



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Faculty of
Electrical Engineering








Postgraduate Booklet
MASTER OF SCIENCE
(BIOMEDICAL ENGINEERING)
(MEBC)

ACADEMIC SESSION
2024/2025

Student Profile

MASTER OF SCIENCE (BIOMEDICAL ENGINEERING)

	Name	
	Matric Number	
	Phone Number	
	Email	
		

*"If you set yourself up for success,
everything is possible"*



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

VISION

**A Premier University Providing World-Class
Education and Research**
*(Universiti Terkemuka Menyediakan
Perkhidmatan Pendidikan dan Penyelidikan
Bertaraf Dunia)*

MISSION

**To Develop Holistic Talents and Prosper Lives
Through Knowledge and Innovative
Technologies**
*(Untuk Membangun Bakat Holistik dan
Mensejahtera Kehidupan Menerusi Ilmu dan
Inovasi Teknologi)*



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Faculty of
Electrical Engineering

ORGANISATION CHART

Faculty of Electrical Engineering
Universiti Teknologi Malaysia



PROFESSOR DR. JAFRI BIN DIN
Dean



PROF. IR. DR. HAZIINA BINTI SELAMAT
Director of Control & Mechatronics Engineering Department



ASSOC. PROF. TS. DR. SHAHRIN BIN MD. AYOB
Director of Electrical Power Engineering Department



PROF. IR. DR. RUBITA BINTI SUDIRMAN
Director of Electronic & Computer Engineering Department



ASSOC. PROF. IR. TS. DR. ASNITA BINTI ABDULKAHAB
Director of Biotechnology Engineering & Health Sciences Department



ASSOC. PROF. IR. TS. DR. NUZUL MU'AZZAH BINTI ABDUL LATIFF
Director of Communication Engineering Department



PROF. IR. DR. MUHAMMAD NADZIR BIN MARSANO
Deputy Dean (Academic & Student Affairs)



PROF. DR. SYED ABDUL RAHMAN BIN SYED ABU BAKAR
Deputy Dean (Research, Innovation & Development)



DR. USMAN ULLAH SHEIKH
Postgraduate Academic Manager



ASSOC. PROF. DR. KAMALUDIN BIN MOHAMAD YUSOF
External Program Academic Manager



ASSOC. PROF. IR. TS. DR. AZRUL IZAM BIN AZMI
Research Manager



MRS. NORAZILA BINTI SAFRI
Knowledge Research Consultant Officer



MRS. NORLIZA BINTI ABD RAHIM
Senior Assistant Registrar



MRS. RAFIDAH BINTI MOHAMAD
IT Manager



MR. MOHD NAZMI BIN ISMAIL
Facility Manager



MRS. NUR FATIMAH BINTI MD RAFI
Assistant Accountant



MRS. NUR ASHIKIN BINTI ABD HADI
Executive Officer (Quality & Strategy)



MRS. NUR HAKIMI BINTI KARSONO
Deputy Registrar



DR. YUSMERAZ BINTI YUSOF
Quality & Strategy Manager

PROGRAMME GUIDELINES

The University adopts the semester system, for an academic year it is divided into two (2) normal semesters, namely Semester I and Semester II, and a short semester at the end of Semester II. A new intake of graduate students is made during Semester I and Semester 2 of the academic year. The minimum duration of the programme is 1.5 years (3 semesters) and the maximum is 4 years (8 semesters).

All courses offered by the faculty have credits, except for courses which are approved by the University Senate. One (1) credit is equivalent to 14 hours of lectures or 30 hours of practical sessions (project), in a semester. The total number of credits for the Master of Science (Biomedical Engineering) programme is 45 credits.

All students' performance and achievements are assessed formally. Normally, every course is assessed based on the coursework, which constitutes not less than 50% of the overall marks, and a final exam paper, which constitutes another 50%. Coursework can be in the form of homework, quizzes, tests and presentations. A final examination is held at the end of each academic semester. Some courses are only being assessed based on course works only. Students' performance in a course is indicated by the letter grade, generally, the passing grade for any course is a 'B-'. Students who obtained grades lower than 'B-' are considered failed, and are required to repeat the course the following semesters when it is offered. Subject to the Faculty and University's Academic Regulation, students may withdraw from a course within the stipulated period. Other information on academic regulation can be retrieved from UTM website (UTM Academic Regulations).

A student must pass all courses specified in the programme of study and fulfil all the requirements specified for the programme of study set by the Faculty and University in order to be awarded with the Masters degree.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

After gaining 3 to 5 years of work experience, our graduates should have developed into professionals who demonstrate the following competencies :

PEO	PEO STATEMENTS
PEO1	Mastery of knowledge and competency in advanced areas of Biomedical Engineering field.
PEO2	Practice professionalism and high standards of ethical conducts within organization and society.
PEO3	Responsive to changing situations by continuously acquiring new knowledge and skills.

PROGRAMME LEARNING OUTCOMES (PLO)

PLO	PLO STATEMENTS
PLO1 (Knowledge & Understanding)	Synthesize complex information, specialized concepts, theories, methods and practice independently in the field of Biomedical Engineering.
PLO2 (Cognitive Skills)	Solve complex problems critically and integratively using systematic approaches
PLO3 (Practical Skills)	Apply practical skills to solve problems in the field of Biomedical Engineering.
PLO4 (Interpersonal Skills)	Demonstrate effective collaboration with stakeholders professionally.
PLO5 (Communication Skills)	Communicate effectively the knowledge, skills, and ideas using appropriate methods to peers, experts and communities.
PLO6 (Digital Skills)	Use digital technologies and appropriate softwares competently to enhance study and practice.
PLO7 (Numeracy Skills)	Evaluate numerical and graphical data critically using quantitative or qualitative tools in solving problems.
PLO8 (Leadership, Autonomy and Responsibility)	Demonstrate leadership, autonomy and responsibility in managing resources.

PROGRAMME LEARNING OUTCOMES (PLO)

PLO	PLO STATEMENTS
PLO9 (Personal Skills)	Engage self-advancement through continuous learning or professional development.
PLO10 (Entrepreneurial Skills)	Initiate entrepreneurial projects supported by relevant knowledge and skills.
PLO11 (Ethics and Professionalism Skills)	Demonstrate respectable ethical conducts and professionalism skills in an organization and society.

PRISMS

PROGRAM INTEGRASI SARJANA MUDA-SARJANA (4 YEARS BACHELOR DEGREE + 1 YEAR MASTER DEGREE)

PRISMS is a newly introduced programme that integrates undergraduate high-level elective SKEB 5**3 courses with the core courses of the Master degree programme. Under PRISMS, students have an opportunity to complete and receive two degrees which are Bachelor degree and Master degree within 5 years (4+1).

REQUIREMENT

Students who have completed third year second semester courses with a cumulative grade point average (CGPA) of 3.3 and above are eligible to apply for PRISMS. Students can apply using the PRISMS application form and must be recommended by the Academic Advisor, approved by the Program Director, and certified by the Dean of Faculty. Once the application to join PRISMS is approved, students can register for the SE**5**3 courses during the course pre-registration or compulsory registration period.

CREDIT TRANSFER

Students must obtain grade B and above of the high-level elective SKEB 5**3 courses for vertical credit transfer into the Master degree program that students plan to enroll. Maximum unit allowed for the credit transfer is twelve (12) credits.

For more information PRISMS, kindly visit FKE website.

MASTER OF SCIENCE (BIOMEDICAL ENGINEERING)

Biomedical engineering and health sciences is a rapidly growing multidisciplinary field which combines engineering with the principles of biology and medicine to solve problems related to healthcare and the development of medical technologies. It consists a wide range of topics including diagnostic and therapeutic technology, healthcare technology management, biomedical measurement technique, medical informatics, biomedical signal processing, biomechanics, tissue engineering, biomedical fluid mechanics and other related topics. It is an excellent choice for individuals who are interested in using their technical skills to make a positive impact on healthcare and human health.

PROGRAMME SPECIFICATION

The Master of Science (Biomedical Engineering) programme is offered on a full-time, either on campus or off campus (PESISIR) . The on campus programme is offered at UTM Main Campus in Johor Bahru, while the off campus programme is offered at UTM Kuala Lumpur. The duration of study for the full-time programme is subjected to the student's entry qualifications and lasts between one (1.5) years to a maximum of four (4) years.

The programme is offered on full-time basis and is based on a 2-Semester per academic session and the short semester. Generally, students are expected to undertake courses equivalent to between fifteen (15) to eighteen (18) credit hours per semester. Assessment is based on coursework and/or final examinations given throughout the semester.

MODE OF STUDY

Graduate students can pursue an on-campus or off-campus taught course program. On-campus taught course programs are offered at UTM's main campus in Johor Bahru while off-campus programs are available at the UTM Kuala Lumpur campus

- On-campus (PERDANA): The on-campus study requires a minimum duration of 1.5 years (three semesters). The student may register a maximum of twenty (20) credits in the normal semester. The class sessions take place during weekdays. International students on study visa can only register for this mode of study.
- Off-campus (PESISIR): Off-campus study normally takes 2 years (4 normal semesters and one 8-week short semester) to complete. The student may register a maximum of twelve (12) credits in the normal semester and maximum of six (6) credits in short semester. Classes are scheduled on weekends to suit working professionals. Expatriates on working visa and permanent residents may register in this mode of study. All of our Masters programs are accredited by the Malaysian Qualification Agency (MQA).

MASTER OF SCIENCE (BIOMEDICAL ENGINEERING)

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

After having exposed to 3 to 5 years working experience, our graduates should become professionals who demonstrate the following competencies:

PEO	EDUCATIONAL OBJECTIVE
PEO1	Mastery of knowledge and competency in advanced areas of Biomedical Engineering field.
PEO2	Practice professionalism and high standards of ethical conducts within organization and society.
PEO3	Responsive to changing situations by continuously acquiring new knowledge and skills.

PROGRAMME GENERAL INFORMATION

Awarding Institution	Universiti Teknologi Malaysia			
Teaching Institution	Universiti Teknologi Malaysia			
Programme Name	Master of Science (Biomedical Engineering)			
Final Award	Master of Science (Biomedical Engineering)			
Programme Code	MEBC			
Professional or Statutory Body of Accreditation	Malaysian Qualification Agency (MQA)			
Language(s) of Instruction	English and Bahasa Melayu			
Mode of Study	Conventional			
Mode of Operation	Self-govern			
Study Scheme	Full Time / Part Time			
Study Duration	Minimum 1.5 years, Maximum 4 years			
Type of Sem	No of Semester		No of Weeks / Semester	
	Full Time	Part time	Full Time	Part Time
Normal	3	4	18	18
Short	-	1	-	10

COURSE CLASSIFICATION

No	Classification	Credit Hour	Percentage
1	University General Course	3	6.67%
2	Programme General Core	3	6.67%
3	Programme Core	15	33.33%
4	Programme Electives	12	26.67%
5	Master Projects	12	26.67%
TOTAL		45	100%
TOTAL CREDIT HOURS TO GRADUATE		45	

PROGRAMME CORE AND GENERAL CORE (18 CREDITS)

No	Course Code	Course Name	Credit Hour
1	MEBC 0013	Research Methodology in Biomedical Engineering	3
2	MEBC 1003	Biomedical Measurement Technique	3
3	MEBC 1013	Diagnostic and Therapeutic Technology	3
4	MEBC 1023	Advanced Biomedical Engineering	3
5	MEBC 1033	Medical Informatics	3
6	MEBC 1043	Biomechanics	3
TOTAL			18

PROGRAMME ELECTIVES – CHOOSE 4 (12 CREDITS)

No	Course Code	Course Name	Credit Hour
1	MEBC 1053	Anatomy and Physiology for Engineers	3
2	MEBC 1063	Biomedical Fluid Mechanics	3
3	MEBC 1073	Introduction to Biostatistics	3
4	MEBC 1083	Healthcare Technology Management	3
5	MEBC 1093	Medical Imaging and Image Processing	3
6	MEBC 1103	Neuroscience	3
7	MEBC 1113	Pathophysiology	3
8	MEBC 1123	Advanced Biosignal Processing	3
9	MEBC 1143	Rehabilitation Engineering	3
10	MEBC 1153	Cardiovascular Engineering	3
11	MEBC 1163	Tissue Engineering	3
12	MEBC 1183	Biomaterials Characterization and Analysis	3
13	MEBC 1193	Genetic Engineering	3
14	MEBC 1203	Biomedical Electronic System Design	3

MASTER PROJECTS (12 CREDITS)

No	Course Code	Course Name	Credit Hour
1	MEBC 1184	Master Project 1	4
2	MEBC 1198	Master Project 2	8
TOTAL			12

MASTER OF SCIENCE (BIOMEDICAL ENGINEERING) (MEBC)

COURSE MENU

 **OCTOBER INTAKE**

 **MARCH INTAKE**

MEBC COURSE MENU

(OCTOBER INTAKE)

YEAR 1 (SEM 1) : 2024/2025-1

Code	Courses	Credit
MEBC 1003	Biomedical Measurement Technique	3
MEBC 1013	Diagnostic and Therapeutic Technology	3
MEBC 1023	Advanced Biomedical Engineering	3
MEBC 1**3	Elective 1	3
U**S 6**3	University's General Course	3
MEBC 0013	Research Methodology in Biomedical Engineering	3
TOTAL CREDIT HOURS		18

YEAR 1 (SEM 2) : 2024/2025-2

Code	Courses	Credit
MEBC 1033	Medical Informatics	3
MEBC 1043	Biomechanics	3
MEBC 1184	Master Project 1	4
MEBC 1**3	Elective 2	3
MEBC 1**3	Elective 3	3
TOTAL CREDIT HOURS		16

YEAR 2 (SEM 1) : 2025/2026-1

Code	Courses	Credit
MEBC1184	Master Project 2	8
MEBC1**3	Elective 2	3
TOTAL CREDIT HOURS		11

MEBC COURSE MENU

(MARCH INTAKE)

YEAR 1 (SEM 1) : 2024/2025-2		
Code	Courses	Credit
MEBC 1033	Medical Informatics	3
MEBC 1043	Biomechanics	3
MEBC 1**3	Elective 1	3
MEBC 1**3	Elective 2	3
U**S 6**3	University's General Course	3
MEBC 0013	Research Methodology for Biomedical Engineering	3
TOTAL CREDIT HOURS		18
YEAR 1 (SEM 2) : 2025/2026-1		
Code	Courses	Credit
MEBC 1003	Biomedical Measurement Technique	3
MEBC 1013	Diagnostic and Therapeutic Technology	3
MEBC 1023	Advanced Biomedical Engineering	3
MEBC 1**3	Elective 3	3
MEBC 1184	Master Project 1	4
TOTAL CREDIT HOURS		16
YEAR 2 (SEM 1) : 2025/2026-2		
Code	Courses	Credit
MEBC1184	Master Project 2	8
MEBC1**3	Elective 4	3
TOTAL CREDIT HOURS		11

MEBC COURSE MENU (PRISMS)

CREDIT TRANSFER – 9 CREDITS

YEAR 1 (SEMESTER 1)		
Code	Courses	Credit
MEBC 1**3	Core 1	3
MEBC 1**3	Elective 1	3
MEBC 1**3	Elective 2	3
U**S 6**3	University's General Course	3
MEBC 0013	Research Methodology for Biomedical Engineering	3
MEBC 1184	Master Project 1	4
TOTAL CREDIT HOURS		19

YEAR 1 (SEMESTER 2)		
Code	Courses	Credit
MEBC 1**3	Core 2	3
MEBC 1**3	Elective 3	3
MEBC 1**3	Elective 4	3
MEBC 1198	Master Project 2	8
TOTAL CREDIT HOURS		17

TOTAL CREDITS: 19 + 17 + 9 CREDITS TRANSFER = 45

Notes*: This course menu recommendation for PRISMS students is to optimize the potential of master program completion within a year duration.

*Terms and conditions applied

MEBC COURSE MENU (PRISMS)

CREDIT TRANSFER – 12 CREDITS

YEAR 1 (SEMESTER 1)		
Code	Courses	Credit
MEBC 1**3	Core 1	3
MEBC 1**3	Elective 1	3
U**S 6**3	University's General Course	3
MEBC 0013	Research Methodology for Biomedical Engineering	3
MEBC 1184	Master Project 1	4
TOTAL CREDIT HOURS		16

YEAR 1 (SEMESTER 2)		
Code	Courses	Credit
MEBC 1**3	Elective 2	3
MEBC 1**3	Elective 3	3
MEBC 1**3	Elective 4	3
MEBC 1198	Master Project 2	8
TOTAL CREDIT HOURS		17

TOTAL CREDITS: 16 + 17 + 12 CREDITS TRANSFER = 45

Notes*: This course menu recommendation for PRISMS students is to optimize the potential of master program completion within a year duration.

*Terms and condition applied

COURSE SYNOPSIS

CORE	
CODE	SYNOPSIS
MEBC 0013 Research Methodology in Biomedical Engineering	<p>This course covers the general principles of Research Methodology that apply to biomedical engineering and related discipline. It discusses the fundamental process of conducting an academic research. The theoretical and practical aspects of preparing a research proposal presented. Amongst topics that will be covered are introduction to research and its philosophy, problem formulation and research objective, literature review, ethical guideline and plagiarism, referencing tools, research methodology and design, data collection procedures, data analysis, research proposal and thesis preparation, presentation preparation and research management.</p>
MEBC 1003 Biomedical Measurement Technique	<p>This course provides the students a complete exposure of various recording mechanism and biomedical parameters measured for diagnostic application. Also introduces students to design biomedical measurement systems and biomedical instrumentation. The architecture of electronic instruments used to measure physiological parameters is addressed, as well as the analysis of major process functions integrated in these instruments.</p>
MEBC 1013 Diagnostic and Therapeutic Technology	<p>This course is designed to introduce students to Diagnostic and Therapeutic Technology and their respective details on the broad collection of various related equipment. At the end of the course, students are able to describe the diagnostic methods and therapeutic technologies used in growing healthcare fields and be able to design a simple diagnostic/therapeutic method which can be used in healthcare environment, clinical and research.</p>

COURSE SYNOPSIS

CODE	SYNOPSIS
MEBC 1023 Advanced Biomedical Engineering	<p>This course provides the students with the introduction to advanced technologies of biomedical engineering in the field of bioinstrumentation, biophysics, biomaterials and biomechanics. The impact of technologies on clinical research, rehabilitation engineering, and patient care will be dealt along with professional ethics. The course explores techniques for assessing current information practices, determining the information needs of health care providers and patients, developing interventions using biomedical technology and evaluating the impact of those interventions.</p>
MEBC 1033 Medical Informatics	<p>This course introduces and exposes the students to the organisation of biomedical informatics, in terms of fundamentals and applications of biomedical informatics. It ranges from data acquisition, decision-making, cognitive science, computing, system design, standards, and ethics, to Electronic Health Record (EHR), imaging, information management, data retrieval, Patient Care and Monitoring, and Bioinformatics. Basic theory and applications will be exposed through teaching and discussion. Practical work in medical informatics will be introduced as part of individual and group assignments.</p>
MEBC 1043 Biomechanics	<p>This course covers the general principles of Research Methodology that apply to biomedical engineering and related discipline. It discusses the fundamental process of conducting an academic research. The theoretical and practical aspects of preparing a research proposal presented. Amongst topics that will be covered are introduction to research and its philosophy, problem formulation and research objective, literature review, ethical guideline and plagiarism, referencing tools, research methodology and design, data collection procedures, data analysis, research proposal and thesis preparation, presentation preparation and research management.</p>

COURSE SYNOPSIS

ELECTIVES	
CODE	SYNOPSIS
MEBC 1053 Anatomy and Physiology for Engineers	<p>This course provide student with knowledge of Human Anatomy and Physiology with an emphasis on how each system plays a vital role in homeostasis. Each of the major body systems will be covered in detail as well as their relevance in the maintenance of the human body as a unit. Applied experiences will include the common areas that have relation to biomedical course. It will not be as details as in the medical courses, rather than, it will cover the most interesting areas that the biomedical research focus in the current era. The course is designed to prepare students for work in the biomedical fields or research. The course is planned to give a conceptual and some practical insight to the human body and its normal function and to the some of the abnormalities might disturbs the body.</p>
MEBC 1063 Biomedical Fluid Mechanics	<p>This course provides the students with application of the principles of mechanics and engineering techniques which is the fluid mechanics to the biological fluid flow, in particular cardiovascular system. Other system related to biological flow will be explored such as respiratory flow, flow around body, and bird flight mechanism. By the end of the course, student should be able to understand fluid mechanics and its pertinent application to flow in the biological system – cardiovascular system, respiratory system and the likes. Other outcome of this course would be for the student to apply fluid mechanics analysis of human circulation, as well as artificial organs implanted within human body for disease treatment.</p>
MEBC 1073 Introduction to Biostatistics	<p>This course will introduce and teach the application of statistics to biomedical engineering and health care field. The students will be taught the biostatistical principle, concepts, and application of statistical principle in health field as well as biomedical engineering. Lecture topics include descriptive statistics, study design, probability, comparing sample means and proportions, and sample size/power calculations. Student will also be expected to receive lecture and tutorial in computer lab to supplement what they learn into practical application by using statistical package computer software to describe and analyse data.</p>

COURSE SYNOPSIS

CODE	SYNOPSIS
MEBC 1083 Healthcare Technology Management	<p>Healthcare technology management provides an overview of systematic process in which qualified health care professionals, typically clinical engineers, in partnership with other healthcare leaders, plan for and manage health technology assets to achieve the highest quality care at the best cost. It explains the basic concepts of managed care and describes various types of health plan in operation today. This subject will cover the strategic planning as well as technology assessment and facilities planning, proceed with technology procurement and conclude with service or maintenance management. In order to emphasize the healthcare technology in the future hospital systems, subjects on health economics, Malaysian acts and international regulation related to healthcare management are provided.</p>
MEBC 1093 Medical Imaging & Image Processing	<p>A course for exposing students to biomedical imaging and image processing advancements. It focuses on understanding analytical point of view of biomedical imaging modalities technology, starting from signal generation to biomedical applications of various imaging modalities. Image processing technique and the fundamental will be covered. MATLAB will be used extensively for better understanding in solving the biomedical image problem.</p>
MEBC 1103 Neuroscience	<p>The neuroscience course is a comprehensive introduction to the mammalian nervous system, focusing on the structure and function of the human brain. Anatomical, cellular, chemical, physiological, and molecular aspects of neuroscience will be discussed. Topics that will be covered include: neurons and glia, neuroanatomy, action potentials, synaptic transmission, neurotransmitters, sensory systems (vision, hearing, and touch), motor systems, behavioural responses, development, learning and memory, ageing, mental illness, neurodegenerative diseases, and genomics. An inquiry-based approach will be taken to facilitate student learning of the material.</p>

COURSE SYNOPSIS

CODE	SYNOPSIS
<p style="text-align: center;">MEBC 1113</p> <p style="text-align: center;">Pathophysiology</p>	<p>This course provides concepts of physiology of altered health state, specifically, the changes that accompany injury, syndrome or diseases. Clinical features will be described to provide an overview of pathological aspects of common physiological disorders in human body. Discussion on the basis of the illustration of the systemic approach for understanding diseases and rational therapeutic design of their diagnosis/treatment through an engineering approach will be addressed in this course.</p>
<p style="text-align: center;">MEBC 1123</p> <p style="text-align: center;">Advanced Biosignal Processing</p>	<p>This course provides an in-depth exploration of advanced biosignal processing techniques, focusing on the application of computational methods to analyze biological signals. It begins with time-frequency analysis and time series models, laying the groundwork for understanding the dynamics of biosignals. Students will learn univariate methods for analyzing single-channel signals and multivariate methods for dealing with multichannel data, equipping them to handle complex systems.</p>
<p style="text-align: center;">MEBC 1143</p> <p style="text-align: center;">Rehabilitation Engineering</p>	<p>This course will focus on the principles and application of rehabilitation sciences & assistive technology from the rehabilitation engineering perspective. It aims to provide the students with in depth understanding pertaining important issues in rehabilitation engineering and equip students with knowledge and skills for the application of science, technology and engineering to the design and development of assistive (adaptive) technology and rehabilitation systems. It will also provide students with an understanding of the nature of problems confronting people with disabilities and an ability to provide technical solutions for these problems. Interdisciplinary Interaction and teamworking for optimal disability management will be stressed, with emphasis being given to the role of the rehabilitation engineering professional in the team.</p>
<p style="text-align: center;">MEBC 1153</p> <p style="text-align: center;">Cardiovascular Engineering</p>	<p>Cardiovascular Engineering integrates physiology, cell and molecular biology, bioelectricity and biomechanics to describe, understand, and re-engineer the cardiovascular systems. The objective of this course is to provide the students with tools for modelling and understanding of cardiovascular disease development and treatment, and for designing appropriate systems and devices for diagnosis and intervention.</p>

COURSE SYNOPSIS

CODE	SYNOPSIS
MEBC 1163 Tissue Engineering	<p>Tissue engineering integrates the principles of engineering and life sciences towards the fundamental understanding of structure function relationships in normal and pathological tissues. The course will cover the introduction and fundamentals of tissue engineering, extracellular matrix, cells, biomaterials in tissue engineering, scaffold in tissue engineering, in-vitro and in-vivo strategies, clinical applications of tissue engineering and ethical and regulatory issues in tissue engineering.</p>
MEBC 1183 Biomaterials Characterisation and Analysis	<p>This course is intended to expose the students with the most important characterization instruments to analyze the physico-chemical properties of biomaterials. A range of advanced techniques for the materials characterization analysis, including materials composition, surface morphological, thermal, spectroscopy and chromatography analyses are introduced by discussing the basic underlying principle and the analysis procedures. Several case studies and recording data are evaluated and analyzed to improve the student's understanding in selecting types of characterization instruments in analyzing biomaterials. Depending on the availability and functionality of instruments, lab visits and demonstrations will be scheduled following the class.</p>
MEBC 1193 Genetic Engineering	<p>This course will provide students with the recent knowledge of genetic engineering. Participants are given information related to cellular and molecular function and those responsible for DNA transcription and translation processes. Additionally, this course will focus on recombinant DNA technology, DNA manipulation, transgenic animals, and the ethics of genetic engineering. The participants will be equipped with basic emphasis on assembling a gene for expression in a cell. More advanced studies of genes appear in high-level classes and may include subjects such as Mendelian genetics, speciation, and evolutionary genetics. This course also equips the participants with social responsibility and ethics for the development of effective genetic manipulation for beneficial purpose.</p>

Notes: Students from non-engineering background are encouraged to opt for the engineering electives courses that are offered in the semester.

UNIVERSITY'S GENERAL COURSES

All students must enrol in at least one of the University's General Courses as follows:

NEW CODE	COURSES	FACULTY
UBSS6013	ORGANIZATION BEHAVIOR AND DEVELOPMENT	AHIBS KL
UBSS6023	BUSINESS ETHICS, RESPONSIBILITY AND SUSTAINABILTY	AHIBS KL
UHMS6013	SEMINAR ON GLOBAL DEVELOPMENT, ECONOMIC AND SOCIAL ISSUES	SHARP, FSSH
UHMZ6023	MALAYSIAN SOCIETY AND CULTURE	SHARP, FSSH
UHS6013	PHILOSOPHY OF SCIENCE AND CIVILISATION	ATI, FSSH
UHPP6013	DYNAMICS OF LEADERSHIP	SP, FSSH
URTS6013	ENVIRONMENTAL EHICS	FTIR
UECS6013	IT PROJECT MANAGEMENT	FC
UECS6023	INTRODUCTION TO TECHNOPRENEURSHIP	FC
UHLM6013	MALAY LANGUAGE FOR ACADEMIC WRITING	FSSH
UMJJ6013	BASIC JAPANESE LANGUAGE AND CULTURE	MJIIT

Notes: Please refer to the faculty offering the courses for further information

<https://sps.utm.my/academic-related-resources/>

GRADUATION CHECKLIST

It is the responsibility of the students to ensure that all courses are taken and passed. In order to graduate, students must pass all courses in the following checklist. Students who do not complete any of the courses are not eligible to graduate.

NO	CODE	COURSES	CREDIT EARNED	CREDIT COUNTED	TICK (/) IF PASSED
1	MEBC 1003	Biomedical Measurement Technique	3	3	
2	MEBC 1013	Diagnostic and Therapeutic Technology	3	3	
3	MEBC 1023	Advanced Biomedical Engineering	3	3	
4	MEBC 1033	Medical Informatics	3	3	
5	MEBC 1043	Biomechanics	3	3	
6	MEBC 0013	Research Methodology	3	3	
7	MEBC 1**3	Elective 1	3	3	
8	MEBC 1**3	Elective 2	3	3	
9	MEBC 1**3	Elective 3	3	3	
10	MEBC 1**3	Elective 4	3	3	
11	MEBC 1184	Master Project 1	4	4	
12	MEBC 1198	Master Project 2	8	8	

In order to facilitate students mainly from non-engineering backgrounds to benefit in the study program comprehensively, the following courses are recommended to attend.

NO	CODE	COURSES	CREDIT EARNED	CREDIT COUNTED
1	SEBB 3423	Clinical Engineering	3	HS
2	SSCE 1693	Engineering Mathematics 1	3	HS

ACADEMIC PROGRESS

SEMESTER	GPA	CGPA	REMARKS



ACADEMIC STAFF

DEPARTMENT OF BIOMEDICAL ENGINEERING AND HEALTH SCIENCES



DIRECTOR

Assoc. Prof. Ir. Dr. Asnida Abd Wahab
PhD (UTM), MEng (Bristol)

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FOR: Thermography, Medical Imaging, Image Processing, Assistive Device, Artificial Intelligence



UG PROGRAM COORDINATOR

Ts. Dr. Aizreena Azaman

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FOR : Rehabilitation Engineering, Motion Analysis, Biosignal Processing, Bioinstrumentation.



FYP I COORDINATOR

Dr. Mohamad Ikhwan Jamaludin

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FOR : Biomaterials, Tissue Engineering, Biofabrication, 3D Printing



FYP II COORDINATOR

Ts. Dr. Raimi Dewan @ Abdul Rahman

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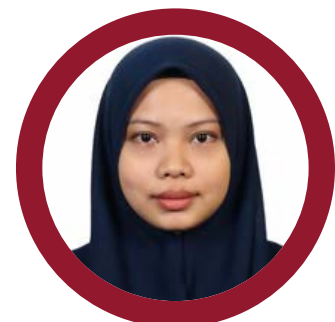
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Revision Notes :

