ACADEMIC GUIDEBOOK

UNDERGRADUATE PROGRAMME

ENGLISH VERSION FOR LOCAL STUDENT

ACADEMIC SESSION 2025/2026

FACULTY OF COMPUTER SCIENCE AND MATHEMATICS

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FACULTY OF COMPUTER SCIENCE AND MATHEMATICS

Universiti Malaysia Terengganu
21030 Kuala Nerus
Terengganu
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Set in Tahoma

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Editorial Board

Table of Content

Words from the Dean

Alhamdulillah...

Assalamualaikum WBT and greetings,

Welcome to the Faculty of Computer Science and Mathematics (FSKM), Universiti Malaysia Terengganu (UMT). Congratulations to all new students who have successfully become part of the FSKM community. Your decision to pursue studies at this faculty is indeed a wise step towards building a bright future in the fields of Computer Science and Mathematics.

FSKM is committed to providing a conducive learning environment as well as a curriculum aligned with industry needs. We believe that learning is not limited to the classroom, but also takes place through practical experiences, research, and various co-curricular activities that will shape you into competent, innovative, and competitive graduates.

This Academic Handbook has been specially published for new FSKM students for the 2025/2026 intake. It contains information about the faculty, general guidelines, student dress code and appearance regulations, as well as the curriculum structure for each academic programme under FSKM. It is hoped that this handbook will serve as a useful reference and guide throughout your studies at FSKM until graduation.

Finally, I hope that you will make the most of every opportunity at UMT, be proactive in your learning, and continue striving for academic excellence and personal growth. Remember that every challenge is an opportunity to grow and become better. Wishing you every success, and may achievement always accompany your academic journey at FSKM, UMT.

Thank you.

Prof. Ts. Dr. Muhammad Suzuri Hitam
Dean
Faculty of Computer Science and Mathematics

About UMT

Universiti Malaysia Terengganu (UMT) started with a Fisheries and Ocean Science Centre in 1979, which offers training facilities to students of the Fisheries and Ocean Science Programme in addition to providing research facilities to lecturers. Through the restructuring of the academic programme at Universiti Putra Malaysia (UPM), the entire Faculty of Fisheries and Ocean Sciences was transferred to Terengganu and given a new name, the Faculty of Science and Technology (FST) starting in June 1996. The Faculty of Science and Specialized Arts (FSSI) and the Matriculation Study Centre (PPM) were also established.

From June 1996, this campus was recognized as a centre of responsibility and named Universiti Putra Malaysia Terengganu Branch (UPMT) and headed by a Rector. On 5 May 1999, the council of ministers agreed to approve the proposal for the establishment of Terengganu University College (KUT). KUT becomes an affiliated campus of UPM, where KUT students graduate from UPM. KUT officially changed its name to Kolej Universiti Sains dan Teknologi Malaysia (KUSTEM) on 1 July 2001.

Starting on 1 February 2007, equivalent to 13 Muharram 1428H, another history was created in the education system in Malaysia. In an effort to strengthen the position of the National Public University, six university colleges have gone through rebranding. Now KUSTEM is known as Universiti Malaysia Terengganu.

UMT has nine academic responsibility centres and four research institutes namely;

1. Faculty of Computer Science and Mathematics
2. Faculty of Ocean Engineering Technology
3. Faculty of Food Science and Agrotechnology
4. Faculty of Science and Marine Environment
5. Faculty of Business, Economics and Social
6. Faculty of Maritime Studies
7. Faculty of Fisheries Science and Aquaculture
8. Centre for Foundation and Continuing Education
9. STEM Foundation Centre
10. Institute of Oceanography and Environment
11. Institute of Tropical Aquaculture and Fisheries
12. Institute of Climate Adaptation and Marine Biotechnology
13. Institute of Tropical Biodiversity and Sustainable Development

Vision, Mission, Objectives and Slogan of UMT

- Explores all areas related to Science, Technology and Natural Resource Management through research.
- Provides the latest facilities (laboratories, libraries, computing and environment) to support the development of knowledge, learning and scholarship.
- Offers excellent programmes of study that meet current and future needs. Produces graduates who are responsible, knowledgeable, confident and competent.
- Plays an active role in the development of social, economic and education through the expansion services specifically to the local community of the East Coast Peninsular and to the Malaysians, in general.

SECTION A

Information of Faculty of Computer Science and Mathematics

About FSKM

The Faculty of Computer Science and Mathematics (FSKM) was officially established on 1 January 2024, as a result of the restructuring of the Faculty of Ocean Engineering Technology and Informatics. FSKM is an academic entity at UMT that provides high-quality education in the field of computing and mathematics at both undergraduate and postgraduate levels.

The establishment of FSKM is to bring together expertise in the fields of software engineering, maritime informatics, mobile computing, applied mathematics, financial mathematics, and data analytics under one centre of responsibility in supporting the main thrust of the university in line with the vision and mission of UMT.

In line with the faculty's mission, FSKM's target is to produce graduates who are moral, skilled, trained, competitive, and have an identity to meet the needs of the country's workforce.

FSKM offered 6 undergraduate programmes with the duration of the study being 7 semesters (3.5 years). The programmes that FSKM offers are as follows:-

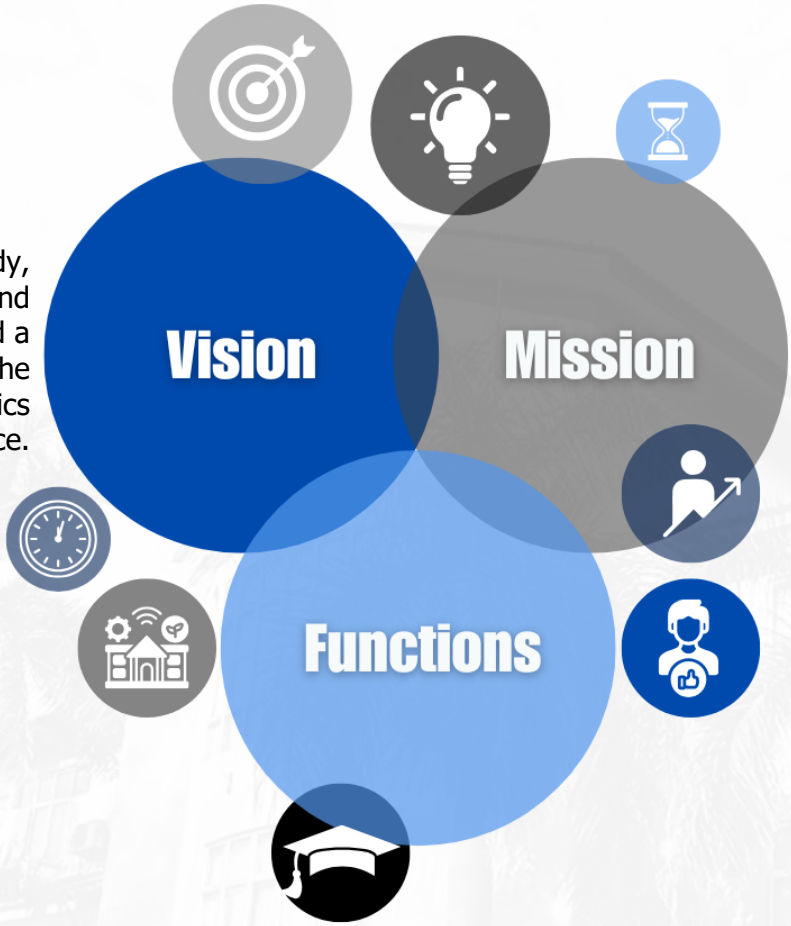
1. Bachelor of Computer Science (Software Engineering) with Honours
2. Bachelor of Computer Science with Maritime Informatics (Honours)
3. Bachelor of Computer Science (Mobile Computing) with Honours
4. Bachelor of Science (Applied Mathematics) with Honours
5. Bachelor of Science (Financial Mathematics) with Honours
6. Bachelor of Science (Data Analytics) with Honours

In addition, FSKM also offers postgraduate study programmes either through coursework or research, as follows:-

1. Master of Mathematics (by Coursework)
2. Master of Statistics in Marine Science (by Coursework)
3. Master of Computer Science (by Coursework)
4. Master of Information Technology (by Coursework)
5. Master of Science (Research)
6. Doctor of Philosophy (Research)

Vision, Mission and Functions of FSKM

Being a centre of study, research and development and a broad knowledge in the field of Mathematics and Computer Science.



Being a centre of study, research and development and a broad knowledge in the field of Mathematics and Computer Science.

- Supports the mission of the university to become the premier centre of learning and research by contributing to the progress of humankind and exploration of knowledge and to the creation of wealth and national development.
- Provides trained manpower with professional skills, high self-discipline and positive work ethics.
- Produces graduates who are sensitive to management ideas, responsive to change and become a role-model for students and community.
- Serves society through the dissemination of ideas and new practices and seek solutions to current problems in society.
- Establishes relationships with other universities, institutions and the industry for mutual benefit and the national development.
- Supports the mission of the university to become an organised centre of research and learning as well as providing good services and exploring in a new technology.

Management Committee of FSKM

1. Prof. Ts. Dr. Muhammad Suzuri Hitam
DEAN
2. Prof. Madya Ts. Dr. Rosmayati Mohemad
DEPUTY DEAN (ACADEMIC & STUDENT AFFAIRS)
3. Dr. Ilyani Abdullah
DEPUTY DEAN (TALENT & RESEARCH)

4. Assoc. Prof. Ts. Dr. Wan Nural Jawahir Hj Wan Yussof
HEAD OF PROGRAMME, (BACHELOR OF COMPUTER SCIENCE (SOFTWARE ENGINEERING) WITH HONOURS
5. Assoc. Prof. Ts. Dr. Zuriana Abu Bakar
HEAD OF PROGRAMME, BACHELOR OF COMPUTER SCIENCE WITH MARITIME INFORMATICS (HONOURS)
6. Assoc. Prof. Ts. Dr. Amir Ngah
HEAD OF PROGRAMME, BACHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING) WITH HONOURS
7. Ts. Dr. Arifah Che Alhadi
CHAIR OF COMPUTER
8. Assoc. Prof. Dr. Shalela Mohd Mahali
HEAD OF PROGRAMME, BACHELOR OF SCIENCE (APPLIED MATHEMATICS) WITH HONOURS
9. Dr. Binyamin Yusoff
HEAD OF PROGRAMME, BACHELOR OF SCIENCE (FINANCIAL MATHEMATICS) WITH HONOURS
10. Prof. Dr. Muhamad Safiih Lola
HEAD OF PROGRAMME, BACHELOR OF SCIENCE (DATA ANALYTICS) WITH HONOURS
11. Dr. Fatimah Noor Harun
CHAIR OF MATHEMATICS

12. Mrs. Napisah Abdul Rahman
SENIOR ASSISTANT REGISTRAR
13. Miss Haszailianawaty Mat Razali
ASSISTANT REGISTRAR
14. Mr. Mohd Arizal Shamsil Mat Rifin
VOCATIONAL TRAINING OFFICER

Academicians of the Computer Science Programme

HEAD OF PROGRAMME BACHELOR OF COMPUTER SCIENCE (SOFTWARE ENGINEERING)

Assoc. Prof. Ts. Dr. Wan Nural Jawahir Hj Wan Yussof
PhD (UMT), MSc, BIT (KUSTEM)
Computer Vision, Image Processing

HEAD OF PROGRAMME BACHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING)

Assoc. Prof. Ts. Dr. Amir Ngah
PhD (Durham), MSc (UPM), BSc (UTM)
Software Engineering, Software Maintenance and Testing

HEAD OF PROGRAMME BACHELOR OF COMPUTER SCIENCE WITH MARITIME INFORMATICS

Assoc. Prof. Ts. Dr. Zuriana Abu Bakar
PhD (UQ, Australia), MSc (UPM), BSc (UTM)
Human and Computer Interaction, Information System, Decision Support System, Data Mining

CHAIR OF COMPUTER

Ts. Dr. Arifah Che Alhadi
PhD (UMT), MIT, BIT (Hons) (UKM), Dip.IT (KUSZA)
Information Retrieval, Information System

PROFESSORS

DEAN

Prof. Ts. Dr. Muhammad Suzuri Hitam
PhD (Leeds), BTech (Hons) (USM)
Artificial Intelligence, Image Processing

Prof. Dato' Ts. Dr. Aziz Deraman
PhD (UMIST), MAppSci (Glasgow), SmSn (Kep) (UKM)
Software Engineering and Management, Software Quality, ICT Strategic Planning, e-Community

Prof. Ts. Dr. Noor Maizura Mohamad Noor
PhD (Manchester), MSc, BSc (UPM)
Decision Support System, Information System

Academicians of the Computer Science Programme

LECTURERS

DEPUTY DEAN (ACADEMIC & STUDENT AFFAIRS)

Assoc. Prof. Ts. Dr. Rosmayati Mohemad
PhD (UKM), MSc, BSc (UTM)
Decision Support System, Ontology Modelling, Knowledge Engineering

Assoc. Prof. Ts. Dr. Noraida Haji Ali
PhD, MIT, BSc (Hons) (UKM)
Software Engineering, Formal Modelling, Algorithm & Data, e-Learning

Assoc. Prof. Ts. Dr. Masita @ Masila Abdul Jalil
PhD (UKM), MSc, BEng (Hons) (Warwick)
Information Science, Software Engineering

Assoc. Prof. Ts. Dr. Mustafa Man
PhD (UTM), MSc, BSc (UPM)
Database, Internet of Things (IOT), Image Processing, Data Mining

Assoc. Prof. Ts. Dr. Ahmad Shukri Mohd Noor
PhD (UTHM), MSc (KUSTEM), BSc (Conventry)
Distributed Computing, Internet of Things (IoT)

Assoc. Prof. Dr. Engku Fadzli Hasan Syed Abdullah
PhD (Cardiff University), MSc (UTM), BMIS (UIAM)
Software Engineering, Intelligent System, Embedded Programming, Internet of Things (IoT)

Assoc. Prof. Dr. Noor Hafhizah Abd Rahim
PhD (Bristol) UK, MSc (UM), BSc (UKM)
Artificial Intelligence, Semantic Web, Natural Language Processing, Machine Learning

Academicians of the Computer Science Programme

LECTURERS

Dr. Abdul Aziz K Abdul Hamid
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Software Engineering, Image Processing

Dr. Noor Azliza Che Mat
PhD (UMT), MIT, BIT (Hons) (UKM), Dip.IT (KUSZA)
Decision Support System, Multimedia

Dr. Mohamad Nor Hassan
PhD (UMT), MSc (UiTM), BSc (Liverpool)
Information System

Dr. Rabiei Mamat
PhD (UTHM), MSc (KUSTEM), BSc (UPM)
Cluster Computing, Machine Learning

Dr. Farizah Yunus
PhD (UTM), B. Eng (Telecommunication) (UTM),
Dip. Eng (Communication) (UTM)
Wireless Sensor Network, Data Communication, Internet of Things (IoT), Cloud Computing, Cyber Security

Dr. Rozniza Ali
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Pattern Recognition, Image Processing, Machine Learning

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PhD (UTS, Sydney), MSc (USM), BIT (UUM)
Software Reliability & Testing, Software Metrics & Measurement, Software Engineering

Academicians of the Computer Science Programme

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Decision Support System and Data Mining

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Ts. Mohammad Aizat Basir
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Artificial Intelligence, Machine Learning

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Dr. Mohd Amir Idzham Iberahim
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Virtual Reality, Multimedia, Machine Learning

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Academicians of the Computer Science Programme

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Software Engineering, Bioinformatics, Artificial Intelligence

Ts. Dr. Khairul Annuar Abdullah
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Bio-inspired Computation, Industrial Robots, Manufacturing Systems, Industrial Computing

Dr. Hasnah Nawang
PhD, MSc (UniSZA), BSc (UPM), Dip Ed (UPSI)
Dip Sc (UC Bestari)
Machine Learning, Ensemble Methods, Software Engineering

Mr. Che Akmal Che Yahaya
MSc (UiTM), BSc (Hons) (UTHM)
Cloud Computing, Artificial Intelligence, Intrusion Detection System

INTERNATIONAL LECTURER

Dr. Waheed Ali Hussein Mohammed Ghanem
PhD, MSc (USM), BSc (AU)
Network Security, Artificial Intelligence, Machine Learning, Swarm Intelligent, Optimization Algorithm

Dr. Wiwied Virgiyanti
PhD (USM), MSc IT (Management) (UTM), B.Eng (Informatics) (Gunadarma University)
Knowledge Management, Project Management, Information Systems, Organizational Behaviour

Academicians of the Computer Science Programme

VOCATIONAL TRAINING OFFICERS

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MSc, BIT (UMT)
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Mrs. Wan Fatin Fatihah Yahya
MSc, BIT (UMT)
Software Engineering

Academicians of the Mathematical Science Programme

HEAD OF PROGRAMME BACHELOR OF SCIENCE (DATA ANALYTICS)

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PhD (USM), MSc (UPM), BEc Hons (UUM)
Applied Statistics (Robust Statistics, Econometrics, Hybrid Statistics), Data Analytics (Forecasting Analysis)

HEAD OF PROGRAMME BACHELOR OF SCIENCE (APPLIED MATHEMATICS)

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CHAIR OF MATHEMATICS

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PROFESSORS

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Prof. Dr. Zabidin Salleh
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Prof. Dr. Roslan Hasni @ Abdullah
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Graph Theory, Combinatorics

Academicians of the Mathematical Science Programme

LECTURERS

Assoc. Prof. Dr. Norizan Mohamed
PhD (UTM), MSc, BSc (UKM)
Statistical Quality Control, Statistical Forecasting

Assoc. Prof. Dr. Che Mohd Imran Che Taib
PhD (UiO, Norway), MSc, BSc (KUSTEM)
Financial Mathematics, Finance, Insurance

Assoc. Prof. Dr. Ruwaidiah Idris
PhD, MSc, BSc (UKM)
Fluid Dynamics

Assoc. Prof. Dr. Auni Aslah Mat Daud
PhD (Western Australia), BSc (UTM)
Mathematical modeling, Dynamical system, Chaos theory, Mathematical epidemiology

Assoc. Prof. Ts. Dr. Nur Aidya Hanum Aizam
PhD (Curtin), Msc (UKM), BSc (KUSTEM)
Operations Research

Assoc. Prof. Dr. Ahmad Termimi Ab Ghani
DSc (Tohoku University), MSc (UMT), BSc (KUSTEM)
Foundation of Mathematics (Logic of Games, Fuzzy Set Theory and its Variations, Algebra and Combinatorics)

Assoc. Prof. Dr. Mohamad Nazri Husin
PhD (UMT), MSc, Bsc (Hons) (USM)
Pure Mathematics, Graph Theory

Academicians of the Mathematical Science Programme

LECTURERS

DEPUTY DEAN (TALENT & RESEARCH)

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PhD (UTM), MSc, BSc (UKM)
Fluid Dynamics, Differential Equations

Dr. Syerrina Zakaria
PhD (USM), MSc, BSc (UKM)
Applied Statistics

Dr. Hanafi A. Rahim
PhD (UiTM), MSc (UKM), BSc (UiTM)
Applied Statistics

Dr. Nur Baini Ismail
PhD (Bradford), MSc, BSc (USM)
Computer Aided Geometry Design

Dr. Azwani Alias
PhD (Loughborough), MSc, BSc (UTM)
Linear and Non-Linear Waves

Dr. Loy Kak Choon
PhD (Uni. Ottawa), MSc (USM), BSc (KUSTEM)
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Dr. Hassilah Salleh
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Stochastic Analysis, Financial Mathematics

Academicians of the Mathematical Science Programme

LECTURERS

Dr. Ummu 'Atiqah Mohd Roslan
PhD (Exeter), MSc, BSc (UMT)
Dynamical System

Ts. Dr. Mohamed Saifullah Hussin
PhD (ULB, Brussels), MSc, BSc (UUM)
Metaheuristics, Simulated Annealing, Tabu Search

Dr. Chong Nyuk Sian
PhD (Uni. Ottawa), MSc (USM), BSc (Hons) (USM)
Mathematical Modeling of Epidemiology

Dr. Nur Fadhilah Ibrahim
PhD (Curtin), MSc, BSc (UTM)
Operations Research, Optimization

Dr. Hanani Farhah Harun
PhD, MSc, BSc (Hons) (UIAM)
Financial Derivatives (Option Pricing), Islamic Finance

Dr. Sharifah Sakinah Syed Abd Mutalib
PhD (UMP), Msc (UKM), BSc (Hons) (UKM)
Multivariate Data, Outlier Detection, Applied Statistics

Dr. Wan Nuraini Fahana Wan Nasir
PhD (UMT), MSc (UPM), BSc (Hons) (USM)
Multivariate Data, Statistics, PLS-SEM

Academicians of the Mathematical Science Programme

LECTURERS

Dr. Mukminah Darus
PhD, MSc, BSc (UMT),
Stochastic Modelling, Financial Mathematics

Dr. Muhammad Hilmi Abdul Majid
Ph.D (UKM), MSc (UM), BSc (University of Auckland)
Statistical Modeling, Applied Statistics

Mrs. Nor Azlida Aleng@Mohamad
MSc, BSc (UKM)
Biostatistics, Management Mathematics

Mrs. Siti Madhihah Abdul Malik
MSc (UKM), BSc (KUSTEM)
Time Series Forecasting

INTERNATIONAL LECTURER

Dr. Maharani Abu Bakar
PhD (Essex), MSc, BSc (UGM, Indonesia)
Numerical Analysis, Artificial Neural Networks, Machine Learning

SECTION B

General Information, Rules for Student Dress Code and Appearance

General Information

1) Studying System

UMT practices a semester-based system. There are two common semesters for each academic year and the duration for each semester is 19 weeks, the breakdown is as follows:

Activity	Semester I	Semester II
Lecture	7 Weeks	7 Weeks
Mid-semester Break	1 Week	1 Week
Lecture	7 Weeks	7 Weeks
Revision Break	1 Week	1 Week
Final Examination	3 Weeks	3 Weeks

2) Programme Curriculum Structure

The curriculum structure for undergraduate students is designed in accordance with the UMT philosophy and vision, which is to produce knowledgeable graduates, competent with multiple skills including entrepreneurship and leadership. There are three course components in the programme curriculum namely University Core, Programme Core, and University Elective.

- **University Core**
  The university's core components comprise several courses that are compulsory for all UMT undergraduates to enrol in and pass the courses. These courses aim to provide general knowledge to students.

- **Programme Core**
  Programme core components comprise courses related to the major programme and determined by the corresponding faculty which is offering the respective programme. The students are compulsory to undertake their respective core programme courses.

- **University Elective**
  University Elective components comprise selected courses chosen by students after discussing with their academic advisor/mentor/head of programme. The credit hours for elective courses are counted and the score point is given.

3) Credit Transfer

Students are allowed to apply for credit transfer through Credit Transfer System online on the MyNemo Student portal (subject to conditions and approval from the Course Lecturer/ Head of Programme). Credit transfer is the process of transferring course credits taken by a student in a programme to another programme that leads to the awarding of a qualification offered by the same institution or a different institution. This process allows the credit for the course to which the credit is transferred to be counted as part of the programme's graduate credit requirement. Credit transferable courses are courses that are equivalent to courses in the programme leading to the award of a qualification subject to the prescribed conditions. Refer to the UMT Academic Regulations Book: Bachelor and Diploma Programmes (10th Edition) for more information.

4) Mentor-mentee System

Mentor-mentee system is introduced in UMT to replace the academic advisor system. A mentor is an academician who is responsible for providing consultation on academic matters to the students (mentees) and also for advising the students if the students encounter any problems with their studies or personal issues. Each student is obliged to meet their mentor for consultation and the appointment can be set in advance, depending on the availability of the mentor.

- **Implementation**

  Faculty will assign a lecturer as a mentor for each student who enrols in the programme. The students can meet their mentor to seek for advice on academic matters or any other matters.

- **Mentor Roles**

  i) Assisting students to understand the curriculum, semester system, registration system, examination system, and course exemption;
  ii) Assisting students to plan their studies structure;
  iii) Assisting students to select courses;
  iv) Giving advice on academic issues faced by students;
  v) Identify problems which may affect the academic progress of the student and directly refer to an expert who has the skill to solve the encountered problems;
  vi) Sign and certify certificates and any documents regarding student academics;
  vii) Become a mentor and motivate students;
  viii) Hold meetings with students at least twice each semester; and
  ix) Keep and update student records and files.

5) Grading System, Grade and Point Average

The grading scheme, Alphabetical Grade, Grade Point Value, and Grade Description are as shown in the following table:

Marks	Alphabet Grade	Grade Point Value	Grade Description
80 – 100	A	4.00	Excellent
75 - 79	A-	3.75	
70 - 74	B+	3.50	Good
65 - 69	B	3.00	
60 - 64	B-	2.75	
55 - 59	C+	2.50	Satisfactory
50 - 54	C	2.00	
45 - 49	C-	1.75	Poor
40 - 44	D	1.00	
Less than 39	F	0.00	Fail

6) Academic Standing

Students will be given the academic standing in every semester based on the following status:

Standing	Description
Passed (L)	Achieved a minimum CGPA of 2.00 and passed all courses.
Repeat (LMK)	Achieved a minimum CGPA of 2.00 and failed any of the courses.
Warning (W)	Achieved a CGPA between 1.00 and 1.99
Warning (WMK)	Achieved a CGPA between 1.00 and 1.99 and failed any of the course.
Probation (P)	Fail to achieve a minimum CGPA 2.00 during Warning status (two consecutive semesters with Warning status).
Failed and Dismissed (GB)	Obtained a CGPA below 0.99 in any one semester; or Failed to attain the required minimum CGPA of 2.00 in the semester following the one in which he/she was placed on probation.
Deferment (TG)	Student whose application for deferment has been granted.
Graduated (IJZ)	Fulfilled all requirements as specified by the programme.

7) Degree Classification

CGPA	Classification	
	In Bahasa Malaysia	In English
3.67 – 4.00	*Cemerlang*	Distinction
2.00 – 3.66	*Kepujian*	Honours

8) Malaysian University English Test (MUET) Graduation Requirement

The minimum MUET Band requirement for graduation in Bachelor's degree programmes is as follows:

- Arts and Social Sciences – Band 3
- Science, Technology, Engineering and Mathematics (STEM) – Band 4

Exemption from this requirement is granted to students who have already achieved the minimum MUET Band upon admission, as they are deemed to have fulfilled the graduation requirement for MUET.

Note:
Effective for students from the 2023/2024 intake onwards.

Rules for Student Dress Code and Appearance

1) Dress Code Introduction

This rule is based on Rule 3(a) and Rule 26, Universiti Malaysia Terengganu Rules (Student Discipline) 2009. It aims to inform students about the UMT dress code.

2) General Rules of UMT

i) It is mandatory for all students to show their matric card while on campus.
ii) All students are prohibited from wearing clothing or accessories that signify certain groups or associations that might cause disharmony on campus.
iii) All students are prohibited from showcasing any elements that might contradict ethics and morale or wearing any attire that might contain designs of words or phrases that are not parallel with good norms or values.
iv) All students are restricted with dress code rules as specified by laboratory guidelines or any other place on campus with its own specified guidelines.

3) Dress Code in the Residential College Area and Attending Official Programmes/Events

- **General Dress Code**
  i) Every student must dress appropriately as a university student by showing **neatness** and **politeness**.
  ii) Students are not allowed to wear tight or sparse clothing, expose the body (any part from the chest to the knees), and dress conspicuously. Students are prohibited from dressing as below when attending lectures or any official event:
    a) Skirt above knee
    b) Wearing jeans
    c) Flip-flops
    d) Tight pants/skirts
    e) Sleeveless dress/ shirt
    f) T-shirt without sleeve collar

    Note: The above list is not final and is subject to the university's current regulations.

iii) Due to safety factors, face covering (purdah/niqab) while in the residential college area or at official events is prohibited.
iv) Students are prohibited from displaying tattoos on any part of the body.
v) Piercing and wearing jewellery for men is strictly prohibited and excessive piercing is also prohibited for female students.

Examples of Dress Code for Male and Female Students

- **Official Programmes/Events**
  i) Students are required to dress appropriately when dealing in the Residence College Office or any official event;
     a) Shirts, collared T-shirts, corporate shirts, batik shirts;
     b) Wearing shoes;
     c) Loose trousers;
     d) Long skirt below knee;
     e) Wearing a traditional Malay dress or wearing decent clothes by wearing a shirt past the butt level.

  ii) Students are also not allowed to wear **hats** or **bandanas** when doing official matters at the university office or in the lecture hall.

- **Sports Attire**
  i) Students must dress in accordance with the chosen sportswear code.
  ii) Students are prohibited from dressing as listed below when in the residential college area, generally multi-purpose courts A, B.
     a) Leggings without additional pants;
     b) Short pants above knee without tight-fit pants;
     c) Flip flops.

4) Hair Style

i) Students should always have neat and tidy hair.
ii) Male students are not allowed to keep long hair and tails in front or back. Hair should not reach the shirt collar.
iii) Exaggerated hair fashion for men (partial patterned hairstyles/qaza') and women is prohibited.
iv) Hair colouring is strictly prohibited.

SECTION C

Academic Programmes Offer

Bachelor of Computer Science (Software Engineering) with Honours

Introduction

The Bachelor of Computer Science (Software Engineering) with Honours is offered to both local and international students with a particular emphasis on STPM, Matriculation, and Diploma graduates or their equivalents. This programme aims to provide students with an understanding of development theory and the application of software systems. This includes skills in problem-solving, software system design, software testing and software maintenance. Aligned with the progress of the Industrial Revolution 4.0 (IR4.0), the fields of computer science and information technology are drivers of social development, capable of fostering an informed society. Both fields are crucial for industrial competitiveness. Therefore, digital talent in software engineering is highly required in various sectors to drive the economic growth of the country.

Programme Educational Objective (PEO)

This programme is offered for students to achieve the following objectives:

PEO1 : Software Engineers who are able to apply knowledge, technical and digital skills in the field of software engineering.

PEO2 : Software Engineers with strong interpersonal and communication skills to effectively engage with stakeholders.

PEO3 : Software Engineers who uphold ethics and professional practices in maintaining integrity.

PEO4 : Software Engineers with leadership skills and competence in solving computing problems using scientific and numerical skills.

PEO5 : Software Engineers who possess autonomous learning skills and an entrepreneurial mindset for personal and career development in the field of software engineering.

Career Prospects

Among the careers that can be pursued by graduates of computer science programmes are as follows:

- Software Engineers
- Software Developer
- Software Tester
- System Analyst
- Web Designer/ Developer
- Programmer/ Programme Analyst
- System Administrator
- Postgraduate Opportunity
- Network Administrator
- Database Administrator
- Information Technology Officer
- IT Consultant
- Network Engineer
- IT Lecturer
- IT Trainer

PROGRAMME CURRICULUM
BACHELOR OF COMPUTER SCIENCE (SOFTWARE ENGINEERING) WITH HONOURS

Total Credit for Graduation

The minimum amount of credit required to graduate is 122 credit hours. The distribution of credit hours by course category is as follows:

Category	Credit Hour	Percentage
University Core Course	14	11
Programme Core Course	46	38
Specialization Core Course	30	25
Final Year Project	8	6
Industrial Training	12	10
University Elective Course	12	10
Total	**122**	**100**

University Core Courses

Students must complete all **SIX** courses at the University Core level, which total 14 credit hours.

No.	Course Code	Course Name	Credit Hour	Prerequisite
1.	CCXXXXX	Co-Curriculum	2(0+2)	None
2.	BBB3033	English for Occupational Purposes	3(3+0)	None
3.	MPU3132	Appreciation of Ethics and Civilization	2(2+0)	None
4.	MPU3142	Philosophy and Current Issues	2(2+0)	None
5.	MPU3223	Basic Entrepreneurship	3(3+0)	None
6.	MPU3352	Integrity and Anti-Corruption	2(2+0)	None

Programme Core Courses

To meet the requirements for graduation, students must take and pass all **FIFTEEN** Programme Core courses totalling 46 credit hours.

No.	Course Code	Course Name	Credit Hour	Prerequisite
1.	CSF3003	Discrete Structure	3(3+0)	None
2.	CSF3013	Data Structure and Algorithm	3(2+1)	None
3.	CSF3023	System Thinking and Logic	3(3+0)	None
4.	CSF3034	Programming	4(3+1)	None
5.	CSF3043	Object-Oriented Programming	3(2+1)	None
6.	CSF3113	System Analysis and Design	3(3+0)	None
7.	CSF3123	Database	3(2+1)	None
8.	CSF3133	Web-Based Interface Design	3(2+1)	None
9.	CSF3143	Basics of Software Engineering	3(3+0)	None
10.	CSF3213	Operating System	3(3+0)	None
11.	CSF3223	Networking	3(2+1)	None
12.	CSF3233	Cyber Security	3(2+1)	None
13.	CSF3243	Computer Organisation and Architecture	3(3+0)	None
14.	CSF3253	Intelligent System	3(3+0)	None
15.	MTK3053	Introduction to Statistics	3(3+0)	None

Specialization Core Courses
To meet the requirements for graduation, students must take and pass all **TEN** Specialization Core courses, which amount to 30 credit hours.

No.	Course Code	Course Name	Credit Hour	Prerequisite
1.	CSE3023	Web-Based Application Development	3(2+1)	None
2.	CSE3203	Software Requirement Engineering	3(3+0)	None
3.	CSE3403	Software Project Management	3(3+0)	None
4.	CSE3413	Software Testing	3(3+0)	None
5.	CSE3423	Software Quality Assurance	3(3+0)	None
6.	CSE3433	Software Architecture	3(3+0)	None
7.	CSE3443	Software Maintenance and Evolution	3(3+0)	None
8.	CSE3453	Ethics and Professional Practices	3(3+0)	None
9.	CSE3953	Application System Development Project	3(0+3)	None
10.	CSM3313	IoT Computing	3(2+1)	None

Final Year Project Courses
Students must complete and pass **TWO** Final Year Project courses for a total of 8 credit hours in order to graduate.

No.	Course Code	Course Name	Credit Hour	Prerequisite
1.	CSF4984	Final Year Project I	4(0+4)	None
2.	CSF4994	Final Year Project II	4(0+4)	CSF4984

Industrial Training Course
Students must complete and pass an Industrial Training course for a total of 12 credit hours in order to graduate.

No.	Course Code	Course Name	Credit Hour	Prerequisite
1.	CSF49712	Industrial Training	12(0+12)	None

University Elective Courses
Students may select 12 credit hours from any of the courses listed as University Elective by the Centre for Foundation and Continuing Education and related faculties.

Notes:
i) The number of elective course credit hours that must be taken by students in the programme of study is subject to the number of elective credit hours set by the programme of study to meet graduate qualifications and is not subject to the number of elective courses taken.
ii) The list of elective courses that can be taken by students in the programme of study refers to the course offerings listed in the handbook of the study programme of the faculty and other faculties.

Credit Transfer
1) Student needs to refer to *Peraturan Akademik Universiti Malaysia Terengganu (Program Diploma dan Sarjana Muda)*.
2) In addition, the following three (3) Core Programme courses are exempted from credit transfer:
   i) CSF3034 Programming;
   ii) CSF3013 Data Structure and Algorithm; and
   iii) CSF3123 Database.

COURSE SCHEME
BACHELOR OF COMPUTER SCIENCE (SOFTWARE ENGINEERING) WITH HONOURS

CODE	COURSE NAME	CREDIT HOUR	PRE REQUISITE	CODE	COURSE NAME	CREDIT HOUR	PRE REQUISITE
SEMESTER 1				**SEMESTER 2**			
CSF3003	Discrete Structure	3(3+0)	-	CSE3203	Software Requirement Engineering	3(3+0)	-
CSF3023	System Thinking and Logic	3(3+0)	-	CSF3043	Object-Oriented Programming	3(2+1)	-
CSF3034	Programming	4(3+1)	-	CSF3213	Operating Systems	3(3+0)	-
CSF3143	Basics of Software Engineering	3(3+0)	-	MPU3132	Appreciation of Ethics & Civilization	2(2+0)	-
CSF3243	Computer Organisation and Architecture	3(3+0)	-	MPU3352	Integrity and Anti-Corruption	2(2+0)	-
CCXXXXX	Co-Curriculum	2(0+2)	-	MTK3053	Introduction to Statistics	3(3+0)	-
MPU3142	Philosophy and Current Issue	2(2+0)	-		Elective 1	3	-
TOTAL		**20**		**TOTAL**		**19**	
SEMESTER 3				**SEMESTER 4**			
CSF3013	Data Structure and Algorithm	3(2+1)	-	CSE3023	Web-Based Application Development	3(2+1)	-
CSF3113	System Analysis and Design	3(3+0)	-	CSE3413	Software Testing	3(3+0)	-
CSF3123	Database	3(2+1)	-	CSE3433	Software Architecture	3(3+0)	-
CSF3133	Web-Based Interface Design	3(2+1)	-	CSE3953	Application System Development Project	3(0+3)	-
	Elective 2	3	-	CSF3223	Networking	3(2+1)	-
	Elective 3	3	-	MPU3223	Basic Entrepreneurship	3(3+0)	-
TOTAL		**18**		**TOTAL**		**18**	
SEMESTER 5				**SEMESTER 6**			
BBB3033	English for Occupational Purposes	3(3+0)	-	CSE3443	Software Maintenance and Evolution	3(3+0)	-
CSE3403	Software Project Management	3(3+0)	-	CSE3453	Ethics and Professionalism Practices	3(3+0)	-
CSE3423	Software Quality Assurance	3(3+0)	-	CSF3233	Cyber Security	3(2+1)	-
CSF3253	Intelligent System	3(3+0)	-	CSF4994	Final Year Project II	4(0+4)	CSF4984
CSF4984	Final Year Project I	4(0+4)	-		Elective 4	3	-
CSM3313	IoT Computing	3(2+1)	-				
TOTAL		**19**		**TOTAL**		**16**	
SEMESTER 7							
CSF49712	Industrial Training	12(0+12)	-				
TOTAL		**12**					
						TOTAL CREDIT	**122**

Note:

1) Students are required to undertake the **Survival and Water Safety Programme** and **Artificial Intelligence for Beginners (MCBS10017)** as a **condition to graduate**.
2) The number of elective course credit hours that must be taken by students in the programme of study is subject to the **number of elective credit hours** set by the programme of study to meet graduate qualifications and **is not subject to the number of elective courses taken**.
3) The list of elective courses that can be taken by students in the programme of study refers to the course offerings listed in the handbook of the study programme of the faculty and other faculties.

Bachelor of Computer Science with Maritime Informatics (Honours)

Introduction

The Bachelor of Computer Science with Maritime Informatics (Honours) is offered to both local and international students with a particular emphasis on STPM, Matriculation, and Diploma graduates or their equivalents. This programme is an interdisciplinary programme that provides opportunities for students to apply their knowledge and skills in computer technology application development to the maritime industry. Apart from developing maritime applications, among other branches in maritime informatics that can be explored are maritime data management, maritime information systems, maritime analytics, and maritime data visualization. Along with the development of the Industrial Revolution 4.0, it is critical to empower digital technologies, robotics, artificial intelligence, and big data to support the maritime shipping and transportation sector. Therefore, there is an increasing demand for computer science graduates with maritime expertise. As such, the programme seeks to produce graduates who are holistic in meeting the needs of the high-tech industry and advancing development and research, particularly in the maritime industry.

Programme Educational Objective (PEO)

This programme is offered for students to achieve the following objectives:

PEO1 : Having knowledge (LO1), technical (LO2) and digital (LO10) skills in Maritime Informatics in accordance with industry standards.

PEO2 : Ability to solve computing problem in team with accountability (LO5) and able to communicate (LO4) effectively with the rest of the team members and the client.

PEO3 : Ethical (LO6) with integrity in carrying out trust and current career.

PEO4 : Exhibit the ability in mastering management and leading computing project (LO9) by utilizing latest scientific, technical (LO3) and numerical (LO11) skills.

PEO5 : Ability to adapt to changes (LO7) of economy, politics, and social environment, while at the same time having entrepreneurship (LO8) skills in area related to information technology and communication.

Career Prospects

Among the careers that can be pursued by graduates of computer science programmes are as follows:

- Maritime System Analyst
- Maritime Intelligence Analyst
- Maritime Business Development Specialist
- Maritime Business Support System and Business Executives
- Software Developer
- Information Technology Officer
- IT Consultant
- Programme Analyst
- Web Designer
- Network Engineer
- Network Administrator
- Database Administrator
- Software Tester
- IT Trainer
- System Administrator
- Computer Science/ IT Lecturer
- Postgraduate Opportunities

PROGRAMME CURRICULUM
BACHELOR OF COMPUTER SCIENCE WITH MARITIME INFORMATICS (HONOURS)

Total Credit for Graduation

The minimum amount of credit required to graduate is 122 credit hours. The distribution of credit hours by course category is as follows:

Category	Credit Hour	Percentage
University Core Course	14	11
Programme Core Course	46	38
Specialization Core Course	30	25
Final Year Project	8	6
Industrial Training	12	10
University Elective Course	12	10
Total	**122**	**100**

University Core Courses

Students must complete all **SIX** courses at the University Core level, which total 14 credit hours.

No.	Course Code	Course Name	Credit Hour	Prerequisite
1.	CCXXXXX	Co-Curriculum	2(0+2)	None
2.	BBB3033	English for Occupational Purposes	3(3+0)	None
3.	MPU3132	Appreciation of Ethics and Civilization	2(2+0)	None
4.	MPU3142	Philosophy and Current Issues	2(2+0)	None
5.	MPU3223	Basic Entrepreneurship	3(3+0)	None
6.	MPU3352	Integrity and Anti-Corruption	2(2+0)	None

Programme Core Courses

To meet the requirements for graduation, students must take and pass all **FIFTEEN** Programme Core courses totalling 46 credit hours.

No.	Course Code	Course Name	Credit Hour	Prerequisite
1.	CSF3003	Discrete Structure	3(3+0)	None
2.	CSF3013	Data Structure and Algorithm	3(2+1)	None
3.	CSF3023	System Thinking and Logic	3(3+0)	None
4.	CSF3034	Programming	4(3+1)	None
5.	CSF3043	Object-Oriented Programming	3(2+1)	None
6.	CSF3113	System Analysis and Design	3(3+0)	None
7.	CSF3123	Database	3(2+1)	None
8.	CSF3133	Web-Based Interface Design	3(2+1)	None
9.	CSF3143	Basics of Software Engineering	3(3+0)	None
10.	CSF3213	Operating System	3(3+0)	None
11.	CSF3223	Networking	3(2+1)	None
12.	CSF3233	Cyber Security	3(2+1)	None
13.	CSF3243	Computer Organisation and Architecture	3(3+0)	None
14.	CSF3253	Intelligent System	3(3+0)	None
15.	MTK3053	Introduction to Statistics	3(3+0)	None

Specialization Core Courses
To meet the requirements for graduation, students must take and pass all **TEN** Specialization Core courses, which amount to 30 credit hours.

No.	Course Code	Course Name	Credit Hour	Prerequisite
1.	CSA3003	Maritime Informatics Technology and Professional Ethics	3(3+0)	None
2.	CSA3013	Modelling and Simulation	3(2+1)	None
3.	CSA3023	Web-Based Application Development	3(2+1)	None
4.	CSA3953	Application Software Development Project	3(0+3)	None
5.	CSE3203	Software Requirement Engineering	3(3+0)	None
6.	CSE3403	Software Project Management	3(3+0)	None
7.	CSM3313	IoT Computing	3(2+1)	None
8.	MMM3763	Principle of Maritime Management	3(3+0)	None
9.	MMM3843	Global Shipping and Port Management	3(3+0)	None
10.	MMT3073	Shipping and Port Technology	3(3+0)	None

Final Year Project Courses
Students must complete and pass **TWO** Final Year Project courses for a total of 8 credit hours in order to graduate.

No.	Course Code	Course Name	Credit Hour	Prerequisite
1.	CSF4984	Final Year Project I	4(0+4)	None
2.	CSF4994	Final Year Project II	4(0+4)	CSF4984

Industrial Training Course
Students must complete and pass an Industrial Training course for a total of 12 credit hours in order to graduate.

No.	Course Code	Course Name	Credit Hour	Prerequisite
1.	CSF49712	Industrial Training	12(0+12)	None

University Elective Courses
Students may select 12 credit hours from any of the courses listed as University Elective by the Centre for Foundation and Continuing Education and related faculties.

Notes:
i) The number of elective course credit hours that must be taken by students in the programme of study is subject to the number of elective credit hours set by the programme of study to meet graduate qualifications and is not subject to the number of elective courses taken.
ii) The list of elective courses that can be taken by students in the programme of study refers to the course offerings listed in the handbook of the study programme of the faculty and other faculties.

Credit Transfer
1) Student needs to refer to *Peraturan Akademik Universiti Malaysia Terengganu (Program Diploma dan Sarjana Muda)*.
2) In addition, the following three (3) Core Programme courses are exempted from credit transfer:
   i) CSF3034 Programming;
   ii) CSF3013 Data Structure and Algorithm; and
   iii) CSF3123 Database.

COURSE SCHEME
BACHELOR OF COMPUTER SCIENCE WITH MARITIME INFORMATICS (HONOURS)

CODE	COURSE NAME	CREDIT HOUR	PRE REQUISITE	CODE	COURSE NAME	CREDIT HOUR	PRE REQUISITE
SEMESTER 1				**SEMESTER 2**			
CSF3003	Discrete Structure	3(3+0)	-	CSA3003	Maritime Informatics Technology and Professional Ethics	3(3+0)	-
CSF3023	System Thinking and Logic	3(3+0)	-	CSE3203	Software Requirement Engineering	3(3+0)	-
CSF3034	Programming	4(3+1)	-	CSF3043	Object-Oriented Programming	3(2+1)	-
CSF3143	Basics of Software Engineering	3(3+0)	-	CSF3213	Operating Systems	3(3+0)	-
CSF3243	Computer Organisation and Architecture	3(3+0)	-	MPU3132	Appreciation of Ethics & Civilization	2(2+0)	-
CCXXXXX	Co-Curriculum	2(0+2)	-	MPU3352	Integrity and Anti-Corruption	2(2+0)	-
MPU3142	Philosophy and Current Issue	2(2+0)	-	MTK3053	Introduction to Statistics	3(3+0)	-
	TOTAL	**20**			**TOTAL**	**19**	
SEMESTER 3				**SEMESTER 4**			
CSF3013	Data Structure and Algorithm	3(2+1)	-	CSA3023	Web-Based Application Development	3(2+1)	-
CSF3113	System Analysis and Design	3(3+0)	-	CSA3953	Application System Development Project	3(0+3)	-
CSF3123	Database	3(2+1)	-	CSF3223	Networking	3(2+1)	-
CSF3133	Web-Based Interface Design	3(2+1)	-	MPU3223	Basic Entrepreneurship	3(3+0)	-
MMM3763	Principle of Maritime Management	3(3+0)	-		Elective 2	3	-
	Elective 1	3	-		Elective 3	3	-
	TOTAL	**18**			**TOTAL**	**18**	
SEMESTER 5				**SEMESTER 6**			
CSE3403	Software Project Management	3(3+0)	-	BBB3033	English for Occupational Purposes	3(3+0)	-
CSF3253	Intelligent System	3(3+0)	-	CSA3013	Modelling and Simulation	3(2+1)	-
CSF4984	Final Year Project I	4(0+4)	-	CSF3233	Cyber Security	3(2+1)	-
CSM3313	IoT Computing	3(2+1)	-	CSF4994	Final Year Project II	4(0+4)	CSF4984
MMM3843	Global Shipping and Port Management	3(3+0)	-		Elective 4	3	-
MMT3073	Shipping and Port Technology	3(3+0)	-				
	TOTAL	**19**			**TOTAL**	**16**	
SEMESTER 7							
CSF49712	Industrial Training	12(0+12)	-				
	TOTAL	**12**					
						TOTAL CREDIT	**122**

Note:

1) Students are required to undertake the **Survival and Water Safety Programme** and **Artificial Intelligence for Beginners (MCBS10017)** as a **condition to graduate**.
2) The number of elective course credit hours that must be taken by students in the programme of study is subject to the **number of elective credit hours** set by the programme of study to meet graduate qualifications and **is not subject to the number of elective courses taken**.
3) The list of elective courses that can be taken by students in the programme of study refers to the course offerings listed in the handbook of the study programme of the faculty and other faculties.

Bachelor of Computer Science (Mobile Computing) with Honours

Introduction

The Bachelor of Computer Science (Mobile Computing) with Honours is offered to all local and international students especially STPM leavers, Matriculation and Diploma graduates or equivalent. This programme prepares students with the knowledge and skills needed to develop mobile and web applications. The programme applies the 2u2i elements through the implementation of 2.5 years of study in the university (university component) and 1 year of study in the industry (industrial component). A total of 4 industry component courses in the form of Work Based Learning (WBL) are offered in the final year of study involving learning in a real industrial environment. The implementation of the 2u2i Mode will expose students to actual learning and practice directly from relevant industry practitioners. In addition to produce graduates, who can meet current and future workforce needs, the programme enhances the prospects and career paths of graduates through new job functions resulting from changes in the ICT landscape following the transition to mobile technology and IR4.0.

Programme Educational Objective (PEO)

This programme is offered for students to achieve the following objectives:

PEO1 : Having knowledge (LO1), technical (LO2) and digital (LO10) skills in Mobile Computing in accordance with industry standards.

PEO2 : Ability to solve computing problem in team with accountability (LO5) and able to communicate (LO4) effectively with the rest of the team members and the client.

PEO3 : Exhibit integrity values, endurance and high-level work ethic (LO6) in organization.

PEO4 : Exhibit the ability in mastering management and lead computing project (LO9) by utilizing latest scientific, technical (LO3) and numerical (LO11) skills.

PEO5 : Ability to adapt to changes (LO7) of economy, politics, and social environment, while at the same time having entrepreneurship (LO8) skills in area related to information technology and mobile computing.

Career Prospects

Among the careers that can be pursued by graduates of computer science programmes are as follows:

- IOS Application Developer
- Android Application Developer
- Front-End/Full Stack Developer
- Software System Developer
- Software Engineer
- Web Designer
- System Analyst
- Programmer/Programme Analyst
- Information Technology Officer
- System Administrator
- Database Administrator
- Network Administrator
- IT Consultant
- IT Lecturer
- IT Trainer
- Postgraduate Opportunities

PROGRAMME CURRICULUM
BACHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING) WITH HONOURS

Total Credit for Graduation

The minimum amount of credit required to graduate is 123 credit hours. The distribution of credit hours by course category is as follows:

Category	Credit Hour	Percentage
University Core Course	14	11
Programme Core Course	46	37
Specialization Core Course	35	28
Final Year Project*	8	7
Industrial Training*	8	7
University Elective Course	12	10
Total	**123**	**100**

University Core Courses

Students must complete all **SIX** courses at the University Core level, which total 14 credit hours.

No.	Course Code	Course Name	Credit Hour	Prerequisite
1.	CCXXXXX	Co-Curriculum	2(0+2)	None
2.	BBB3033	English for Occupational Purposes	3(3+0)	None
3.	MPU3132	Appreciation of Ethics and Civilization	2(2+0)	None
4.	MPU3142	Philosophy and Current Issues	2(2+0)	None
5.	MPU3223	Basic Entrepreneurship	3(3+0)	None
6.	MPU3352	Integrity and Anti-Corruption	2(2+0)	None

Programme Core Courses

To meet the requirements for graduation, students must take and pass all **FIFTEEN** Programme Core courses totalling 46 credit hours.

No.	Course Code	Course Name	Credit Hour	Prerequisite
1.	CSF3003	Discrete Structure	3(3+0)	None
2.	CSF3013	Data Structure and Algorithm	3(2+1)	None
3.	CSF3023	System Thinking and Logic	3(3+0)	None
4.	CSF3034	Programming	4(3+1)	None
5.	CSF3043	Object-Oriented Programming	3(2+1)	None
6.	CSF3113	System Analysis and Design	3(3+0)	None
7.	CSF3123	Database	3(2+1)	None
8.	CSF3133	Web-Based Interface Design	3(2+1)	None
9.	CSF3143	Basics of Software Engineering	3(3+0)	None
10.	CSF3213	Operating System	3(3+0)	None
11.	CSF3223	Networking	3(2+1)	None
12.	CSF3233	Cyber Security	3(2+1)	None
13.	CSF3243	Computer Organisation and Architecture	3(3+0)	None
14.	CSF3253	Intelligent System	3(3+0)	None
15.	MTK3053	Introduction to Statistics	3(3+0)	None

Specialization Core Courses

To meet the requirements for graduation, students must take and pass all **TEN** Specialization Core courses, which amount to 51 credit hours.

No.	Course Code	Course Name	Credit Hour	Prerequisite
1.	CSE3203	Software Requirement Engineering	3(3+0)	None
2.	CSM3023	Web-Based Application Development	3(2+1)	None
3.	CSM3103	Front-End Programming	3(2+1)	None
4.	CSM3114	Framework based Mobile Application Development	4(3+1)	None
5.	CSM3123	Native Mobile Programming	3(2+1)	None
6.	CSM3313	IoT Computing	3(2+1)	None
7.	CSM4908-I	Industrial Project Management	8(0+8)	None
8.	CSM4918-I	Industrial Project Development	8(0+8)	None
9.	CSM4928-I	Integrated Industrial Project Management	8(0+8)	None
10.	CSM4938-I	Integrated Industrial Project Development	8(0+8)	None

University Elective Courses

Students may select 12 credit hours from any of the courses listed as University Elective by the Centre for Foundation and Continuing Education and related faculties.

Notes:

i) The number of elective course credit hours that must be taken by students in the programme of study is subject to the number of elective credit hours set by the programme of study to meet graduate qualifications and is not subject to the number of elective courses taken.

ii) The list of elective courses that can be taken by students in the programme of study refers to the course offerings listed in the handbook of the study programme of the faculty and other faculties.

Credit Transfer

1) Student needs to refer to *Peraturan Akademik Universiti Malaysia Terengganu (Program Diploma dan Sarjana Muda)*.
2) In addition, the following three (3) Core Programme courses are exempted from credit transfer:
   i) CSF3034 Programming;
   ii) CSF3013 Data Structure and Algorithm; and
   iii) CSF3123 Database.

COURSE SCHEME
BACHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING) WITH HONOURS

CODE	COURSE NAME	CREDIT HOUR	PRE REQUISITE	CODE	COURSE NAME	CREDIT HOUR	PRE REQUISITE
SEMESTER 1				**SEMESTER 2**			
CSF3003	Discrete Structure	3(3+0)	-	CSE3203	Software Requirement Engineering	3(3+0)	-
CSF3023	System Thinking and Logic	3(3+0)	-	CSF3043	Object-Oriented Programming	3(2+1)	-
CSF3034	Programming	4(3+1)	-	CSF3213	Operating Systems	3(3+0)	-
CSF3143	Basics of Software Engineering	3(3+0)	-	MPU3132	Appreciation of Ethics & Civilization	2(2+0)	-
CSF3243	Computer Organisation and Architecture	3(3+0)	-	MPU3352	Integrity and Anti-Corruption	2(2+0)	-
CCXXXXX	Co-Curriculum	2(0+2)	-	MTK3053	Introduction to Statistics	3(3+0)	-
MPU3142	Philosophy and Current Issue	2(2+0)	-		Elective 1	3	-
	TOTAL	**20**			**TOTAL**	**19**	
SEMESTER 3				**SEMESTER 4**			
CSF3013	Data Structure and Algorithm	3(2+1)	-	CSF3223	Networking	3(2+1)	-
CSF3113	System Analysis and Design	3(3+0)	-	CSM3023	Web-Based Application Development	3(2+1)	-
CSF3123	Database	3(2+1)	-	CSM3103	Front-End Programming	3(2+1)	-
CSF3133	Web-Based Interface Design	3(2+1)	-	CSM3313	IoT Computing	3(2+1)	-
	Elective 2	3	-	MPU3223	Basic Entrepreneurship	3(3+0)	-
	Elective 3	3	-		Elective 4	3	-
	TOTAL	**18**			**TOTAL**	**18**	
SEMESTER 5				**SEMESTER 6**			
BBB3033	English for Occupational Purposes	3(3+0)	-	CSM4908-I	Industrial Project Management	8(0+8)	-
CSF3233	Cyber Security	3(2+1)	-	CSM4918-I	Industrial Project Development	8(0+8)	-
CSF3253	Intelligent System	3(3+0)	-				
CSM3114	Framework based Mobile Application Development	4(3+1)	-				
CSM3123	Native Mobile Programming	3(2+1)	-				
	TOTAL	**16**			**TOTAL**	**16**	
SEMESTER 7							
CSM4928-I	Integrated Industrial Project Management	8(0+8)	-				
CSM4938-I	Integrated Industrial Project Development	8(0+8)	-				
	TOTAL	**16**					
						TOTAL CREDIT	**123**

Note:

1) Students are required to undertake the **Survival and Water Safety Programme** and **Artificial Intelligence for Beginners (MCBS10017)** as a **condition to graduate**.
2) The number of elective course credit hours that must be taken by students in the programme of study is subject to the **number of elective credit hours** set by the programme of study to meet graduate qualifications and **is not subject to the number of elective courses taken**.
3) The list of elective courses that can be taken by students in the programme of study refers to the course offerings listed in the handbook of the study programme of the faculty and other faculties.

COURSE SYNOPSIS
BACHELOR OF COMPUTER SCIENCE (SOFTWARE ENGINEERING) WITH HONOURS
BACHELOR OF COMPUTER SCIENCE WITH MARITIME INFORMATICS (HONOURS)
BACHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING) WITH HONOURS

CSA3003 Maritime Informatics Technology and Professional Ethic
Credit 3 (3+0)
Prerequisite None

This course introduces students to the basic concepts of information and communication technology (ICT) in the maritime sector such as in the area of marine science, port and shipping management, logistics and security. Students are also exposed to ethics in digital security, intellectual property and professional ethics. This course emphasizes students to apply information technology ethically and professionally to solve problems in Maritime Informatics.

CSA3013 Modelling and Simulation
Credit 3 (2+1)
Prerequisite None

This course introduces the concept of modelling and simulation of dynamic systems. It includes the fundamentals of simulation, system dynamics, data collection and analysis methods, model building, model validation and verification, output analysis and subsequently comparing the performances of different system and its optimization. The main emphasis of this course is to expose students to the fundamental modelling and simulation methods used in problem solving.

CSA3023/CSE302/ CSM3023 Web-Based Application Development
Credit 3 (2+1)
Prerequisite None

The course provides all aspects of knowledge related to dynamic web development. Throughout this course, students will spend most of the time focusing on server-side components. Students will learn J2EE technologies such as Java Server Page (JSP), JavaBeans, Servlets and Java Database Connectivity (JDBC). They will also learn Model-View-Controller (MVC) design pattern using Java Servlet and will communicate with database for any kind of data transactions. Students will develop an interactive web-based application on the topic of their choice for the final project.

CSA3953/CSE3953 Application System Development Project
Credit 3 (0+3)
Prerequisite None

This course strengthens the students' knowledge in programming by the group application development. Students are divided into small groups to develop certain applications. Focus is given to the knowledge transfer among students in the group through the application that will be built.

CSE3203 Software Requirement Engineering
Credit 3 (3+0)
Prerequisite None

This course introduces key concepts and practices in software requirements engineering. It covers requirement types, system context, elicitation techniques, documentation methods (natural language and model-based), verification, validation, and change management. Students will learn how to gather, analyse, document, and manage requirements effectively to meet stakeholder and project needs.

CSE3403 Software Project Management
Credit 3 (3+0)
Prerequisite None

This course introduces the concept, functions and responsibilities of a software management project and how to manage a software development project. The emphasis is on the production of quality product in time, meet the scope and within budget. It covers project scheduling and planning, cost estimation, risk management, human management, document production, quality management and software maintenance. This course is essential for providing an understanding of scope management methods, work scheduling, time management, costs, and human resources in software project management.

CSE3413 Software Testing
Credit 3 (3+0)
Prerequisite None

This course introduces basic concepts, principles and techniques related to software testing. Students will become acquainted with both the strengths and limitations of various functional and structural testing methods. Topics include: black-box and white-box test case design strategies, incremental integration testing techniques, inspections and reviews. Students will have the opportunity to practice the techniques presented in class via project exercises and case studies.

CSE3423 Software Quality Assurance
Credit 3 (3+0)
Prerequisite None

This course introduces the functions, procedures, and methods used in controlling and assuring software quality. Topics include quality assurance elements and roles, quality inspection, software testing, and basic software quality tools. By the end of this course, students will be able to apply quality assurance principles and software testing techniques to evaluate and improve software quality effectively.

CSE3433 Software Architecture
Credit 3 (3+0)
Prerequisite None

This course provides an in-depth exploration of software architectural patterns. Students will examine foundational patterns such as layered architecture, client-server, Service-Oriented Architecture (SOA), microservices, and event-driven architectures. The course also covers emerging architectural trends. Through detailed discussions on the characteristics, advantages, and trade-offs of these patterns, students will gain the knowledge necessary to select and implement the most suitable architecture for various applications.

CSE3443 Software Maintenance and Evolution
Credit 3 (3+0)
Prerequisite None

This course covers fundamental aspects of software maintenance and evolution, including concepts and techniques, software changes and impact analysis, testing for software maintenance, process models for system evolution, software reuse and current issues in software maintenance. By the end of this course, students will be able to analyse, plan, and implement effective software maintenance strategies to support system evolution and sustainability.

CSE3453 Ethics and Professional Practices
Credit 3 (3+0)
Prerequisite None

This course analyses ethical and societal issues in relation to the usage and development of information technology and communication (ICT). Brief introduction on the issues of theory, ethics, social and laws pertaining to ICT is given. Emphasis is also given on the specific problems such as privacy, reliability, security, responsibility in using ICT and also both the advantages and disadvantages of ICT. Students ought to be exposed to these issues prior to be qualified and ethical ICT practitioners and entrepreneurs. The development of ICT must be human-centred, beneficial to society and finally able to better the civilization of mankind. Concerns are also given to various ethical violations in using ICT. Cyber laws and acts in Malaysia are made known to educate students that the unethical used of ICT will invite problems. Professional code of ethics and responsibility in using the Internet and several solutions to the problems are discussed.

CSF3003 Discrete Structure
Credit 3 (3+0)
Prerequisite None

This course discusses the fundamental concepts of discrete mathematics and their applications in computer science. Topics include the principle of counting, fundamentals of logic, sets, mathematical induction, relations and functions, recurrence relations, and graphs. This course plays a crucial role in strengthening students' understanding of computing foundations. At the end of this course, students will be able to apply discrete mathematical techniques to solve problems, construct logical arguments, and model relationships in computing contexts.

CSF3013 Data Structure and Algorithm
Credit 3 (2+1)
Prerequisite None

This course introduces programming methods to solve computational problems, focusing on basic data structures such as linked lists, stacks, queues, trees, and graphs, as well as sorting and searching techniques. Emphasis is given to modular programming and the concept of time complexity to evaluate algorithm efficiency. At the end of this course, students will be able to apply suitable data structures, implement modular solutions, and evaluate algorithm performance effectively.

CSF3023 System Thinking and Logic
Credit 3 (3+0)
Prerequisite None

This course discusses the concepts of programming logic and design and how to use them in computer science environment. It covers the fundamentals topics such as decisions, looping, arrays, file handling, modularization and object-oriented programming. The course is significant because it emphasises the preparation and reinforcement of computing and programming fundamentals for students, as well as improving understanding of programme logic construction and analysis methods in Computer Science.

CSF3034 Programming
Credit 4 (3+1)
Prerequisite None

This course contains basic programming and programming language; Problem solving techniques; flow diagram and structured algorithm; Program coding techniques and instructions to solve formal problems. Hands-on programming exercises will be given to strengthen students programming knowledge. The availability of this course is critical for exposing students to the fundamental concepts of programming. At the end of this course, students will be able to develop Java programs using basic programming techniques.

CSF3043 Object-Oriented Programming
Credit 3 (2+1)
Prerequisite None

This course introduces object-oriented programming concepts. Students will be taught object concept and its differences with procedural technique and elementary Java language, including class and object, inheritance, polymorphism, interface, exception handling and GUI components. This course is critical for students to learn how to use object-oriented programming to solve computing problems.

CSF3113 System Analysis and Design
Credit 3 (3+0)
Prerequisite None

This course introduces object-oriented concepts in system development. Project management and planning, systems analysis, systems design, systems implementation and operation will be discussed in details. The student also will be taught on analysis and design the object-oriented design by using UML notation and particular tools. This course is necessary because it introduces object-oriented concepts in system modelling and development using the Unified Modified Language (UML) notation. At the end of this course, students will learn to relate the conception process in object-oriented design to real-world problems.

CSF3123 Database
Credit 3 (2+1)
Prerequisite None

This course introduces database concepts (goals of DBMS, relationships, physical and logical organization, schema and subschema); data models, normalisation (until BCNF), canonical schema and data independence; data description language; query facilities, query functions; design and translation strategies; and data integrity and reliability. This course is important because it focuses on the fundamental concepts of integrated databases. At the end of the course, students will be able to apply suitable methods to solve database problems and develop database systems using DBMS and query languages.

CSF3133 Web-Based Interface Design
Credit 3 (2+1)
Prerequisite None

This course offers the knowledge of integrating a basic concept of Human Computer Interaction (HCI) with Web Design. This course also, practically, will expose students to the two (2) core technologies for building web sites which are Hypertext Markup Language (HTML) and Cascading Style Sheets (CSS). Before the end of this course, students will develop a simple web site by applying the principles and methods to the design of user-centred web sites. This course is critical for exposing students to the fundamentals of web interface design and web programming.

CSF3143 Basic of Software Engineering
Credit 3 (3+0)
Prerequisite None

This course introduces key principles and techniques in software engineering, including software process models, requirements engineering, design, testing, and maintenance. At the end of the course, students will be able to apply these fundamentals in real-world projects.

CSF3213 Operating System
Credit 3 (3+0)
Prerequisite None

This course introduces operating system concepts as well as discusses the mechanisms necessary for the protection and security of computer systems. Major topics in operating systems cover process, thread and multiprogramming concepts (scheduling, synchronization, deadlock etc.), memory management, storage management and file management. Students will also be exposed to the current technologies in operating system through a case study. At the end of this course, students will gain exposure to the latest operating systems and their primary components.

CSF3223 Networking
Credit 3 (2+1)
Prerequisite None

This course exposes students to the architecture, structure, functions, and components of the Internet and other computer networks. By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes. This course is important for students in the Computer Science program because it introduces them to protocols, data networks, and network configurations.

CSF3233 Cyber Security
Credit 3 (2+1)
Prerequisite None

This course introduces cybersecurity, especially Internet. The usage of the cryptography technique will be discussed. This course also introduces to the student the form of threat to the Internet. Several defence applications, such as firewall and network analysis tools will be introduced to the student. This course is essential as the core of the Computer Science program because it introduces students to cybersecurity threats and techniques that can be used to improve cybersecurity.

CSF3243 Computer Organization and Architecture
Credit 3 (3+0)
Prerequisite None

This course introduces the structure and organization of digital computers, focusing on the Central Processing Unit (CPU), Main Memory (MM), and Input/Output (I/O) subsystems. It explores the functions and relationships between these components during instruction execution. Students will also be exposed to basic digital logic as well as the structure and organization of multiprocessor systems. By the end of this course, students will gain a foundational understanding of how computer components operate and interact, demonstrate comprehension of digital logic principles behind computer design, and describe how basic architectural concepts affect the overall operation of a computer system.

CSF3253 Intelligence System
Credit 3 (3+0)
Prerequisite None

This course introduces the fundamental concept of intelligent system and its applications. It covers the fundamental topic in intelligent system such as expert system, fuzzy logic, artificial neural network, computer evolution, hybrid system and intelligent agent. This course is offered as the core of the Computer Science programme to introduce students to the concept of intelligent systems, how to use basic intelligent system techniques in solving a given problem, and how to apply the concept of intelligent systems in software design.

CSF3513 Special Topics in Software Engineering
Credit 3 (3+0)
Prerequisite None

The content of this course depends on current development in computer science. Current issues will be discussed by the lecturers. Part of this course will be in a form of seminar. Students will prepare and present working papers based on certain selected topics. This course is important as an elective of the Computer Science program to introduce students to the latest technology in software engineering.

CSF3523 Information System
Credit 3 (3+0)
Prerequisite None

This course explores various types of information systems and their roles in today's business. It examines the processes, organizations, and infrastructure of information systems while addressing key aspects such as ethical and social issues, emerging technologies, current trends, business intelligence, and security. This subject is crucial as information systems serve as the foundation of digital transformation, enhancing organizational efficiency and supporting effective decision-making.

CSF3533 Multimedia Technology
Credit 3 (3+0)
Prerequisite None

This course exposes students to the current technology in multimedia. It involves the study of multimedia hardware and software, the standards used in multimedia industries, the importance of multimedia in various fields, multimedia applications, and multimedia elements such as text, graphics, pictures, sound, video and animation. It also covers on the development of multimedia project and multimedia project management.

CSF3543 Digital Image Processing
Credit 3 (3+0)
Prerequisite None

This course introduces students to the basic concepts and methodologies of digital image processing using marine data. Among the topics covered are the basic of digital image processing, image enhancement in spatial domain, morphological image processing, image segmentation as well as image representation and description. This course is important to expose students to the use of image processing techniques that can be applied in a given case study.

CSF3553 Information Retrieval
Credit 3 (3+0)
Prerequisite None

This course provides an overview of the important issues in information retrieval. The course emphasizes the technology used in information retrieval theories and concepts that underlie the appropriate applications. It will cover algorithm, design, and implementation of modern information retrieval systems. Topics include: retrieval system design and implementation, text processing techniques, retrieval models (e.g., Boolean, vector space, probabilistic, and learning-based methods), query languages, evaluation models, social search, and classification or clustering techniques. This course is important to expose students to the basics of accessing information and applying it in a given case study.

CSF3563 Data Mining
Credit 3 (3+0)
Prerequisite None
This course is an introductory course on data mining. It introduces the basic concept of data mining such as data pre-processing, data warehousing as well as online analytical processing (OLAP). Students will be exposed to the data mining method and their implementations which focus to two major data mining functions i.e.: pattern discovery and cluster analysis.

CSF3573 Computer Auditing
Credit 3 (3+0)
Prerequisite None
This course covers the technology and audit, knowledge of audit function, basic concepts of auditing and risks of Information Technology (IT), standards and guidelines for IT auditing, Knowledge of the concept of internal control, audit planning process, audit management, audit evidence process and follow-up of audit reporting.

CSF3583 Formal Method
Credit 3 (3+0)
Prerequisite None
This course introduces formal methods for designing software system requirements, provides formal Z method languages, semantic operations for programming languages. This course is important in exposing students to the basics of formal method specification for software requirements and applying it in a given case study.

CSF3593 Computer Forensics
Credit 3 (3+0)
Prerequisite None
This course introduces students to the principles and practices of computer forensics, focusing on the identification, collection, analysis, and preservation of digital evidence. Topics include forensic methodologies, operating system analysis, network and mobile forensics, malware investigation, cloud forensics, and legal considerations. Emphasis is placed on theoretical foundations and forensic best practices.

CSF3603 Digital Commerce
Credit 3 (3+0)
Prerequisite None
This course focuses on principles of e-commerce, providing an overview of commercial platform development and technology topics, commercial web development, virtual value chains and social innovation and marketing strategies. In addition, this course also covers intellectual property rights, authentication, encryption, acceptable use policies and legal liabilities. Students will build their own presence and market it using an online platform.

CSF3613 Machine Learning
Credit 3 (3+0)
Prerequisite None
This course is an introductory course for undergraduate students related to machine learning. The class will briefly cover topics in supervised learning, unsupervised learning, and reinforcement learning. Besides, this course also will familiarize students with models and algorithms for machine learning and prepare students for research or industry application of machine learning techniques.

CSF3623 Programming Paradigms
Credit 3 (3+0)
Prerequisite None

This course focuses on the fundamental concepts of modern programming languages, highlighting the differences between paradigms: imperative, object-oriented, logic, functional, and scripting. For each paradigm, relevant programming languages will be covered. By the end of the course, students will be able to understand the core principles of each paradigm, identify their appropriate applications, and apply these concepts effectively in writing programs.

CSF49712 Industrial Training
Credit 12 (0+12)
Prerequisite None

This course exposes a student to the actual work environment. Students will carry out current duties appropriate to the Computer Science program under the supervision of both industrial and university supervisors. This course incorporates elements of peeragogy (collaborative teaching and learning) between students and supervisors in the industry and unconventional learning and teaching elements (situation learning and inquiries) in completing the mini-projects entrusted. It will assess the aspects of cognitive, communication, interpersonal, ethics and professionalism, and leadership, autonomy and responsibility skills through final reports, presentations and feedback from both industrial and UMT supervisors.

CSF4984 Final Year Project I
Credit 4 (0+4)
Prerequisite None

The student will carry out a software development project or research under supervision of a lecturer. The student will perform initial study on the selected topic, analyse and design the system. Several documentations of proposed project will be prepared by the students.

CSF4994 Final Year Project II
Credit 4 (0+4)
Prerequisite CSF4984

This course is an extension of CSE4984. The student will carry out a programming project or equivalent under supervision of a lecturer. The student will focus on the implementation phase of project development. At the end of this course, the student will prepare a complete thesis and present the project for evaluation.

CSM3103 Front-End Programming
Credit 3 (2+1)
Prerequisite None

This course provides exposures to application development for mobile environment, specifically the front-end development. Topics covered include the design of dynamic and interactive user interface and interaction, server and database connectivity and event handling through JScript, jQuery, JSON, AJAX, PHP, RESTful web services and UI interface, Bootstrap. Hands on programming exercises and a group project will be given to strengthen students programming skills.

CSM3114 Framework-Based Mobile Application Development
Credit 4 (3+1)
Prerequisite None

This course exposes students to JavaScript frameworks and their application in the development of mobile applications (frontend web application). Students will have hands-on experience in developing mobile applications based on JavaScript frameworks such as backbone.js and Angular.js. In addition, the hybrid application development experience through the use PhoneGap Cordova is also exposed to the students. Before the end of this course, students will undertake group project on framework based mobile application development by applying the methods they have learnt. This course is important for the development of mobile applications (frontend) based on Javascript framework.

CSM3123 Native Mobile Programming
Credit 3 (2+1)
Prerequisite None

This course is an introduction to development of native applications for mobile environment. Topics covers include user interaction patterns, connectivity, interface design, software design pattern and application architectures within the context of mobile computing. Hands on programming exercises will be given to strengthen students programming language. This course is important for exposing students to mobile applications in a native development environment.

CSM3313 IoT Computing
Credit 3 (2+1)
Prerequisite None

This course introduces concepts and main components of the Internet of Things (IoT). The student will be exposed to the concept of IoT through the network technology and protocol as well as the wireless environment. Students also will be exposed to data analytics in an IoT environment. Exposure to the selected IoT application development will be carried out in the lab to increase the student learning experiences. This course is essential for introducing students to the fundamentals of the IoT and its relationship to everyday life.

CSM4908-I Industrial Project Management
Credit 8 (0+8)
Prerequisite None

This course introduces students to the concepts and techniques used in managing a mobile application project development in industrial environment. Through this project, students will generate project plan and schedule, cost estimation, in addition to preparing related documentations. The aspect that will be accessed here is students' ability in managing project development. This course will be supervised by industrial supervisor and monitored by UMT.

CSM4918-1 Industrial Project Development
Credit 8 (0+8)
Prerequisite None

Students will develop a mini application project under the supervision of an industrial supervisor and monitored by UMT. At the end of this course, the developed application will be evaluated by the appointed panels.

CSM4928-I Integrated Industrial Project Management
Credit 8 (0+8)
Prerequisite None
This course enables students to apply the concepts and techniques of managing a mobile application project in industrial environment. In addition to preparing project plan and schedule, emphasis is given to the aspect of risks and quality management as well as project documentations. This course will be supervised by industrial supervisor and monitored by UMT.

CSM4938-I Integrated Industrial Project Development
Credit 8 (0+8)
Prerequisite None
Students will develop a larger scale application in a team under the supervision of industry supervisors and monitored by UMT. Emphasis is also given to the ability to lead project development, manage resources, integrate modules and monitoring of progress and project costs. At the end of the course, the application will be evaluated by the appointed panel.

MMM3763 Principle of Maritime Management
Credit 3 (3+0)
Prerequisite None
This course introduces students to the elements of basic management in maritime sectors. Topics include the theories, principles, analytical techniques, processes, and functions of management. Emphasis will also be given on the basic management with the example within maritime context.

MMM3843 Global Shipping and Port Management
Credit 3 (3+0)
Prerequisite None
This course is designed to provide an understanding and exposure to the concepts of port and shipping management and administration, including port types, ship types, port operations, shipping operations, and port and shipping support services.

MMT3073 Shipping and Port Technology
Credit 3 (3+0)
Prerequisite None
This course explores the environmental factors influencing technology choices in the maritime industry. It covers specialization in cargo forms, containment, handling methods, transport modes, and efficient intermodal interfaces. Students will examine the selection of ship and port technologies, as well as contemporary issues in technology development.

MTK3053 Introduction to Statistics
Credit 3 (3+0)
Prerequisite None
This course is selected to expose students to important concepts in statistics that can be used to analyze data. The basic concepts of data description, probability theory, random variable, probability distribution, parameter estimation, hypothesis testing, correlation and linear regression will be introduced in this course. The mastery of this knowledge is crucial to preventing misuse of statistics in data analysis and decision making.

Bachelor of Science (Applied Mathematics) with Honours

Introduction

The Bachelor of Science (Applied Mathematics) with Honours is a programme designed to produce graduates who are trained in the field of Mathematical Sciences who are able to apply their knowledge and expertise to meet the country's workforce needs. The programme curriculum has been completely blended to meet the eleven domains of learning outcomes of the programme recommended by KPT. This programme basically trains students to apply mathematical knowledge and related concepts in various areas of focus such as modelling, computing, optimization, geometry, use in physical science and so on. Students will also be exposed to knowledge and skills in various latest mathematical methods and also computer programming.

Along with the current technological developments and the requirements of the industrial revolution (IR) 4.0, some courses in this programme have been integrated with SAS modules that allow students to obtain SAS professional certificates that are recognized globally. In addition, this programme also trains students to think logically, organized and accurate and further helps them in finding effective solutions in related fields. At the end of the studies, which is in the seventh semester, students will undergo Industrial Training for 24 weeks in the industry whether public or private sector, local or international. While in the industry, students will be supervised by a supervisor from the industry and have the opportunity to practice the theory learned in the lecture room as well as through real work experience in preparation for the next phase. The study period is for 7 semesters or three and a half years.

Programme Education Objective (PEO)

At the end of their studies, students who follow this programme are able to achieve the following objectives:

PEO1	:	Knowledgeable and has practical skills in the field of Applied Mathematics that is in line with the needs of the industry.
PEO2	:	Communicate and have interpersonal skills effectively and show good leadership qualities in the organization.
PEO3	:	Able to analyse and solve real problems using numeracy skills based on scientific methods and critical thinking without neglecting pure values and integrity.
PEO4	:	Able to achieve, manage and deliver information by using the latest digital technology and demonstrate entrepreneurial skills as an added value for career advancement.

Career Prospects

Based on the principle of integrated education, when the field of Mathematical Science is offered together with various other disciplines, this programme is able to produce Applied Mathematics graduates who are knowledgeable, competent, authoritative and can provide excellent service in various job sectors that they enter into later. Among the careers that can be pursued are:

- Research Officer
- Science Officer
- Data Analyst
- Computerized Information Systems Manager
- Computerized Model Designer
- Computer Programmer
- Mathematics Teacher / Lecturer
- Bank Officer
- Insurance Officer
- Executive
- Financial Planner
- Applied Mathematician

PROGRAMME CURRICULUM
BACHELOR OF SCIENCE (APPLIED MATHEMATICS) WITH HONOURS

Total Credits to Graduate

The minimum number of credits to graduate is 120 credit hours. The distribution of credit hours by course category is as follows:

Category	Credit Hour	Percentage
University Core	20	17
Programme Core	70	58
University Elective	30	25
Total	**120**	**100**

University Core Courses

Students must attend and pass all **NINE** University Core courses with 20 credit hours. For co-curriculum courses, students can choose **ONE** from the various co-curriculum courses offered by the Centre for Foundation and Continuing Education.

No	Course Code	Course Name	Credit Hour	Prerequisite
1.	BBB3013	Academic Writing Skills	3(3+0)	None
2.	BBB3033	English for Occupational Purposes	3(3+0)	None
3.	MPU3132	Appreciation of Ethics and Civilizations	2(2+0)	None
4.	MPU3142	Philosophy and Current Issues	2(2+0)	None
5.	MPU3223	Basic Entrepreneurship	3(3+0)	None
6.	MPU3352	Integrity and Anti-Corruption	2(2+0)	None
7.	COM3122	Malay Language Communication	2(2+0)	None
8.	CCM3011	Community Care	1(0+1)	None
9.	CCXXXXX	Co-Curriculum	2(0+2)	None

Programme Core Courses

In order to meet the graduation requirements, students must attend and pass all **EIGHTEEN** Programme Core courses with 70 credits.

No	Course Code	Course Name	Credit Hour	Prerequisite
1.	MKG3002	Principle of Mathematical Modelling	2(2+0)	None
2.	MKG3003	Vector Calculus	3(3+0)	None
3.	MKG3004	Numerical Analysis	4(3+1)	None
4.	MKG3013	Modern Algebra	3(3+0)	None
5.	MKG3023	Applied Mathematical Methods	3(3+0)	None
6.	MKG3033	Scientific Computing	3(2+1)	None
7.	MTM3003	Ordinary Differential Equations	3(3+0)	None
8.	MTM3004	Linear Algebra	4(3+1)	None
9.	MTM3013	Real Analysis	3(3+0)	None
10.	MTM3014	Calculus	4(3+1)	None
11.	MTM3024	Statistics	4(3+1)	None
12.	MTM3034	Advanced Statistics	4(3+1)	None
13.	MTM3044	Operations Research with SAS	4(3+1)	None
14.	MTM3054	Programming Language	4(3+1)	None
15.	MTM4004	Optimization	4(3+1)	None
16.	MTM49712	Industrial Training	12(0+12)	None
17.	MTM4982	Final Year Project I	2(0+2)	None
18.	MTM4994	Final Year Project II	4(0+4)	None

University Elective Courses

Students are required to undertake and pass elective courses amounting to a total of thirty (30) credit hours. Out of this total, six (6) credit hours are allocated for Third Language courses, namely Mandarin Language I (BBC3013) and Mandarin Language II (BBC3023), which are offered in Semester 3 and Semester 4 of study.

The remaining credit hours may be selected from any elective courses offered at UMT according to the student's interests and suitability. However, students are encouraged to take at least eighteen (18) credit hours from the list of grouped elective courses specified below. Students may also seek guidance from their assigned mentor for the purpose of elective course selection.

No	Course Code	Course Name	Credit Hour	Prerequisite
Applied Mathematics Group				
1.	MKG4003	Partial Differential Equations	3(3+0)	None
2.	MKG4013	Computational Methods for Differential Equations	3(2+1)	None
3.	MKG4023	Mathematical Fluid Mechanics	3(3+0)	None
4.	MKG4033	Introduction to Fuzzy Set Theory	3(3+0)	None
Mathematical Analysis Group				
1.	MKG4043	Dynamical Systems	3(3+0)	None
2.	MKG4053	Complex Analysis	3(3+0)	None
3.	MKG4063	Functional Analysis	3(3+0)	None
4.	MKG4073	Topology	3(3+0)	None
Operations Research Group				
1.	MKG4004	Advanced Operations Research	4(3+1)	None
2.	MKG4013	Computational Methods for Differential Equations	3(2+1)	None
3.	MKG4083	Logic and Computing	3(3+0)	None
4.	MKG4093	Heuristic Techniques for Combinatorial Optimization	3(3+0)	None
Computer Based Geometric Design Group				
1.	MKG4013	Computational Methods for Differential Equations	3(2+1)	None
2.	MKG4183	Introduction to Logic and Discrete Mathematics	3(3+0)	None
3.	MKG4103	Graph Theory	3(3+0)	None
4.	MKG4113	Computer Aided Geometric Design	3(2+1)	None

COURSE SCHEME
BACHELOR OF SCIENCE (APPLIED MATHEMATICS) WITH HONOURS

CODE	COURSE NAME	CREDIT HOUR	PRE REQUISITE	CODE	COURSE NAME	CREDIT HOUR	PRE REQUISITE
SEMESTER 1				**SEMESTER 2**			
MTM3004	Linear Algebra	4(3+1)	-	MTM3034	Advanced Statistics *	4(3+1)	-
MTM3014	Calculus	4(3+1)	-	MTM3044	Operations Research with SAS *	4(3+1)	-
MTM3024	Statistics*	4(3+1)	-	MKG3013	Modern Algebra	3(3+0)	-
MPU3132	Appreciation of Ethics and Civilizations	2(2+0)	-	BBB3013	Academic Writing Skills	3(3+0)	-
COM3122	Malay Language Communication	2(2+0)	-	CCXXXXX	Co-Curriculum	2(0+2)	-
MPU3352	Integrity and Anti-Corruption	2(2+0)	-	MPU3142	Philosophy and Current Issues	2(2+0)	-
	TOTAL	**18**			**TOTAL**	**18**	
SEMESTER 3				**SEMESTER 4**			
MTM3003	Ordinary Differential Equations	3(3+0)	-	MKG3004	Numerical Analysis	4(3+1)	-
MTM3054	Programming Language	4(3+1)	-	MTM3013	Real Analysis	3(3+0)	-
MKG3002	Principle of Mathematical Modelling	2(2+0)	-	MKG3023	Applied Mathematical Methods	3(3+0)	-
CCM3011	Community Care	1(0+1)	-	MKG3033	Scientific Computing	3(2+1)	-
	Elective 1	3			Elective 4	3	-
	Elective 2	3	-		Elective 5	3	-
	Elective 3	3	-				
	TOTAL	**19**			**TOTAL**	**19**	
SEMESTER 5				**SEMESTER 6**			
MTM4004	Optimization*	4(3+1)	-	MTM4994	Final Year Project II	4(0+4)	-
MTM4982	Final Year Project I	2(0+2)	-	MPU3223	Basic Entrepreneurship	3(0+3)	-
MKG3003	Vector Calculus	3(3+0)	-		Elective 8	3	-
BBB3033	English for Occupational Purposes	3(3+0)	-		Elective 9	3	-
	Elective 6	3	-		Elective 10	3	-
	Elective 7	3	-				
	TOTAL	**18**			**TOTAL**	**16**	
SEMESTER 7							
MTM49712	Industrial Training	12(0+12)	-				
	TOTAL	**12**					
						TOTAL CREDIT	**120**

* A course equipped with a SAS certification module.

Note:

1) Students are required to follow the **Survival and Water Safety Programme** and **Artificial Intelligence for Beginners (MCBS10017)** as a **condition to graduate**.
2) The number of elective course credit hours that students must take in the study programme is subject to the **number of elective credit hours** set by the study programme to meet the qualification to graduate and is not subject to the **number** of elective courses taken.
3) The list of elective courses that can be taken by students in the study programme refers to the course offerings listed in the study programme handbook of that faculty and also other faculties.
4) Students are required to enrol **Third Language courses**, namely **Mandarin Language I (BBC3013)** and **Mandarin Language II (BBC3023)**, as elective (ELF) courses with a total of 6 credit hours over two (2) semesters, comprising two (2) levels: Level I and Level II.

Bachelor of Science (Financial Mathematics) with Honours

Introduction

The Bachelor of Science (Financial Mathematics) with Honours is a programme developed to provide knowledge about the use of mathematical methods such as probability theory, statistics, optimization, stochastic analysis and economic theory in financial problems that cover investment, insurance, Islamic finance, risk analysis etc. The curriculum of this programme has been completely blended to meet the eleven domains of learning outcomes of the programme recommended by the Ministry of Education throughout the course of 7 semesters or three and a half years.

In addition, in line with the development of the industrial revolution (IR) 4.0, several core courses of the programme have been implemented with SAS modules that qualify graduates for SAS certification at the end of the programme. This certification is an added value to graduates because it is recognized worldwide and is in demand from a wide range of industries.

To ensure students get real work experience, Industrial Training courses for 24 weeks implemented in the last semester (semester 7) in finance or other related industries. The knowledge that has been learned while on campus can be used during industrial training in addition to gaining new knowledge in the relevant sector.

Programme Education Objective (PEO)

At the end of their studies, students who follow this programme are able to achieve the following objectives:

PEO1	:	Knowledgeable and have practical skills in the field of Financial Mathematics that are in line with industry requirements.
PEO2	:	Communicate effectively and have interpersonal skills and demonstrate good leadership qualities in the organization.
PEO3	:	Able to analyse and solve real problems using numeracy skills based on scientific methods and critical thinking without neglecting pure values and integrity.
PEO4	:	Able to achieve, manage and communicate information by using the latest digital technology and demonstrate entrepreneurial skills as an added value for career advancement.

Career Prospects

Graduates of the Bachelor of Science (Financial Mathematics) with honours can engage in various service and career fields in either the public or private sector. The main sectors that graduates can enter are finance, insurance, banking or services. Among the careers that can be pursued are:

- Strategic Risk Officer
- Risk Modeler
- Investment Management Officer
- Actuarial Manager
- Mathematics Teacher/Lecturer
- Quantitative/Technical Analyst
- Data Analyst
- Researcher
- Science Officer
- Entrepreneur

PROGRAMME CURRICULUM
BACHELOR OF SCIENCE (FINANCIAL MATHEMATICS) WITH HONOURS

Total Credits to Graduate

The minimum number of credits to graduate is 120 credit hours. The distribution of credit hours by course category is as follows:

Category	Credit Hour	Percentage
University Core	20	17
Programme Core	70	58
University Elective	30	25
Total	**120**	**100**

University Core Courses

Students must attend and pass all **NINE** University Core courses with 18 credit hours. For co-curriculum courses, students can choose **ONE** from the various co-curriculum courses offered by the Centre for Foundation and Continuing Education.

No	Course Code	Course Name	Credit Hour	Prerequisite
1.	BBB3013	Academic Writing Skills	3(3+0)	None
2.	BBB3033	English for Occupational Purposes	3(3+0)	None
3.	MPU3132	Appreciation of Ethics and Civilizations	2(2+0)	None
4.	MPU3142	Philosophy and Current Issues	2(2+0)	None
5.	MPU3223	Basic Entrepreneurship	3(3+0)	None
6.	MPU3352	Integrity and Anti-Corruption	2(2+0)	None
7.	COM3122	Malay Language Communication	2(2+0)	None
8.	CCM3011	Community Care	1(0+1)	None
9.	CCXXXXX	Co-Curriculum	2(0+2)	None

Programme Core Courses

In order to meet the graduation requirements, students must attend and pass all **EIGHTEEN** Programme Core courses with 70 credits.

No	Course Code	Course Name	Credit Hour	Prerequisite
1.	ECO3043	Macroeconomics	3(3+0)	None
2.	MKW3003	Probability Theory in Finance	3(3+0)	None
3.	MKW3013	Stochastic Modeling and Applications	3(3+0)	None
4.	MKW3023	Investment Mathematics	3(3+0)	None
5.	MKW4003	Introduction to Stochastic Differential Equations	3(3+0)	None
6.	MKW4013-E	Financial Derivatives	3(3+0)	None
7.	MTM3003	Ordinary Differential Equations	3(3+0)	None
8.	MTM3004	Linear Algebra	4(3+1)	None
9.	MTM3013	Real Analysis	3(3+0)	None
10.	MTM3014	Calculus	4(3+1)	None
11.	MTM3024	Statistics	4(3+1)	None
12.	MTM3034	Advanced Statistics	4(3+1)	None
13.	MTM3044	Operations Research with SAS	4(3+1)	None
14.	MTM3054	Programming Language	4(3+1)	None
15.	MTM4004	Optimization	4(3+1)	None
16.	MTM49712	Industrial Training	12(0+12)	None
17.	MTM4982	Final Year Project I	2(0+2)	None
18.	MTM4994	Final Year Project II	4(0+4)	None

University Elective Courses

Students are required to undertake and pass elective courses amounting to a total of thirty (30) credit hours. Out of this total, six (6) credit hours are allocated for Third Language courses, namely Mandarin Language I (BBC3013) and Mandarin Language II (BBC3023), which are offered in Semester 3 and Semester 4 of study.

In addition, students are free to register for any courses offered according to their interests and level of maturity. However, students are **encouraged** to undertake at least twenty-one (21) credit hours from the list of elective courses provided below, with guidance from their assigned mentor.

No	Course Code	Course Name	Credit Hour	Prerequisite
1.	MKW4004	Numerical Methods in Finance	4(3+1)	None
2.	MKW4023	Financial Forecasting	3(3+0)	None
3.	MKW4033	Mathematical Theory in Insurance	3(3+0)	None
4.	MKW4043	Financial Optimization	3(3+0)	None
5.	MKW4053	Financial Risk Analysis	3(3+0)	None
6.	MKW4063	Financial Econometric	3(3+0)	None
7.	MKW4073	Islamic Financial Mathematics	3(3+0)	None
8.	MKG3004	Numerical Analysis	4(3+1)	None
9.	MKG4003	Partial Differential Equations	3(3+0)	None

COURSE SCHEME
BACHELOR OF SCIENCE (FINANCIAL MATHEMATICS) WITH HONOURS

CODE	COURSE NAME	CREDIT HOUR	PRE REQUISITE	CODE	COURSE NAME	CREDIT HOUR	PRE REQUISITE
SEMESTER 1				**SEMESTER 2**			
MTM3004	Linear Algebra	4(3+1)	-	MTM3034	Advanced Statistics*	4(3+1)	-
MTM3014	Calculus	4(3+1)	-	MTM3044	Operations Research with SAS*	4(3+1)	-
MTM3024	Statistics*	4(3+1)	-	MKW3003	Probability Theory in Finance	3(3+0)	-
COM3122	Malay Language Communication	2(2+0)	-	BBB3013	Academic Writing Skills	3(3+0)	-
MPU3352	Integrity and Anti-Corruption	2(2+0)	-	MPU3132	Appreciation of Ethics and Civilization	2(2+0)	-
CCXXXXX	Co-Curriculum	2(0+2)	-	MPU3142	Philosophy and Current Issues	2(2+0)	-
	TOTAL	**18**			**TOTAL**	**18**	
SEMESTER 3				**SEMESTER 4**			
MTM3003	Ordinary Differential Equations	3(3+0)	-	MTM3013	Real Analysis	3(3+0)	-
MTM3054	Programming Language	4(3+1)	-	MKW3023	Investment Mathematics	3(3+0)	-
MKW3013	Stochastic Modelling and Applications	3(3+0)	-	ECO3043	Macroeconomics	3(3+0)	-
CCM3011	Community Care	1(0+1)	-		Elective 4	3	-
	Elective 1	3	-		Elective 5	3	-
	Elective 2	3	-		Elective 6	3	-
	Elective 3	3	-				
	TOTAL	**20**			**TOTAL**	**18**	
SEMESTER 5				**SEMESTER 6**			
MTM4004	Optimization*	4(3+1)	-	MTM4994	Final Year Project II	4(0+4)	-
MTM4982	Final Year Project I	2(0+2)	-	MKW4013-E	Financial Derivatives	3(3+0)	-
MKW4003	Introduction to Stochastic Differential Equations	3(3+0)	-	MPU3223	Basic Entrepreneurship	3(3+0)	-
BBB3033	English for Occupational Purposes	3(3+0)	-		Elective 9	3	-
	Elective 7	3	-		Elective 10	3	-
	Elective 8	3	-				
	TOTAL	**18**			**TOTAL**	**16**	
SEMESTER 7							
MTM49712	Industrial Training	12(0+12)	-				
	TOTAL	**12**					
						TOTAL CREDIT	**120**

* A course equipped with a SAS certification module.

Note:

1) Students are required to follow the **Survival and Water Safety Programme** and **Artificial Intelligence for Beginners (MCBS10017)** as a **requirement to graduate**.
2) The number of elective course credit hours that students must take in the study programme is subject to the **number of elective credit hours** set by the study programme to meet the qualification to graduate and is not subject to the **number** of elective courses taken.
3) The list of elective courses that can be taken by students in the study programme refers to the course offerings listed in the study programme handbook of that faculty and also other faculties.
4) Students are required to enrol **Third Language courses**, namely **Mandarin Language I (BBC3013)** and **Mandarin Language II (BBC3023)**, as elective (ELF) courses with a total of 6 credit hours over two (2) semesters, comprising two (2) levels: Level I and Level II.

Bachelor of Science (Data Analytics) with Honours

Introduction

The Bachelor of Science (Data Analytics) with Honours has been designed to provide a study programme that combines data science, statistics, machine learning and mathematics in line with Industrial Revolution 4.0. This programme applies 2u2i elements through the implementation of 2.5 years of study at university (university component) and 1 year of study in industry (industry component). After completing this study programme, students will obtain a SAS Certificate known as "SAS Academic specialization in Data Analytics".

The curriculum of this study programme has been fully integrated to meet the increasing needs of highly skilled data analysts who are able to analyse the growing amount of data in various disciplines and process it into useful information for decision making. The programme also aims to meet the industry's high demand for business and data analysts. Graduates will be trained with the latest methods, concepts and tools through knowledge, skills and abilities to understand data in various forms.

Students will have the opportunity to work with industry through 4 industry component courses in the form of Work-Based Learning (WBL) offered in the final year of study. This learning involves a project in a real industrial environment related to IR4.0. The implementation of the 2u2i mode will expose students to real learning and practice directly from relevant industry practitioners. Such training will add value to their qualifications and increase their employment opportunities.

Programme Education Objective (PEO)

Students in this programme are targeted to achieve the following objectives:

PEO1	:	Able to apply knowledge (PLO1) and technical skills (PLO2) as well as practical skills supported by intellectual skills (PLO3) in the field of Data Analytics in line with Industrial Revolution 4.0 (IR4.0)
PEO2	:	Able to communicate effectively in various levels of autonomy (PLO4) as well as capable in planning and managing relationships in teams and organizations with different political, cultural and social backgrounds (PLO5)
PEO3	:	Practicing knowledge ethically and professionally with integrity and accountability (PLO6)
PEO4	:	Able to solve problems in an IR4.0 environment effectively with the spirit of "esprit de corps" (PLO7) and able to make decisions critically and analytically at various levels of autonomy in the organization (PLO9)
PEO5	:	Able to sharpen the entrepreneurial mind related to IR4.0 (PLO8) by leveraging digital technology knowledge and skills (PLO10) supported by quantitative skills to analyse and manage the economic, political, social and climate change environment in IR4.0 (PLO11)

Career Prospects

Graduates of the Bachelor of Science (Data Analytics) programme with honours can be involved in various fields and services of big data or industrial revolution 4.0 either in the public or private sector such as finance, insurance, banking, investment, transport, manufacturing, mining, health, marketing, sports, research and development and more. Among the careers that can be pursued are:

- Data Scientist
- Data Analyst
- Data Engineer
- Data Manager
- Data Architect
- Business/Marketing Analyst
- Quantitative Analyst
- Financial Analyst
- System Analyst
- Information Security Analyst
- Research and Development
- Business Consultant
- Database Developer or Administrator

PROGRAMME CURRICULUM
BACHELOR OF SCIENCE (DATA ANALYTICS) WITH HONOURS

Total Credits to Graduate

The minimum number of credits to graduate is 125 credit hours. The distribution of credit hours by course category is as follows:

Category	Credit Hour	Percentage
University Core	20	16
Programme Core	68	54
Programme Specialization	22	18
University Elective	15	12
Total	**125**	**100**

University Core Courses

Students must attend and pass all **NINE** University Core courses with 18 credit hours. For co-curriculum courses, students can choose **ONE** from the various co-curriculum courses offered by the Centre for Foundation and Continuing Education.

No	Course Code	Course Name	Credit Hour	Prerequisite
1.	BBB3013	Academic Writing Skills	3(3+0)	None
2.	BBB3033	English for Occupational Purposes	3(3+0)	None
3.	MPU3132	Appreciation of Ethics and Civilizations	2(2+0)	None
4.	MPU3142	Philosophy and Current Issues	2(2+0)	None
5.	MPU3223	Basic Entrepreneurship	3(3+0)	None
6.	MPU3352	Integrity and Anti-Corruption	2(2+0)	None
7.	COM3122	Malay Language Communication	2(2+0)	None
8.	CCM3011	Community Care	1(0+1)	None
9.	CCXXXXX	Co-Curriculum	2(0+2)	None

Programme Core Courses

In order to meet the graduation requirements, students must attend and pass all **FIFTEEN** Programme Core courses with 68 credits.

No	Course Code	Course Name	Credit Hour	Prerequisite
1.	CSF3013	Data Structure and Algorithm	3(2+1)	None
2.	CSF3123	Database	3(2+1)	None
3.	MDA3003	Introduction to Data Science	3(2+1)	None
4.	MDA3024	Multivariate Calculus	4(3+1)	None
5.	MDA3044	Industrial Programming Language	4(3+1)	None
6.	MDA3053	Introduction to Machine Learning	3(2+1)	None
7.	MDA3103	Topological Data Analysis	3(2+1)	None
8.	MDA3123	Data Visualisation	3(3+0)	None
9.	MDA3133	Network Science	3(2+1)	None
10.	MDA4003	Scientific Research	3(3+0)	None
11.	MDA4908-I	Industrial Project I	8(0+8)	None
12.	MDA4918-I	Project Management I	8(0+8)	None
13.	MDA4928-I	Industrial Project II	8(0+8)	None
14.	MDA4938-I	Project Management II	8(0+8)	None
15.	MTM3004	Linear Algebra	4(3+1)	None

Programme Specialization Courses

In order to meet the graduation requirements, students must attend and pass all **SEVEN** Programme Specialization courses with 22 credits.

No	Course Code	Course Name	Credit Hour	Prerequisite
1.	MDA3014	Probability and Statistics for Data Analytics	4(3+1)	None
2.	MDA3033	Applied Statistical Linear Model	3(2+1)	None
3.	MDA3063	Experimental Design	3(3+0)	None
4.	MDA3073	Survey Sampling Methods	3(3+0)	None
5.	MDA3083	Predictive Analytics	3(3+0)	None
6.	MDA3093	Bayesian Statistics	3(3+0)	None
7.	MDA3113	Multivariate Statistics	3(3+0)	None

University Elective Courses

Students are free to enrol in any of the courses offered as appropriate based on interest and maturity. However, it is suggested that students take at least 15 credit hours from the list of elective courses below or subject to the approval of the Head of Programme:

No	Course Code	Course Name	Credit Hour	Prerequisite
1.	CSF3563	Data Mining	3(3+0)	None
2.	MKG3002	Principles of Mathematical Modelling	2(2+0)	None
3.	MKG3033	Scientific Computing	3(2+1)	None
4.	MKG4083	Logic and Computing	3(3+0)	None
5.	MKG4093	Heuristic Techniques for Combinatorial Optimization	3(3+0)	None
6.	MKG4103	Graph Theory	3(3+0)	None

PROGRAMME SCHEME
BACHELOR OF SCIENCE (DATA ANALYTICS) WITH HONOURS

CODE	COURSE NAME	CREDIT HOUR	PRE REQUISITE	CODE	COURSE NAME	CREDIT HOUR	PRE REQUISITE
SEMESTER 1				**SEMESTER 2**			
MDA3003	Introduction to Data Science	3(2+1)	-	MDA3033	Applied Linear Statistical Models*	3(2+1)	-
MDA3014	Probability and Statistics for Data Analytics*	4(3+1)	-	MDA3044	Industrial Programming Language	4(3+1)	-
MDA3024	Multivariate Calculus	4(3+1)	-	MDA3053	Introduction to Machine Learning*	3(2+1)	-
MTM3004	Linear Algebra	4(3+1)	-	BBB3013	Academic Writing Skills	3(3+0)	-
MPU3142	Philosophy and Current Issues	2(2+0)	-	COM3122	Malay Language Communication	2(2+0)	-
CCXXXXX	Co-Curriculum	2	-	MPU3352	Integrity and Anti-Corruption	2(2+0)	-
			-				
	TOTAL	**19**			**TOTAL**	**17**	
SEMESTER 3				**SEMESTER 4**			
MDA3063	Experimental Design	3(3+0)	-	MDA3083	Predictive Analytics*	3(3+0)	-
MDA3073	Survey Sampling Methods	3(3+0)	-	MDA3093	Bayesian Statistics*	3(3+0)	-
CSF3013	Data Structure and Algorithm	3(2+1)	-	MDA3103	Topological Data Analysis	3(2+1)	-
CSF3123	Database	3(2+1)	-	MPU3223	Basic Entrepreneurship	3(3+0)	-
CCM3011	Community Care	1(0+1)	-	MPU3132	Appreciation of Ethics and Civilization	2(2+0)	-
	Elective 1	3	-		Elective 3	3	-
	Elective 2	3	-		Elective 4	3	-
	TOTAL	**19**			**TOTAL**	**20**	
SEMESTER 5				**SEMESTER 6 (INDUSTRIAL COMPONENT 1)**			
MDA3113	Multivariate Statistics*	3(3+0)	-	MDA4908-I	Industrial Project I	8(0+8)	-
MDA3123	Data Visualisation*	3(3+0)	-	MDA4918-I	Project Management I	8(0+8)	-
MDA3133	Network Science	3(2+1)	-				
MDA4003	Scientific Research	3(3+0)	-				
BBB3033	English for Occupational Purposes	3(3+0)	-				
	Elective 5	3	-				
	TOTAL	**18**			**TOTAL**	**16**	
SEMESTER 7 (INDUSTRIAL COMPONENT 2)							
MDA4928-I	Industrial Project II	8(0+8)	-				
MDA4938-I	Project Management II	8(0+8)	-				
	TOTAL	**16**					
						TOTAL CREDIT	**125**

* A course equipped with a SAS certification module.

Note:

1) Students are required to follow the **Survival and Water Safety Programme** and **Artificial Intelligence for Beginners (MCBS10017)** as a **requirement to graduate**.
2) The number of elective course credit hours that students must take in the study programme is subject to the **number of elective credit hours** set by the study programme to meet the qualification to graduate and is not subject to the **number** of elective courses taken.
3) The list of elective courses that can be taken by students in the study programme refers to the course offerings listed in the study programme handbook of that faculty and also other faculties.

COURSE SYNOPSIS
BACHELOR OF SCIENCE (APPLIED MATHEMATICS) WITH HONOURS
BACHELOR OF SCIENCE (FINANCIAL MATHEMATICS) WITH HONOURS
BACHELOR OF SCIENCE (DATA ANALYTICS) WITH HONOURS

CSF3013 Data Structure and Algorithm
Credit 3(2+1)
Prerequisite No

This course introduces programming methods to solve computational problems, focusing on basic data structures such as linked lists, stacks, queues, trees, and graphs, as well as sorting and searching techniques. Emphasis is given to modular programming and the concept of time complexity to evaluate algorithm efficiency. At the end of this course, students will be able to apply suitable data structures, implement modular solutions, and evaluate algorithm performance effectively.

CSF3123 Database
Credit 3(2+1)
Prerequisite No

This course introduces database concepts (goals of DBMS, relationships, physical and logical organization, schema and subschema); data models, normalisation (until BCNF), canonical schema and data independence; data description language; query facilities, query functions; design and translation strategies; and data integrity and reliability. This course is important because it focuses on the fundamental concepts of integrated databases. At the end of the course, students will be able to apply suitable methods to solve database problems and develop database systems using DBMS and query languages.

CSF3563 Data Mining
Credit 3(3+0)
Prerequisite No

This course is an introductory course on data mining. It introduces the basic concept of data mining such as data pre-processing, data warehousing as well as online analytical processing (OLAP). Students will be exposed to the data mining method and their implementations which focus to two major data mining functions i.e.: pattern discovery and cluster analysis.

MDA3003 Introduction to Data Science
Credit 3(2+1)
Prerequisite No

This course introduces the student to the collection, preparation, data acquisition, cleaning, aggregation, exploratory data analysis, data modelling, and visualization of data, feature engineering, and model creation and validation, covering conceptual and practical issues. Examples from diverse fields will be presented, and hands-on use of statistical and data manipulation software will be included.

MDA3014 Probability and Statistics for Analytical Data
Credit 4(3+1)
Prerequisite No
This course introduces the student to the important concepts in probability and statistics such as probability, random variables, probability distribution random variables, sampling distribution theory, estimation and hypothesis testing. Examples of data from marine and aquatic life will be presented, and hands-on use of statistical and data manipulation software (SAS) will be included.

MDA3024 Multivariate Calculus
Credit 4(3+1)
Prerequisite No
This course discusses the topics like the limit and continuity, multivariable functions, partial derivatives, total derivative and multiple integration. In addition, this course discusses the cylinder coordinate, spherical coordinate and the change of variables in multiple integration.

MDA3033 Applied Linear Statistical Models
Credit 3(2+1)
Prerequisite No
The course discusses the concepts of linear models to solve a wide range of regression and analysis of variance problems. Topics include simple regression, correlation, multiple regression, single- and multi-factor ANOVAs, model adequacy checking, model selection, generalized linear models including logistic regression, interpretation and presentation of analysis results, and variable selection.

MDA3044 Industrial Programming Language
Credit 4(3+1)
Prerequisite No
This course contains basic programming and programming language; Problem-solving techniques; flow diagrams and structured algorithms; Program coding techniques and instructions to solve formal problems. Hands-on programming exercises will be given to expose students to the integration of SQL, TensorFlow, and many other valuable functions and libraries for data science and machine learning.

MDA3053 Introduction to Machine Learning
Credit 3(2+1)
Prerequisite No
This course discusses the basics of machine learning which includes introduction to machine learning, various concepts and methods in machine learning, classification of machine learning algorithms, various types of machine learning such as Neural Networks, Support Vector Machine and ending with language learning.

MDA3063 Experimental Design
Credit 3(3+0)
Prerequisite No
This course begins with Basic principles of experimental design; Randomization; Completely randomized design; Randomized blocks, Latin Squares, Factorial design; Blocking in factorial design; 2k factorial design; Extension of 2k factorials; Blocking and confounding in 2k factorials; Fractional factorial designs; Blocking in fractional factorials; Nested and split-plot designs; Replicated and un-replicated designs; Random effects model.

MDA3073 Survey Sampling Methods
Credit 3(3+0)
Prerequisite No

The course introduces the student to a set of principles of survey and data analytics that are the basis of standard practices in these fields. This course begins with how to do survey research for data analytics, quality of data, modes of survey data collection, data generation from other sources, sampling technique such as simple random, probability sampling, stratified sampling, ratio and regression estimation, cluster and systematic sampling, two-stage sampling, estimating the population size, total survey error, writing reports and managing the survey process. Examples from diverse fields will be presented, and hands-on.

MDA3083 Predictive Analytics
Credit 3(3+0)
Prerequisite No

This course introduces students to the knowledge of widely-used forecasting techniques, such as the forecasting problem, an introduction to time series methods, time series methods, data reduction and big data. Examples of data from marine and aquatic will be presented, and hands-on use of forecasting methods and data manipulation will be included.

MDA3093 Bayesian Statistics
Credit 3(3+0)
Prerequisite No

The course begins with a brief overview of the probabilities and is followed by Statistics. Topics to be covered in this course include one-parameter models, multiparameter models, Marke Monte Carlo chains and model comparisons.

MDA3103 Topological Data Analysis
Credit 3(2+1)
Prerequisite No

This course introduces fundamental elements of the emerging science of Topological Data Analysis (TDA) with the underlying principles from computational geometry, general topology, algebra, metric, algebraic topology, data analysis, and many other related scientific areas. The application of topological techniques to complex data has opened up new opportunities in exploratory data analysis and data mining. This course is intended to cover theory, algorithm and application of TDA for identifying topological signatures of complex data sets, not just massive in size, but rich in features.

MDA3113 Multivariate Statistics
Credit 3(3+0)
Prerequisite No

This course covers introduction to multivariate data, multivariate data visualization, application of multivariate models such as principle component analysis, multidimensional scaling, factor analysis and group analysis.

MDA3123 Data Visualization
Credit 3(3+0)
Prerequisite No
This course introduces the principles and basic data visualization design; visualization representation methods and techniques including charts, tables, graphics, effective presentations, multimedia content, animation, and dashboard design for visualizing multivariate, temporal, text-based, geospatial, hierarchical and network data. Tableau software will be used as hands-on visualization exercises based on common data domains will be given to experience designing data graphics and visualizations, and reporting findings using data visualization tools.

MDA3133 Network Science
Credit 3(2+1)
Prerequisite No
This course introduces fundamental elements of the emerging science of complex networks, with emphasis on social and information networks. Students will learn about mathematical and computational methods used to analyze networks, models used to understand and predict behavior of networked systems, and theories used to reason about network dynamics. Students will also be exposed to current trends in the field and derive insights on complex structures.

MDA4003 Scientific Research
Credit 3(3+0)
Prerequisite No
The course aims to provide in-depth knowledge of scientific research in data analytics. This course provides students with the body of knowledge and practical skills of scientific work in data analytics from introduction to scientific research, understanding of the scientific literature, and its ethics, methodology of scientific research including the problem identification, investigation design, data collection, data analysis, formulation, elaboration of the model of research, methods of research, instruments, and consult students to the systematic scientific research, writing a good report and effective presentation.

MDA4908-I Industrial Project I
Credit 8(0+8)
Prerequisite No
This course introduces the student to the basic requirement of industrial project particularly data science projects in the industrial environment.

MDA4918-I Project Management I
Credit 8(0+8)
Prerequisite No
This course introduces students to the concepts and techniques used in managing a project particularly data science projects in an industrial environment. Through this project, students will generate a project plan and schedule, cost estimation, in addition to preparing the related documents. The aspect that will be accessed here is students' ability in managing project development. This course will be supervised by an industrial supervisor and monitored by UMT.

MDA4928-I Industrial Project II
Credit 8(0+8)
Prerequisite No

This course is a continuation from the Industrial Project I (MDA4908-I). Through this course, students will implement the concepts and techniques used in the Industrial Project I in terms of the real industrial environment. The aspect that will be accessed here is students' ability in managing project development with minimum supervision by industrial and UMT supervisors.

MDA4938-I Project Management II
Credit 8(0+8)
Prerequisite No

This course is a continuation from Project Management I (MDA4918-I). Through this course, students will implement the concepts and techniques used in the Project Management I in terms of real industrial environment such as the project plan and schedule, cost estimation, in addition to preparing the related documents. The aspect that will be accessed here is students' ability in managing project development with minimum supervision by industrial and UMT supervisors.

MKG3002 Principle of Mathematical Modelling
Credit 2(2+0)
Prerequisite No

This course provides a foundational understanding of mathematical modelling, equipping students with the skills to construct, analyse, and validate models for real-world applications. Key topics include fundamental principles of mathematical modelling, dimensional analysis, model approximation techniques, and model verification methods. Through practical examples, students will learn how to formulate mathematical models of complex phenomena and assess their accuracy. The course emphasizes both theoretical understanding and practical application using digital tools, preparing students for applications in various scientific and engineering fields.

MKG3003 Vector Calculus
Credit 3(3+0)
Prerequisite No

This course discusses the concepts and techniques of vector calculus involving the topics vector and geometry of space, calculus for vector valued functions in two and three dimensional space. This course will focus on understanding the gradient, divergence, curl, and related vector operators. It also emphasizes the application of the theorems such as Green's Theorem, Stokes' Theorem, and the Divergence Theorem to solve the problems involving line, surface, and volume integrals.

MKG3004 Numerical Analysis
Credit 4(3+1)
Prerequisite No

This course presents numerical methods for solving mathematical problems. Both theoretical and computer implementation of the methods are discussed in this course. It covers solutions of nonlinear equations, interpolation and approximation, numerical integration and differentiation and solution of ordinary differential equations. Students will also utilise MATLAB software to implement the numerical computation.

MKG3013 Modern Algebra
Credit 3(3+0)
Prerequisite No

Modern Algebra is a branch of mathematics that studies algebraic structures such as groups, rings, fields, and ideals. These structures involve one or more mathematical operations. This course will cover integers, the Euclidean algorithm, binary relations, and equivalence relations. It also discusses groups, subgroups, symmetric groups, dihedral groups, homomorphisms, and their properties. Furthermore, the course will focus on rings, fields, and ideals, including several basic facts and theories relating to these topics. This course gradually builds students' intuition and proof-writing skills in abstract algebra, preparing them to study mathematics ethically.

MKG3023 Applied Mathematical Methods
Credit 3(3+0)
Prerequisite No

This course discusses mathematical methods and techniques commonly used in solving science, technology and engineering problems. It begins with a series solution for differential equations involving the power series method and the Frobenius method. Later, Fourier analysis which is one of the methods often used in solving real world problems is also discussed in this course. At the end of the course, the partial differential equations involving the Heat, Wave and Laplace equations are introduced and solved using the mathematical methods and techniques learned in this course.

MKG3033 Scientific Computing
Credit 3(2+1)
Prerequisite No

This course discusses the basic elements of scientific computing, particularly the methods for solving or approximating solutions to calculus and linear algebra problems associated with real-world applications. Using sophisticated scientific computing and visualization environments, students are introduced to fundamental computational concepts such as stability, accuracy, and efficiency. New numerical methods and techniques are also introduced to address more challenging problems.

MKG4003 Partial Differential Equations
Credit 3(3+0)
Prerequisite No

This course discusses partial differential equations and its applications in physics. This course introduces partial differential equations of the first and second order and the solutions using the method of characteristics. This course also discusses the main three partial differential equations in physics, namely the heat equation, the wave equation and the Laplace equation and their solutions using the method of separation of variables.

MKG4004 Advanced Operations Research
Credit 4(3+1)
Prerequisite No

This course builds upon foundational concepts in Operations Research, offering an in-depth exploration of advanced optimisation techniques. It is designed to equip students with both the theoretical understanding and practical skills necessary to model, solve and analyse decision-making problems. Students will explore topics beyond linear programming, including integer, non-linear, and deterministic dynamic programming. A key feature of the course is the integration of SAS software that is used in organization. Through hands-on SAS projects and exercises, students will develop computational competencies relevant to real-world applications in logistics and operations management. By the end of the course, students will be able to understand and apply a range of mathematical models in operations research, select appropriate techniques for various classes of problems, and justify their methodological choices. They will also be expected to analyse and interpret optimisation problems and solutions using developed critical thinking and psychomotor skills.

MKG4013 Computational Methods for Differential Equations
Credit 3(2+1)
Prerequisite No

This course pursues a numerical approach modeling natural phenomena that often can not be solved analytically. Chapters included in this course are finite-difference and shooting methods to solve linear and nonlinear ordinary differential equations with boundary values, and various numerical approaches to solve hyperbolic, parabolic and elliptic partial differential equations. Students are exposed to solve a wide variety of real problems in science, engineering, and other fields using numerical methods.

MKG4023 Mathematical Fluid Mechanics
Credit 3(3+0)
Prerequisite No

This course introduces the fundamental concepts of fluid mechanics, covering its definition, scope, and key principles. Topics include the basic equations governing fluid motion, methods of analysis, and fluid classification. The course explores fluid statics, the integral forms of basic equations, and the differential analysis of fluid motion. Applications focus on incompressible flow, with an introduction to the Bernoulli equation.

MKG4033 Introduction to Fuzzy Set Theory
Credit 3(3+0)
Prerequisite No

This course offers a comprehensive introduction to fuzzy set theory and its real-world applications in uncertain environments. Students will learn core concepts such as fuzzy numbers, fuzzy relations, fuzzy logic, and fuzzy averaging methods, along with their operational principles. Emphasis is placed on critical thinking and justification in selecting and applying suitable fuzzy logic control and fuzzy decision-making techniques. Through a blend of theory and practice, students will enhance their analytical skills, work independently and collaboratively, and apply fuzzy models in areas such as economics, finance, and decision science.

MKG4043 Dynamical Systems
Credit 3(3+0)
Prerequisite No

This course discusses the continuous and discrete dynamical systems using a qualitative approach and involves the concepts of a number of concepts, including equilibrium points, orbits, phase portraits and limit cycles. Several methods such as linearization are discussed to determine existence and stability of equilibrium points and analyze nonlinear dynamical systems. An introduction to chaos theory is also presented. The techniques will be applied to nonlinear dynamical systems in biology, physics and economy.

MKG4053 Complex Analysis
Credit 3(3+0)
Prerequisite No

This course covers the algebra of complex numbers, analytic and elementary functions, and their mappings. It then progresses to complex integration, including Cauchy's theorem and integration formula, Liouville's theorem, and the maximum modulus theorem. The course concludes with discussions on the fundamental theorem of algebra, power and Taylor series, zeroes and poles, residues, the residue theorem, and the evaluation of contour integrals.

MKG4063 Functional Analysis
Credit 3(3+0)
Prerequisite No

This course discusses the concepts of metric spaces and their examples. Next, normed spaces as well as topological concepts such as ideas of openness and closeness, compact set, and continuity in metric and normed spaces will be discussed. Later, inner product spaces, their examples and their properties also will be discussed. Banach and Hilbert spaces will be discussed in more detail. This course also discusses the properties of convergence including strong and weak convergences, and uniform boundedness. Discussion on several important properties such dual spaces, LP spaces, spectrum theory and compact linear operators end this course.

MKG4073 Topology
Credit 3(3+0)
Prerequisite No

This course discusses the basic concepts such as functions, countability of sets, cardinality, and partially ordered sets. Next, definitions of topological spaces, neighbourhoods, sequences, bases and subbases are discussed. This course also discusses the continuity of functions, homeomorphisms, and topological properties. Moreover, first and second countable spaces, Lindelöf's theorems, hereditary properties and some separation axioms will be discussed. Discussion on compact spaces, compactification, connected spaces, components and simply connected spaces will be in touch. In addition, some selected topics from the fields related to topology ended this course.

MKG4093 Heuristic Techniques for Combinatorial Optimization
Credit 3(3+0)
Prerequisite No

NP-hard problems, which are notoriously difficult to solve optimally in a reasonable amount of time, are prevalent in various real-world domains like transportation, scheduling, networking, and bioinformatics. For these challenging scenarios, optimization using heuristic techniques offers a frequently used and effective approach. Students will explore memory-based strategies, probabilistic acceptance criteria, iterative improvement through perturbation, and biologically-inspired operators. Practical assignments will train students in applying these heuristics to real-world problems.

MKG4103 Graph Theory
Credit 3(3+0)
Prerequisite No

In mathematics, graph theory studies graphs, which are mathematical structures used to model pairwise relationships between objects. Graphs in this context consist of vertices and edges. This course illustrates simple graphs based on fundamental concepts in Graph Theory, including Eulerian and Hamiltonian graphs and their applications, graphs and subgraphs, graph connectivity, traversals and matchings, graph coloring, planar graphs, and directed graphs. The ability to apply graph theory in the fields of science and technology concludes this course. This course helps students analyze, identify, and apply graph concepts in real-world contexts.

MKG4113 Computer Aided Geometric Design
Credit 3(2+1)
Prerequisite No

This course discusses the principles of geometric modeling focusing on Bézier curves, B-Splines curves and Bézier surfaces. Clear comprehension of the underlying mathematics of curve and surface design may prepare the students to explore various applications such as scientific visualization, manufacturing design and computer graphics by utilizing Mathematica software.

MKG4183 Introduction to Logic and Discrete Mathematics
Credit 3(3+0)
Prerequisite No

This course introduces fundamental principles of formal logic and discrete mathematics. It is designed for students with basic mathematical proficiency, particularly those who have completed introductory mathematics courses or equivalent pre-university qualifications. Classical logic covers propositional logic and first-order logic, the foundation of logical thinking and mathematical proof techniques. Additionally, discrete mathematics which include modelling computation, basic counting principles, algorithms, and recursion, are explored as the foundation tools in Computer Science. By the end of the course, students will be able to represent and reason about information using a formal logic system, analyze logical arguments and mathematical proofs, apply discrete mathematical concepts to analyze the structure and the behaviour of algorithms, and understand the capabilities and limitations of computational models.

MKW3003 Probability Theory in Finance
Credit 3(3+0)
Prerequisite No

The course introduces probability theory, mainly the ones that are used in finance. It elaborates important topics; namely set and function, measure theory, random variables, probability distribution and conditional expectation which underlie the area of financial mathematics. This knowledge of relevant probability theory is essential in understanding the development of stochastic calculus used in finance.

MKW3013 Stochastic Modelling and Applications
Credit 3(3+0)
Prerequisite No

This course provides essential tools to understand, predict, and make informed decisions under uncertainty, like in finance, science, engineering, and data analysis fields. It begins with the basic definitions and properties of the Markov chain in discrete time including transition probability. The course continues with limiting distribution as the long-term behavior of Markov, before the Poisson process is highlighted. Finally, discussion on the continuous time Markov chain ends this course. Some examples of real applications will be given throughout the course.

MKW3023 Investment Mathematics
Credit 3(3+0)
Prerequisite No

This course provides an introductory analysis of investments from a quantitative perspective, focusing primarily on interest rate theory. It brings together the essential tools and techniques used by investment professionals to evaluate various investment opportunities. The course covers basic analyses of financial securities, including fixed-interest bonds, equities, and real estate. It culminates with a discussion on real returns, exploring the impact of inflation on investment performance. This course equips students with the foundational knowledge needed to assess investments using interest rate models in various financial contexts.

MKW4003 Introduction to Stochastic Differential Equations
Credit 3(3+0)
Prerequisite No

The course discusses some basic concepts of calculus for the development of stochastic differential equations which are widely used in finance, other than application in engineering, physics and biology. Explanation on Brownian motion , the main continuous process used in stochastic calculus, is done before stochastic integral and related Itô process are described. Next, the application of Itô formula for Brownian motion and Ito process, also several other cases are illustrated. The course ended with the derivation of stochastic differential equations from ordinary differential equation and solution for few types of stochastic differential equations by using Itô formula. By the end of this course, students will be able to model, analyze, and solve stochastic differential equations using Itô calculus, with applications in finance.

MKW4004 Numerical Methods in Finance
Credit 4(3+1)
Prerequisite No

This course explains the use of numerical methods in finance through programming aids (the use of MATLAB) as well as an overview of financial theory. The main focus is option pricing through the Monte Carlo method and finite difference scheme. These methods are important for solving the problem of calculating the price of an option that has no analytical form. Topics discussed include financial theory, numerical methods and option pricing. Students are assumed to have an understanding of numerical analysis and the basis of option pricing. By the end of this course, students will be able to apply numerical methods and MATLAB to price options based on financial theory.

MKW4013-E Financial Derivatives
Credit 3(3+0)
Prerequisite No

This course discusses the fundamentals of financial derivatives, covering the basic properties and the pricing fundamentals of futures and options. It also explores trading and hedging strategies involving financial derivatives. Finally, time permitting special topics such as exotic options are explored. The course provides the foundation of financial derivatives and lays the ground for a rigorous risk management course.

MKW4023 Financial Forecasting
Credit 3(3+0)
Prerequisite No

This course discusses the introduction to financial time series forecasting, forecasting using regression analysis, forecasting using exponential smoothing and forecasting using Box-Jenkins method. This knowledge of forecasting financial time series is essential in forecasting financial time series in the future.

MKW4033 Mathematical Theory in Insurance
Credit 3(3+0)
Prerequisite No

The course gives students exposure to various types of life insurance and annuity. By applying knowledge from the interest rate and probability theories, the values for net single premium and net premium for each type of life insurance and annuities are formulated. The formulas are then employed in solving the related practical insurance problems.

MKW4043 Financial Optimization
Credit 3(3+0)
Prerequisite No

This course covers advanced optimization techniques, focusing on linear and quadratic programming applied to financial problems. It begins with linear programming, exploring optimization problems, the concept of duality, optimal conditions, and the simplex method. The course then delves into asset pricing and arbitrage detection using linear programming. It further introduces quadratic programming, including nonlinear problems, optimality conditions, and interior-point methods. Finally, the course applies quadratic programming to portfolio optimization, emphasizing mean-variance optimization and maximizing the Sharpe ratio for effective portfolio management. Students will gain essential skills in solving financial optimization problems using these effective methods.

MKW4053 Financial Risk Analysis
Credit 3(3+0)
Prerequisite No

This course is designed to provide a foundational understanding of risk management using the Value at Risk (VaR) approach. The primary focus is on the measurement and application of the VaR method, which is essential for students to grasp the latest advancements in financial risk management. Key topics include financial risk measurement, VaR calculation, risk and correlation forecasting, and stress testing. Students will actively engage in a hands-on VaR calculation project using real financial data, enhancing their practical skills and analytical abilities. The course assumes students have prior knowledge of probability concepts, including probability distributions, expectations, and quantiles.

MKW4063 Financial Econometrics
Credit 3(3+0)
Prerequisite No

This course discusses several topics in financial econometrics, such as return predictability and the effect of market hypothesis, event study analysis, portfolio choice, and testing the capital asset pricing model, the multifactor pricing model, volatility, and vector autoregressive models. Through this course, students will gain theoretical insights and practical competencies in applying econometric techniques to solve problems in financial economics.

MKW4073 Islamic Financial Mathematics
Credit 3(3+0)
Prerequisite No

This course discusses core concepts that differentiate Islamic finance from conventional practices, including the prohibitions guiding financial activities according to Sharia law. Students will gain a practical understanding of this financial system through an examination of the sources of funds (deposits and Islamic investment accounts) and their permissible uses (capital and money market instruments, Islamic trade financing). The course explores various Islamic investment instruments (Musharakah, Murabahah, Mudharabah), enabling students to distinguish between different financial asset investments like Sukuk and Unit Trusts. By the end of the course, students will be equipped with the knowledge to identify different Islamic financial products and make informed financial decisions that align with their values.

MTM3003 Ordinary Differential Equations
Credit 3(3+0)
Prerequisite No

This course introduces students to analytical methods for solving ordinary differential equations. Emphasis is placed on solving first-order and higher-order equations, including homogeneous, non-homogeneous, and linear systems of equations. Students will explore various solution methods such as separation of variables, integrating factors, undetermined coefficients, variation of parameters, and the Laplace transform. Through a theory and application based approach, students are expected to analyse and evaluate the appropriate solution method for a given differential equation based on its equation's characteristics accurately and effectively.

MTM3004 Linear Algebra
Credit 4(3+1)
Prerequisite No

Linear Algebra is a branch of mathematics that aims to solve systems of linear equations with a finite number of unknowns. Students will learn Linear Algebra and computational skills to solve systems of linear equations, perform operations on matrices, compute eigenvalues, and find matrix determinants. This course discusses vector space concepts including row space and column space, matrix representation and matrix equations, orthogonality up to the Gram-Schmidt orthogonalization process, eigenvalues, eigenvectors, and numerical linear algebra. By the end of this course, students will be able to explain Linear Algebra concepts in solving systems of linear equations, build technical skills in the lab using appropriate mathematical software, apply Linear Algebra concepts in solving related mathematical problems, and report learning outcomes about vector spaces, matrices, and orthogonality ethically during presentations.

MTM3013 Real Analysis
Credit 3(3+0)
Prerequisite No

This course explores the building blocks of real numbers, including concepts like real number space, bounded sets, and different types of sets such as finite and countable sets. We'll then dive into point set topology, covering ideas of openness, closeness, compactness, and connectedness on the real number line. Finally, the course examines convergent sequences of real numbers, including pointwise and uniform convergence of functions, and important properties like limit functions, continuity, and uniform continuity on various sets.

MTM3014 Calculus
Credit 4(3+1)
Prerequisite No

This course discusses the topics of limit and continuity, multivariable functions, partial derivatives, total derivative and multiple integration. In addition, this course also discusses the cylinder coordinate, spherical coordinate and the change of variables in multiple integration. Students will use MAPLE software to solve and visualize calculus problems algebraically and graphically. At the end of this course, students should be able to solve multivariable calculus problems and generate solutions using MAPLE software.

MTM3024 Statistics
Credit 4(3+1)
Prerequisite No

This course introduces the basic concepts of statistics, distributions, and methods that can be applied in the fields of science and social science. By the end of the course, students will know how to apply scientifically appropriate statistical theories and methodologies, analyze real data using appropriate statistical approaches, and develop programming solutions using SAS to solve statistical problems. In addition, this course emphasizes collaborative learning, where students discuss and apply statistical theory and probability using real data in groups. Through practical exercises and projects, students will improve their analytical and computational skills in statistical data analysis using a problem-based and collaborative learning approach.

MTM3034 Advanced Statistics
Credit 4(3+1)
Prerequisite No
This course discusses the important concept in advanced statistics for analyzing the data. Topics include the hypothesis testing two samples, analysis of variance, nonparametric hypothesis testing and correlation & regression in the context of applied statistics. The main emphasis is on solving problems by using appropriate statistical methods.

MTM3044 Operations Research with SAS
Credit 4(3+1)
Prerequisite No
This course introduces the fundamental principles and applications of methods in Operations Research, with a primary focus on linear programming and its use in solving real-world decision-making problems. Students will learn to formulate mathematical models that represent organizational challenges, particularly in resource allocation. Emphasis will be placed on the development and analysis of linear programming models, including graphical solutions, the simplex method, duality theory, and sensitivity analysis. Students will also explore specific applications such as the transportation problem and network optimization techniques like shortest path, minimal spanning trees, and project scheduling using PERT/CPM. A key feature is the use of SAS programming, enabling students to model and solve optimization problems through hands-on assignments. By the end of the course, students will be able to develop, solve using appropriate methods and interpret results effectively. They will also be able to recognize and address a variety of operational and network-related decision problems.

MTM3054 Programming Language
Credit 4(3+1)
Prerequisite No
This course introduces students to the fundamentals of computer programming using the C++ language, with emphasis on its application in mathematical problem-solving and logical reasoning. It is designed to equip students with essential programming skills that support computational thinking and algorithm development. Students will learn basic programming concepts such as data types, operators, input/output operations, control structures, functions, arrays, and file handling. The course will focus on applying C++ to solve mathematical problems. By the end of the course, students will be able to write structured, well-documented C++ programs and understand how programming complements solving mathematical problems.

MTM4004 Optimization
Credit 4(3+1)
Prerequisite No
This course introduces the theory and methods of constrained and unconstrained optimization, in line with quality education practices. Students will be exposed to analytical problem-solving skills through a theory- and application-based approach. Methods covered include the gradient method, Newton's method, and the conjugate direction method. The learning process also includes collaborative activities to encourage teamwork and critical thinking. Students will conduct practical sessions using SAS software to solve optimization problems.

MTM49712 Industrial Training
Credit 12 (0+12)
Prerequisite No

Students who have met the requirements for practical training shall be located at suitable industries for a period of 24 weeks, after 6 semesters of studies. Each student is required to do a comprehensive report equivalent to 12 credits under the supervision of a lecturer decided upon by the coordinator for practical training and the supervisor in charge at the industry concerned mathematics/statistics. The main emphasis is on solving problems by using appropriate mathematical or statistical methods.

MTM4982 Final Year Project I
Credit 2(0+2)
Prerequisite No

This course exposes the students with the basics in academic research, especially in writing the proposal of a scientific research project. It provides the rationale for the research, research objectives, the proposed methods, and expected findings/results. All students are required to discuss the research topic with their respective supervisor(s), write, submit, and present the research proposal in chronological order as determined by the Program. Throughout this course, students will develop research and academic writing skills, enabling them to present a research proposal clearly and systematically.

MTM4994 Final Year Project II
Credit 4(0+4)
Prerequisite No

This course is a direct continuation of the MTM4982 course, which is designed to cultivate independent research capabilities and critical thinking among students. Among the areas of research thrust are pure mathematics, applied mathematics, statistics, optimization, fuzzy set theory, financial mathematics, computer-assisted graphic design, numerical analysis methods, operations research, and any mathematics-related fields. All students are required to discuss the research topic with their respective supervisor(s), write, submit, and present the research project in chronological order as determined by the Program. Throughout the course, students will be required to identify a research problem, conduct a literature review, design appropriate methodologies, and carry out theoretical, computational, and/or empirical investigations. Students are expected to demonstrate anticipatory competency and consider the long-term sustainability implications of their work.


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