513 Advanced Database Programming

This course gives opportunity for the students to develop, test and deploy interactive Internet applications using Oracle Forms and Reports Developer software. Working in a GUI environment, students will learn how to create and customize forms with user input items such as check boxes, list items and radio groups. Students will also learn how to modify data access by creating event-related triggers and display Forms elements and data in multiple canvases and windows. The course is designed to prepare the students for the corresponding Oracle Certified Professional (OCP) certification.

BTMU 1093 Business Statistics

This course is related to the application of applied statistics used for problem solving in conducting any business operation. The topics include introduction to statistics, data classification, graphic presentation, central tendency measurement, frequency of spread distribution measurement, concepts of probability, probability distribution, sampling distribution, interval estimation, hypothesis testing, chi-square distribution, variance analysis (ANOVA), simple linear regression analysis, and correlation analysis. Knowledge acquired will arm students with the competencies in statistics for analyzing and solving daily business problems.

BITS 2573 Cloud Computing Foundation

This course teaches the student on how to develop technical proficiency in cloud computing and launch or pivot to careers in a cloud-first world. It will provide a detailed overview of concepts covering cloud basics, big data, and machine learning and where and how Cloud Computing fits in. Starts with an overview of cloud computing and then dives deeper into two areas - cloud computing infrastructure, and big data and machine learning. By the end of the course, students will be able to articulate concepts around cloud computing, big data, and machine learning and demonstrate some hands-on skills.

BTMT 3323 Contemporary Business Management

This course is designed to develop business talent for the future world of production. Students will be guided through the process of creating, analysing, planning and implementing disruptive and innovative business models with its operational strategies pertaining to the Industry 4.0. Students will be exposed to the theoretical and hands-on exercises of Industry 4.0 business management to enable them to apprehend the concept of the 4^{th} Industrial Revolution.

Topics discuss will include the emergence of business model 4.0, coopetition and co-innovation, 4.0 products and services, Industrial Internet of Things (IIoT), cyber-physical system, digital business transformation, digital enterprise, smart factory, intelligent robots and intelligent production and manufacturing. In the hands-on exercises, students will use visualisation software as well as stationary modules or simulators.

Students are expected to acquire the skills and knowledge to utilise the Industry 4.0 model in the current and future global marketplace. These would enhance their professional career as technopreneur, executive or consultant in the field of Industry 4.0 transformation. By end of this course, students should able to define, discuss, understand and apply the business strategies and tactics learnt in the context of Industry 4.0.

BITP 5383 Data Governance And Security

The aim of this course is to teach students the process of managing the availability, usability, integrity and security of the data in enterprise systems, based on internal data standards and policies that also control data usage. They will also explore how to manage organizations' evolving data privacy regulations, effective data governance, ensuring the consistency and trustworthiness of data. Topics include the introduction of data governance, the framework, best practices and implementation of ensuring data security. The topic will also include the challenges and pillars of data governance.

BITP 5703 Data Quality Management

This course covers data quality management strategies across the data lifecycle. It emphasizes architecting for reliability and introduces the ISO 8000-61 standard for managing quality at scale. Topics include ISO processes, capability maturity models, implementation considerations like organizational factors, and real-world case studies. Additionally, the course prepares organizations for implementing data quality management, highlighting the human factor's impact on data quality, and provides insights from real-world case studies to equip students with practical knowledge.

BITP 2323 Database Administration

This course students will take up the roles, issues and responsibilities as database administrator. They will also identify the functions of the DBMS such as storage, access and data updates, database objects, data integrity, physical database design, user management and database performance.

BITM 2123 Digital Audio and Video Technology

This course will give details and valuable insight of the wonderful world of digital audio and video. Students will be introduced to topics on audio production, recording techniques, video production tools, video hardware, shooting procedure, special effects, MIDI sequencing, and audio/video production concepts. Besides, various tools for editing, practical as well as composing digital audio and video will be taught during the course.

BITS 3443 Digital Forensics

This course is an introduction to digital forensics reflects the need for conducting professional computing investigations. Students will explore general computer investigations, security issues with operating systems, setup and maintenance of a digital forensics lab, use of computer forensics tools, digital evidence controls, data acquisition and analysis, e-mail investigations and the preparation of investigation report.

BITM 2323 Digital Imaging for Multimedia

This beginner digital imaging course is meant to help students to master the creation of one of the multimedia elements; image, using digital camera. They will learn the basic functions of DSLR camera, capturing high-quality images suitable for industry standard multimedia production. Lecturer will show them how to see the world like a photographer, whether they are just starting out or have been taking photos for years. This course focusing on practical training, rather than just theory.

BITS 3343 Fiber Optic

This subject covers basic and advanced applications that will relate to optical fiber in common usage in the network. Specific mechanism will be discussed from operating principles of optical communication device to fiber optic communication technology.

BTMP 2083 Franchise and Retail Management

Subjek ini akan memberi tumpuan kepada aspek runcit dan francais yang merangkumi pemahaman konsep, strategi dan trend yang berkaitan dengan operasi dalam bidang runcit dan francais di pasaran Malaysia. Akhir sekali, pelajar akan menjadi seorang pengurus yang cekap dalam menguruskan organisasi serta mampu mengatasi cabaran di luar jangkaan. Ia melibatkan kerja secara individu dan berkumpulan serta menggunakan kajian kes sebenar. Setelah tamat kursus ini, pelajar akan dapat memahami aktiviti runcit dan francais sebenar serta menggunakannya sebagai salah satu pilihan dalam pembangunan kerjaya mereka.

BITE 3723 Game Mechanics

This course focuses on the game's graphics, physics, sound and input of artificial intelligent, networking and recognition levels. This course provides a comprehensive foundation in the relevant field of computer games, serving as a premier and provides a con-

text for special courses in final year. This course provide students with an introduction to the theory and practice of video game programming. Students will be involved in lab training sessions and also work together as a team for the awakening of the real game, designing and building their own game works by using the existing game engine (e.g., OPENGL C++ or Micosoft XNA or DirectX).

BITE 3523 Game Physics

This course discusses techniques to create realistic 3D graphics environments using advanced computer game programming, C++. The emphasis is on mathematics and physic concepts in the development of computer games. The topics discussed range from geometry, matrix, kinematics, rotation and offense and its application in the development of computer games.

BITE 3633 Game Play

This course is designed to provide fundamental level and basic requirement aspects of game design and gameplay. Topics include basic understanding of casual gaming, game mechanic and gameplay type such as matching, sorting, seeking, managing, hitting, chaining, constructing, bouncing, tossing, rolling, stacking and socializing. Other topics include such as game reward and ranking in game. Current issues related to the latest trends and trend game players and platforms were also discussed at the end of the course.

BITP 3483 Geographic Information System

This course will introduce students to GIS. GIS is a computer based data processing tool that is used to manage, analyse and visualise spatial data. It can be considered as advanced database. Students will explore some of the GIS applications in the area of electronic government, resources management, disaster management, businesses, banking and insurance industries. Students must be familiar with traditional methods of identifying and describing locations using paper maps. The students will begin by examining the geographic basics of mapping and examine the processes in which spatial data can be recorded, captured, stored, processed using computers. Next, the students will introduce the methods used in spatial analysis.

BTMP3523 Industrial Leadership

This subject discuss the concepts, theories, strategies and elements of leadership in organizations. Among the topics which also will be discussed are the leadership characterictics, leadership and motivation, empowerment, leadership power and influence, shaping values and culture in the workplace, leading team and leading innovation.

BITM 1123 Interactive Media Authoring

This course will introduces the various stages of interactive media project development from definition to the delivery of a multimedia product. The students will be introduced to instructional design followed by different stages in the product development including learning objects including prior analysis, the design, delivery considerations and evaluation. The lessons will also cover different models in instructional design, e-learning standards and concept of interactivity. Lab sessions will cover tools that assist the

development on an interactive learning product including iBook Author and Adobe Flash/ Unity. A complete project and report has to be submitted at the end of the semester.

BITI 2213 Knowledge-Based Management

This course introduces the students to the concept of Knowledge-Based Systems, KBS, such as phases of developing KBS, types of knowledge representations, knowledge acquisitions, and types of inference techniques and reasoning. Students also are exposed to Expert Systems as one of the KBS.

BITS 2313 Local Area Network

This course is an introduction to the current methods and practices in the use of LANs. The emphasis will be placed on LAN hardware and software, installation management and connection to other networks. Topics covered include network architecture, network communication protocols, end-to-end protocol stacks, network components, network management and the Open Systems Interconnection reference model.

BITI 2223 Machine Learning

In this course, students are exposed to the foundation of machine learning, which is the study of how to build a computer system that learns from experience. The course starts with an overview of Data Mining for a background study. Main topics that will be covered are such as concept learning, decision tree learning, Bayesian learning, linear model, instance-based learning, model evaluation, association analysis, and reinforcement learning. Besides, some applications of machine learning including robotic control, autonomous navigation, bioinformatics, speech recognition, and web data processing will be introduced.

BMIP 3122 Manufacturing Sustainability

This course is designed to provide students with an understanding of sustainability issues, the concepts and the scope of Sustainable Manufacturing (SM), the strategies in SM, the management approaches in SM, and tools commonly used in SM. In the current situation, integrating sustainability into business process will enhance the business's total performance and competitiveness. Skills developed and knowledge acquired from this course will prepare students to be environmentally conscious engineers who are sensitive to environment, economic and social/community related problems and capable to solve those problems and enhance total performance of industries.

BITP 3453 Mobile Application Development

This course exposes the students to the development of mobile application development focusing on Android. Students are to be exposed to the introduction of native and hybrid application development as well as multi-threading programming and client server interaction via web services.

BITE 3623 Motion Graphics

This course is designed to expose the students to the basic visual effect and motion graphics. This includes

understanding and designing aspects by using a visual effect and motion graphics application. The students will be exposed to the skill of using a visual effect and motion graphics software such as After Effect.

BITE 3713 Multi-platform Game

This course provide student with a study of multiplatform development strategy in game development pipeline. Understanding multiplatform concept is an important step to determine business process and goal for the developer. Various architecture of game consoles and other platform such as mobile devices lead towards different performance and expectation toward one game title. Thus the need to understand various game development pipeline across multiple gaming platform is crucial in order to deliver the final game product expectation. Students will participate in individual hands-on lab exercises, and also work together like a real game development team to design and build their own game across several platform.

BITP 3353 Multimedia Database

Multimedia Database Management System, MMDBMSs, is a Database Management System, DBMS, that supports both traditional and multimedia data types, and is capable of handling large collections of multimedia entities. This course revolves around fundamental components that need to be integrated into conventional DBMSs to make them practical for developing multimedia database applications. The most important is to overview various feature and approaches for handling large collections of multimedia entities by existing relational and object-relational DBMSs. Then, developing a set of features and functions that a MMDBMSs should provide to effectively and efficiently support various multimedia data types, such as text document, images, audio and video.

BITS 3333 Multimedia Networking

This course covers topics in basic and advanced network multimedia. Certain topics will be selected from multimedia information representation, compression, network high-speed such as frame relay and ATM network local high-speed computers. The emphasis will also be given to the transmission protocol (TCP/IP, RSVP, MPLS, RTP) and Quality of Service, QoS, in networks such as intergrated services and differentiate services.

BITS 2333 Network Analysis and Design

This course covers a systems approach to network design, the concept, guidelines and practice for requirement analysis and flow analysis. The technology choices, interconnection mechanism, network management and security will be covered in logical design. Some issue on network design will be included in physical design, addressing and routing. Software for network analysis and design, namely the Microsoft Visio will be introduced and used to help in understanding and applying the network analysis and design knowledge areas and processes.

BITS 3323 Network Project Management

This course covers project management body of knowledge (project integration management, scope

management, time management, cost management, quality management, and human management). It also covers the processes or steps in project management (project initiation, planning, executing, controlling and project closing or termination). Software for project management (Microsoft Project and Microsoft Excel) will be introduced and used to help in understanding and applying the project management knowledge areas and processes.

BITS 3483 Network Security

This course introduces fundamental principles of network security, focusing on threats, vulnerabilities, and attacks in various environments. Students will identify security risks, analyze their impact, and determine appropriate protection measures. The course covers authentication mechanisms, secure network protocols, cloud and virtualization security, endpoint protection, and network security technologies. Learners will manipulate security tools to enhance cybersecurity defenses and demonstrate a security-conscious mindset by proposing secure network designs. Through practical applications, students will develop essential technical skills and critical thinking in securing networks against evolving cyber threats.

BTMT 4293 Risk Management

Kursus ini akan dilaksanakan dalam persekitaran industri sebenar melalui pembelajaran berasaskan kerja (WBL) secara pelepasan blok. Aktiviti pengajaran dan pembelajaran akan disampaikan melalui pendekatan pembelajaran campuran. Pelajar akan dapat mengakses bahan pengajaran dan berdiskusi dengan pensyarah melalui forum di platform pembelajaran dalam talian UTeM (U-learn).

Kursus ini menyediakan pengenalan kepada pengurusan risiko dalam organisasi yang merupakan disiplin yang sangat bernilai dan sangat dicari oleh organisasi yang sangat dikawal selia dan memerlukan daya tahan tinggi. Kursus ini mengenal pasti isu semasa dan membincangkan keperluan untuk mengurus risiko. Ia merangkumi dorongan di sebalik pengurusan risiko perusahaan dan isu-isu berkaitan tadbir urus korporat. Kursus ini menerangkan hubungan antara tadbir urus korporat, kawalan dalaman, dan pengurusan risiko. Ia merangkumi pelbagai peringkat dalam keseluruhan proses pengurusan risiko.

Pelajar juga akan berpeluang menganalisis amalan pengurusan risiko dalam industri dan mensimulasikan aspek teori kursus ke dalam persekitaran industri sebenar melalui projek WBL yang diberikan oleh jurulatih industri.

BTMT 3303 Seminar in Global Issues and New Business Trends

Kursus ini menerangkan kepentingan isu global terhadap operasi harian perniagaan. Ini termasuk pengaruh politik, sosial, undang-undang, teknologi, dan ekonomi terhadap perniagaan baru. Pelajar diharapkan dapat menganjurkan siri seminar mengenai topik yang diberikan dan menulis laporan kritikal berdasarkan topik yang dibincangkan dalam seminar.

BTMT 3383 Social Entrepreneurship

This course explores the approaches of social innovation and social entrepreneurship (SISE) used by social entrepreneurs to develop innovative social business models and breakthrough solutions to pressing social problems. Students learn about the full range of social business models, including non-profit organisations, businesses that produce income-generating products or services for a social purpose, and socially responsible for-profit businesses. Students must understand how social enterprises use the SISE to develop business models that provide innovative solutions to deep-rooted social challenges. Students will also critically engage with social problems in communities and create innovative strategies for transformative social change. For the course's final project, students will need to design and manage viable SISE projects that target the social beneficiaries or communities they want to transform.

BITP 3253 Software Verification And Validation

This course gives exposure to the students about the software testing concept and focus on process to develop and implement testing plan, testing strategy, software check, unit testing, integration testing, system testing and acceptance testing. The students will implement software quality assurance activity such as quality requirement, quality criteria, software metrics, software quality model, software evaluation,and review.

BITP 3423 Special Topic in Software Engineering

This course provides the students with the foundation in rationalizing the critical skill sets of the core architectural principles and alignment to the IT Architecture Body of Knowledge. Ultimately, the focus of IT Architecture for Special Topic in Software Engineering this semester underlies the need for a holistic IT Architecture approach, skills requirements and strategically equips individual roles in the enterprise to realize the business values of a sound technology adoption.

BITP 3233 Strategic Information System Planning

This course will introduce the importance of IS to enhance organisation competitiveness. Therefore the students will be equipped with various types of information systems and a strategic planning process, tools and techniques to propose business information systems that strategically differentiate and competitive than other organisations. Then students will work to integrate organisation's business objectives with IS that support its business direction and creating competitive advantage to the organisation.

BTMP 3243 Strategic Innovation Management

This subject discusses strategic imperatives in research implementation and innovation management. Topics include developing research and innovation processes, as well as technology and innovation strategic management. Students will acquire

the neccesary knolwedge and skills in innovation processes and management. The subject also discusses intellectual property rights. Case studies will be incorporated to enhance students' understanding on strategic innovation management.

BTMT 3343 Technopreneurship Growth Strategy

This subject discusses strategic imperatives in research implementation and innovation management. Topics include developing research and innovation processes, as well as technology and innovation strategic management. Students will acquire the neccesary knolwedge and skills in innovation processes and management. The subject also discusses intellectual property rights. Case studies will be incorporated to enhance students' understanding on strategic innovation management.

BITM 2113 Web Application Development

The purpose of this course is to provide students with a comprehensive understanding of the tools and problem-solving techniques related to building effective World Wide Web sites. It emphasis 4 components in developing web applications which are: client site technologies: HTML, XHTML, HTML5, CSS, JavaScript, jQuery; server site technologies: PHP; database server: MySQL; and web servers: Apache. This course also brings together all of the elements of web site design, graphics, animation, data storage in the construction of fully functional commercial web site applications.

BITS 3535 Wireless Networks and Mobile Computing

This course provides a broad introduction to wireless communication systems and mobile computing, covering the evolution of mobile networks from early analog systems to advanced digital technologies like 4G, 5G, and emerging innovations. It explores the basic principles of wireless transmission, including signal propagation, antennas, modulation, and multiplexing, along with key multiple access techniques such as FDMA, TDMA, CDMA, and OFDM. Students gain an understanding of various wireless standards and systems used globally, as well as different types of wireless networks including personal, local, wide area, and satellite networks. The course also examines mobile network generations, mobile transport protocols, satellite communication basics, and the architecture of mobile computing systems. Topics such as mobile applications, mobile commerce, wireless security, and recent technologies like LTE, IoT, and NFC are included to highlight real-world uses and future trends in the field.

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