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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ACADEMIC HANDBOOK 2023/2024

FOR BACHELOR DEGREE AND DIPLOMA PROGRAMMES

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY

ACADEMIC HANDBOOK

Bachelor Degree and Diploma Programmes

Session 2023/2024

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.

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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.

FOREWARD BY THE DEAN

Assoc. Prof. Ts. Dr. Mohd Sanusi Azmi
Dean,
Faculty of Information and Communication Technology

Assalamualaikum w.r.t. and greetings,

Welcome to all new diploma, undergraduate, and postgraduate students in the 2023/2024 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 2023/2024, 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.

Diploma and undergraduate students will be guided by academic advisors who can be considered as their guardians at UTeM. You can refer to your academic advisor if you encounter difficulties understanding the handbook or planning your studies for each semester.

Students are expected to fully utilize the academic handbook for 2023/2024. 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

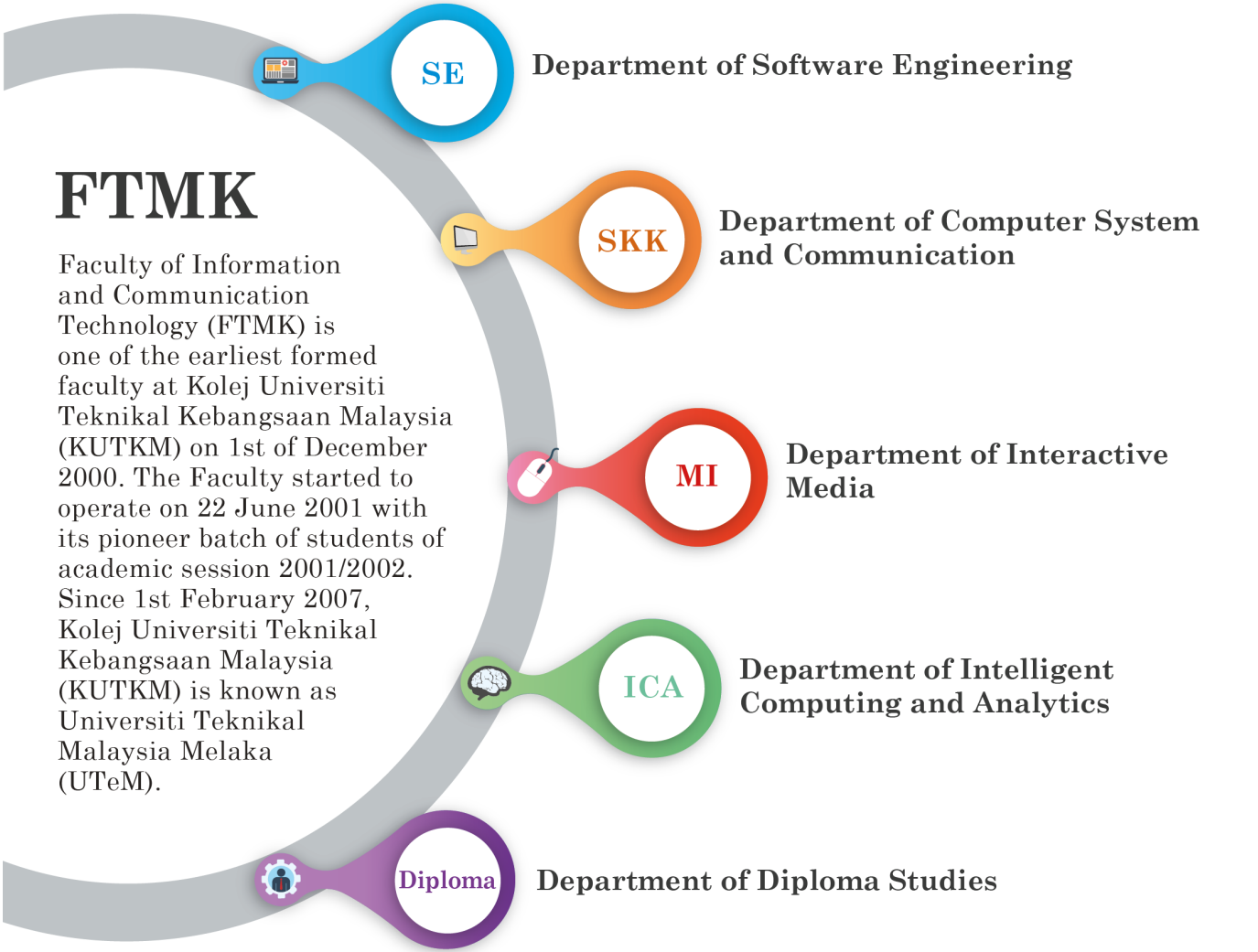
To develop highly competent professionals with outstanding personalities through a world class technical education on the basis of **application-oriented teaching, learning** and **research** with smart partnership with industry and university.

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).



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Senior Assistant Registrar

List of Programme offered (Postgraduate)[1]

Doctor of Philosophy

1. Doctor of Philosophy in Information and Communication Technology, PITA.

Master's Degree

By research:

1. Master in Information and Communication Technology, MITA.

By coursework:

1. Master of Computer Science (Database Technology), MITD.
2. Master of Computer Science (Internetworking Technology), MITI.
3. Master of Computer Science (Software Engineering), MITS.
4. Master of Computer Science (Security Science), MITZ.
5. Master of Computer Science (Multimedia Computing), MCSM.
6. Master of Software Engineering (Mobile Development), MSMD.
7. Master of Technology (Data Science and Analytics), MTDS.

[1]Please browse through our **Postgraduate Academic Handbook** for details of Postgraduate Programmes

List of Programme offered (Undergraduate)
And Its Coordinator

Bachelor's Degree

1. Bachelor of Computer Science (Computer Networking) with Honours, BITC.
   Coordinator: Dr. Zurina Sa'aya.
2. Bachelor of Computer Science (Database Management) with Honours, BITD.
   Coordinator: Ts. Dr. Norashikin Ahmad.
3. Bachelor of Computer Science (Artificial Intelligence) with Honours, BITI.
   Coordinator: Dr. Fauziah Kasmin.
4. Bachelor of Computer Science (Interactive Media) with Honours, BITM.
   Coordinator: Ts. Dr. Hamzah Asyrani Sulaiman.
5. Bachelor of Computer Science (Software Development) with Honours, BITS.
   Coordinator: Dr. Nor Hafeizah Hassan.
6. Bachelor of Computer Science (Computer Security) with Honours, BITZ.
   Coordinator: Dr. Nur Fadzilah Othman.
7. Bachelor of Information Technology (Game Technology) with Honours, BITE.
   Coordinator: Dr. Mohamad Lutfi Dolhalit.

Diploma

1. Diploma in Computer Science, DCS.
   Coordinator: Ts. Dr. Noraswaliza Abdullah.

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) 5. Artificial Intelligence (BITI) 6. Computer Security (BITZ)	**PEO 1**	Have strong knowledge of sciences, engineering and technology in their profession.
	PEO 2	Attain knowledge of contemporary issues in technology through research and life-long learning activities.
	PEO 3	Ability to function as an effective team player with the capability to lead and appreciate team work and leadership qualities.
	PEO 4	Appreciate and uphold professional attitudes and ethics necessary in fulfilling their responsibilities towards the Almighty, clients and the society.

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**	Computing practitioners who have a broad knowledge of the general theories, principles and demonstrate skills in computer science and able to provide solutions to computing problems in various application domains.
	PEO 2	Computing practitioners who are able to communicate effectively, show good attitudes and social skills in engaging with society and community, use digital resources and process data.
	PEO 3	Computing practitioners who have interest in pursuing further education, at bachelor degree or in computing professional development, able to apply entrepreneurial skills and lead diverse teams.
	PEO 4	Computing practitioners who have a commitment for appropriate ethical behaviour and professionalism in work and community.

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.

- BITE 2610 Adobe Professional Certification (Visual Design using Photoshop).
- BITI 3910 Machine Learning Professional Certification.
- BITM 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 12 with each room for 60 pax Rooms No. 13 to 14 with each room for 120 pax
Recording Capture System (ReCap)	Mini Theatre for interactive learning environment for 114 pax
Collaborative Learning Laboratory (CLeAR)	A collaborative learning laboratory with 60 pax capacity
Mini Theatre	The theatre room for student animation presentation for 32 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. Information Security Forensics & Computer Networking (INSFORNET) Laboratory 3. Optimization, Modelling, Analytics and Simulation (OptiMAS) Laboratory 4. Computational Intelligence and Technologies (CIT) Laboratory 5. Human Centered Computing and Information Systems Lab (HCC-ISL) Laboratory 6. Pervasive Computing & Educational Technology (PET) Laboratory 7. Biomedical and Engineering (BIOCORE) Laboratory

University-Industry Centre	UTeM Cybersecurity Competency Centre - collaboration with CyberSecurity Malaysia, ASK-Pentest, Ministry of Higher Education
University-Industry Laboratory	Coordinated Malware Eradication and Remediation Project (CMERP) Satellite Laboratory – collaboration with Cyber Security Malaysia
Teaching Laboratories	1. Computer Game Laboratory 2. Software Engineering Lab 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. Security Laboratory 9. System / Hardware Laboratory 10. Wireless Laboratory 11. Virtual Reality Laboratory 12. Multimedia Laboratory 1, 2, 3 and 4 13. Artificial Intelligence Laboratory 1, 2, 3 and 4 14. Student Workshop Laboratory
Other Facilities	1. Visiting Professor Rooms 2. Executive Laboratory 3. Administration Office – Level 2 & 3 4. FICTS Room 5. Student Common Room 6. Surau or Prayer Room 7. Lobby Area 8. Parking Area for students and staffs

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.

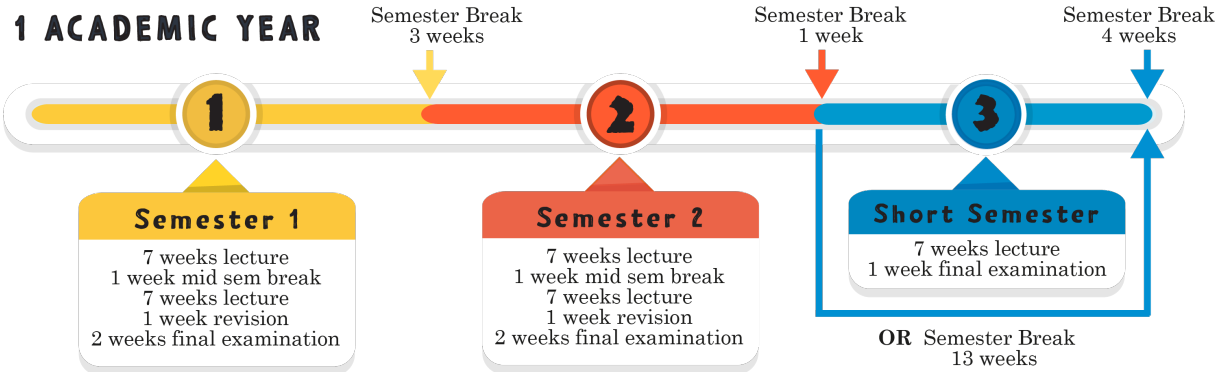
DISCIPLINARY ACTIONS WILL BE TAKEN AGAINST ANY STUDENT WHO IS FOUND BREAKING ANY RULE LISTED ABOVE.

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 of all programme	7 semesters (3 $\frac{1}{2}$ years)	11 semester (5 $\frac{1}{2}$ 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)[1]	14 trimesters (5 years)	29 trimesters (10 years)

[1]Details can be obtained from Lifelong Learning Centre (*Pusat Pembelajaran Sepanjang Hayat*), UTeM

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	Very Good
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.

$$\begin{aligned} \text{Total Grade Point (TGP)} &= k_1m_1 + k_2m_2 + \ldots + k_nm_n \\ \text{Total Calculated Point (TCP)} &= k_1 + k_2 + \ldots + k_n \\ \text{GPA} &= \frac{TGP}{TCP} \end{aligned}$$

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

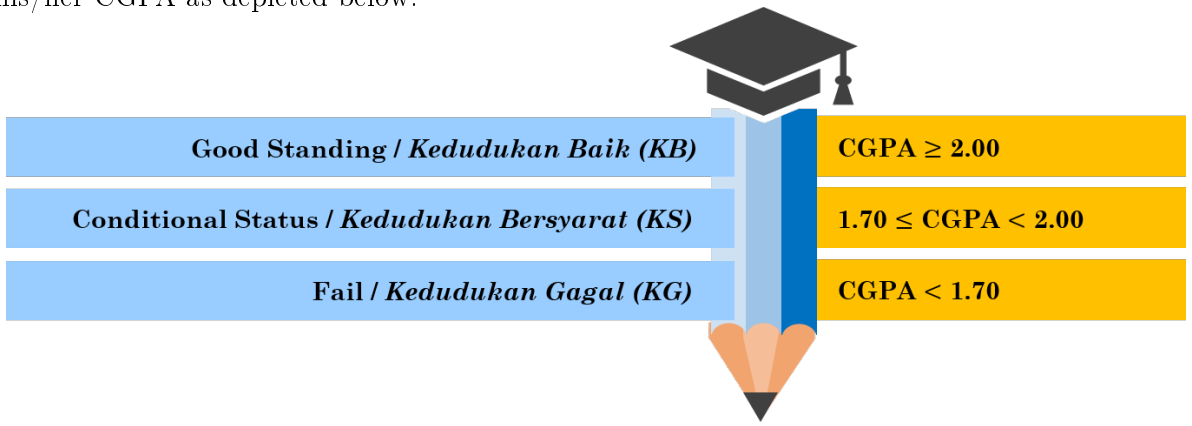
Cumulative Grade Point Average (CGPA):

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)

Artificial Intelligence Club (AIC)


BITC
BACHELOR OF COMPUTER SCIENCE
(COMPUTER NETWORKING)
WITH HONOURS

BITC 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.

Programme Learning Outcomes (PLO)

The aim of the Bachelor of Computer Science (Computer Networking) 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 ICT applications.
3. Able to analyse, create, assemble, configure, implement, manage, maintain and administer network infrastructure and security.
4. Able to develop advanced computer network applications.
5. Able to obtain recognition from professional bodies.
6. Able to resolve problems in creative way and able to communicate effectively.
7. Able to contribute individually or in 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

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. Information System Executive.
2. Computer Security Executive.
3. Network Project Administrator.
4. System Analyst.
5. Network Programmer.
6. Network Engineer.

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**
General Module	W	14
Core Module	P	45
Specialisation Module	K	30
Final Year Project	P	6
Industrial Training	P	12
Free Module	E	13
	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	
BITI 1213	Linear Algebra and Discrete Mathematics	P	2	2	3	
BITM 1113	Multimedia System	P	2	2	3	
BITP 1113	Programming Technique	P	2	2	3	
BITS 1123	Computer Organisation and Architecture	P	2	2	3	
				Total Credits	**16**	

Year One : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITI 1223	Calculus and Numerical Methods	P	2	2	3	
BITM 2313	Human Computer Interaction	P	2	2	3	
BITP 1123	Data Stucture and Algorithm	P	2	2	3	BITP 1113
BITP 1323	Database	P	2	2	3	
BITS 1313	Data Communication and Networking	P	2	2	3	
B*** ***3	Faculty Free Module I	E	2	2	3	
				Total Credits	**18**	

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
BITU 2913	Workshop I	P	1[2]		3	BITP 1113
BITI 2233	Statistics and Probability	P	2	2	3	
BITP 3113	Object-oriented Programming	P	2	2	3	
BITS 1213	Operating System	P	2	2	3	
BITS 2313	Local Area Network	K	2	2	3	BITS 1313
			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		
BKK* ***1	Co-Curriculum I[1]	W	0	3	1	
BITI 1113	Artificial Intelligence	P	2	2	3	
BITP 2213	Software Engineering	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
B*** ***2	University Free Module I	E	2	0	2	
B*** ***3	Faculty Free Module II	E	2	2	3	
			Total Credits		**18**	

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

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
BKK* ***1	Co-Curriculum II[1]	W	0	3	1	
BITU 3923	Workshop II	K	1[2]		3	BITU 2913
BITS 3313	Network Administration and Management	K	2	2	3	BITS 2333
BITS 3323	Network Project Management	K	2	2	3	
BITS 3533	Wireless Network and Mobile Computing	K	2	2	3	BITS 1313
B*** ***3	Faculty Free Module III	E	2	2	3	
				Total Credits	**18**	

[1]This course can be taken in any semester. Please refer to Co-Curriculum Unit before register.
[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	
BITU 3973	Final Year Project I	P	1[1]		3	BITU 3923
BITS 3333	Multimedia Networking	K	2	2	3	BITS 2313
BITS 3413	Information Technology and Network Security	K	2	2	3	BITS 1213, BITS 1313
BITS 3513	TCP/IP Programming	K	2	2	3	BITP 1113
B**W ***2	University Free Module II	E	2	0	2	
				Total Credits	**16**	

[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

Below is the list of courses in free module that can be selected as part of the curriculum. The courses in the free module are divided into two categories, that is,

1. University free module (2 courses, 2 credit each).
2. Faculty free module (3 courses, 3 credit each).

List of courses offered can be changed from time to time in accordance with industry needs.

Course Code	Course Name	Contact Hrs		Crdt	Pre-requisite
		Lect	Lab		
University Free Module I					
BIPW 1152	Industrial and Organisational Psychology	2	0	2	
BLHC 4032	*Pemikiran Kritis dan Kreatif*	2	0	2	
BLHC 4012	Organisational Communication	2	0	2	
BLHC 4022	Negotiation Skills	2	0	2	
University Free Module II (For Local Students)					
BLLW 1212	Arabic I	1	2	2	
BLLW 1222	Mandarin I	1	2	2	
BLLW 1232	Japanese I	1	2	2	
BLLW 1242	Korean Language	1	2	2	
BLLW 1252	German I	1	2	2	
University Free Module II (For International Students)					
BLLW 1172	Bahasa Melayu Komunikasi.	2	0	2	
Faculty Free Module I, II, III (Subject to course availability)					
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	
BITS 2513	Internet Technology	2	2	3	
BITS 3343	Fibre Optic	2	2	3	BITS 1313
BITS 3443	Digital Forensics	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.

Programme Learning Outcomes (PLO)

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

1. Able to apply knowledge of computer science and information technology.
2. Able to analyze, design and develop ICT applications.
3. Able to develop database by applying database concept using latest technology.
4. Able to develop database application with standard security measures.
5. Able to administer and maintain database according to the standard procedure and policy.
6. Able to resolve problems in creative way and able to communicate effectively.
7. Able to contribute individually or in a team in various discipline 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

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 system analyst, system programmer, IT officer, database designer, database application developer, database analyst, database administrator, data engineer, and other careers that require expertise in information technology particularly data analysis and management in diverse disciplines.

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. Data Engineer.
8. Other careers that require expertise in information technology particularly data analysis and management in diverse disciplines.

Other than that, the graduates will have the opportunity to further their studies at thepostgraduate 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**
General Module	W	14
Core Module	P	45
Specialisation Module	K	30
Final Year Project	P	6
Industrial Training	P	12
Free Module	E	13
	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	
BKK* ***1	Co-Curriculum I[1]	W	0	3	1	
BITI 1213	Linear Algebra and Discrete Mathematics	P	2	2	3	
BITM 1113	Multimedia System	P	2	2	3	
BITP 1113	Programming Technique	P	2	2	3	
BITS 1123	Computer Organisation and Architecture	P	2	2	3	
				Total Credits	**17**	

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

Year One : Semester 2

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	
BITI 1223	Calculus and Numerical Methods	P	2	2	3	
BITP 1123	Data Stucture and Algorithm	P	2	2	3	BITP 1113
BITP 1323	Database	P	2	2	3	
BITP 2213	Software Engineering	P	2	2	3	
B*** ***2	University Free Module I	E	2	0	2	
				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 register.

Year Two : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITU 2913	Workshop I	P	1[1]		3	BITP 1113
BITI 2233	Statistics and Probability	P	2	2	3	
BITM 2313	Human Computer Interaction	P	2	2	3	
BITS 1213	Operating System	P	2	2	3	
BITP 2303	Database Programming	K	2	2	3	BITP 1323
BITP 2313	Database Design	K	2	2	3	BITP 1323
				Total Credits	**18**	

[1]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
BITI 1113	Artificial Intelligence	P	2	2	3	
BITP 3113	Object-oriented Programming	P	2	2	3	
BITS 1313	Data Communication and Networking	P	2	2	3	
BITP 2223	Software Requirement and Design	K	2	2	3	
BITP 2323	Database Administration	K	2	2	3	BITP 1323
B**W ***2	University Free Module II	E	2	0	2	
				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
BITU 3923	Workshop II	K	1[1]		3	BITU 2913
BITP 3433	Information Technology and Database Security	K	2	2	3	
BITP 3223	Software Project Management	K	2	2	3	
BITP 3363	Data Warehousing and Business Intelligence	K	2	2	3	
BITP 3483	Geographic Information System	K	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	
BITU 3973	Final Year Project I	P	1[1]		3	BITU 3923
BITP 3353	Multimedia Database	K	2	2	3	BITP 1323
BIT* ***3	Faculty Free Module I	E	2	2	3	
BIT* ***3	Faculty Free Module II	E	2	2	3	
BIT* ***3	Faculty Free Module III	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

Below is the list of courses in free module that can be selected as part of the curriculum. The courses in the free module are divided into two categories, that is,

1. University free module (2 courses, 2 credit each).
2. Faculty free module (3 courses, 3 credit each).

List of courses offered can be changed from time to time in accordance with industry needs.

Course Code	Course Name	Contact Hrs		Crdt	Pre-requisite
		Lect	Lab		
University Free Module I					
BIPW 1152	Industrial and Organisational Psychology	2	0	2	
BLHC 4032	*Pemikiran Kritis dan Kreatif*	2	0	2	
BLHC 4012	Organisational Communication	2	0	2	
BLHC 4022	Negotiation Skills	2	0	2	
University Free Module II (For Local Students)					
BLLW 1212	Arabic I	1	2	2	
BLLW 1222	Mandarin I	1	2	2	
BLLW 1232	Japanese I	1	2	2	
BLLW 1242	Korean Language	1	2	2	
BLLW 1252	German I	1	2	2	
University Free Module II (For International Students)					
BLLW 1172	Bahasa Melayu Komunikasi	2	0	2	
Faculty Free Module I, II, III (Subject to course availability)					
BITI 2223	Machine Learning	2	2	3	BITI 1113
BITM 2113	Web Application Development	2	2	3	
BITP 3233	Strategic Information System Planning	2	2	3	
BITP 3253	Software Validation and Verification	2	2	3	BITP 2213
BITP 3423	Special Topic in Software Engineering	2	2	3	
BITP 3513	Advanced Database Programming	2	2	3	BITP 2303
BITP 3523	Advanced Database Administration	2	2	3	BITP 2323
BITS 2313	Local Area Network	2	2	3	BITS 1313
BITS 2513	Internet Technology	2	2	3	


BITI
BACHELOR OF COMPUTER SCIENCE
(ARTIFICIAL INTELLIGENCE)
WITH HONOURS

Bachelor of Computer Science (Artificial Intelligence) with Honours

Programme Details

Bachelor of Computer Science (Artificial Intelligence) academic programme is offered to prepare graduates with a thorough understanding and superior skills of Computer Science, particularly in the area of Artificial Intelligence. Graduates will also be equipped with advanced scientific knowledge and engineering skills in Artificial Intelligence (AI) to fulfil industry needs especially in the field of information and communication technology (ICT), robotics and manufacturing.

Programme Learning Outcomes (PLO)

The aim of the Bachelor of Computer Science (Artificial Intelligence) 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 ICT applications.
3. Able to apply AI techniques such as searching techniques, fuzzy logic, machine learning, neural networks, evolutionary computing and intelligent agents in developing a system.
4. Equipped with skills to develop individually or in a group on AI-based systems such as intelligent systems, expert systems, intelligent agent systems and robotic systems.
5. Able to conduct research in the fields related and based on AI.
6. Able to resolve problems in a 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 enterpreneurship skills.
9. Able to perform continuous self-learning to obtain knowledge and skills.

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 AI. Among the career opportunities are:

1. Knowledge Engineer / AI Engineer / Machine Learning Engineer.
2. Intelligent Systems / Expert Systems Developer.
3. Data Analyst / Data Engineer.
4. System Analyst / Programmer / Designer.
5. Software Developer / Consultant.
6. Computer / Data Scientist.
7. Researcher.

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 (Artificial Intelligence) with Honours. The programme components are as follows:

Bachelor's Degree (Computer Science) Minimum graduating credit - 120		
Component	**Component's Code**	**Credits**
General Module	W	14
Core Module	P	45
Specialisation Module	K	30
Final Year Project	P	6
Industrial Training	P	12
Free Module	E	13
	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	
BKK* ***1	Co-Curriculum I[1]	W	0	3	1	
BITI 1213	Linear Algebra and Discrete Mathematics	P	2	2	3	
BITM 1113	Multimedia System	P	2	2	3	
BITP 1113	Programming Technique	P	2	2	3	
BITS 1123	Computer Organisation and Architecture	P	2	2	3	
				Total Credits	**17**	

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

Year One : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITI 1113	Artificial Intelligence	P	2	2	3	
BITI 1223	Calculus and Numerical Methods	P	2	2	3	
BITP 1123	Data Stucture and Algorithm	P	2	2	3	BITP 1113
BITP 1323	Database	P	2	2	3	
BITS 1213	Operating System	P	2	2	3	
BITS 1313	Data Communication and Networking	P	2	2	3	
				Total Credits	**18**	

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
BITU 2913	Workshop I	P	1[2]		3	BITP 1113
BITI 2233	Statistics and Probability	P	2	2	3	
BITP 3113	Object-oriented Programming	P	2	2	3	
BITI 2213	Knowledge Based System	K	2	2	3	BITI 1113
BITI 2223	Machine Learning	K	2	2	3	BITI 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		
BITM 2313	Human Computer Interaction	P	2	2	3	
BITP 2213	Software Engineering	P	2	2	3	
BITI 3123	Fuzzy Logic	K	2	2	3	BITI 1113
BITI 3133	Neural Network	K	2	2	3	BITI 1113
BITI 3143	Evolutionary Computing	K	2	2	3	BITI 1113
B*** ***3	Faculty Free Module I	E	2	2	3	
				Total Credits	**18**	

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
BKK* ***1	Co-Curriculum II[1]	W	0	3	1	
BITU 3923	Workshop II	K	1[2]		3	BITU 2913
BITI 3413	Natural Language Processing	K	2	2	3	BITI 1113
BITI 3523	Artificial Intelligence in Robotics and Automation	K	2	2	3	
BITI 3533	Artificial Intelligence Project Management	K	2	2	3	
B*** ***3	Faculty Free Module II	E	2	2	3	
				Total Credits	**18**	

[1]This course can be taken in any semester. Please refer to Co-Curriculum Unit before register.
[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	
BITU 3973	Final Year Project I	P	1[1]		3	BITU 3923
BITS 3423	Information Technology Security	K	2	2	3	
B*** ***3	Faculty Free Module III	E	2	2	3	
B*** ***2	University Free Module I	E	2	0	2	
B**W ***2	University Free Module II	E	2	0	2	
				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.

List of Courses in Free Module

Below is the list of courses in free module that can be selected as part of the curriculum. The courses in the free module are divided into two categories, that is,

1. University free module (2 courses, 2 credit each).
2. Faculty free module (3 courses, 3 credit each).

List of courses offered can be changed from time to time in accordance with industry needs.

Course Code	Course Name	Contact Hrs		Crdt	Pre-requisite
		Lect	Lab		
University Free Module I					
BIPW 1152	Industrial and Organisational Psychology	2	0	2	
BLHC 4032	*Pemikiran Kritis dan Kreatif*	2	0	2	
BLHC 4012	Organisational Communication	2	0	2	
BLHC 4022	Negotiation Skills	2	0	2	
University Free Module II (For Local Students)					
BLLW 1212	Arabic I	1	2	2	
BLLW 1222	Mandarin I	1	2	2	
BLLW 1232	Japanese I	1	2	2	
BLLW 1242	Korean Language	1	2	2	
BLLW 1252	German I	1	2	2	
University Free Module II (For International Students)					
BLLW 1172	Bahasa Melayu Komunikasi	2	0	2	
Faculty Free Module I, II, III (Subject to course availability)					
BITI 3113	Intelligent Agent	2	2	3	
BITI 2113	Logic Programming	2	2	3	
BITI 2513	Introduction to Data Science	2	2	3	
BITI 3213	Decision Support Systems	2	2	3	
BITI 3313	Image Processing and Pattern Recognition	2	2	3	BITI 1113
BITI 3513	Artificial Intelligence in Manufacturing	2	2	3	BITI 1113
BITM 2113	Web Application Development	2	2	3	
BITM 3133	Computer Games Development	2	2	3	
BITP 3253	Software Validation and Verification	2	2	3	BITP 2213
BITP 3453	Mobile Application Development	2	2	3	
BITP 3473	Formal Methods	2	2	3	
BITS 2513	Internet Technology	2	2	3	
BTMT 3323	Contemporary Business Management	2	2	3	
BENT 4733	Digital Signal Processing	2	2	3	


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.

Programme Learning Outcomes (PLO)

The aim of the Bachelor of Computer Science (Interactive Media) 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 (ICT) applications.
3. Able to apply interactivity concept in designing and developing multimedia-based applications and products.
4. Able to analyse requirements, configure, implement and maintain digital audio/video equipment.

5. Able to develop multimedia application with the quality that fulfills 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

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. Web Designer / Web Developer.
2. Computer Games Designer.
3. Computer Graphics Designer.
4. Animator.
5. Digital Audio Video Engineer.
6. User Interface Designer.
7. Interactive Media Application Developer.
8. Multimedia Consultant.

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**
General Module	W	14
Core Module	P	45
Specialisation Module	K	30
Final Year Project	P	6
Industrial Training	P	12
Free Module	E	13
	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 1213	Linear Algebra and Discrete Mathematics	P	2	2	3	
BITM 1113	Multimedia System	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 register.

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
BTMW 4012	Technology Entrepreneurship	W	2	0	2	
BKK* ***1	Co-Curriculum II[1]	W	0	3	1	
BITI 1223	Calculus and Numerical Methods	P	2	2	3	
BITP 1123	Data Stucture and Algorithm	P	2	2	3	BITP 1113
BITP 1323	Database	P	2	2	3	
BITS 1313	Data Communication and Networking	P	2	2	3	
BITM 2123	Digital Audio and Video Technology	K	2	2	3	
				Total Credits	**20**	

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

Year Two : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BLHW 2772A	*Penghayatan Etika dan Peradaban*[1]	W	2	0	2	
BITU 2913A	Workshop I	P	1[2]		3	BITP 1113
BITI 1113A	Artificial Intelligence	P	2	2	3	
BITS 1213A	Operating System	P	2	2	3	
BITM 1123A	Interactive Media Authoring	K	2	2	3	
BITM 2213A	Computer Animation	K	2	2	3	
				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		
BITI 2233A	Statistics and Probability	P	2	2	3	
BITM 2313A	Human Computer Interaction	P	2	2	3	
BITP 3113A	Object-oriented Programming	P	2	2	3	
BITP 2213A	Software Engineering	P	2	2	3	
B*** ***2A	University Free Module I	E	2	0	2	
B*** ***2A	University Free Module II	E	2	0	2	
				Total Credits	**16**	

Year Three : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITM 3213	Interactive Computer Graphics	K	2	2	3	
BITU 3923	Workshop II	K	1[1]		3	BITU 2913
BITM 2113	Web Application Development	K	2	2	3	
BITM 3113	Interactive Media Project Management	K	2	2	3	
BITM 3133	Computer Games Development	K	2	2	3	
BIT* ***3	Faculty Free Module I	E	2	2	3	
				Total Credits	**18**	

[1] Average official contact hours per week.

Year Three : Semester 2

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 3973	Final Year Project I	P	1[1]		3	BITU 3923
BITM 3223	Virtual Reality Technology	K	2	2	3	
BITS 3423	Information Technology Security	K	2	2	3	
BIT* ***3	Faculty Free Module II	E	2	2	3	
BIT* ***3	Faculty Free Module III	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

Below is the list of courses in free module that can be selected as part of the curriculum. The courses in the free module are divided into two categories, that is,

1. University free module (2 courses, 2 credit each).
2. Faculty free module (3 courses, 3 credit each).

List of courses offered can be changed from time to time in accordance with industry needs.

Course Code	Course Name	Contact Hrs		Crdt	Pre-requisite
		Lect	Lab		
University Free Module I					
BIPW 1152	Industrial and Organisational Psychology	2	0	2	
BLHC 4032	*Pemikiran Kritis dan Kreatif*	2	0	2	
BLHC 4012	Organisational Communication	2	0	2	
BLHC 4022	Negotiation Skills	2	0	2	
University Free Module II (For Local Students)					
BLLW 1212	Arabic I	1	2	2	
BLLW 1222	Mandarin I	1	2	2	
BLLW 1232	Japanese I	1	2	2	
BLLW 1242	Korean Language	1	2	2	
BLLW 1252	German I	1	2	2	
University Free Module II (For International Students)					
BLLW 1172	Bahasa Melayu Komunikasi.	2	0	2	
Faculty Free Module I, II, III (Subject to course availability)					
BITE 3623	Motion Graphics	2	2	3	
BITE 3633	Game Play	2	2	3	
BITE 3713	Multi-platform Game	2	2	3	
BITI 2223	Machine Learning	2	2	3	
BITM 2323	Digital Imaging for Multimedia	2	2	3	
BITP 2223	Software Requirements and Design	2	2	3	
BITP 3453	Mobile Application Development	2	2	3	
BITP 3353	Multimedia Database	2	2	3	
BITS 2513	Internet Technology	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.

Programme Learning Outcomes (PLO)

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

1. Able to apply knowledge of computer science and information technology.
2. Able to analyze, design and develop ICT applications.
3. Able to perform system coding using relevant programming language according to industry need.
4. Able to manage software development project by applying software engineering concepts.
5. Able to perform research in software engineering field.
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 entrepreneurshipship skills.
9. Able to perform continuous self learning to obtain knowledge and skills.

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. Information System Officer.
2. System Analyst.
3. Software Engineer.
4. Software Development Manager.
5. System Administrator.
6. Team member of Software Quality Assurance.
7. Software Tester / Software Development Consultant.

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 (Software Development) with Honours. The programme components are as follows:

Bachelor's Degree (Computer Science) Minimum graduating credit - 120		
Component	**Component's Code**	**Credits**
General Module	W	14
Core Module	P	45
Specialisation Module	K	30
Final Year Project	P	6
Industrial Training	P	12
Free Module	E	13
	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	
BKK* ***1	Co-Curriculum I[1]	W	0	3	1	
BITI 1213	Linear Algebra and Discrete Mathematics	P	2	2	3	
BITP 1113	Programming Technique	P	2	2	3	
BITM 1113	Multimedia System	P	2	2	3	
BITS 1123	Computer Organisation and Architecture	P	2	2	3	
				Total Credits	**17**	

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

Year One : Semester 2

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	
BITI 1223	Calculus and Numerical Methods	P	2	2	3	
BITP 1123	Data Stucture and Algorithm	P	2	2	3	BITP 1113
BITP 2213	Software Engineering	P	2	2	3	
BITP 1323	Database	P	2	2	3	
B*** ***2	University Free Module I	E	2	0	2	
				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 register.

Year Two : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITU 2913	Workshop I	P	1[1]		3	BITP 1113
BITI 2233	Statistics and Probability	P	2	2	3	
BITP 3113	Object-oriented Programming	P	2	2	3	
BITS 1213	Operating System	P	2	2	3	
BITP 2113	Algorithm Analysis	K	2	2	3	BITP 1113
BITP 2313	Database Design	K	2	2	3	BITP 1323
				Total Credits	**18**	

[1] 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
BITI 1113	Artificial Intelligence	P	2	2	3	
BITS 1313	Data Communication and Networking	P	2	2	3	
BITP 2223	Software Requirement and Design	K	2	2	3	
BITP 3253	Software Validation and Verification	K	2	2	3	BITP 2213
BITP 3123	Distributed Application Development	K	2	2	3	BITP 3113
B**W ***2	University Free Module II	E	2	0	2	
				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
BITM 2313	Human Computer Interaction	P	2	2	3	
BITU 3923	Workshop II	K	1[1]		3	BITU 2913
BITS 3423	Information Technology Security	K	2	2	3	
BITP 3223	Software Project Management	K	2	2	3	
BITP 3453	Mobile Application Development	K	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	
BITU 3973	Final Year Project I	P	1[1]		3	BITU 3923
BITP 3423	Special Topic in Software Engineering	K	2	2	3	
B*** ***3	Faculty Free Module I	E	2	2	3	
B*** ***3	Faculty Free Module II	E	2	2	3	
B*** ***3	Faculty Free Module III	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

Below is the list of courses in free module that can be selected as part of the curriculum. The courses in the free module are divided into two categories, that is,

1. University free module (2 courses, 2 credit each).
2. Faculty free module (3 courses, 3 credit each).

List of courses offered can be changed from time to time in accordance with industry needs.

Course Code	Course Name	Contact Hrs		Crdt	Pre-requisite
		Lect	Lab		
University Free Module I					
BIPW 1152	Industrial and Organisational Psychology	2	0	2	
BLHC 4032	*Pemikiran Kritis dan Kreatif*	2	0	2	
BLHC 4012	Organisational Communication	2	0	2	
BLHC 4022	Negotiation Skills	2	0	2	
University Free Module II (For Local Students)					
BLLW 1212	Arabic I	1	2	2	
BLLW 1222	Mandarin I	1	2	2	
BLLW 1232	Japanese I	1	2	2	
BLLW 1242	Korean Language	1	2	2	
BLLW 1252	German I	1	2	2	
University Free Module II (For International Students)					
BLLW 1172	Bahasa Melayu Komunikasi	2	0	2	
Faculty Free Module I, II, III (Subject to course availability)					
BITI 2213	Knowledge Based System	2	2	3	
BITM 1123	Interactive Media Authoring	2	2	3	
BITM 2113	Web Application Development	2	2	3	
BITP 2323	Database Administration	2	2	3	BITP 1323
BITP 3233	Strategic Information System Planning	2	2	3	
BITP 3443	Enterprise Application Development	2	2	3	
BITP 3473	Formal Methods	2	2	3	
BITP 3483	Geographic Information System	2	2	3	
BITS 2313	Local Area Network	2	2	3	BITS 1313
BITS 2513	Internet Technology	2	2	3	


BITZ
BACHELOR OF COMPUTER SCIENCE
(COMPUTER SECURITY)
WITH HONOURS

Bachelor of Computer Science (Computer Security) with Honours

Programme Details

Bachelor of Computer Science (Computer Security) is aimed to produce highly knowledgeable and skilful graduates in the field of security related to computer science and information technology. Graduates are competent in advanced specialised knowledge and skill to analyse, design, install, configure, implement, administer, maintain and monitor the security infrastructure.

Programme Learning Outcomes (PLO)

The aim of the Bachelor of Computer Science (Computer Security) 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 ICT applications.
3. Able to analyse, create, assemble, configure, implement, manage, maintain and administer network infrastructure and security.
4. Able to analyse and design the physical and cybersecurity policy.
5. Able to obtain recognition from professional bodies.
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

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 Security, either in the government sector or private sector, as well as undertaking business ventures of their own. Among the career opportunities are:

1. System Analyst.
2. Computer Security Executive / Consultant.
3. Network Security Administrator / Manager / Executive / Engineer / Consultant.
4. System Security Administrator / Manager / Consultant.
5. Information Technology Executive.
6. Information Technology Project Manager.
7. Researcher.

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 Security) with Honours. The programme components are as follows:

Bachelor's Degree (Computer Science) Minimum graduating credit - 120		
Component	**Component's Code**	**Credits**
General Module	W	14
Core Module	P	45
Specialisation Module	K	30
Final Year Project	P	6
Industrial Training	P	12
Free Module	E	13
	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	
BKK* ***1	Co-Curriculum I[1]	W	0	3	1	
BITI 1213	Linear Algebra and Discrete Mathematics	P	2	2	3	
BITM 1113	Multimedia System	P	2	2	3	
BITP 1113	Programming Technique	P	2	2	3	
BITS 1123	Computer Organisation and Architecture	P	2	2	3	
				Total Credits	**17**	

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

Year One : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BITI 1223	Calculus and Numerical Methods	P	2	2	3	
BITM 2313	Human Computer Interaction	P	2	2	3	
BITP 1123	Data Stucture and Algorithm	P	2	2	3	BITP 1113
BITP 1323	Database	P	2	2	3	
BITS 1313	Data Communication and Networking	P	2	2	3	
B*** ***2	University Free Module I	E	2	0	2	
				Total Credits	**17**	

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
BKK* ***1	Co-Curriculum II[1]	W	0	3	1	
BITU 2913	Workshop I	P	1[2]		3	BITP 1113
BITI 1113	Artificial Intelligence	P	3	2	3	
BITI 2233	Statistics and Probability	P	2	2	3	
BITS 1213	Operating System	P	2	2	3	
BITS 2343	Computer Network	K	2	2	3	
				Total Credits	**18**	

[1]This course can be taken in any semester. Please refer to Co-Curriculum Unit before register.
[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 3113	Object-oriented Programming	P	2	2	3	
BITP 2213	Software Engineering	P	2	2	3	
BITS 2413	Network Security Infrastructure and Design	K	2	2	3	
BITS 2423	Physical Security and Electronic Surveillance	K	2	2	3	
BITS 2523	Cyber Law and Security Policy	K	2	2	3	
BIT* ***3	Faculty Free Module I	E	2	2	3	
				Total Credits	**18**	

Year Three : 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 3923	Workshop II	K	1[2]		3	BITU 2913
BITS 3353	Network Security Administration and Management	K	2	2	3	
BITS 3363	Network Security Project Management	K	2	2	3	
BITS 3463	Applied Cryptography and Information Theory	K	2	2	3	
BIT* ***3	Faculty Free Module II	E	2	2	3	
				Total Credits	**17**	

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

Year Three : Semester 2

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
BTMW 4012	Technology Entrepreneurship	W	2	0	2	
BITU 3973	Final Year Project I	P	1[1]		3	BITU 3923
BITS 3523	Computer Audit and Risk Management	K	2	2	3	
BITS 3613	Hacking Techniques and Prevention	K	2	2	3	
BIT* ***3	Faculty Free Module III	E	2	2	3	
B**W ***2	University Free Module II	E	2	0	2	
				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

Below is the list of courses in free module that can be selected as part of the curriculum. The courses in the free module are divided into two categories, that is,

1. University free module (2 courses, 2 credit each).
2. Faculty free module (3 courses, 3 credit each).

List of courses offered can be changed from time to time in accordance with industry needs.

Course Code	Course Name	Contact Hrs		Crdt	Pre-requisite
		Lect	Lab		
University Free Module I					
BIPW 1152	Industrial and Organisational Psychology	2	0	2	
BLHC 4032	*Pemikiran Kritis dan Kreatif*	2	0	2	
BLHC 4012	Organisational Communication	2	0	2	
BLHC 4022	Negotiation Skills	2	0	2	
University Free Module II (For Local Students)					
BLLW 1212	Arabic I	1	2	2	
BLLW 1222	Mandarin I	1	2	2	
BLLW 1232	Japanese I	1	2	2	
BLLW 1242	Korean Language	1	2	2	
BLLW 1252	German I	1	2	2	
University Free Module II (For International Students)					
BLLW 1172	Bahasa Melayu Komunikasi	2	0	2	
Faculty Free Module I, II, III (Subject to course availability)					
BITM 2113	Web Application Development	2	2	3	
BITS 2513	Internet Technology	2	2	3	
BITS 3443	Digital Forensics	2	2	3	
BITS 3453	Malware Analysis and Digital Investigation	2	2	3	BITS 3443
BITS 3473	Watermarking and Steganography	2	2	3	BITS 3463
BITS 3513	TCP/IP Programming	2	2	3	BITS 1113
BITS 3533	Wireless Network and Mobile Computing	2	2	3	BITS 1313


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	14
Core Module	P	33
Specialisation Module	K	42
Final Year Project	P	6
Industrial Training	P	12
Free Module	E	13
	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	
B**W ***2	University Free Module I	E	2	0	2	
				Total Credits	**17**	

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	
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	**16**	

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 I[2]	W	0	3	1	
BITU 2913	Workshop I	P	1[3]		3	
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	
B**W ***2	Univesrity Free Module II	E	2	0	2	
				Total Credits	**19**	

[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 register.
[3]Average official contact hours per week.

Year Two : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
BKK* ***1	Co-Curriculum II[1]	W	0	3	1	
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	Faculty Free Module I	E	2	2	3	
				Total Credits	**19**	

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

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	University Free Module II	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	University Free Module III	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

Below is the list of courses in free module that can be selected as part of the curriculum. The courses in the free module are divided into two categories, that is,

1. University free module (2 courses, 2 credit each).
2. Faculty free module (3 courses, 3 credit each).

List of courses offered can be changed from time to time in accordance with industry needs.

Course Code	Course Name	Contact Hrs		Crdt	Pre-requisite
		Lect	Lab		
University Free Module I					
BIPW 1152	Industrial and Organisational Psychology	2	0	2	
BLHC 4032	*Pemikiran Kritis dan Kreatif*	2	0	2	
BLHC 4012	Organisational Communication	2	0	2	
BLHC 4022	Negotiation Skills	2	0	2	
University Free Module II (For Local Students)					
BLLW 1212	Arabic I	1	2	2	
BLLW 1222	Mandarin I	1	2	2	
BLLW 1232	Japanese I	1	2	2	
BLLW 1242	Korean Language	1	2	2	
BLLW 1252	German I	1	2	2	
University Free Module II (For International Students)					
BLLW 1172	Bahasa Melayu Komunikasi	2	0	2	
Faculty Free Module I, II, III (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

The Diploma in Computer Science programme 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 engineering and introduction to multimedia.

Programme Learning Outcomes (PLO)

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

1. Graduates should be able to demonstrate understanding of a broad range of complex technical and theoretical knowledge and skills to address issues in Computer Science discipline.
2. Graduates should be able to evaluate general concepts, theory and operational principles of computer science to solve issues and problems in critical and creative way.
3. Graduates should be able to apply appropriate practical skills, essential tools, methods and procedures to perform required tasks in computing practices and processes.
4. Graduates should be able to interact effectively, individually or as member of a team with supervisors, peers and subordinates through clear communication in both written and oral forms.
5. Graduates should be able to demonstrate skills to use a range of digital applications and interpret numerical, graphical or visual data related to study or work.
6. Graduates should be able to demonstrate leadership to manage diverse teams and perform work with significant degree of personal responsibility and autonomy.
7. Graduates should be able to demonstrate self-improvement intiatives for independent learning and engage in activities relating to entrepreneurship.
8. Graduates should be able to demonstrate ability to understand and comply with organizational and professional ethics in work environment.

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**
General Module	W	14
Core Module	P	19
Concentration Module	K	39
Final Year Project	P	4
Industrial Training	P	5
Elective	E	9
	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		
DLHW 1742	*Kepimpinan*	W	2	0	2	
DLHW 2772	*Penghayatan Etika dan Peradaban*	W	2	0	2	
DLLW 1112	Foundation English	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	
DITI 1243	Linear Algebra and Discrete Mathematics	P	2	2	3	
DITP 1113	Programming I	P	2	2	3	
DITP 1333	Database	K	2	2	3	
DITS 1133	Computer Organisation and Architecture	K	2	2	3	
DITM 2113	Multimedia System	K	2	2	3	
				Total Credits	**16**	

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

Year One : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
DLLW 2122	English for Effective Communication	W	1	2	2	
DITI 1233	Calculus and Numerical Methods	P	2	2	3	
DITP 1123	Programming II	P	2	2	3	DITP 1113
DITM 1313	Human Computer Interaction	K	2	2	3	
DITP 2213	System Analysis and Design	K	2	2	3	
DITS 2213	Operating System	K	2	2	3	DITS 1133
				Total Credits	**17**	

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	
DITP 2113	Data Structure and Algorithm	K	2	2	3	DITP 1113 DITP 1123
DITP 3113	Object-oriented Programming	K	2	2	3	DITP 1113
DITS 2313	Data Communication and Networking	K	2	2	3	
DITS 2413	Computer Security	K	2	2	3	DITS 2213
				Total Credits	**17**	

Year Two : Semester 2

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
DTMW 1012	*Asas Pembudayaan Keusahawanan*	W	2	0	2	
DKK* ***1	Co-Curriculum II[1]	W	0	3	1	
DITU 3934	System Development Workshop	P	0	8	4	DITP 2213
DITM 2123	Web Programming	K	2	2	3	
DITP 2123	Event-driven Programming	K	2	2	3	DITP 1113
DIT* ****	Elective I	E	2	2	3	
				Total Credits	**16**	

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

Year Two : Special Semester

Course Code	Course Name	Comp Code	Duration (weeks)	Crdt	Pre-requisite
DITU 2343	Industrial Training	P	10	3	
DITU 2362	Industrial Training Report	P	10	2	
			Total Credits	**5**	

Year Three : Semester 1

Course Code	Course Name	Comp Code	Contact Hrs		Crdt	Pre-requisite
			Lect	Lab		
DITU 3964	Diploma Project	P	1[1]		4	DITU 3934
DITI 3133	Applied Artificial Intelligence	K	2	2	3	
DIT* ****	Elective II	E	2	2	3	
DIT* ****	Elective III	E	2	2	3	
				Total Credits	**13**	

[1]Average official contact hours per week.

List of Courses in Elective Component

Below is the list of courses in elective component that can be selected as part of the curriculum. Students need to choose a minimum of **THREE (3)** courses during the study to complete at least 9 credits.

List of courses offered can be changed from time to time in accordance with industry needs.

Course Code	Course Name	Contact Hrs		Crdt	Pre-requisite
		Lect	Lab		
DITI 3513	Artificial Intelligence in Robotic and Automation	2	2	3	
DITI 3523	Introduction to Data Science	2	2	3	
DITM 3133	Digital Audio and Video Technology	2	2	3	
DITM 3143	Digital Media Design	2	2	3	
DITM 3333	Introduction to Computer Games Design Principles	2	2	3	
DITP 2313	Database Programming	2	2	3	
DITP 3213	Software Engineering	2	2	3	
DITP 3263	Software Verification and Validation	2	2	3	
DITP 3283	Software Project Management	2	2	3	
DITP 3313	Database Design	2	2	3	
DITP 3323	Database Administration	2	2	3	
DITP 3413	Cross-platform Mobile Application Development	2	2	3	
DITS 2513	Cloud Computing Foundation	2	2	3	
DITS 3323	Local Area Network	2	2	3	
DITS 3333	Wide Area Network	2	2	3	
DITS 3343	Network Services	2	2	3	
DITS 3653	Active Directory and Server Administration	2	2	3	


Course Synopsis
Mata Pelajaran Umum (MPU) Module

List of General Courses

Course Code	Course Name	BITC	BITD	BITI	BITM	BITS	BITZ	BITE	DCS
BLHW 1762	Philosophy and Current Issues	√	√	√	√	√	√	√	
BLHW 2772	*Penghayatan Etika dan Peradaban*	√	√	√	√	√	√	√	
(BLHW 2752)	(Malaysian Culture)[1]	√	√	√	√	√	√	√	
BLLW 1142	English for Academic Purposes	√	√	√	√	√	√	√	
BLLW 2152	Academic Writing	√	√	√	√	√	√	√	
BLLW 3162	English for Professional Interaction	√	√	√	√	√	√	√	
BTMW 4012	Technology Entrepreneurship	√	√	√	√	√	√	√	
BKK* ***1	Co-Curriculum I	√	√	√	√	√	√	√	
BKK* ***1	Co-Curriculum II[2]	√	√	√	√	√	√	√	
DLHW 1742	*Kepimpinan*								√
DLHW 2772	*Penghayatan Etika dan Peradaban*								√
DLLW 1112	Foundation English								√
DLLW 2122	English for Effective Communication								√
DLLW 3132	English for Marketability								√
DTMW 1012	*Asas Pembudayaan Keusahawanan*								√
D*** ***1	Co-Curriculum I								√
D*** ***1	Co-Curriculum II[2]								√
Total number of courses should be taken		8	8	8	8	8	8	8	8

[1] For International Student
[2] Co-Curriculum II must be different from Co-Curriculum I

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 multi-cross 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.

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 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.

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 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 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.

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.

DLHW 1742 *Kepimpinan*

Kursus ini membincangkan konsep-konsep kepimpinan, kemahiran interpersonal dalam kepimpinan, kerja berpasukan, kepengikutan, budaya kepimpinan dan kepelbagaian budaya dan etika organisasi. Tujuan kursus ini ialah memberi kefahaman dan penghayatan aspek kepimpinan dalam diri pelajar. Pengajaran dan pembelajaran akan dilaksanakan dalam bentuk pembelajaran berasaskan pengalaman melalui aktiviti berpasukan di dalam dan di luar kuliah. Pada akhir kursus ini, pelajar diharapkan dapat membentuk keyakinan diri, kesedaran kendiri, etika dan profesionalisme disamping dapat mengaplikasi kemahiran komunikasi, kepimpinan dan kerja berpasukan dalam mengurus kehidupan seharian mahupun dalam mengurus organisasi.

DLHW 2772 *Penghayatan Etika dan Peradaban*

Kursus ini membincangkan tentang teori dan konsep ilmu, etika serta peradaban yang berunsurkan perbandingan sistem, kemajuan sosial dan kebudayaan merentas budaya yang pelbagai di Malaysia. Selain itu, kursus ini juga menerangkan tentang isu kontemporari berkaitan pelbagai bidang mengikut acuan etika dan peradaban di Malaysia. Pendekatan kursus ini boleh membina rakyat Malaysia yang datang dari pelbagai latar budaya merentasi nilai budaya bagi melahirkan budaya manusiawi dengan nilai-nilai baik.

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.

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

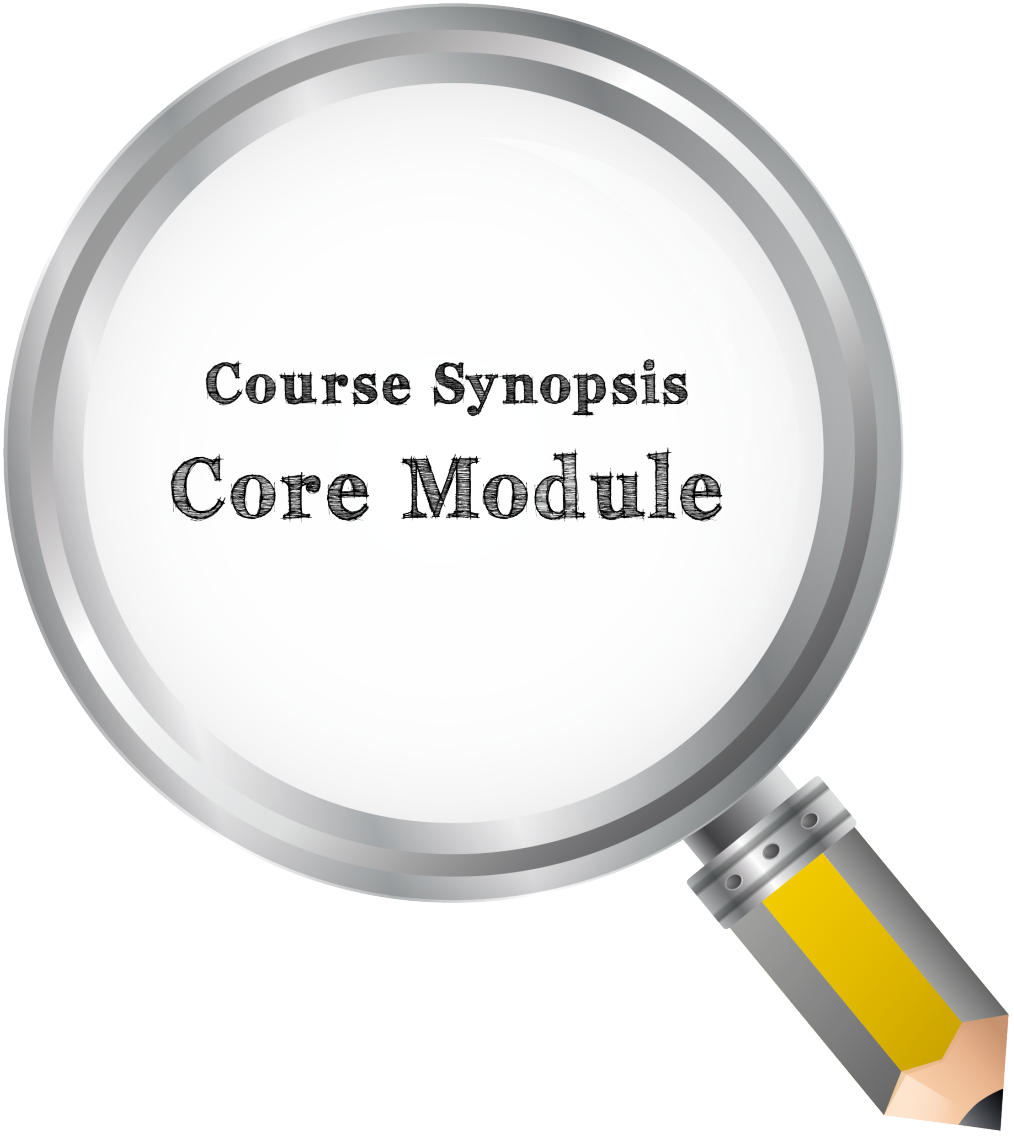
exercised during the oral presentation of the product as well as role-play.

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.


Course Synopsis
Core Module

List of Core Courses

Course Code	Course Name	BITC	BITD	BITI	BITM	BITS	BITZ	BITE	DCS
BITE 1513	Programming Fundamentals							√	
BITI 1113	Artificial Intelligence	√	√	√	√	√	√		
BITI 1213	Linear Algebra and Discrete Mathematics	√	√	√	√	√	√	√	
BITI 1223	Calculus and Numerical Methods	√	√	√	√	√	√	√	
BITI 2233	Statistics and Probability	√	√	√	√	√	√	√	
BITM 1113	Multimedia System	√	√	√	√	√	√		
BITM 2313	Human Computer Interaction	√	√	√	√	√	√	√	
BITP 1113	Programming Technique	√	√	√	√	√	√		
BITP 1123	Data Structure and Algorithm	√	√	√	√	√	√		
BITP 1323	Database	√	√	√	√	√	√	√	
BITP 2213	Software Engineering	√	√	√	√	√	√		
BITP 3113	Object-oriented Programming	√	√	√	√	√	√		
BITS 1123	Computer Organisation and Architecture	√	√	√	√	√	√	√	
BITS 1213	Operating System	√	√	√	√	√	√	√	
BITS 1313	Data Communication and Networking	√	√	√	√	√	√	√	
BITS 3423	Information Technology Security							√	
BITU 2913	Workshop I	√	√	√	√	√	√	√	
DITI 1233	Calculus and Numerical Methods								√
DITI 1243	Linear Algebra and Discrete Mathematics								√
DITI 2233	Statistics and Probability								√
DITP 1113	Programming I								√
DITP 1123	Programming II								√
DITU 3934	System Development Workshop								√
Total number of courses should be taken		15	15	15	15	15	15	11	6

Course Code	Course Name	BITC	BITD	BITI	BITM	BITS	BITZ	BITE	DCS
BITU 3973	Final Year Project I	√	√	√	√	√	√	√	
BITU 3983	Final Year Project II	√	√	√	√	√	√	√	
BITU 3926	Industrial Training	√	√	√	√	√	√	√	
BITU 3946	Industrial Training Report	√	√	√	√	√	√	√	
DITU 3964	Diploma Project								√
DITU 2343	Industrial Training								√
DITU 2362	Industrial Training Report								√

BITE 1513 Programming Fundamentals

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, array, file, structured data and pointer are among the topics covered in the course.

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 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.

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.

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.

BITM 1113 Multimedia System

This course prepares students with the basic concept of multimedia, technology and the importance of multimedia application. It covers the introduction to multimedia elements such as text, graphic, audio, animation and video include 2D / 3D graphic and authoring, multimedia integration and multimedia application development. During lab sessions, students will be introduced to several tools for selected media element and authoring software for media integration. In addition, students will be trained for practical preparation of still image, simple animation, sound and effectively apply it to multimedia project. Students also will be exposed to teamwork, leadership, problem-solving and communication skills while performing their various tasks and project. Blended Learning / Flipped Classroom / Cooperative Learning (CL) / Problem Based Learning (PBL) / Collaborative Learning approach will be used to enhance students capability such as competency, attitude, knowledge and communication skills.

BITM 2313 Human Computer Interaction

This course introduces the concept of 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.

BITP 1113 Programming Technique

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, array, file, structured data and pointer are among the topics covered in the course.

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 will introduce student to the fundamental concepts of database management, which include the aspects of data models, database language; SQL and RA as well as database design. This course also focuses on practical skills which make students be able to apply fundamental concepts required for the use and design of database management systems (DBMS).

BITP 2213 Software Engineering

This course introduces the basic concept of software engineering to the student. It covers all the software development process which includes analysis, requirement, design, implementation and testing. The course also covers support areas such as project management and quality management. The course exposes the student to structured approach and object oriented approach.

BITP 3113 Object-oriented Programming

This course discusses about the concept of object-oriented approach by using Java programming language. The student will be able to apply and construct the object oriented programming basic structures (such as polymorphism, inheritance, encapsulation and abstraction), GUI, swing, event handling, interface components, exception handling, database, multimedia, networking and threads. The student should be able to develop a complete Java applications with database.

BITS 1123 Computer Organisation and Architecture

This course 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 course includes digital circuit design and its application in microprocessor architecture.

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 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.

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.

BITU 2913 Workshop I

This course aims to provide exposure and skills to the students in submitting 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. Students must use the techniques learned in programming technique and system development subjects 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 course, students must present and debate to defend the project that had been built. 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. Workshop I is also functioned as the platform to prepare the students for their industrial training program.

DITI 1233 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.

DITI 1243 Linear Algebra and Discrete Mathematics

This course covers selected topics from two disciplines of mathematics, namely Linear Algebra and Discrete Mathematics, that are important for computer science students. For Linear Algebra, the students will learn about theory and application of matrices, system of linear equations and eigenvalues as well as eigenvectors. For Discrete Mathematics, the students will be exposed to the theory and application of introduction to logic, integers, algorithms, induction, recursive function, combinatoric, relation, graph and tree.

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 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.

DITP 1123 Programming II

This course covers the introductory topics in programming using C++ language. It includes problem solving using array, file, structured data and pointer are among the topics covered in the course.

DITU 3934 System Development Workshop

In this course, students should be able to integrate subjects learned in earlier semesters such as analysis and design, database programming, data structures and algorithms, operating system, web programming, data communication and networking.

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 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 2343 Industrial Training

Students must do the internship no less than 10 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 only once and usually it will be near the end of the 10-week period. During the visit, students are required to do a presentation at the organisation in attendance of both Industrial and Faculty supervisors. Students must also submit a copy of Industrial Training Report to the faculty supervisor for evaluation.

DITU 2362 Industrial Training Report

This course is an extension of DITU 2343 where students must do the internship no less than 10 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 only once and usually it will be near the end of the 10-week period. During the 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.


Course Synopsis
Specialisation
Module

List of Specialisation Courses

Course Code	Course Name	BITC	BITD	BITI	BITM	BITS	BITZ	BITE	DCS
BITE 1523	Computer Game Programming							√	
BITE 1613	2D Game Development							√	
BITE 1713	Game Architecture							√	
BITE 1723	Game Design Principle							√	
BITE 2123	Artificial Intelligence for Games							√	
BITE 2513	Game Engine Development I							√	
BITE 2523	Web Game Development							√	
BITE 2613	Interactive 3D Animation							√	
BITE 2623	3D Game Development							√	
BITE 2633	Audio Video Production for Game							√	
BITE 3513	Game Engine Development II							√	
BITE 3613	Game Project Management							√	
BITE 3713	Multi-platform Game							√	
BITI 2213	Knowledge Based System			√					
BITI 2223	Machine Learning			√					
BITI 3123	Fuzzy Logic			√					
BITI 3133	Neural Network			√					
BITI 3143	Evolutionary Computing			√					
BITI 3413	Natural Language Processing			√					
BITI 3523	Artificial Intelligence in Robotics and Automation			√					
BITI 3533	Artificial Intelligence Project Management			√					
BITM 1123	Interactive Media Authoring				√				
BITM 2113	Web Application Development				√				
BITM 2123	Digital Audio and Video Technology				√				
BITM 2213	Computer Animation				√				
BITM 3113	Interactive Media Project Management				√				
BITM 3133	Computer Games Development				√				

Course Code	Course Name	BITC	BITD	BITI	BITM	BITS	BITZ	BITE	DCS
BITM 3213	Interactive Computer Graphics				√				
BITM 3223	Virtual Reality Technology				√				
BITP 2113	Algorithm Analysis					√			
BITP 2223	Software Requirement and Design		√			√			
BITP 2303	Database Programming		√						
BITP 2313	Database Design		√			√			
BITP 2323	Database Administration		√						
BITP 3123	Distributed Application Development					√			
BITP 3223	Software Project Management		√			√			
BITP 3253	Software Validation and Verification					√			
BITP 3353	Multimedia Database		√						
BITP 3363	Data Warehousing and Business Intelligence		√						
BITP 3423	Special Topic in Software Engineering					√			
BITP 3433	Information Technology and Database Security		√						
BITP 3453	Mobile Application Development					√			
BITP 3483	Geographic Information System		√						
BITS 2313	Local Area Network	√							
BITS 2323	Wide Area Network	√							
BITS 2333	Network Analysis and Design	√							
BITS 2343	Computer Network						√		
BITS 2413	Network Security Infrastructure and Design						√		
BITS 2423	Physical Security and Electronic Surveillance						√		
BITS 2523	Cyber Law and Security Policy						√		
BITS 3313	Network Administration and Management	√							
BITS 3323	Network Project Management	√							
BITS 3333	Multimedia Networking	√							

Course Code	Course Name	BITC	BITD	BITI	BITM	BITS	BITZ	BITE	DCS
BITS 3353	Network Security Administration and Management						√		
BITS 3363	Network Security Project Management						√		
BITS 3413	Information Technology and Network Security	√							
BITS 3423	Information Technology Security			√	√	√			
BITS 3463	Applied Cryptography and Information Theory						√		
BITS 3513	TCP/IP Programming	√							
BITS 3523	Computer Audit and Risk Management						√		
BITS 3533	Wireless Network and Mobile Computing	√							
BITS 3613	Hacking Techniques and Prevention						√		
BITU 3923	Workshop II	√	√	√	√	√	√	√	
DITI 3133	Applied Artificial Intelligence								√
DITM 1313	Human Computer Interaction								√
DITM 2113	Multimedia System								√
DITM 2123	Web Programming								√
DITP 1333	Database								√
DITP 2113	Data Structure and Algorithm								√
DITP 2123	Event-driven Programming								√
DITP 2213	System Analysis and Design								√
DITP 3113	Object-oriented Programming								√
DITS 1133	Computer Organisation and Architecture								√
DITS 2213	Operating System								√
DITS 2313	Data Communication and Networking								√
DITS 2413	Computer Security								√
Total number of courses should be taken		10	10	10	10	10	10	14	13

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

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 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 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 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 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.

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.

BITI 2213 Knowledge Based System

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.

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.

BITI 3123 Fuzzy Logic

This course aims to provide exposure on the foundation of fuzzy logic as one of the soft computing techniques. The course starts with an overview on the concept of fuzziness. The main topics will cover the algebra, quantities and the logical aspect of fuzzy sets, fuzzy membership functions, fuzzy operations, fuzzification, de-fuzzification, and fuzzy system. Various applications of fuzzy system such as the automated fuzzy system, fuzzy decision making system, fuzzy classification and clustering system, fuzzy pattern recognition system and fuzzy control system will be included in the discussion.

BITI 3133 Neural Network

This course will discuss soft computing techniques, which is neural network. The fundamental theories of neural network is introduced, which includes biological and statistical foundations of neural networks. Radial Basis, Hebbian and competitive learning also will be introduced. Additionally, types of learning, information theories and their applications in neural networks will be discussed.

BITI 3143 Evolutionary Computing

This course introduces evolutionary computing in problem-solving. Evolutionary computing uses algorithms which are inspired by mechanisms of biological evolution. These search-algorithms apply the concepts of genetic recombination, mutation, and natural selection in producing the potential solutions. A number of evolutionary computing techniques will be taught, and this course puts greater emphasis on Genetic Algorithms. Other techniques such as Memetic Algorithm and constraints handling will also be covered in this course.

BITI 3413 Natural Language Processing

This course deals with the application of computational models to text or speech data. This course provides knowledge to students about natural language processing, NLP. Topics covered are morphology (word formation), NLP tasks including syntax analysis (sentence structure and parsing), semantic analysis (meaning), and discourse analysis (pronoun resolution) and NLP applications such as machine translation, information retrieval and extraction, question-answering systems, and dialog systems.

BITI 3523 Artificial Intelligence in Robotics and Automation

This course covers introduction of robotics, which includes principles behind the AI approach to robotics and to programme an artificially intelligent robot for applications involving sensing, navigation and uncertainty. The students also will be exposed to the principles of automation and mobile robotics programming as well as health and safety issues. Ethical aspects and the future of AI in robotics and automation are also covered.

BITI 3533 Artificial Intelligence Project Management

This course provides students with fundamental discipline in managing AI project. The course exposes students to a variety of techniques to manage people, budget, schedule, risk and quality of AI project. The course also provides skills to the students on how to analyse potential problems in managing project that they would responsible for.

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.

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 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 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 students. 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.

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.

BITM 3133 Computer Games Development

This course is conducted to give an exposure to students with regards to core concepts of computer games design and games technology. The topics which the students will learn include the game concepts, character development, creating the user experience, game balancing as well as the game genre such as action games, adventure games, puzzle games and construction management games. Lab sessions will introduce students to the fundamental of design and constructing of a particular game. Students will also be assess through practical sessions which involving individual and group task in order to produce a creative and quality games output. At the end of the semester, each individual and group will be required to present their projects.

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'.

BITM 3223 Virtual Reality Technology

This course will introduce students to the technology and techniques used in Virtual Reality, VR, (also known as virtual environments). Students will gain knowledge about the history of VR, latest innovations in this field, understand the

important research issues and methodologies for VR, and have the opportunity to gain practical experience with the hardware and software used to create VR applications.

BITP 2113 Algorithm Analysis

This course will enable students to write source codes and SQL statements taking into consideration the efficiency of algorithms. Topics include introduction to algorithm analysis, code optimisation, algorithm design techniques, SQL and code tuning techniques.

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.

BITP 2303 Database Programming

This course contents are based on the syllabus of two modules in Oracle certification (Oracle Certified Associate). The first part of the lesson introduces the concepts of relational database and SQL syntax. This includes topics related to Oracle database architecture, its ability, constraints in data integrity, and other database objects such as views, index, sequence and synonyms. The second part of the lesson explains the objectives, functions and benefits of PL/SQL in developing database applications. This includes the development, implementation and maintenance of procedures, functions, packages and database triggers. The lesson also explains the use of stored procedures and triggers in retrieving data and executing complex business rules to enhance data integrity. Students will be introduced to Oracle packages, subprograms and PL/SQL triggers.

BITP 2313 Database Design

This course emphasizes the importance of database design and presents the fundamental principles of relational and non-relational data models which include object-oriented and object-relational data model together with the enhanced features of an entity-relationship diagram. 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. Design issues related to distributed databases such as data fragmentation, allocation, transparency and replication are also discussed. The course also discusses database design issues in specialised database applications such as data warehousing, data mining, online analytical processing, decision support system and electronic commerce.

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.

BITP 3123 Distributed Application Development

This course exposes the students to the development of distributed programming applications which are used in the industry for network-based applications. Students are to be exposed to the introduction of distributed computing, multi-threading programming, client server application using socket programming, distributed object using RMI, web services and cloud computing.

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 3253 Software Validation and Verification

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, review, audit and accreditation.

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.

BITP 3363 Data Warehousing and Business Intelligence

This course 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 the tools and techniques supporting business intelligence such as decision making system, query and reporting, online analytical processing, statistical analysis, forecasting and data mining.

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 3433 Information Technology and Database Security

This course introduces the basic concepts of data security in an environment that involves databases, computer systems and networks, and the Internet. It outlines fundamental data security requirements and explains the risks that threaten the integrity and privacy of organisational data. Students are introduced to several technologies that can contribute to system and database security such as access control, cryptography, authentication methods, user administration, virtual private database and database auditing. In the aspect of database security students will be exposed to the standard practices and procedures in security implementation within Oracle9i database environment. Other security issues such as risk management, computer crime and cyber law will also be covered in this course.

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 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.

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 2343 Computer Network

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 2413 Network Security Infrastructure and Design

This course is designed to provide fundamental knowledge in planning and designing a secure network infrastructure. Topics covered include how to analyse security policies, procedures and requirements as well as how to identify and design for potential security threats. Students will also be exposed to designing a network infrastructure security, authentication strategy for the organisation domain, access control strategy for network resources and public key infrastructure with certificate services. They will also be involved in designing security for internet information services, servers with specific roles, as well as designing an infrastructure for updating computers and secure network management infrastructure.

BITS 2423 Physical Security and Electronic Surveillance

This course is designed to provide fundamental knowledge in physical security and electronic surveillance. It addresses the threats, vulnerabilities and countermeasures that can be utilised to physically protect an enterprise's resources and sensitive information. These resources include people, the facility in which they work and the data, equipment, support systems, media and supplies they utilise. Topics cover protection techniques for the entire facility, from the outside perimeter to the inside office space, including all of the information system resources. These focus on the methods of recognition, anticipation, selection and design of security technologies as well as examining the principles and applications of security systems.

BITS 2523 Cyber Law and Security Policy

This course is designed to provide fundamental skills needed to understand cyber laws related to copyright, patents, digital rights, computer crimes, privacy issues, hacking and prosecution in Malaysia. This course will also covers the scope and enforcement bodies in Malaysia. Furthermore, students will be exposed to design and produce security policies accordance with legal laws.

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 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 3353 Network Security Administration and Management

This course covers the topics in network security administration and management. The students will be equipped with the knowledge and practicality of a network security administrator / manager. Together with the tools used in lab sessions and the skills trained, the students will be educated and qualified enough to be network security practitioners.

BITS 3363 Network Security Project Management

This course provides distinct knowledge in network security project management. The topics cover project management body of knowledge namely managing projects in aspects of integration, scope, time, cost, quality and human resource. It also covers the phases of network security project management namely project initiation, planning, executing, controlling and closing or termination. Software for security project management such as Microsoft Project and Microsoft Excel will be introduced and used to help in applying the network security project management knowledge areas and processes.

BITS 3413 Information Technology and Network Security

This course covers background views of ICT threats and the needs to have theoretical security method on information security in software, operating system, data centre, computer networks. The course will also cover the basic cryptographic elements and authentication, IP security, firewalls, security management, and the related issue in computer crimes and cyber laws. Security related computing namely Microsoft Excel and Windows 2012 will be introduced and used to help in understanding and applying the security mechanism and algorithms.

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.

BITS 3463 Applied Cryptography and Information Theory

This course covers the probability theory concept, information theory, complexity theory, number theory, abstract algebra and finite fields to understand the ideas regarding the discrete log problem, strength of an algorithm, information security, encryption, decryption, symmetric systems, symmetric systems and cryptanalysis in cryptography. The symmetric and asymmetric cryptosystems and its cryptographical mathematical theory behind it are emphasized.

BITS 3513 TCP/IP Programming

This course intended to expose student on how network programming works. Since Java is one of the most demanding skill in industry, so this course will emphasize on how to write a network programming by using Java language. This course will show students on how to use Java's network class library to quickly and easily write programmes that accomplish many common networking tasks.

BITS 3523 Computer Audit and Risk Management

This course focuses on the fundamental knowledge of computer security and risk management. In addition, emphasizes has given to the importance of computer audit and risk management. The enclosed topics are mainly related to security audit analysis, security monitoring, environmental security and follow up auditing in security concern. The student will be exposed to the field of risk and incident response, recovery and disaster recovery.

BITS 3533 Wireless Network and Mobile Computing

This course is designed to give the knowledge of the concept of mobile computing and wireless networks, by exploring the relationship between hardware, software and development kits. Through class, research and application development, students will understand the current mobile technology and the relation to operating systems and standards. Students will be exposed to the challenges to handle the constraints of memory and storage of these hardware.

BITS 3613 Hacking Techniques and Prevention

In this course, students will study and gain experience with the role of defending hosts and networks from attack as well as learning how the hacker uses tools to attack and penetrate networks. Students will be able to use several open software tools that will analyse host and networks for vulnerabilities and be exposed to the hacker technique of "thinking outside the box". It will immerse the student into an interactive environment where they will be shown how to scan, test, hack and secure their own systems. The lab intensive environment gives each student in-depth knowledge and practical experience with the current essential security systems. Students will begin by understanding how perimeter defences work and then be lead into scanning and attacking their own networks, no real network is harmed. Students then learn how intruders escalate privileges and what steps can be taken to secure a system.

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 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.

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.

DITM 2113 Multimedia System

This course prepares students with the basic concept of multimedia, technology and the importance of multimedia application. It covers the introduction to multimedia elements such as text, graphic, audio, animation and video include 2D/3D graphic and authoring, multimedia integration and multimedia application development. During lab sessions, students will be introduced to several tools for selected media element and authoring software for media integration. In addition, students will be trained for practical preparation of still image, simple animation, sound and effectively apply it to multimedia project. Students also will be exposed to teamwork, leadership, problem-solving and communication skills while performing their various tasks and project. Active Cooperative Learning, ACL, approach will be used to enhance students capability such as competency, attitude, knowledge and communication skills.

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 1333 Database

This course will introduce student to the fundamental concepts of database management, which include the aspects of data models, database language, SQL and Relational Algebra, RA, as well as database design. This course also focuses on practical skills which make students be able to apply fundamental concepts required for the use and design of Database Management Systems, DBMS.

DITP 2113 Data Structure and Algorithm

This course aims to develop students' knowledge in data structures and algorithms. The course begins with the introduction of concepts and techniques of structuring and operating on abstract data types in problem solving. Followed by the discussion on the operations for maintaining common data structures. Students are exposed on how to recognise the associated algorithms' operations and complexity. Common sorting, searching and graph algorithms will be discussed and the complexity and comparisons among these various techniques will be studied.

DITP 2123 Event-Driven Programming

This course will introduce the concepts of Windows programming (applications with GUI) through C#. It will begin with an introduction to event-driven programming which includes types of programming, differences and advantage of event-driven programming. Followed by creating forms with suitable GUI, event handling that includes mouse and keyboard interactions as well as how to handle data storing with LINQ. Students are exposed in designing suitable problem solution which combines their basic programming concepts skills and their comprehension in C# and LINQ.

DITP 2213 System Analysis and Design

In this course, students will be introduced to a variety of information systems. Then, this course explains the development methodology especially the Waterfall and Rapid Application Development, RAD. After that, it discusses the planning phase with a focus on project management and project identification. The analysis phase will emphasize on the determination of user requirements, DFD and ERD in structuring user's needs. The design phase then discusses form design and report, database, and interface design. Final phase of system development will cover the coding, testing and system maintenance.

DITP 3113 Object-oriented Programming

This course will introduce the fundamentals of object oriented programming such as encapsulation, polymorphism and inheritance. Apart from that, GUI, event handling and exception handling in Java will be explained.

DITS 1133 Computer Organisation and Architecture

This course provides a detail of computer system's functional components, their characteristics, their performance and their interactions including system bus, different types of memory and Input/Output and CPU, as well as practical implementations of the components. Besides, the architectural issues, such as instruction set design and data types, are covered. In addition to this, students are introduced to the increasingly important area of parallel organisation.

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.

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.

DITS 2413 Computer Security

This course provides students with the knowledge and skills which are mandatory to maintain Workstation resources, monitor Workstation performance, and safeguard data on a computer running on preferable operating systems.


Course Synopsis
Free Module

List of Free Module Courses

Course Code	Course Name	BITC	BITD	BITI	BITM	BITS	BITZ	BITE	DCS
Degree: University Free Module									
BIPW 1152	Industrial and Organisation Psychology	√	√	√	√	√	√	√	
BIPW 3112	*Pemikiran Kritis dan Kreatif*	√	√	√	√	√	√	√	
BIPW 4112	Organisational Communication	√	√	√	√	√	√	√	
BIPW 4122	Negotiation Skills	√	√	√	√	√	√	√	
BLLW ***2	Third Language	√	√	√	√	√	√	√	
Total number of courses should be taken		2	2	2	2	2	2	2	
Degree: Faculty Free Module									
BITE 3523	Game Physics							√	
BITE 3623	Motion Graphics				√			√	
BITE 3633	Game Play				√			√	
BITE 3713	Multi-platform Game				√				
BITE 3723	Game Mechanics							√	
BITI 2113	Logic Programming			√					
BITI 2213	Knowledge Based System					√			
BITI 2223	Machine Learning		√		√				
BITI 2513	Introduction to Data Science			√					
BITI 3113	Intelligent Agent			√					
BITI 3213	Decision Support Systems			√					
BITI 3313	Image Processing and Pattern Recognition			√					
BITI 3513	Artificial Intelligence in Manufacturing			√					
BITM 1123	Interactive Media Authoring	√				√			
BITM 2113	Web Application Development	√	√	√		√	√		
BITM 2123	Digital Audio and Video Technology	√							
BITM 2323	Digital Imaging for Multimedia				√				
BITM 3133	Computer Games Development			√					

Course Code	Course Name	BITC	BITD	BITI	BITM	BITS	BITZ	BITE	DCS
BITP 2223	Software Requirements and Design				√				
BITP 2323	Database Administration					√			
BITP 3233	Strategic Information System Planning		√			√			
BITP 3253	Software Validation and Verification		√	√					
BITP 3353	Multimedia Database				√				
BITP 3423	Special Topic in Software Engineering		√						
BITP 3443	Enterprise Application Development					√			
BITP 3453	Mobile Application Development			√	√				
BITP 3473	Formal Methods			√		√			
BITP 3483	Geographic Information System					√			
BITP 3513	Advanced Database Programming		√						
BITP 3523	Advanced Database Administration		√						
BITS 2313	Local Area Network		√			√			
BITS 2513	Internet Technology	√	√	√	√	√	√		
BITS 3333	Multimedia Networking							√	
BITS 3343	Fibre Optic	√							
BITS 3443	Digital Forensics	√					√		
BITS 3453	Malware Analysis and Digital Investigation						√		
BITS 3473	Watermarking and Steganography						√		
BITS 3513	TCP/IP Programming						√		
BITS 3533	Wireless Network and Mobile Computing						√		
BITS 3453	Malware Analysis and Digital Investigation						√		
BENT 4733	Digital Signal Processing			√					
BTMT 3323	Contemporary Business Management			√					
Total number of courses should be taken		3	3	3	3	3	3	3	

Course Code	Course Name	BITC	BITD	BITI	BITM	BITS	BITZ	BITE	DCS
Diploma: Free Module 3 credit									
DITI 3513	Artificial Intelligence in Robotic and Automation								√
DITI 3523	Introduction to Data Science								√
DITM 3133	Digital Audio and Video Technology								√
DITM 3143	Digital Media Design								√
DITM 3333	Introduction to Computer Games Design Principles								√
DITP 2313	Database Programming								√
DITP 3213	Software Engineering								√
DITP 3263	Software Verification and Validation								√
DITP 3283	Software Project Management								√
DITP 3313	Database Design								√
DITP 3323	Database Administration								√
DITP 3413	Cross-platform Mobile Application Development								√
DITS 2513	Cloud Computing Foundation								√
DITS 3323	Local Area Network								√
DITS 3333	Wide Area Network								√
DITS 3343	Network Services								√
DITS 3653	Active Directory and Server Administration								√
Total number of courses should be taken									3

BIPW 1152 Industrial and Organisation Psychology

Kursus ini memberi pendedahan kepada aspek psikologi dalam dunia pekerjaan dalam sektor industri serta permasalahan yang berhubung dengan tingkah laku dalam organisasi. Terdapat beberapa topik yang dibincangkan termasuk isu-isu semasa dalam psikologi di tempat kerja, perancangan personel, tekanan di tempat kerja dan psikologi kejuruteraan.

BIPW 3112 *Pemikiran Kritis dan Kreatif*

Kursus ini direka untuk memberi pendedahan kepada pelajar tentang prinsip-prinsip asas dalam pemikiran kritis dan kreatif. Pelajar akan mengaplikasikan kaedah pemikiran kritis dan kreatif dalam penyelesaian masalah melalui pendekatan pembelajaran berpusatkan pelajar termasuk pendekatan pembelajaran berasaskan permasalahan (PBL). Pelajar akan dipandu di dalam projek akhir di mana penganalisaan kehendak pasaran akan datang akan dilaksanakan dan cadangan penyelesaian adalah berasaskan produk keperluan pasaran dari pelbagai perspektif dan pemikiran di luar kotak (out of the box).

BIPW 4112 Organisational Communication

This course aims to equip the students with the basic principles of organisational communication by understanding the definition and development of organisational communication. The students will analyse formal and informal communication as well as forms of communication within the organisation such as downward, upward and horizontal communication. Students will be able to outline selected organisational communication theories and practices of organisational communication and relate them to organisational effectiveness. In addition, the students are expected to explore ideas and seek alternative solutions to address problems of conflict, crisis and change in organisations.

BIPW 4122 Negotiation Skills

This course is designed to equip students with the knowledge and skills necessary to implement and manage negotiation. Important communication skills in negotiation will also be discussed. Some of the topics that will be exposed are effective communication skills, basic negotiation skills, effective listening skills, questioning techniques to obtain information and win-win negotiation techniques.

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 Language

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.

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 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 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.

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 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 context 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).

BITI 2113 Logic Programming

This course exposing students to the basic of logic programming which include the syntax and semantics of Prolog software. Elements such as predicate logic, rules, queries, recursive rule, controlling backtracking, unification and input

output are the main concern while conducting this course. This course use Prolog software to develop the simple computer solution of some AI applications such as problem solving and expert systems.

BITI 2213 Knowledge Based System

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.

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.

BITI 2513 Introduction to Data Science

This course delivers an essential exposure on the fundamental concepts and techniques of data science. It is divided into two parts; Part 1 is the introductory lecture and guided practical session for the first 5 weeks. The main topics covers the five important phases in understanding data science; introduction to data science, data wrangling, exploratory data analysis, data manipulation, applied machine learning and data visualization and communication. Part 2 is a guided capstone project for another 9 weeks. The capstone project provides a platform to the students to applied their previously learn knowledge especially in Artificial Intelligent, AI, statistics, analytics, project managements and data science in a real project setting. The last 3 weeks is the project presentation and technical report submission. There is no final written examination for this course.

BITI 3113 Intelligent Agent

This course will cover the underlying theory of agents, the common agent architectures, methods of cooperation and communication, and the potential applications for agents. Students will be exposed to the concept of intelligent agent and multiagent systems. Students will also construct their own agents for solving different types of problems. The potential applications of agents are numerous including web search assistants, travel advisors, electronic secretaries, bidders in on-line auctions, tutoring systems, and actors in games or simulations. Some of the tools to be used are Jade and Jason.

BITI 3213 Decision Support Systems

This course aims to provide students with an overview of various Decision Support Systems, DSS, and artificial intelligence systems and the ways in which they support effective decision making in organisations. Topics covered are introduction to DSS, decision makers, types of DSS, development of DSS, modeling and optimisation, group DSS, executive ESS, and intelligent DSS.

BITI 3313 Image Processing and Pattern Recognition

This course introduces essential image processing techniques, such as image enhancement, image restoration, colour image processing, image morphology, segmentation, feature extraction and motion from image sequences. Students will also be exposed with MATLAB programming in order to implement the image processing techniques. The image processing implementation makes use images from different sources including internet, satellite, UAV and digital camera.

BITI 3513 Artificial Intelligence in Manufacturing

Students are exposed to manufacturing operations in several areas/domain such as system design, planning, scheduling, monitoring and control. The theory and principles accompanied by the real world problem in each area will be studied. It will then be extended with the applications of AI techniques such as Knowledge-Based System, Neural Network and other that the students already learn from previous Artificial Intelligence course. At the end of the course, students will involve in the development of intelligence manufacturing module system by using appropriate AI techniques.

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.

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 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 2323 Digital Imaging for Multimedia

This 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.

Throughout the course, they will complete a series of photo projects that will help them practice the skills of photography. The lecturer will work with them, reviewing their photos and helping them to improve as they complete the program. A critics session among peers and audience will be held to help students to get better exposure in the process of learning. At the end of the course, they will have the skills and know-how to take professional-quality photographs.

BITM 3133 Computer Games Development

This course is conducted to give an exposure to students with regards to core concepts of computer games design and games technology. The topics which the students will learn include the game concepts, character development, creating the user experience, game balancing as well as the game genre such as action games, adventure games, puzzle games and construction management games. Lab sessions will introduce students to the fundamental of design and constructing of a particular game. Students will also be assess through practical sessions which involving individual and group task in order to produce a creative and quality games output. At the end of the semester, each individual and group will be required to present their projects.

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.

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.

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.

BITP 3253 Software Validation and Verification

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, review, audit and accreditation.

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.

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 3443 Enterprise Application Development

This course exposes the students to the various process, life cycle stages, patterns, frameworks, tools and technologies required to build a successful enterprise application catering to the business needs of today's enterprises. The students will experience the overall journey of building enterprise application from inception to rollout phase. Enterprise application case study will helps the student to point out the required skills sets for developing enterprise application. Enterprise analysis and business modeling is conducted in inception phase using tools such as UML (use case) and prototype. Framework and architecture of typical enterprise application will be defined in the next stage where several tools, framework, technologies and best practices are applied. A construction map will be layout to bridge the gap between designer and developer that deals with layers and layers of component. The student will construct the application using the construction map. Several of testing techniques and tools will be introduced to test the application. Finally, the project will be roll out and wrap. A report is produced for each deliverables of the project.

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 3473 Formal Methods

This course covers the fundamentals of formal methods and can be used as a breadth course for Software Engineering. We will examine techniques for modeling and formally analysing computing systems and will consider applications in software and hardware. Students will learn the fundamentals of classical logic, induction and recursion, program semantics, rewriting, reactive systems, temporal logic, model checking, and abstraction. We will examine how these methods can be used to build reliable software and hardware.

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.

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.

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.

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 2513 Internet Technology

Internet has become a major tool in doing business today. The evolutions of web-based knowledge also contribute to this phenomenon. This course is purposely designed to provide an introduction to Internet technologies. This course covers a wide range of material about the Internet and the major areas of study include basic concepts and client, networking, programming on the Internet, security and Internet applications.

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 3343 Fibre Optic

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

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.

BITS 3453 Malware Analysis and Digital Investigation

This course presents the malware issues that cover malware taxonomy, malware intrusion and malware behaviour. The course also offers the malware intrusion investigation based on digital forensic investigation framework. The goal is to provide an understanding of digital forensic investigation process implemented in malware intrusion crime. This course will use lectures, homework assignments, case studies and group projects to promote learning. Students are expected to be active participants, asking questions, challenging instructors and generally taking responsibility for their own learning.

BITS 3473 Watermarking and Steganography

This course provide students with the basic concept of digital watermarking, steganography including knowledge on fingerprint and biometric. It covers the introduction to the theoretical background on above-mentioned area and development as well as implementation of

fundamental techniques in digital watermarking and steganography. In the lab session, students will be introduced to selected editing software for embedding information in the media. Students will be trained for practical embedding on text, image, audio and video. Students will be exposed to teamwork, leadership, problem-solving and communication skills while performing their various tasks and project.

BITS 3513 TCP/IP Programming

This course intended to expose student on how network programming works. Since Java is one of the most demanding skill in industry, so this course will emphasize on how to write a network programming by using Java language. This course will show students on how to use Java's network class library to quickly and easily write programmes that accomplish many common networking tasks.

BITS 3533 Wireless Network and Mobile Computing

This course is designed to give the knowledge of the concept of mobile computing and wireless networks, by exploring the relationship between hardware, software and development kits. Through class, research and application development, students will understand the current mobile technology and the relation to operating systems and standards. Students will be exposed to the challenges to handle the constraints of memory and storage of these hardware.

BENT 4733 Digital Signal Processing

This course consists of topics: Introduction to DSP, discretetime signals and systems, spectrum of representation of discrete-time signals, discrete Fourier transform, difference equations and discrete-time systems, z-transform and its applications, analysis and design of digital filters and random signal processing.

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.

DITI 3513 Artificial Intelligence in Robotic and Automation

This course covers introduction of robotics, which includes principles behind the AI approach to robotics and to program an artificially intelligent robot for applications involving sensing, navigation and uncertainty. The students also will be exposed to the principles of automation and mobile robotics programming as well as health and safety issues. Ethical aspects and the future of AI in robotics and automation are also covered.

DITI 3523 Introduction to Data Science

This course delivers an essential exposure on the fundamental concepts and techniques of data science. It is divided into two parts. Part 1 is the introductory lecture and guided practical session for the first 5 weeks. The main topics covers the five important phases in understanding data science: introduction to data science, data wrangling, exploratory data analysis, data manipulation, applied machine learning, and data visualization and communication.

Part 2 is a guided capstone project for another 9 weeks. The capstone project provides a platform to the students to applied their previously learn knowledge especially in artificial intelligent, statistics, analytics, project managements and data science in a real project setting. The last 3 weeks is the project presentation and technical report submission. There is no final written examination for this course.

DITM 3133 Digital Audio and Video Technology

This course is an extension from Multimedia System. It will give details and valuable insight of the wonderful world of digital audio and video. Throughout the semester, candidates will be introducing to topics on digital audio and video hardware, the art of audio production, recording techniques, video production, indoor and outdoor shooting procedure, 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.

DITM 3143 Digital Media Design

This course provides students with the concepts, techniques and desktop publishing process used in the industry. It emphasizes the use of text (typography), colour selection, paragraph, objects, graphics and images composition. At the end of the course, students can master the principles in generating design cases and printing for desktop publishing by using the appropriate software and tools.

DITM 3333 Introduction to Computer Games Design Principles

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.

DITP 2313 Database Programming

This course is based on the syllabus of two modules in Oracle certification (Oracle Certified Associate). The first part of the lesson introduces the concepts of relational database and SQL syntax. This includes topics related to Oracle database architecture, its ability, constraints in data integrity and other database objects such as views, index, sequence and synonyms. The second part of the lesson explains the objectives, functions and benefits of PL/SQL in developing database applications. This includes the development, implementation and maintenance of procedures, functions, packages and database triggers. The lesson also explains the use of stored procedures and triggers in retrieving data and executing complex business rules to enhance data integrity. Students will be introduced to Oracle packages, subprograms and PL/SQL triggers.

DITP 3213 Software Engineering

This course introduces the basic concept of software engineering to the student. It covers all the software development process which includes analysis, requirement, design, implementation and testing. This course also covers support areas such as project management and quality management. This course exposes the student to structured approach and object-oriented approach using UML.

DITP 3263 Software Verification and Validation

This course gives exposure to the students on the principles and terms of verification and validation. It will focus on the process of designing testing plan, test requirements and test cases to satisfy the quality of a software product. The study will also cover software quality assurance activities such as quality requirement, quality criteria, software metrics, software quality model, software evaluation, review, audit and accreditation.

DITP 3283 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.

DITP 3313 Database Design

This course discusses 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. Advanced database concepts and applications such as data warehouse, OLAP, data mining, database in electronic commerce and distributed databases systems also will be discussed.

DITP 3323 Database Administration

This course focus on the roles, issues and responsibilities of database administrators, functions of the Database Management System (DBMS) such as storage, access and data updates; database objects; indexes and data integrity; planning and implementation of performance activities, upgrading and user management.

DITP 3413 Cross-platform Mobile Application Development

This course exposes the students to the development of cross-platform mobile application from single codebase development frameworks. Topics that will be included are from the concept of mobile application to the development of mobile application. The topics are lifecycle, environments, components, operations, and processes until deploying application into mobile devices.

DITS 2513 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.

DITS 3323 Local Area Network

This course is an introduction to the current methods and practices in the use of Local Area Networks (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 (OSI) reference model.

DITS 3333 Wide Area Network

This course introduces the concepts, practices, and technologies used in the design and implementation of Wide Area Networks. Topics will include: overview of network fundamentals, considerations for 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 Wide Are Network technology concepts and skills in network applications, troubleshooting, and preparing for CCNA examinations.

DITS 3343 Network Services

Internet has become a major tool in today's people communication, entertainment, shop and doing business. This course covers a wide range of material about the network architecture, operation of the Internet services such as e-mail, file transfer, the World-Wide Web, streaming media and the principals involved in the design of such distributed services.

DITS 3653 Active Directory and Server Administration

This course teaches the student on how to implement and configure Active Directory Domain Services (AD DS). It also guides to manage name resolution, schema, and replication. The purpose of active directory usage is to manage users, groups, shared folder, and network resource, and to administer the user environment and software with group policy. It also will cover monitoring and optimizing Active Directory. Besides, students expose with various file system and disk management function. It also explains the elements of the network infrastructure such as intranet, remote access, remote office, internet and extranet. Student should be able to configure and managing network infrastructures such as DHCP, DNS, WINS, RRAS, SMTP and FTP.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