Republic of Yemen
Minstry of Higher
Education &Sientific Research
21 september University – for Medical and
Applied Science
Faculty of Engineering and Computer

الجمهورية اليمنية
وزارة التعليم العالي والبحث العلمي
جامعة 21 سبتمبر للعلوم الطبية والتطبيقية
كلية الهندسة والحاسوب

21 September University

Biomedical Engineering

Program Specifications

Preparation Committee:

1. Dr. Jamial Ahsan Mujalli
2. Dr. Awadh Ali Alkubati
3. Dr. Abdalruhman Mohemmed Obaid
4. Eng. Maeen Ali Albukhiti

2022

Department Head | Faculty Dean | Quality Unit | President

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1. Program Identification and General Information:		
1	**Scientific name of the program:**	Biomedical Equipment Technology
2	**Total credit hours required to award the degree**	143 Credit Hours
3	**Number of years needed for completion of the program:**	4 Years [8 Academic semesters]
4	**The body responsible for granting the degree:**	21 September for medical and Applied sciences University
5	**The body responsible for the program:**	**Department** of Biomedical Equipment's Technology **Faculty** of Medical Technology
6	**Award granted on completion of the program:**	**Bachelor of Science in** Biomedical Equipment Technology
7	**Study system:**	Regular attendance (Semester based System)
8	**Study Language of the Program:**	English
9	**Entry requirements:**	Secondary School Certificate (Scientific)
10	**Departments participating in the program:**	Department of Biomedical Technology
11	**Starting year of the program:**	2022/2023
12	**Study methods in the program:**	Full time
13	**Location of Delivery:**	Faculty of Medical Technology 21 September for medical and Applied sciences University Campus
14	**The program resources:**	21 September for medical and Applied sciences
15	**Minimum grade requirements:**	Following the Admission Rules made by Ministry of Higher Education and Scientific Research- Republic of Yemen.
16	**Other admission requirements:**	21 Admission and Regulations Rules.
17	**Date of current development of the program:**	Feb 2022
18	**Prepared by:**	1- Dr. Jamial Ahsan Mujalli 2- Dr. Awadh Ali Alkubati 3- Dr. Abdalruhman Mohemmed Obaid 4- Eng. Maeen Ali Albukhiti
19	**Program coordinator:**	1. Dr. Awadh Ali Alkubati

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2. Introduction:

The Bachelor's programme in Biomedical Equipment's Technology (BET) focuses on providing academic education to Bachelor's students to enable them to graduate with knowledge, insight and experience in the integrated and coordinated development of Health processes in organizations and associated information and communication technology support structures. The graduates have thorough understanding and insight into the academic disciplines of Computing and Management, and they are capable of integrating their knowledge and insights. This program is designed to provide students with expertise in the development and use of computer systems and quantitative modeling techniques for solving Health problems and making managerial decisions. Students learn the necessary information technology and computing skills to develop and implement sophisticated Health-related computer systems.

The degree program focuses on the practical application of computing to Health problem-solving. Students develop an academically inquisitive attitude while on the programme, along with thorough technical understanding, insight and experience in the integrated application of their expertise in a design process. Programme graduates are thus capable of working with advanced BET in an academically prudent, ethically sound and socially responsible way, and of contributing to the further development of the field of study. Furthermore, graduates are capable of pursuing a Master's programme to specialize in a particular type of BET system or aspect of the field and/or to gain further experience by conducting scientific research. The design-oriented programme activates and challenges students by focusing on the combination of expertise, quality, creativity and technological developments, thus preparing them for a future in which they continually work on their professional development and apply their expertise appropriately, effectively and with sound professional judgement.

Promising Jobs:

Graduates of the Biomedical Engineering program find employment in the medical device and pharmaceutical industries, as well as in hospitals, research organizations, and government agencies. Alternatively, Biomedical Engineering graduates pursue advanced degrees in fields such as biomedical engineering, engineering management, medicine, dentistry, prosthetics and orthotics, and public health. In general, biomedical engineering graduates can look at opportunities and jobs in the following sectors and industries:

1. Governmental and private hospitals
2. Governmental and private laboratories
3. Various clinics and medical centers
4. Physiotherapy centers and prostheses
5. Ministry of Public Health and Population
6. Specialized scientific and research bodies and centers

3. University Vision, Mission, Values, Objectives, and Goals:

University vision:

A Contemporary University with National Responsibility and Faith Identity

University Mission:

Leadership of transformation/upturning headway in managing and providing the health care with all partners via having the distinction standard in education and applied and medical researches that meet the needs of Yemeni people and regional influence.

University Core values:

- Leadership and Influence
- Excellence and Innovation
- Work effectively with a time

Special University Goals:

1- Ensuring the application of quality standards and having the distinction standards in medical and applied sciences, scientific research and community service.

2- Adopting student-centered learning, the partnership with them for life, consolidating the principles of national responsibility and faith identity, looking after them and developing their capabilities after graduation and during work.

3- Attracting and Eemploying scientists, cadres and talents to gain minds and put an end for the "brain drain" in a way that promotes and ensures the availability of thinkers, businessmen and good citizens.

4- Developing the distinguished academic infrastructure continuously and establishing modern research and service centers with high efficiency that can give a real effect locally and regionally.

5- Enhancing the university status as a preferred partner for local, regional and international partnership through implementing creative styles of education, exchanging researches and knowledge, and providing real and effective outcomes for developing professional practices to benefit from them locally and regionally.

4. Faculty Vision, Mission, Values, and Objectives:

Faculty Vision:

To achieve excellent standard of quality education and internally acknowledged in Medical Technology.

Faculty Mission:

To produce highly qualified Computing professionals in field of healthcare that contribute to the Yemeni and regional knowledge and serve society providing excellent quality education.

Faculty Values:

- Leadership and influence
- Development and innovation
- Professional integrity
- Job commitment and adherence to goals

Faculty Goals:

1- To produce highly qualified students in computing field who fulfill Health care needs.

2- To enhance computing as well as healthcare knowledge and skills in the society.

3- To contribute to the direction and future advancement of the national profile in the global competition and its increase dependency on computing.

4- To display excellent academic quality and relevant to the academic and professional programs that enables students to meet the criteria required by future employers.

5- To extended the innovative application in modern Health computing by providing services to the community.

5. Department Vision, Mission, and Objectives :

Department Vision:

To maintain regionally leading and recognized reputation in the field of Biomedical Equipment's Technology by providing distinguished academic programs and quality education.

Department Mission:

To prepare distinguished and well-qualified graduates who are capable of meeting the market demands

in the field of medical equipment's technology by providing high quality academic programs and appropriate teaching-learning and research environment.

Department Objectives:

1- To provide distinguished and excellent academic programs in field of Medical Technology.

2- To encourage creative and innovative thinking to identify and solve the MT problems to serve the needs of Health organization.

3- To implement acquired knowledge of MT in efficient and effective manner to construct MT solution to solve Health problem in dynamic environment.

4- To acquire skills to communicate and work effectively as an individual or as member in team.

5- To pursue lifelong learning, career development and provide foundation for research and further studies.

6- To encourage graduates to follow appropriate computing practices with professional, societal, legal, and ethical responsibility.

6. Biomedical Equipment's Technology Program Mission and Objectives:

Program Mission:

Providing quality biomedical equipment's technology education to preparing highly competent graduates with a solid biomedical equipment's technology education who can employ engineering principles and methods to develop medical instrumentation, diagnostic and therapeutic devices, and other technologies needed in biology and medicine.

Program Educational Objectives:

PEO1. Prepare qualified graduates possess broad and multidisciplinary education, including problem-solving skills and knowledge of important current issues in biomedical technology.

PEO2. Preparing an Adepted leaders in providing and preparing seminars, trainings and consultations in the field of medical device technology and hospital management and planning.

PEO3. Establishing leaders to lead a transformation in biomedical equipment's technology or interrelated fields of healthcare, academia, and clinical practice.

PEO4. Consolidate the maintenance principles of biomedical devices and continuing professional and educational development by pursuing lifelong learning and becoming successful educators for

the healthcare community.

Annex- 1, Survey on the Strategic Orientations of the Department and Similar Departments, and their Alignment to the Strategic Orientations of the University and Faculty.

7. Program Standards & Benchmarks:

Academic Standards:

1. National Academic Reference Standards (NARS) For Undergraduate Computing Programs, Yemen, First Edition, Council for Accreditation & Quality Assurance, Yemen, May 2018.
2. Accreditation Board for Engineering and Technology (ABET) criteria for accrediting engineering programs 2020 (Computing Program)

Governmental Rules and Regulations:

1. Act No. 13/2005 of the Law of private universities, higher institutes and colleges, Yemen.
2. The executive regulations of Act No. 13/2005 of the Law of private universities, higher institutes and colleges, Yemen.
3. 21 September for medical and Applied sciences University.

Annex- 2, Academic Standards Curriculum Criteria of Accreditation Board

Annex- 3, Unified Regulations for Student Affairs, Ministry of Higher Education and Scientific Research

Program Benchmarks:

1. King Saud University, B.Sc. (Bachelor of Science in Biomedical Technology), College of applied medical sciences , Department of Biomedical Technology - Instruments , KSA https://cams.ksu.edu.sa/en/departments/biomedical-technololgy
2. Majmaah University, B.Sc.(Biomedical Equipment Technology), College of Applied Medical Sciences, Department of Medical Equipment Technology, KSA. https://m.mu.edu.sa/en/colleges/college-of-applied-medical-sciences/173196
3. National University of Singapore, B.Sc.(Bachelor of Biomedical Engineering) , College of Engineering , Department of Biomedical Engineering, Singapore. https://www.eng.nus.edu.sg/bme/undergraduate/degree-programmes/beng-bme/modules/
4. The University of Hong Kong, B.Sc.(Biomedical Engineering), Faculty of Engineering, Department of Biomedical Engineering, China. https://www.engineering.hku.hk/bmeengg/
5. East Tennessee State University , B.Sc.(Biomedical Engineering Technology), College of Business and Technology, Department of Engineering Technology, Surveying, and Digital Media , United States.

https://www.etsu.edu/cbat/applieddesign/biomed.php

6. Eastern Mediterranean University. B.Sc (Biomedical Engineering Technology) college of Computing and Technology, , Department of Biomedical Equipment Technology, Turkey. https://www.emu.edu.tr/en/programs/biomedical-equipment-technology-associate-program-turkish/784

8. Graduate Attributes:

After successfully completing the program, the graduate should be able to:

1. Demonstrate knowledge of biomedical equipment's technology discipline theoretically and practically.
2. Identify biomedical equipment's technology problems and Health requirements using computational approaches, modern information technologies, tools and techniques.
3. Analyze, design and manage computing-based solutions within the context of biomedical equipment's technology discipline to meet the organization's goals and Health objectives.
4. Work effectively within a team or individually in planning, implementing, deploying, configuring, maintaining, and managing practices and technology trends of Health's computing infrastructures.
5. Use efficiently project management, research capability, leadership, communication, interpersonal relationship and life-long learning skills.
6. Demonstrate commitment to ethical, legal, security and social responsibilities as professionals in Health information Technology.

9. Program Intended Learning Outcomes (PILOs):

A. Knowledge and Understanding:

Upon successful completion of the Program, the graduates will be able to:

A1 Demonstrate an understanding of appropriate models, theories, mathematical foundations, and techniques related to Biomedical Equipment's Technology discipline.

A2 Identify user and Healthcare needs to provide BET based solutions to real-world problem.

A3 Demonstrate a profound knowledge in utilizing and adapting BET tools, techniques, practices, and methods for solving biomedical equipment's problems in Health environment.

A4 Demonstrate a sound understanding the biomedical equipment's technology concept related to analysis, design, implementation, and evaluation of Biomedical equipment's system.

B. Cognitive/ Intellectual Skills:

Upon successful completion of the Program, the graduates will be able to:

B1. Critically analyze complex biomedical equipment's problems and propose appropriate biomedical equipment's technology based solutions and integrate them effectively into the uses and organization Health.

B2. Analyze the impacts of biomedical equipment's technology on Health objectives and customer needs, and consider them during the selection, integration, configuration and administration of biomedical equipment's systems.

B3. Explore variety of challenges and problems related to biomedical equipment's technology to select the optimal solution.

B4. Evaluate biomedical equipment's technology based solution to meet a given set of Health requirements in the context of biomedical equipment's technology discipline.

C. Practical and Professional Skills:

Upon successful completion of the Program, the graduates will be able to:

C1. Employ effectively the concepts, principles of engineering, maintenance and evaluation tools, techniques used for the analysis and troubleshooting of medical equipment's faults of varying complexity.

C2. Design, implement, and test an equipment-based solution to meet a given set of engineering requirement in the context of biomedical equipment's technology.

C3. Use systematic approaches to select, develop, apply integrates, and administrate maintenance of biomedical equipment's technologies to accomplish user and Health goals.

C4. Use current techniques, skills, and tools necessary for biomedical equipment's maintenance practices.

D. General and Transferable Skills:

Upon successful completion of the Program, the graduates will be able to:

D1. Function effectively as an individual, as a member, or leader of a team engaged in activities appropriate to the biomedical equipment's technology discipline to accomplish a common goal.

D2. Commit to professional ethics, responsibilities, and norms of professional biomedical equipment's technology practices.

D3. Communicate effectively in writing and orally in a variety of professional contexts.

D4. Engage in continuing professional development and lifelong learning as an biomedical equipment's technology professional.

Annex- 4, Survey of Similar Accredited Programs at National and International Universities (Benchmarks)

#	The Academic Program	The University	The Faculty	The Department	The Country	Program Accrediting Body
Current Program	Health Information Technology	21 September for medical and Applied sciences University	Medical Technology	Biomedical Technology	Yemen	Under Accreditation
The 1st Program	Biomedical Technology - Instruments	King Saud University	College of applied medical sciences	Biomedical Technology	KSA	ABET
The 2nd Program	Biomedical Equipment Technology	Majmaah University	College of Applied Medical Sciences	Medical Equipment Technology	KSA	ABET
The 3rd Program	Biomedical Engineering	National University of Singapore	Engineering	Biomedical Engineering	Singapore	EAB , ABET
The 4th Program	Biomedical Engineering	The University of Hong Kong	Engineering	Biomedical Engineering	China	ABET
The 5th Program	Biomedical Engineering Technology	East Tennessee State University	Business and Technology	Engineering Technology, Surveying, and Digital Media	USA	ABET
The 6th Program	Biomedical Equipment Technology	Eastern Mediterranean University	School of Computing and Technology	Biomedical Equipment Technology	Turkey	Euro-Inf Label , ASIIN accreditation

Annex- 5, Survey on Mission and Objectives of the Program and Similar Accredited Programs and its Alignment to the University, Faculty, and Department Missions and

Annex- 6, Alignment of Program Intended Learning Outcomes (PILOs) to the Faculty Objective

Annex- 8, Alignment of Program Intended Learning Outcomes (PILOS) to Program Objectives (POs)

Annex- 9, Mapping of Program Objectives to the Faculty Mission

Annex- 10, Mapping Program Objectives to the Department Mission

Annex- 11, Mapping of Program Objectives (POs) to the Department Objectives

Annex- 12, Survey of PILOs for Similar Accredited Programs at National and International Universities.

10. Teaching and Learning Strategies:

Students gain practical skills through laboratory work and range of exercises undertaken in lectures, seminars and workshops.

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Teaching Strategy	Description
Active lectures	The lectures are conducted in the class. It are provided on a weekly basis. It also showing students what they need to know, the teacher incorporates a variety of formats including lectures and multimedia presentations.
Problem solving	This allows students to become more active in their learning as they work out which information they need to find out how to solve a particular problem.
Tutorials	Some courses need to have tutorial sessions to solve problems related to the subjects. The students exchange their knowledge with the teacher.
Seminar/ Project/Presentation	Assigned project is given to student and she/he must give a seminar to present her/his project.
Teamwork	The students are assigned to work in a small group as a team on some subjects.
Laboratory based session	Laboratory based sessions are required for some courses to balance between theoretical and practical issues.
Interactive Class Discussions	Interactive class discussions are carried out about some aspects, related to the subject. It involves a large or small group activity that encourages students to focus on a topic and contribute to the free flow of ideas. The teacher may begin a brainstorming session by posing a question or a problem, or by introducing a topic. Students then express possible answers, relevant words and ideas
Directed Self- Study	The student should be directed to some related references to read and summarize some.
Exercises and Home Works	Exercises and home works are assigned to students periodically, so the students will gain more knowledge about the subjects.
Art Gallery	The students are assigned to show their work individually or in groups to visitor.
Drawing Sessions	The students are assigned to work individual in the drawing halls.
Field Visits	The students are assigned to perform a site visit to acquire field related information.

11. Assessment Methods:

- Coursework Activities
- Written tests
- Written assessments such as multiple-choice questions and Quizzes
- Report/Project/ Practical Lab Sessions
- Home works and assignments.
- Presentations

Assessment Strategy	Description
Written exams (Midterm and final exams)	Midterm & Final exams for each course is required for all courses except Graduation Projects. These exams will evaluate the extent in which the student

Assessment Strategy	Description
	understanding of theoretical and applied subjects
Case studies	Assigning case studies to students is very helpful to assess the extent of understanding the topics.
Presentations	It's an assessment of the ability of organizing and the way of presentation.
Project/ Practical Lab/ Reports	Assessing students to their ability to write theoretical and lab reports as well as the understanding of organizing the reports. The practical lab sessions are required for some courses.
Coursework Activities	Coursework Activities is one of the assessment methods by which it can evaluate students.
Homework's	Home works and assignments will evaluate students according to their ability to explain and illustrate the assignments they are given.
Written assignments such as multiple choice questions, quizzes or drawings	Some points are assigned to multiple choice questions and Quizzes in order to asses' student ability to follow the lecturer during the study course.

12. Alignment of Program Intended Learning Outcomes (PILOs) to Teaching Strategies and Assessment Methods:

PILOs	Teaching Strategy	Assessment Methods
Knowledge and Understanding	Lectures, Interactive class discussions, Tutorials.	Written exams, assignment work, quizzes, submission of reports.
Intellectual Skills	Lectures, Tutorial, Interactive class discussions, and group work, presentation.	Written exams, Project, Case studies and assignment work.
Professional & practical skills	Short lectures, case study, Laboratory experiments, Project, and group work, Field training, Drawing sessions.	Written exams, quizzes, Practical exam assignment and report submission.
General & Transferable Skills	Group work, Self-study, Interactive class discussions, Tutorials, Seminar/ project/presentation, Laboratory experiments, Project, and Art Gallery	Project presentation, Laboratory exam, Report/Project

13. Project Assessment:

Each project will be assessed by a committee of three members as follows:

Item	Marks Distribution
Project supervisor	60%
Internal examiner: a member of the department staff.	20%
External examiner: a qualified external examiner (either from other departments of the faculty or from another university)	20%

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Total	100%

14. Training Course Assessment:

The training course will be assessed through:

Item	Assessment	Mark
Field Training	Weekly Report from the student	2 marks per report (24marks)
	Training partner reports	20 marks
	Final report from the student	16 marks
	Final Presentation from the students	40 marks
Total		**100%**

15. Intended Learning Outcomes Mapping:

See below Annexes.

Annex- 13, Alignment of Program PILOs with Council of Accreditation and Standards
Annex- 14, Survey of Credit Hours of Similar Programs

16. Program Structure:

No	Requirements		No. of Courses	Credit Hours	Rational Weight %
1	University Requirements	Compulsory	7	14	٩.٧٩%
		Elective	--	--	
2	Faculty Requirements	Compulsory	١١	٢٣	١٦,٠٨. %
		Elective	--	--	
3	Department Requirements	Compulsory	١٥	٣٦	٢٥.١٧%
		Elective	--	--	
4	Program Requirements	Compulsory	٢٧	٦٤	٤٤.٧٦%
		Elective			
5	Field Training	Compulsory	1	6	4.٢%
		Elective	--	--	
	Total:		٦١	١٤٣	100.00%

* The Project Courses Credit Hours are already added to the total credit hours with the faculty requirements.

16.1. University Requirements

Compulsory Courses

No.	Level-Sem.	Course Code	Course Name	اسم المقرر	Cr. Hrs.	L	T	P	Prerequisites, Co-requisites
1.	1/1	06.11.701	Arabic 101	لغة انجليزية ١٠١	2	2			
2.	1/1	06.11.703	English 101	لغة عربية ١٠١	2	2			
3.	1/1	06.11.705	Islamic Culture	ثقافة اسلامية	2	2			
4.	1/1	06.11.706	National Culture	ثقافة وطنية	2	2			
5.	1/2	06.11.704	English 102	لغة انجليزية ١٠٢	2	2			06.11.503
6.	1/2	06.11.702	Arabic 102	لغة عربية ١٠٢	2	2			06.11.501
7.	1/2	06.11.707	Arabic Israeli Conflict	الصراح العربي الإسرائيلي	2	2			
Total					14	14			

Elective Courses: None

16.2. Faculty Requirements

Compulsory Courses

No.	Level/Sem.	Course Code	Course Name	Cr. Hrs.	L	T	P	Prerequisites, Co-requisites
1.	Level 1/ semester 1	04.01.701	Fundamentals of Nursing اساسيات التمريض	2	2			

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2.	Level 1/ semester 1	04.02.702	Medical Terminology مصطلحات طبية	2	2			
3.	Level 1/ semester 2	05.01.703	Principle of Health Management مبادئ الادارة الصحية	2	2			
4.	Level 1/ semester 2	01.01.704	Anatomy and Physiology علم التشريح ووظائف الأعضاء	2	2			
5.	Level 2/ semester 1	05.02.705	Communication skills and Presentation مهارات الاتصال	2	2			
6.	Level 2/ semester 1	05.02.706	Biostatistics الاحصاء الحيوي	3	2		1	
7.	Level 2/ semester 1	03.01.707	Fundamentals of Microbiology علم الوبائيات الدقيقة	2	2			
8.	Level 2/ semester 2	05.01.708	Principles of Marketing مبادئ التسويق	2	2			
9.	Level 3/ semester 1	05.01.709	Total Quality Management ادارة الجودة الشاملة	2	2			
10.	Level 3/ semester 2	05.02.710	Research methodology اساليب البحث العلمي	2	2			
11.	Level 4/ semester 2	05.02.711	Occupational Ethics اخلاقيات مهنية	2	2			
Total				**٢٣**	**٢٢**		**1**	

Elective Courses: None

16.3. Department Requirements

Compulsory Courses

No.	Level/Sem.	Course Code	Course Name	Cr. Hrs.	L	T	P	Prerequisites, Co-requisites
1.	1/1	07.02.711	Math 1 رياضيات ١	2	2			
2.		07.02.712	Computer principles and programming اساسيات الحاسوب والبرمجة	٣	٢		١	
3.	1/2	07.02.713	Math ٢ رياضيات ٢	2	2			
4.	2/1	07.02.714	Programming 2 برمجة ٢	2	2			
5.	1/2	07.02.715	Math 3 رياضيات ٣	3	2		1	
6.	2/1	07.02.716	Object-Oriented Programming برمجة هدفية موجهة	3	2		1	
7.	2/1	07.02.717	Computer Network شبكات الحاسوب	3	2		1	

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8.	2/2	07.02.718	Operating System نظم التشغيل	2	2			
9.	2/2	07.02.719	Advanced Programming برمجة متقدمة	2	2			
10.	3/1	07.02.720	System Analysis and Design تحليل وتصميم النظم	3	2		1	
11.	3/1	07.02.721	Software Engineering هندسة برمجيات	2	2			
12.	4/1	07.02.722	Mobile Application Development تطوير تطبيقات الأجهزة المتنقلة	3	2		1	
13.	4/1	07.02.723	Artificial Intelligent ذكاء اصطناعي	٢	2			
14.	4/2	07.02.724	Entrepreneurship ريادة أعمال	2	2			
15.	4/2	07.02.725	Machine Learning تعليم الآلة	2	2			
Total				٣٦	٣٠		٦	

Elective Courses: None

16.4 Program Major

Compulsory Courses

No.	Level-Sem.	Course Code	Course Name	Cr. Hrs.	L	T	P	Prerequisites, Co-requisites
1.	1/1	07.01.711	Introduction to Biomedical Equipment's Technology مقدمة الى تكنولوجيا الأجهزة الطبية	2	2			
2.	1/2	07.01.712	Physics فيزياء	2	2			
3.	2/1	07.01.713	Electrical Circuits ١ دوائر كهربائية ١	3	2		1	
4.	2/1	07.01.714	Digital Logic Design التصميم المنطقي الرقمي	٢	٢			
5.	2/2	07.01.715	Engineering Drawing رسم هندسي	3	2		1	
6.	2/2	07.01.716	Electrical Circuits 2 دوائر كهربائية ٢	3	2		1	
7.	2/2	07.01.717	Biomedical Measurements and Instrumentations القياسات واجهزة القياس الطبية	2	2			
8.	2/2	07.01.718	Statics ستاتيكا	2	2			

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No.	Level-Sem.	Course Code	Course Name	Cr. Hrs.	L	T	P	Prerequisites, Co-requisites
9.	2/2	07.01.719	Dynamics ديناميكا	2	2			
10.	2/2	07.01.720	Special Topics on Biomedical Equipment's Technology موضوعات خاصة عن تكنولوجيا المعدات الطبية الحيوية	3	2		1	
11.	3/1	07.01.721	Biomedical Electronics 1 الكترونيات طبية ١	٣	2		١	
12.	3/1	07.01.722	Biomedical Equipment's 1 أجهزة طبية ١	٢	2			
13.	3/1	07.01.723	Biomaterials المواد الحيوية	٢	٢			
14.	3/1	07.01.724	Biomechanics ميكانيكا حيوية	2	2			
15.	3/2	07.01.725	Biomedical Electronics 2 الكترونيات طبية ٢	2	2			
16.	3/2	07.01.726	Biomedical Equipment's 2 أجهزة طبية ٢	٣	2		١	
17.	3/2	07.01.727	Biomedical signals processing معالجة الإشارات الطبية الحيوية	٣	٢		١	
18.	3/2	07.01.728	Microcontroller and Microprocessor معالجات ومتحكمات دقيقة	٣	٢		١	
19.	3/2	07.01.729	Rehabilitation Procedures إجراءات إعادة التأهيل	٢	٢			
20.	3/2	07.01.730	Clinical Engineering هندسة اكلينيكية	٢	٢			
21.	4/1	07.01.731	Biomedical Equipment's Maintenance and Management 1 صيانة وإدارة الأجهزة والمعدات الطبية ١	٣	٢		١	
22.	4/1	07.01.732	Safety for Biomedical Equipment's Technology Specialists السلامة المهنية	٢	٢			
23.	4/1	07.01.733	Artificial Organs and Extremities اعضاء واطراف صناعية	٢	٢			
24.	4/1	07.01.734	Project 1 مشروع تخرج ٢	٢	٢			
25.	4/2	07.01.735	Project 2 مشروع تخرج ٢	٣	٢		١	
26.	4/2	07.01.736	Biomedical Equipment's Maintenance and Management ٢	٢	٢			

No.	Level-Sem.	Course Code	Course Name	Cr. Hrs.	L	T	P	Prerequisites, Co-requisites
			صيانة وإدارة الأجهزة والمعدات الطبية ٢					
27.	4/2	07.01.737	Special studies (Seminars and Case Study) in Biomedical Equipment Technology دراسات متخصصة (دراسة حالة وسمنارات)	٢	٢			
Total				٦٤	٥٣	**0**	١٢	

Field Attachments and Training Courses								
No	**Level-Sem.**	**Course Code**	**Course Name**	**Cr. Hrs.**	**L**	**T**	**P**	**Prerequisites, Co-requisites**
1	4/2		Field Training	6				
Total				**6**				

Project Work Courses								
No	**Level-Sem.**	**Course Code**	**Course Name**	**Cr. Hrs.**	**L**	**T**	**P**	**Prerequisites, Co-requisites**
2	4/2	07.11.1052	Project	2				
Total				**2**				

16.4 Study Plan:

Level 1

Term 1							
No.	Course Code	Course Name	L	T	P	Cr. Hrs.	Prerequisites, Co-requisites
1	06.11.701	English 101 لغة انجليزية ١٠١	2			2	-
2	06.11.703	Arabic 101 لغة عربية ١٠١	2			2	-
3	06.11.705	Islamic Culture ثقافة اسلامية	2			2	-
4	06.11.706	National Culture ثقافة وطنية	2			2	-
5	04.01.701	Fundamentals of Nursing اساسيات التمريض	2			2	-
6	04.02.702	Medical Terminology مصطلحات طبية	2			2	-
7	07.02.711	Math 1 رياضيات ١	2			2	-
8	07.02.711	Introduction to Biomedical Equipment's Technology مقدمة الى تكنولوجيا الأجهزة الطبية	2			2	
٩	07.02.712	Computer principles and programming اساسيات الحاسوب والبرمجة	٢		١	٣	
			١٨		١	١٩	

Term 2							
No.	Course Code	Course Name	L	T	P	Cr. Hrs.	Prerequisites, Co-requisites
1	06.11.704	English 102 لغة انجليزية ١٠٢	2			2	06.11.503
2	06.11.702	Arabic 102 لغة عربية ١٠٢	2			2	06.11.501
3	06.11.707	Arabic Israeli Conflict الصراع العربي الإسرائيلي	2			2	-
4	05.01.703	Principle of Health Management مبادئ الادارة الصحية	2			2	-
5	01.01.704	Anatomy and Physiology علم التشريح ووظائف الأعضاء	2			2	-
6	05.02.705	Communication skills and Presentation مهارات الاتصال	2			٢	-
7	07.02.713	Math ٢ رياضيات ٢	2			2	-

8	07.02.714	Programming 2 برمجة ٢	2		١	٣	
٩	07.02.712	Physics فيزياء	2			2	
			١٨		**1**	١٩	

Level 2

Term 1							
No.	Course Code	Course Name	L	T	P	Cr. Hrs.	Prerequisites, Co-requisites
1	07.02.713	Electrical Circuits ١ دوائر كهربائية ١	2		1	3	
2	05.02.706	Biostatistics الاحصاء الحيوي	2			2	
3	03.01.707	Fundamentals of Microbiology علم الوبائيات الدقيقة	2		1	3	
4	07.02.715	Math 3 رياضيات ٣	2			2	
5	07.02.714	Digital Logic Design التصميم المنطقي الرقمي	2		١	2	
6	07.02.716	Object-Oriented Programming برمجة هدفية موجهة	2		١	٣	
7	07.02.715	Engineering Drawing رسم هندسي	٢			2	
8	07.02.717	Computer Network شبكات الحاسوب	2		1	3	
			١٦		٥	٢١	

Term 2							
No.	Course Code	Course Name	L	T	P	Cr. Hrs.	Prerequisites, Co-requisites
1	07.02.716	Electrical Circuits 2 دوائر كهربائية ٢	2		١	٣	
2	07.02.717	Biomedical Measurements and Instrumentations القياسات واجهزة القياس الطبية	2		١	٣	
3	07.02.718	Statics ستاتيكا	2			٢	
4	07.02.719	Dynamics ديناميكا	٢			2	
5	05.01.708	Principles of Marketing مبادئ التسويق	2			٢	
6	07.02.720	Special Topics on Biomedical Equipment's Technology	2			٢	

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		موضوعات خاصة عن تكنولوجيا المعدات الطبية الحيوية					
7	07.02.718	Operating System نظم التشغيل	2			2	
8	07.02.719	Advanced Programming برمجة متقدمة	2			2	
			١٦		٢	١٨	

Level 3

Term 1							
No.	Course Code	Course Name	L	T	P	Cr. Hrs.	Prerequisites, Co-requisites
1	07.02.721	Biomedical Electronics 1 الكترونيات طبية ١	2		١	٣	
2	05.01.709	Total Quality Management ادارة الجودة الشاملة	2			2	
3	07.02.722	Biomedical Equipment's 1 أجهزة طبية ١	2			٢	
4	07.02.720	System Analysis and Design تحليل وتصميم النظم	2		١	٣	
5	07.02.721	Software Engineering هندسة برمجيات	2			2	
6	07.02.723	Biomaterials المواد الحيوية	2			٢	
7	07.02.724	Biomechanics ميكانيكا حيوية	2			2	
			١٤		**2**	١٦	

Term 2							
No	Course Code	Course Name	L	T	P	Cr. Hrs.	Prerequisites, Co-requisites
1	07.02.725	Biomedical Electronics 2 الكترونيات طبية ٢	2		1	3	
2	07.02.726	Biomedical Equipment's 2 أجهزة طبية ٢	2			٢	
3	07.02.727	Biomedical signals processing معالجة الإشارات الطبية الحيوية	2		١	٣	
4	07.02.728	Microcontroller and Microprocessor معالجات ومتحكمات دقيقة	2		١	٣	
5	07.02.729	Rehabilitation Procedures إجراءات إعادة التأهيل	2			٢	
6	07.02.730	Clinical Engineering	2			2	

		هندسة اكلينيكية					
7	05.02.710	Research methodology اساليب البحث العلمي	2			٢	
			14		٣	١٧	

Level 4

Term 1							
No.	Course Code	Course Name	L	T	P	Cr. Hrs.	Prerequisites, Co-requisites
1	07.02.722	Mobile Application Development تطوير تطبيقات الأجهزة المتنقلة	2		١	٣	-
2	07.02.731	Biomedical Equipment's Maintenance and Management 1 صيانة وإدارة الأجهزة والمعدات الطبية ١	2		1	3	
3	07.02.732	Safety for Biomedical Equipment's Technology Specialists السلامة المهينة	2			2	
4	07.02.723	Artificial Intelligent ذكاء اصطناعي	٢			2	
5	07.02.733	Artificial Organs and Extremities اعضاء واطراف صناعية	2			2	
6	07.02.734	Project 1 مشروع تخرج ٢	2			2	
			١٢		٢	١٤	

Term 2							
No.	Course Code	Course Name	L	T	P	Cr. Hrs.	Prerequisites, Co-requisites
1	07.02.735	Project 2 مشروع تخرج ٢	2			2	
2	07.02.736	Biomedical Equipment's Maintenance and Management ٢ صيانة وإدارة الأجهزة والمعدات الطبية ٢	٢		١	٣	
3	07.02.724	Entrepreneurship ريادة أعمال	2			2	
4	07.02.737	Special studies (Seminars and Case Study) in Biomedical Equipment Technology دراسات متخصصة (دراسة حالة وسمنارات)	٢			2	
5	07.02.725	Machine Learning	2			2	

		تعليم الآلة					
6	05.02.711	Occupational Ethics اخلاقيات مهنية	2			2	
			١٢		١	١٣	

Term 2							
No.	Course Code	Course Name	L	T	P	Cr. Hrs.	Prerequisites, Co-requisites
1	07.11.1053	Field Training				6	-
						6	

16.5 Distribution of Total Credit Hours:

Level	Term	University Requirements		Faculty Requirements		Department Requirements		Program Requirements		Elective Courses		Training		Project		Total Cr. Hrs.		Total Cr. Hrs./ Level
		No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	
First	First	4	8	2	4	٢	٥	١	٢	-	-	-	-	-	-	٩	١٩	٢٦,٥٧%
	Second	3	6	٣	٦	٢	٥	١	٢	-	-	-	-	-	-	٩	١٩	
Second	First	-	-	٢	٥	٣	٨	٣	٨	-	-	-	-	-	-	٨	٢١	٢٧,٢٧%
	Second	-	-	١	٢	٢	٤	٥	١٢	-	-	-	-	-	-	8	١٨	
Third	First	-	-	١	٢	٢	٥	٤	٩	-	-	-	-	-	-	٧	١٦	٢٣,٠٨%
	Second	-	-	١	٢	-	-	٦	١٥	-	-	-	-	-	-	٧	١٧	
Fourth	First	-	-	--	-	٢	٥	٣	٧	-	-	-	-	-	-	٥	١٢	٢٣,٠٨%
	Second	-	-	1	2	٢	٤	٢	٥	-	-	1	6	٢	٤	٨	٢١	
Total:		7	14	١١	٢٣	١٥	٣٤	٢٥	٦٢	-	-	1	6	٢	٤	--	١٤٣	
Percentage:		١١,٤٨ %		١٨,٠٣ %		٢٤,٥٩%		٤٠,٩٨%		٠%		١,٦٤ %		٣,٢٨%		100%		

Annex- 15, Survey of Number of Courses and Credit Hours of Similar Programs

Annex- 16, Themes of Courses of Study and their Weightage

Annex- 17, Coding System

Annex- 18, Survey of Course Names per Academic Semesters of Similar Program

Annex- 19, Comparison of Program Courses and Similar Programs Courses

Annex- 20, Matrix of Mapping Program PILO's with Courses

Department Head Faculty Dean Quality Unit President

16.6 Admission Requirements:

1. Admissions to the program shall be made as per the admission rules set by the Ministry of Higher Education and Scientific Research as well as IUTT admission guidelines.
2. General Secondary school certificate (Science Section) or any equivalent certificate with grade as specified in the admission rules made by Ministry of Higher Education and Scientific Research.
3. Pass the aptitude test and personal interview if any.
4. Any necessary requirement for specialization, decided by the Faculty.

16.7 Attendance and Graduation Requirements:

1. Student attendance should not be less than 75%.
2. Student will graduate after successfully passing all program requirements.
3. Total credit hours for the program are **133** credit hours**.**
4. Minimum score for any student to pass any credit hours course is 50% marks.

16.8 Grading System:

From 90% to 100% of total marks	Excellent
From 80% to less than 90%	Very Good
From 65% to less than 80%	Good
From 50% to less than 65%	Pass
Less than 50%	Poor/Fail

16.9 Facilities Required for Running the Program:

1. Sufficient Classrooms furnished with all necessary pieces and equipment.
2. Drawing halls.
3. Library and study room
4. Computer Labs.
5. Audio Studio.
6. Photography and Video Studio.
7. Academic and administrative staff offices.
8. Internet.

16.10 Program Assessment:

	Type of the Sample who Assess the program	Instruments used	Sample
1	**Graduates**	**Questionnaire**	20%
2	**Academic Staff**	**Interviews**	100%
3	**Employment agencies (views)**	**Questionnaires**	50%
4	**Final year students**	**Focus group discussions**	20%
5	**External Examiners**	**Interviews**	100%
6	**Others CAQA**	**Interviews/ Documents analysis**	100%

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16.11 Program Quality Standards:

16.12 Internal and external training to satisfy program standards:

16.13 Program Policies:

Based on University Regulations

1.	**(Class Attendance):** A student should attend not less than 75 % of total hours of the subject; otherwise, he/she will not be able to take the exam and will be considered as exam failure. If the student is absent due to illness, he/she should bring a proof statement from university Clinic. If the absent is more than 25% of a course total contact hour, student will be required to retake the entire course again.
2.	**(Tardy) :** For late in attending the class, the student will be initially notified. If he repeated lateness in attending class, he/she will be considered as absent.
3.	**(Exam Attendance/Punctuality) :** A student should attend the exam on time. He/she is permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and he/she will be considered as absent in exam.
4.	**(Assignments & Projects) :** Assignments and projects are given as per course specification; the student has to submit all the assignments for checking on time, mostly one week after given the assignment.
5.	**(Cheating) :** For cheating in exam, a student will be considered as fail. In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty.
6.	**(Plagiarism) :** Plagiarism is the attending of a student the exam of a course instead of another student. If the examination committee proofed a plagiarism of a student, he/she will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Council Affair of the university or according to the university roles.
7.	**(Other policies) :** - Mobile phones are not allowed to use during a class lecture. It must be closed; otherwise the student will be asked to leave the lecture room. - Mobile phones are not allowed in class during the examination. - Lecture notes and assignments might be given directly to students using soft or hard copy.

Annex- 1, Survey on the Strategic Orientations of the Department and Similar Departments, and their Alignment to the Strategic Orientations of the University and Faculty:

Benchmarked Programs:

1. King Saud University, B.Sc. (Bachelor of Science in Biomedical Technology), College of applied medical sciences , Department of Biomedical Technology - Instruments , KSA
   https://cams.ksu.edu.sa/en/departments/biomedical-technololgy
2. Majmaah University, B.Sc.(Biomedical Equipment Technology), College of Applied Medical Sciences, Department of Medical Equipment Technology, KSA.
   https://m.mu.edu.sa/en/colleges/college-of-applied-medical-sciences/173196
3. National University of Singapore, B.Sc.(Bachelor of Biomedical Engineering) , College of Engineering , Department of Biomedical Engineering, Singapore.
   https://www.eng.nus.edu.sg/bme/undergraduate/degree-programmes/beng-bme/modules/
4. The University of Hong Kong, B.Sc.(Biomedical Engineering), Faculty of Engineering, Department of Biomedical Engineering, China.
   https://www.engineering.hku.hk/bmeengg/

5. East Tennessee State University , B.Sc.(Biomedical Engineering Technology), College of Business and Technology, Department of Engineering Technology, Surveying, and Digital Media , United States.
   https://www.etsu.edu/cbat/applieddesign/biomed.php

6. Eastern Mediterranean University. B.Sc (Biomedical Engineering Technology) college of Computing and Technology, , Department of Biomedical Equipment Technology, Turkey.
   https://www.emu.edu.tr/en/programs/biomedical-equipment-technology-associate-program-turkish/784

Annex- 1, Survey on the Strategic Orientations of the Department and Similar Departments, and their Alignment to the Strategic Orientation of the University and Faculty:

Department Head	Faculty Dean	Quality Unit	President

Vision of the Corresponding Departments and Suggested Vision:

#	The Department	Vision
1.	**Faculty of Medical Information Technology (FMIT)**	Pioneering and Excellence in preparing competent professional in the field of Biomedical Equipment Technology
2.	**Department Health Information Technology**	The department vision is compatible with the Saudi Arabian missions, where it's focused on the creativity and innovation in teaching medical devices technology to establish local and national partnership and to contribute to scientific research internationally.
3.	**Department of Computer and Information Technology**	A leading biomedical engineering department advancing knowledge and nurturing talent
4.	**Department of Health Information Management**	To train a new generation of biomedical engineers who can apply quantitative engineering analysis to understand the working principle of living systems, and design novel solutions to address unmet needs in biomedicine, especially for healthy ageing.
5.	**- Department Health Information Systems**	Developing a knowledge of modern electronics and biomedical instrumentation
6.	**Department of Applied Health Sciences**	To create world-class graduates to meet the 21st century needs of biomedical-related industries focused on patient care via medical devices and pharmaceuticals, as well as government and private consulting practice – all founded on a strong science and engineering education.

Annex- 1, Survey on the Strategic Orientations of the Department and Similar Departments, and their Alignment to the Strategic Orientation of the University and Faculty:

Department Head Faculty Dean Quality Unit President

1- Mapping of Department Vision to the University and Faculty Visions:

University Vision	Faculty of Medical Technology	Department of Biomedical Technology Vision
A Contemporary University with National Responsibility and Faith Identity	To achieve excellent standard of quality education and internally acknowledged in medical technology.	To maintain regionally leading and recognized reputation in the field of biomedical technology by providing distinguished academic programs and quality education.

2- Mission of the Corresponding Departments and Suggested Mission:

#	The Department	Mission
1.	Department of Biomedical Technology - Instruments	Preparing highly competent graduates in the field of Biomedical Equipment Technology to support the health care sector, to serve the community, and contribute towards the knowledge-based economy.
2.	Department of Medical Equipment Technology	The department Mission is to qualify distinctive and innovative competencies scientifically, skillfully and behaviorally in the field of medical equipment technology and to provide community services through an advanced academic environment.
3.	Department of Biomedical Engineering	• To provide quality biomedical engineering education through integration of engineering with the biomedical sciences.

Annex- 1, Survey on the Strategic Orientations of the Department and Similar Departments, and their Alignment to the Strategic Orientation of the University and Faculty:

Department Head Faculty Dean Quality Unit President

#	The Department	Mission
		• To foster new knowledge and achieve leadership in biomedical engineering research, the development of novel technologies and innovative applications.
4.	Department of Biomedical Engineering	To provide world-class biomedical engineering education to students who can employ engineering principles and methods to develop medical instrumentation, biomaterials, diagnostic and therapeutic devices, and other technologies needed in biology and medicine, and also to discover principles governing the functioning and structure of living systems.
5.	Engineering Technology, Surveying, and Digital Media	To enable the student to carry out the responsibilities and duties of a Biomedical Engineering Technologist
6.	Department of Biomedical Equipment Technology	To bring up well-qualified and highly-motivated intermediate workforce equipped with theoretical and practical information, possessing the skills to use computers and technology effectively when needed, following the new developments in their area of profession, communicating in a foreign language, easily adapting to changes, effectively working in a team, possessing cultural awareness and professional ethics in catering for the demand from the hospitals and health institutions both in Turkey and the TRNC.

Annex- 1, Survey on the Strategic Orientations of the Department and Similar Departments, and their Alignment to the Strategic Orientation of the University and Faculty:

Department Head Faculty Dean Quality Unit President

3- Mapping of Department Mission to the University and Faculty Missions:

University Mission	Faculty of Medical Technology Mission	Department of Biomedical Technology
21 Leadership of transformation/upturning headway in managing and providing the health care with all partners via having the distinction standard in education and applied and medical researches that meet the needs of Yemeni people and regional influence	To produce highly qualified Computing professionals that contribute to the world knowledge and serve society needs by providing excellent quality education.	To prepare distinguished and well-qualified graduates who are capable of meeting the market demands in the field of medical technology by providing high quality academic programs and appropriate teaching-learning and research environment.

Annex- 1, Survey on the Strategic Orientations of the Department and Similar Departments, and their Alignment to the Strategic Orientation of the University and Faculty:

Department Head Faculty Dean Quality Unit President

4- Objectives (Educational) of the Corresponding Departments and Suggested Objectives:

#	The Department	Objectives
1.	Department of Biomedical Technology - Instruments	1. To achieve successful careers in biomedical instrumentation technology 2. To become successful technical advisors, managers, and techno-entrepreneurs 3. To pursue life-long learning and become successful educators for healthcare community through higher education and continual professional development.
2.	Department of Medical Equipment Technology	The BMET Program Educational Objectives (PEOs) provide the link between the program and the needs of stakeholders as well as a link between the program and the missions of the university and CAMS. The BMET program education objectives are: 1. Adept at applying their engineering and biological training to solving problems related to health and healthcare that are globally relevant and based on ethically sound principles. 2. Leaders in their respective careers in biomedical engineering or interrelated areas of industry, government, academia, and clinical practice. 3. Engaged in life-long learning by continuing their education in graduate or professional school or through opportunities for advanced career or professional training.
3.	Department of Biomedical Engineering	1. Apply the core concepts of Biomedical Engineering, its underlying sciences, and relevant technologies in their chosen profession. 2. Utilize effective communication, learning, and teamwork skills to facilitate continued professional development. 3. Possess a high standard of personal and professional integrity, and ethical responsibility. 4. Progress into positions of increasing leadership responsibilities.
4.	Department of Biomedical	**Depth -** Graduates possess an understanding of the fundamental and interdisciplinary knowledge prerequisite for the practice of, or for advanced study in biomedical engineering,

Annex- 1, Survey on the Strategic Orientations of the Department and Similar Departments, and their Alignment to the Strategic Orientation of the University and Faculty:

#	The Department	Objectives
	Engineering	including its scientific principles, methods, rigorous analysis, and creative design. **Breadth -** Graduates possess broad and multidisciplinary education, including problem-solving skills and knowledge of important current issues in biomedical engineering, necessary for productive careers in the public or private sectors, or for the pursuit of graduate education. **Professionalism -** Graduates demonstrate skills for clear and cross-disciplinary communication and responsible teamwork, and professional attitudes and ethics, so that they are prepared for the complex modern work environment and for lifelong learning.
5.	Engineering Technology, Surveying, and Digital Media	1. Produce graduates that possess the technical and professional skills to have successful careers in regional, state, or national industries related to their discipline. 2. Pursue life-long learning so the BMET graduates can become the experts, advisors, or managers in their profession.
6.	Department of Biomedical Equipment Technology	1. Are prepared as entry-level technicians responsible for the operation, inspection, installation, repair, maintenance and safety of patient-care and non-critical patient care equipment. 2. Develop skills for effective verbal and written communication, and for participating effectively in the execution of projects, and to foster professional attitudes and awareness of the benefits of life-long learning. 3. Have a learning environment that is based on open interaction with experienced staff and a curriculum that follows the developments in BET field with practical knowledge compatible with business requirements.

Annex- 1, Survey on the Strategic Orientations of the Department and Similar Departments, and their Alignment to the Strategic Orientation of the University and Faculty:

Department Head Faculty Dean Quality Unit President

Mapping of Department Objectives to the University and Faculty Objectives:

University Objectives	Faculty of Medical Technology Objectives	Department of Biomedical Technology

Annex- 1, Survey on the Strategic Orientations of the Department and Similar Departments, and their Alignment to the Strategic Orientation of the University and Faculty:

University Objectives	Faculty of Medical Technology Objectives	Department of Biomedical Technology
1- Ensuring the application of quality standards and having the distinction standards in medical and applied sciences, scientific research and community service. 2- Adopting student-centered learning, the partnership with them for life, consolidating the principles of national responsibility and faith identity, looking after them and developing their capabilities after graduation and during work. 3- Attracting and Employing scientists, cadres and talents to gain minds and put an end for the "brain drain" in a way that promotes and ensures the availability of thinkers, businessmen and good citizens. 4- Developing the distinguished academic infrastructure continuously and establishing modern research and service canter's with high efficiency that can give a real effect locally and regionally. 5- Enhancing the university status as a preferred partner for local, regional and international partnership through implementing creative styles of education, exchanging researches and knowledge, and providing real and effective outcomes for developing professional practices to benefit from them locally and regionally.	1- To produce highly qualified students in computing field who fulfill Health care needs. 2- To enhance computing as well as healthcare knowledge and skills in the society. 3- To contribute to the direction and future advancement of the national profile in the global competition and its increase dependency on computing. 4- To display excellent academic quality and relevant to the academic and professional programs that enables students to meet the criteria required by future employers. 5- To extended the innovative application in modern Health computing by providing services to the community.	1- To provide distinguished and excellent academic programs in field of Medical Technology. 2- To encourage creative and innovative thinking to identify and solve the MT problems to serve the needs of Health organization. 3- To implement acquired knowledge of MT in efficient and effective manner to construct MT solution to solve Health problem in dynamic environment. 4- To acquire skills to communicate and work effectively as an individual or as member in team. **5-** To pursue lifelong learning, career development and provide foundation for research and further studies. 6- To encourage graduates to follow appropriate computing practices with professional, societal, legal, and ethical responsibility.

Annex- 1, Survey on the Strategic Orientations of the Department and Similar Departments, and their Alignment to the Strategic Orientation of the University and Faculty:

Department Head Faculty Dean Quality Unit President

Annex- 2, Academic Standards Curriculum Criteria of Accreditation Board

Council for Accreditation & Quality Assurance

ACCREDITATION BOARD FOR ENFINEERING AND TECHNOLOGY (ABET)

CRITERIA FOR ACCREDITING COMPUTING PROGRAMS 2020 (Information Technology)

ABET
415 N. Charles Street
Baltimore, MD 21201
Telephone: 410-347-7700
E-mail: accreditation@abet.org
Website: www.abet.org

Annex- 3, Unified Regulations for Student Affairs, Ministry of Higher Education and Scientific Research

Attached Separately

Annex- 4, Survey of Similar Accredited Programs at National and International Universities (Benchmarks)

* National Academic Reference Standards (NARS) * Tohe National Architectural Accrediting Board (NAAB) * National Authority of Quality Assurance and Accreditation of Education (QAAE)
* Middle States Commission on Higher Education (MSCHE) * European Credit Transfer and Accumulation System (ECTS)

#	The Academic Program	The University	The Faculty	The Department	The Country	Program Accrediting Body	Degree Award at Program Completion	Year of accreditation	Study Duration
Current Program	Health Information Technology	21 September for medical and Applied sciences University	Medical Technology	Biomedical Technology	Yemen	Under Accreditation	Bachelor of Health & Information Technology		4
The 1st Program	Biomedical Technology - Instruments	King Saud University	College of applied medical sciences	Biomedical Technology	KSA	ABET	Bachelor of Science in Biomedical Technology	Oct 1, 2010 – Present	4
The 2nd Program	Biomedical Equipment Technology	Majmaah University	College of Applied Medical Sciences	Medical Equipment Technology	KSA	ABET	Bachelor of Biomedical Equipment Technology	Aug 07, 2015 – Present	4
The 3rd Program	Biomedical Engineering	National University of Singapore	Engineering	Biomedical Engineering	Singapore	EAB , ABET	Bachelor of Biomedical Engineering		4
The 4th Program	Biomedical Engineering	The University of Hong Kong	Engineering	Biomedical Engineering	China	ABET	Bachelor of Biomedical Engineering	2014	4
The 5th Program	Biomedical Engineering Technology	East Tennessee State University	Business and Technology	Engineering Technology, Surveying, and	USA	ABET	Bachelor of Science in Biomedical Engineering Technology	Oct 1, 2012 – Present	4

				Digital Media					
The 6th Program	Biomedical Equipment Technology	Eastern Mediterranean University	School of Computing and Technology	Biomedical Equipment Technology	Turkey	Euro-Inf Label , ASIIN accreditation	Bachelor of Science in Biomedical Engineering Technology		3

Annex- 5, Survey on Mission and Objectives of the Program and Similar Accredited Programs and its Alignment to the University, Faculty, and Department Missions and 0bjectives

1- Survey on Mission and Objectives of the Program and Similar Accredited Programs

University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University	21 September University
Faculty	College of applied medical sciences	College of Applied Medical Sciences	Engineering	Faculty of Engineering	Business and Technology	School of Computing and Technology	Applied medical sciences
Department	Biomedical Technology	Medical Equipment Technology	Biomedical Engineering	Biomedical Engineering	Engineering Technology, Surveying, and Digital Media	Biomedical Equipment Technology	Medical Equipment Technology
Program	Biomedical Technology - Instruments	Biomedical Equipment Technology	Biomedical Engineering	Biomedical Engineering.	Biomedical Engineering Technology	Biomedical Equipment Technology	Biomedical Equipment Technology
Country	Kingdom of Saudi Arabia	KSA	Singapore	China	United States	Turkey	Yemen
Program Mission	Preparing highly competent graduates in the	To graduate distinctive and innovative	1. To provide quality biomedical	To provide world-class biomedical	To enable the student to carry out the	To bring up well-qualified and highly-motivated	Providing quality biomedical equipment's technology education to

University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University	21 September University
	field of Biomedical Equipment Technology to support the health care sector, and to serve the community.	competencies scientifically, skillfully and behaviorally in the field of medical equipment technology, and providing community services through an advanced academic environment.	engineering education through integration of engineering with the biomedical sciences. 2. To foster new knowledge and achieve leadership in biomedical engineering research, the development of novel technologies and innovative applications.	engineering education to students who can employ engineering principles and methods to develop medical instrumentation, biomaterials, diagnostic and therapeutic devices, and other technologies needed in biology and medicine, and also to discover principles governing the functioning and structure of living systems.	responsibilities and duties of a Biomedical Engineering Technologist	intermediate workforce equipped with theoretical and practical information, possessing the skills to use computers and technology effectively when needed, following the new developments in their area of profession, communicating in a foreign language, easily adapting to changes, effectively working in a team, possessing cultural awareness and professional ethics in catering for the demand from the hospitals and health institutions both in Turkey and the TRNC.	preparing highly competent graduates with a solid biomedical equipment's technology education who can employ engineering principles and methods to develop medical instrumentation, diagnostic and therapeutic devices, and other technologies needed in biology and medicine.
Program	4. To achieve successful	The BMET Program	5. Apply the core	**Depth -** Graduates	3. Produce graduates that	4. Are prepared as entry-level	**PEO1.** Prepare

University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University	21 September University
Objectives	careers in biomedical instrumentation technology 5. To become successful technical advisors, managers, and techno-entrepreneurs 6. To pursue life-long learning and become successful educators for healthcare community through higher education and continual professional development.	Educational Objectives (PEOs) provide the link between the program and the needs of stakeholders as well as a link between the program and the missions of the university and CAMS. The BMET program education objectives are: 1. Adept at applying their engineering and biological training to solving problems related to health and healthcare that are globally relevant and based on	concepts of Biomedical Engineering, its underlying sciences, and relevant technologies in their chosen profession. 6. Utilize effective communication, learning, and teamwork skills to facilitate continued professional development. 7. Possess a high standard of personal and professional integrity, and ethical responsibility	possess an understanding of the fundamental and interdisciplinary knowledge prerequisite for the practice of, or for advanced study in biomedical engineering, including its scientific principles, methods, rigorous analysis, and creative design. **Breadth -** Graduates possess broad and multidisciplinary education, including problem-	possess the technical and professional skills to have successful careers in regional, state, or national industries related to their discipline. 4. Pursue life-long learning so the BMET graduates can become the experts, advisors, or managers in their profession.	technicians responsible for the operation, inspection, installation, repair, maintenance and safety of patient-care and non-critical patient care equipment. 5. Develop skills for effective verbal and written communication, and for participating effectively in the execution of projects, and to foster professional attitudes and awareness of the benefits of life-long learning. 6. Have a learning environment that is based on open	qualified graduates possess broad and multidisciplinary education, including problem-solving skills and knowledge of important current issues in biomedical technology. **PEO2.** Preparing an Adepted leaders in providing and preparing seminars, trainings and consultations in the field of medical device technology and hospital management and planning. **PEO3.** Establishing leaders to lead a transformation in biomedical equipment's technology or interrelated fields of healthcare, academia, and

University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University	21 September University
		ethically sound principles. 2. Leaders in their respective careers in biomedical engineering or interrelated areas of industry, government, academia, and clinical practice. 3. Engaged in life-long learning by continuing their education in graduate or professional school or through opportunities for advanced career or professional training.	. 8. Progress into positions of increasing leadership responsibilities.	solving skills and knowledge of important current issues in biomedical engineering, necessary for productive careers in the public or private sectors, or for the pursuit of graduate education. **Professionalism** - Graduates demonstrate skills for clear and cross-disciplinary communication and responsible teamwork, and professional attitudes and ethics, so that		interaction with experienced staff and a curriculum that follows the developments in BET field with practical knowledge compatible with business requirements.	clinical practice. **PEO4.** Consolidate the maintenance principles of biomedical devices and continuing professional and educational development by pursuing lifelong learning and becoming successful educators for the healthcare community.

University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University	21 September University
				they are prepared for the complex modern work environment and for lifelong learning.			
Program ILOs	1. Ability to apply acquired knowledge into the internship working field 2. Ability to analyze a problem, identify and define the requirements appropriate to its solution 3. Ability to function effectively on teams to accomplish a common goal 4. Ability to understand professional,	1. A knowledge of the impact of engineering technology solutions in societal and global context 2. An ability to select and apply knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied	1. Apply knowledge of mathematics, science and engineering to the solution of complex engineering problem 2. Design and conduct experiments, analyse, interpret data and synthesise valid conclusions. 3. Design a system, component,	1. Upon successful completion of the curriculum, students should be able to possess: a. an ability to apply knowledge of mathematics, science, and engineering appropriate to the biomedical engineering (BME) discipline b. an ability to	Biomedical Engineering Technology students are expected to have demonstrated proficiency in the following areas: 1. The interaction of medical equipment* with the human body; 2. The principles of medical equipment, safety and operational tests, the use of test results in order to improve	1. Use theoretical and practical knowledge and skills to analyse, troubleshoot, and maintain systems and devices used in the biomedical equipment industry. 2. Can apply acquired skills and learn new skills by engaging in lifelong learning 3. Can work as a productive and responsible team member. 4. Can adapt to changing	**A.** Knowledge and Understanding: Upon successful completion of the Program, the graduates will be able to: **A1** Demonstrate an understanding of appropriate models, theories, mathematical foundations, and techniques related to Biomedical Equipment's Technology discipline. **A2** Identify user and Healthcare needs to provide BET based solutions to real-

University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University	21 September University
	ethical, legal, security, and social issues and responsibilities 5.Ability to communicate effectively with a range of audiences.	procedures or methodologies; 3. An ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives; 4. An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology	or process, and synthesise solutions to achieve desired needs. 4. Identify, formulate, research through relevant literature review, and solve engineering problems reaching substantiated conclusions. 5. Use the techniques, skills, and modern engineering tools necessary for engineering practice with appropriate	design and conduct experiments, as well as to analyse and interpret data c. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice appropriate to the BME discipline d. an ability to recognise the need for, and to engage in life-long learning an ability to use the computer/IT tools relevant to the BME	processes and ensure that equipment is functioning properly and safely with appropriate documentation; 3. The clinical application of computer networks, networking protocols, and medical device interoperability including data security and privacy standards; 4. Potential unsafe conditions related to the use of medical equipment and systems, preventative and corrective actions including	business requirements by using their practical skills. 5. Have improved skills in oral and written communication in the biomedical technology field. 6. Have basic English knowledge in oral and written communication. 7. Are aware of the importance of use of professional ethics in the biomedical technology field.	world problem. **A3** Demonstrate a profound knowledge in utilizing and adapting BET tools, techniques, practices, and methods for solving biomedical equipment's problems in Health environment. **A4** Demonstrate a sound understanding the biomedical equipment's technology concept related to analysis, design, implementation, and evaluation of Biomedical equipment's system. **B.** Cognitive/ Intellectual Skills: Upon successful completion of the Program, the graduates will be able

University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University	21 September University
		activities; 5. An ability to identify, analyze, and solve broadly-defined engineering technology problems; 6. An ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes; 7. An ability to function effectively as a member or leader on a technical team; 8. An	considerations for public health and safety, cultural, societal, and environmental constraints. 6. Communicate effectively. 7. Recognize the need for, and have the ability to engage in life-long learning. 8. Understand the impact of engineering solutions in a societal context and to be able to respond effectively to the needs for sustainable development. 9. Function	discipline along with an understanding of their processes and limitations 2. Upon successful completion of the curriculum, students should be able to possess: a. an ability to design a system, component or process to meet desired needs within realistic constraints, such as economic, environmental, social, political, ethical, health	risk mitigation; 5. Technology utilized in specialized clinical areas such as patient imaging and the operating room, including the interconnectedness (connectivity) of medical devices and systems; 6. The principles of project management to the healthcare setting; 7. The financial information associated with the process of clinical equipment acquisition, management and support including budgeting and		to: **B1.** Critically analyse complex biomedical equipment's problems and propose appropriate biomedical equipment's technology based solutions and integrate them effectively into the uses and organization Health. **B2.** Analyze the impacts of biomedical equipment's technology on Health objectives and customer needs, and consider them during the selection, integration, configuration and administration of biomedical equipment's systems. **B3.** Explore variety of challenges and problems related to

University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University	21 September University
		understanding of the need for and an ability to engage in self-directed continuing professional development; 9. An understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity; 10. A commitment to quality, timeliness, and continuous improvement. 11. An ability to apply written, oral, and graphical communicatio	effectively within multi-disciplinary teams and understand the fundamental precepts of effective project management. 10. Understand professional, ethical and moral responsibility .	and safety, manufacturability and sustainability b. an ability to identify, formulate and solve engineering problems 3. Upon successful completion of the curriculum, students should be able to possess: a. an ability to understand the impact of engineering solutions in a global and societal context, especially the importance of health, safety	life-cycle planning.		biomedical equipment's technology to select the optimal solution. **B4.** Evaluate biomedical equipment's technology based solution to meet a given set of Health requirements in the context of biomedical equipment's technology discipline. **C.** Practical and Professional Skills: Upon successful completion of the Program, the graduates will be able to: **C1.** Employ effectively the concepts, principles of engineering, maintenance and evaluation tools, techniques used for

University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University	21 September University
		n in both technical and non-technical environments; and an ability to identify and use appropriate technical literature.		and environmental considerations to both workers and the general public b. an ability to understand professional and ethical responsibility			the analysis and troubleshooting of medical equipment's faults of varying complexity. **C2.** Design, implement, and test an equipment-based solution to meet a given set of engineering requirement in the context of biomedical equipment's technology. **C3.** Use systematic approaches to select, develop, apply integrates, and administrate maintenance of biomedical equipment's technologies to accomplish user and Health goals. **C4.** Use current techniques, skills, and tools necessary

University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University	21 September University
							for biomedical equipment's maintenance practices. **D.** General and Transferable Skills: Upon successful completion of the Program, the graduates will be able to: **D1.** Function effectively as an individual, as a member, or leader of a team engaged in activities appropriate to the biomedical equipment's technology discipline to accomplish a common goal. **D2.** Commit to professional ethics, responsibilities, and norms of professional biomedical

Annex- 5, Survey on Mission and Objectives of the Program and Similar Accredited Programs and its Alignment to the University, Faculty, and Department Missions and 0bjectives

University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University	21 September University
							equipment's technology practices . **D3.** Communicate effectively in writing and orally in a variety of professional contexts. **D4.** Engage in continuing professional development and lifelong learning as an biomedical equipment's technology professional. **D5.**

2- Mapping of Program Mission with the University, Faculty and Department Missions:

University Mission	Faculty of Medical Technology Mission	Department Biomedical Technology Mission	Biomedical Equipment's Technology. Program Mission
Leadership of transformation/upturning headway in managing and providing the health care with all partners via having the distinction standard in education and applied and medical researches that meet the needs of Yemeni people and regional influence.	To produce highly qualified Computing professionals in field of healthcare that contribute to the Yemeni and regional knowledge and serve society providing excellent quality education.	To prepare distinguished and well-qualified graduates who are capable of meeting the market demands in the field of medical equipment's technology by providing high quality academic programs and appropriate teaching-learning and research environment.	Providing quality biomedical equipment's technology education to preparing highly competent graduates with a solid biomedical equipment's technology education who can employ engineering principles and methods to develop medical instrumentation, diagnostic and therapeutic devices, and other technologies needed in biology and medicine.

Annex- 5, Survey on Mission and Objectives of the Program and Similar Accredited Programs and its Alignment to the University, Faculty, and Department Missions and 0bjectives

Department Head Faculty Dean Quality Unit President

3- Mapping of Program Objectives with the University, Faculty and Department Objectives:

University Objectives	Faculty of Medical Technology Objectives	Department of Biomedical Technology Objectives	Biomedical Equipment's Technology Program Objectives
1.	1- To produce highly qualified students in computing field who fulfill Health care needs. 2- To enhance computing as well as healthcare knowledge and skills in the society. 3- To contribute to the direction and future advancement of the national profile in the global competition and its increase dependency on computing. 4- To display excellent academic quality and relevant to the academic and professional programs that enables students to meet the criteria required by future employers. 5- To extended the innovative application in modern Health computing by providing services to the community.	1- To provide distinguished and excellent academic programs in field of Medical Technology. 2- To encourage creative and innovative thinking to identify and solve the MT problems to serve the needs of Health organization. 3- To implement acquired knowledge of MT in efficient and effective manner to construct MT solution to solve Health problem in dynamic environment. 4- To acquire skills to communicate and work effectively as an individual or as member in team. **5-** To pursue lifelong learning, career development and provide foundation for research and further studies. 6- To encourage graduates to follow appropriate computing practices with professional, societal, legal, and ethical responsibility.	**PEO1.** Prepare qualified graduates possess broad and multidisciplinary education, including problem-solving skills and knowledge of important current issues in biomedical technology. **PEO2.** Preparing an adapted leaders in providing and preparing seminars, trainings and consultations in the field of medical device technology and hospital management and planning. **PEO3.** Establishing leaders to lead a transformation in biomedical equipment's technology or interrelated fields of healthcare, academia, and clinical practice. **PEO4.** Consolidate the maintenance principles of biomedical devices and continuing professional and educational development by pursuing lifelong learning and becoming successful educators for the healthcare community.

Annex- 6, Alignment of Program Intended Learning Outcomes (PILOs) to the Faculty Objective

Program PILOs	Faculty Objectives				
	FObj1	FObj2	FObj3	FObj4	FObj5
A1		√	√		
A2	√				
A3	√		√	√	
A4			√	√	
B1					
B2		√	√	√	√
B3			√		√
B4		√		√	√
C1	√			√	
C2	√	√		√	
C3		√	√		
C4				√	
D1	√	√			√
D2		√			√
D3		√			√
D4			√	√	√

Annex- 7, Alignment of Program Intended Learning Outcomes (PILOs) to the Department Objective

Program PILOs	Department Objectives					
	DObj1	DObj2	DObj3	DObj4	DObj5	DObj6
A1	√	√				
A2		√				
A3	√	√	√			
A4						
B1		√				
B2	√					
B3	√					
B4	√	√				
C1			√			
C2			√			
C3	√		√			
C4			√			
D1				√		
D2						√
D3		√		√		√
D4	√				√	

Annex- 8, Alignment of Program Intended Learning Outcomes (PILOS) to Program Objectives (POs)

Program PILOs	Program Objectives					
	POobj1	POobj2	POobj3	POobj4	POobj5	POobj6
A1	√					
A2			√			
A3	√		√			
A4	√					
B1						
B2	√	√				
B3		√				
B4	√	√		√		
C1		√				
C2		√	√			
C3		√	√			
C4		√				
D1					√	
D2					√	
D3				√	√	
D4						√

Annex- 9, Mapping of Program Objectives to the Faculty Mission

Program Objectives	Faculty Mission				
	Highly qualified graduates	Professional skills	Knowledge contribution	Society needs	Excellent academic programs
PEO1	√	√	√		√
PEO2	√	√	√	√	√
PEO3		√	√	√	√
PEO4	√	√	√	√	√

Annex- 10, Mapping Program Objectives to the Department Mission

Program Objectives	Department Mission			
	well-qualified graduates	Market needs	high quality academic programs	Professional Education
PEO1	√		√	√
PEO2	√	√	√	√
PEO3			√	√
PEO4	√	√	√	√

Annex- 11, Mapping of Program Objectives (POs) to the Department Objectives

Program Objectives	Department Objectives					
	DObj1	DObj2	DObj3	DObj4	DObj5	DObj6
PEO1	√	√				
PEO2	√	√				
PEO3	√		√			
PEO4	√	√	√			

Annex- 12, Survey of PILOs for Similar Accredited Programs at National and International Universities

Program PILOs	Similar Accredited Programs					
	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University
A1	1	1,2	1	A	1,2,3,4,5,6,7	1,2,6
A2	1	2,8	1,4,7	1A,1D	2,3,5	1,6
A3	1,2	1,2,4,8	1,4,5,8	1A,1C,1D	3,4	1,2
A4	1,3,4	2,3,4	1,2,4,5,7,10	1A,1C	2,3,4,5,7	1
B1	2	5,6,11	4,5	1A,2B,3A	2	2
B2	2	2,4,6,8	4,5,8	3A	4	
B3	2,4	2,5,8,11	4,8	2B	2	
B4	2,4	4,5	2,3,4,5	2B,3A		
C1	1,2	3,4,5,6	1,2,3,4,5,8	1A,1D,2A,2B	2,3,4	
C2	1,2,4	3,4,6,11	2,3	2A	2,4,5	
C3	1,2,4	3,4,6,11	5,8	2B,3A	2,3,4,5	
C4	1,2	2,4,5,6,11	5	2A,2B	1,2,3,4,5	
D1	3,4,5	7,8,9,10	9			3,4
D2	4,5	9,10,11	10	3B		7
D3	3,5	9,11	6			4,5,6
D4	1	8,11	9,9			2,4

اسم هيئة الاعتماد: مجلس الاعتماد الأكاديمي وضمان جودة التعليم العالي، اصدار المعايير: مايو ٢٠١٨م إن وجد

Annex- 13, Alignment of Program PILOs with Council of Accreditation and Standards

Accreditation Body: National Academic Reference Standards (NARS), Yemen, May 2018 If Any

Program PILOs	NARS (Yemen), ILOs for Programs	Students Criterion
A1	A1	
A2	A5	
A3	A2	
A4	A4-A7	
B1	B6	
B2		1
B3	B3	
B4	C2	
C1	C4-C6	4
C2	B10	2
C3	C1	
C4		
D1	C5	5
D2	B11-C7	4
D3	C11	3

Program PILOs	NARS (Yemen), ILOs for Programs	Students Criterion
D4	C10	

1- National Academic Reference Standards for Computing Programs, Yemen, May 2018: If Any??

I. GRADUATE ATTRIBUTES

Upon successful completion of an undergraduate computing program, the graduates will be able to:

1. Knowledge of computing and mathematics appropriate to the discipline
2. Analyze a problem, and identify and define the computing requirements appropriate to its solution
3. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
4. Demonstrate independent critical thinking and problem solving skills and function effectively on a team to accomplish a common goal.
5. An understanding of professional, ethical, legal, security and social issues and responsibilities
6. Communicate effectively with a range of audiences
7. Analyze the local and global impact of computing on individuals, organizations, and society
8. Recognition of the need for and an ability to engage in continuing professional development
9. Use current techniques, skills, and tools necessary for Information technology practice and in the creation of an effective project plan

II. LEARNING OUTCOMES

A. Knowledge and Understanding

Upon successful completion of the undergraduate computing education programs, the graduates will be able to demonstrate understanding of:

A1. Demonstrate basic knowledge and understanding of fundamental principles of core computing.

A2. Demonstrate strong knowledge of fundamentals of programming and the construction of computer-based systems, data structures and algorithms, software engineering techniques and information retrieval.

A3. Provide a deeper understanding of some aspects of the subject, such as multimedia, computer and communication network, data mining and knowledge discovery, information storage and retrieval systems, mobile Communication Systems, pattern recognition, artificial Intelligence, cryptography and network security.

A4. Show the understanding of technologies for the design, development and management of database systems, systems analysis and design and of information retrieval systems.

A5. Know the role of human factors in the design of Information Technology systems.

A6. Apply tools and techniques for the design and development of applications.

A7. Know methods for the construction of web-based materials and systems, design of internet-based systems.

A8. Provide an understanding of legal, professional and moral aspects of the exploitation of IT.

A9. Understand the broad context within computer information technology such as quality, reliability, enterprise, employment law, accounting and health.

A10. Understand the challenges inherent in the maintenance and evolution of IT based systems, and the techniques and best practices currently available for dealing with them.

B. Cognitive / Intellectual Skills

Upon successful completion of an undergraduate computing education program, the graduates will be able to:

B1. Information technology systems problems, set goals towards solving them, observe results, reason and apply judgment.

B2. Identify attributes, components, relationships, patterns, main ideas, and errors.

B3. Summarize the proposed solutions and their results.

B4. Restrict solution methodologies upon their results.

B5. Establish criteria, and verify solutions

B6. Identify a range of solutions and critically evaluate and justify proposed design solutions.

B7. Solve information technology problems with pressing commercial or industrial constraints.

B8. Generate an innovative design to solve a problem containing a range of commercial and industrial constraints.

B9. Perform problem analysis from written descriptions; derive requirements specifications from an understanding of problems (analysis, synthesis).

B10. Create and/or justify designs to satisfy given requirements (synthesis, evaluation, application).

B11. Recognize the professional, moral and ethical issues of involved in the exploitation of Information Technology and be guided by their adoption, reflect on issues of professional practice within the discipline.

C. Practical and Professional Skills:

Upon successful completion of an undergraduate computing education program, the graduates will be able to:

C1. Specify, investigate, analyze, design and develop computer-based systems using appropriate tools and techniques.

C2. Evaluate systems in terms of their quality and possible trade-offs , evaluate appropriate hardware and software solutions for given scenarios.

C3. Recognize risks or safety aspects involved in the operation of computer based systems.

C4. Deploy tools for the implementation and documentation of computer-based systems.

C5. Work as part of a development team and to recognize the different roles of its members.

C6. Operate computing equipment efficiently, taking into account its logical and physical properties.

C7. Recognize and address professional, moral and ethical issues within the discipline.

C8. Effectively employ information-retrieval skills, (including the use of browsers, search engines, and on-line library catalogues), communicate effectively using a variety of communication methods, communicate effectively with team members, managers and customers.

C9. Make effective use of general IT facilities, plan and manage a project to complete within budget and schedule

C10. Manage one's own learning and development, including time management and organizational skills.

C11. Present their work in the form of reports, oral presentations or an internet web site.

2- Proposed Program Criteria for Information Technology and Similarly Named Computing Programs

1- Criterion 3. Student Outcomes

The program must have documented and publicly stated student outcomes that include (1) through (5) below and any outcomes required by applicable Program Criteria. The program may define additional outcomes.

Graduates of the program will have an ability to:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Use systemic approaches to select, develop, apply, integrate, and administer secure computing technologies to accomplish user goals.

2- Criterion 5. Curriculum

The curriculum requirements are in addition to the General Criteria curriculum requirements and specify topics, but do not prescribe specific courses. The requirements are:

(a) Information Technology: At least 45 semester credit hours (or equivalent) that must include:

1. Fundamentals and applied practice in:
   - **a.** health Information management
   - **b.** Integrated systems
   - **c.** Platform technologies
   - **d.** System paradigms
   - **e.** User experience design
   - **f.** Networking

g. Software development and management
h. Web and mobile systems

2. Advanced and supplemental IT topics that build on fundamentals and applied practice to provide depth.
3. Experiential learning appropriate to the program.
4. Principles and practices of IT project management.

(b) Mathematics: At least six semester credit hours (or equivalent) of appropriate mathematical topics that includes relevant discrete mathematics.

Annex- 14, Survey of Credit Hours of Similar Programs

Benchmarking		King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University	21 September for medical and Applied sciences University	Average Cr. Hrs.
University Requirements	Credit Hours	33	-	20	54	12	-	14	**26.6%**
	Percentage	19.5 %	-	12.5 %	22.5%	9.38 %	-	9.79%	**14.73%**
University Electives	Credit Hours	6	12	32	-	6	-	-	**14%**
	Percentage	3.6 %	8. 57 %	20 %	-	4.69 %	-		**9.22%**
Faculty Requirements	Credit Hours	9	2	6	42	15	9	23	**15.14%**
	Percentage	5.3 %	1,43 %	3.75 %	17.5%	11.72 %	7.9 %	16.08 %	**9.1%**
Faculty Electives	Credit Hours	6	4	-	12	6	9	-	**7.4%**
	Percentage	3.6 %	2.86 %	-	5%	4.69 %	7.9 %		**4.81%**
Department Requirements	Credit Hours	6	**19**	34	30	15	9	34	**43%**
	Percentage	3.6 %		21.25 %	12.5%	11.72 %	7.9 %	23.78%	**13.46%**
Major Requirements	Credit Hours	76	87	28	90	68	57	66	**69.7.07%**
	Percentage	50 %	62.14 %	17.5 %	37.5%	53.13 %	50 %	46.15%	**45.20%**
Major Electives	Credit Hours	6	6	8	-	6	-	-	**6.5%**
	Percentage	3.6 %	4.28 %	5 %	-	4.69 %	-	-	**4.39%**
Practical Courses	Credit Hours	6	29	14	12	-	-	-	**15.25%**
	Percentage	3.6 %	% 71.2	8.75 %	5%	-	-	-	**22.14%**
Training Courses	Credit Hours	3 months	-	10	-	30	30	6	**19%**
	Percentage	-	-	6.25 %	-	1.6 %	26.3%	1.19%	**8.95%**
Project Courses	Credit Hours	-	-	-	-	-	-	-	**00%**
	Percentage	-	-	-	-	-	-	-	**00%**

Benchmarking		King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University	21 September for medical and Applied sciences University	Average Cr. Hrs.
Total Credit Hours	**Credit Hours**	**169**	**140**	**160**	**240**	**128**	**114**	**143**	**156**

Annex- 14, Survey of Credit Hours of Similar Programs

Annex- 15, Survey of Number of Courses and Credit Hours of Similar Programs

University		King Saud University		Majmaah University		National University of Singapore		The University of Hong Kong		East Tennessee State University		Eastern Mediterranean University		21 September for medical and Applied sciences University		Average	
Total Courses and Cr. Hrs.		Cr. Hrs.	Courses	Cr. Hrs.	Courses	Cr. Hrs.	Courses	Cr. Hrs.	Courses	Cr. Hrs.	Courses	Cr. Hrs.	Courses	Cr. Hrs.	Courses	Cr. Hrs.	Courses
University Requirements	Compulsory	33	9	-	-	20	5	54	9	12	4	-	-	14	7	26.60	6.80
	Electives	6	3	12	6	32	8	-	-	6	2	-	-	-	-	14.00	3.80
Faculty Requirements	Compulsory	9	3	2	1	6	3	42	7	15	5	9	3	23	11	15.14	4.71
	Electives	6	3	4	2	-	-	12	2	6	2	9	3	-	-	7.40	2.40
Department Requirements	Compulsory	6	3	-	-	34	10	30	15	15	5	9	3	34	15	21.33	8.50
	Electives	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Major Requirements	Compulsory	76	29	87	34	28	7	90	15	68	19	57	19	62	25	66.86	21.14
	Electives	6	3	6	6	8	4			6	3					6.50	4.00
	Graduation Project	-	-	-	-	-	-	-	-	-	-	-	-	4	2	4.00	2.00
	Summer Training	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Field Training	-	-	-	-	10	1	-	-	30	2	30	2	6	1	19.00	1.50

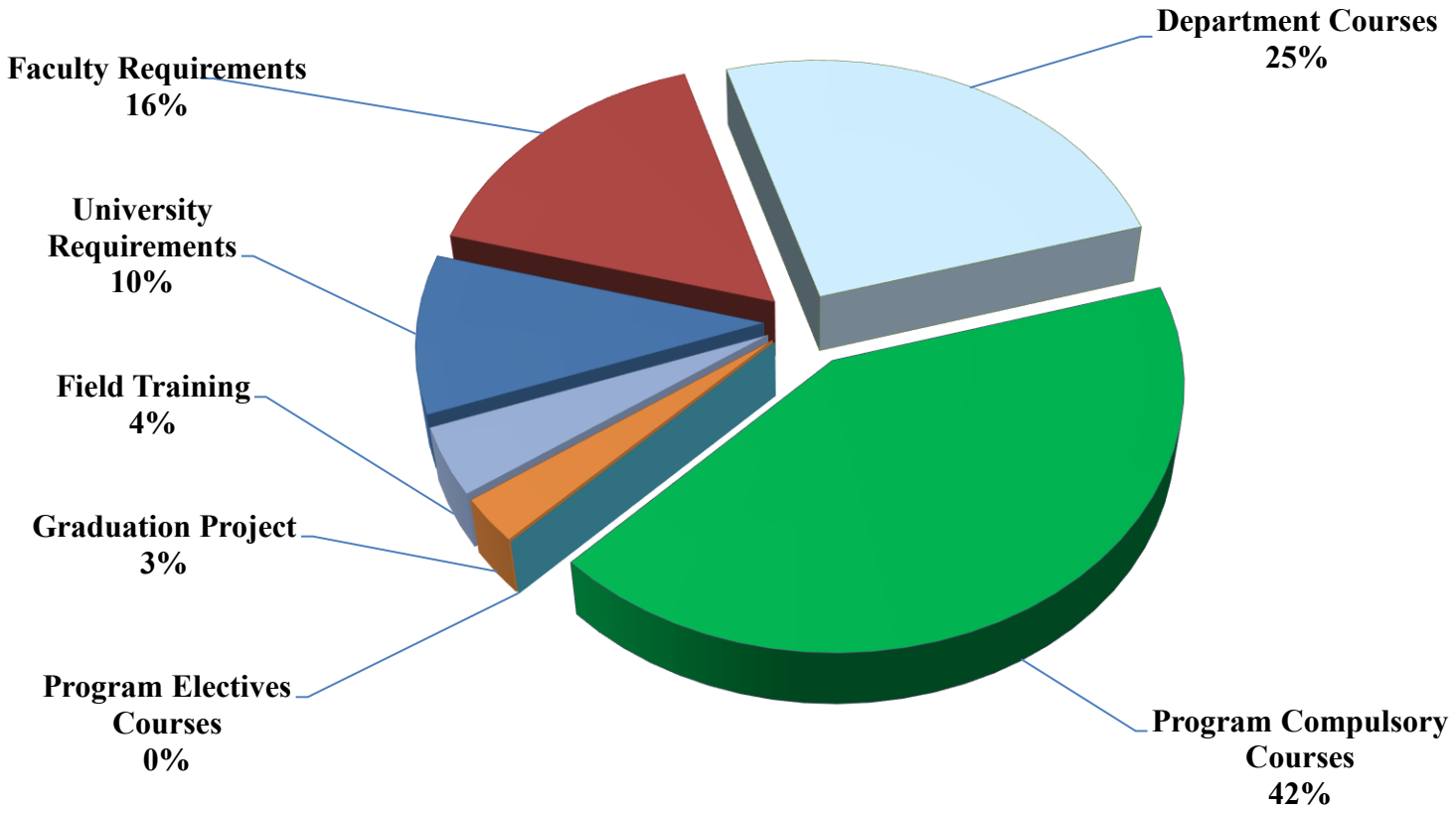
	Practical Skills	6	2	-	-	-	-	-	-	-	-	-	-	-	-	6.00	2.00
Other Courses		-	-	29	9	14	2	12	2	-	-	-	-	-	-	18.33	4.33
Total		Cr. Hrs.	Courses	Cr. Hrs.	Courses	Cr. Hrs.	Courses	Cr. Hrs.	Courses	Cr. Hrs.	Courses	Cr. Hrs.	Courses	Cr. Hrs.	Courses	Cr. Hrs.	Courses
		148	55	140	58	152	40	240	50	158	42	114	30	143	61	205.1666667	61.1905

Annex- 16, Themes of Courses of Study and their Weightage

#	Themes	No. of Courses	Credit Hours	Percentage of Cr. Hrs.
0	University Requirements	7	14	9.79%
1	Faculty Requirements	11	23	16.08%
2	Department Courses	15	36	25.17%
3	General Courses (Program Courses)	25	60	41.96%
4	Electives Courses (Program Courses)	-	-	-
5	Graduation Project Courses*	2	4	2.80%
6	Field Training	1	6	4.20%
Program Total		61	143	100.00%

* The Project Courses Credit Hours are already added to the total credit hours with the faculty requirements.

Themes of Courses of Study and their Weightage



Annex- 16, Themes of Courses of Study and their Weightage

Annex- 17, Coding System

Program	Level	Theme Code	No. of the course in the list
AAA	1	0	1

Themes	Theme Code	No.	Course Title	Course Code	Credit Hours				Prerequisites/ Co-requisites	Level/Term
					Cr. Hrs.	L	T	P		
University Requirements	0	1.	Arabic 101	06.11.701	2					1/1
		2.	English 101	06.11.703	2					1/2
		3.	Islamic Culture	06.11.705	2					1/1
		4.	National Culture	06.11.706	2					1/2
		5.	English 102	06.11.704	2				06.11.503	1/1
		6.	Arabic 102	06.11.702	2				06.11.501	1/1
		7.	Arabic Israeli Conflict	06.11.707	2					1/2
Total					14					

Themes	Theme Code	No.	Course Title	Course Code	Credit Hours				Prerequisites/ Co-requisites	Level/Term
					Cr. Hrs.	L	T	P		
Faculty Requirements	1	1.	Fundamentals of Nursing	04.01.701	2					Level 1/ semester 1
		2.	Medical Terminology	04.02.702	2					Level 1/ semester 1
		3.	Principle of Health Management	05.01.703	2					Level 1/ semester 2

		4.	Anatomy and Physiology	01.01.704	2					Level 1/ semester 2
		5.	Communication skills and Presentation	05.02.705	2	2				Level 2/ semester 1
		6.	Biostatistics	05.02.706	3	2		1		Level 2/ semester 1
		7.	Fundamentals of Microbiology	03.01.707	2	2				Level 2/ semester 1
		8.	Principles of Marketing	05.01.708	2	**2**				Level 2/ semester 2
		9.	Total Quality Management	05.01.709	2	2				Level 3/ semester 1
		10.	Research methodology	05.02.710	2	2				Level 3/ semester 2
		11.	Occupational Ethics	05.02.711	2	2				Level 4/ semester 2
Total					42	30				

Themes	**Theme Code**	**No.**	**Course Title**	**Course Code**	**Credit Hours**				**Prerequisites/ Co-requisites**	**Level/Term**
					Cr. Hrs.	L	T	P		
Department Requirements	2	**1.**	Math 1١	07.01.711	2	2				1/1
		2.	Computer principles and programming	07.01.712	٣	٢		١		1/1
		3.	Math ٢	07.01.713	2	2				1/2
		4.	Programming 2	07.01.714	2	2				2/1
		5.	Math 3	07.01.715	3	2		1		1/2
		6.	Object-Oriented Programming	07.01.716	3	2		1		2/1
		7.	Computer Network	07.01.717	3	2		1		2/1
		8.	Operating System	07.01.718	2	2				2/2

Annex- 17, Coding System

		9.	Advanced Programming	07.01.719	2	2				2/2
		10.	System Analysis and Design	07.01.720	3	2		1		3/1
		11.	Software Engineering	07.01.721	2	2				3/1
		12.	Mobile Application Development	07.01.722	3	2		1		4/1
		13.	Artificial Intelligent	07.01.723	٢	2				4/1
		14.	Entrepreneurship	07.01.724	2	2				4/2
		15.	Machine Learning	07.01.725	2	2				
Total					٣٦	٣٠		٦		

Themes	Theme Code	No.	Course Title	Course Code	Credit Hours				Prerequisites/ Co-requisites	Level/Term
					Cr. Hrs.	L	T	P		
General Courses (Program Courses)	3	**1.**	Introduction to Biomedical Equipment's Technology	07.02.711	2	2				1/1
		2.	Physics	07.02.712	2	2				1/2
		3.	Electrical Circuits ١	07.02.713	3	2		1		2/1
		4.	Digital Logic Design	07.02.714	٢	٢				2/1
		5.	Engineering Drawing	٠٧,٠٢,٧١٥	3	2		1		2/2
		6.	Electrical Circuits 2	07.02.716	3	2		1		2/2
		7.	Biomedical Measurements and Instrumentations	٠٧,٠٢,٧١٧	2	2				2/2
		8.	Statics	07.02.718	2	2				2/2
		9.	Dynamics	٠٧,٠٢,٧١٩	2	2				2/2
		10.	Special Topics on Biomedical Equipment's Technology	07.02.720	3	2		1		2/2

Annex- 17, Coding System

		11.	Biomedical Electronics 1	٠٧,٠٢,٧٢١	٣	2		١		3/1
		12.	Biomedical Equipment's 1	07.02.722	٢	2				3/1
		13.	Biomaterials	٠٧,٠٢,٧٢٣	٢	٢				3/1
		14.	Biomechanics	07.02.724	2	2				3/1
		15.	Biomedical Electronics 2	٠٧,٠٢,٧٢٥	2	2				3/2
		16.	Biomedical Equipment's 2	07.02.726	٣	2		١		3/2
		17.	Biomedical signals processing	٠٧,٠٢,٧٢٧	٣	٢		١		3/2
		18.	Microcontroller and Microprocessor	07.02.728	٣	٢		١		3/2
		19.	Rehabilitation Procedures	٠٧,٠٢,٧٢٩	٢	٢				3/2
		20.	Clinical Engineering	07.02.730	٢	٢				3/2
		21.	Biomedical Equipment's Maintenance and Management 1	٠٧,٠٢,٧٣١	٣	٢		١		4/1
		22.	Safety for Biomedical Equipment's Technology Specialists	07.02.732	٢	٢				4/1
		23.	Artificial Organs and Extremities	٠٧,٠٢,٧٣٣	٢	٢				4/1
		24.	Project 1	07.02.734	٢	٢				4/1
		25.	Project 2	٠٧,٠٢,٧٣٥	٣	٢		١		4/2
		26.	Biomedical Equipment's Maintenance and Management ٢	07.02.736	٢	٢				4/2
		27.	Special studies (Seminars and Case Study) in Biomedical Equipment Technology	٠٧,٠٢,٧٣٧	٢	٢				4/2
Total					**٦٤**	**٥٣**	**0**	**١٢**		

Annex- 17, Coding System

Themes	Theme Code	No.	Course Title	Course Code	Credit Hours				Prerequisites/ Co-requisites	Level/Term
					Cr. Hrs.	L	T	P		
Graduation Project Courses		**1.**	Project 1	07.11.1052	2					4/1
		2.	Project 2	07.11.1053	2					4/2
Total					4					

Themes	Theme Code	No.	Course Title	Course Code	Credit Hours				Prerequisites/ Co-requisites	Level/Term
					Cr. Hrs.	L	T	P		
Field Training		**1.**	Field Training	07.11.1053	6					4/2
Total					6					

Annex- 18, Survey of Course Names per Academic Semesters of Similar Programs

University		21 September University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University
No of Courses		61	54	55	40	41	40	30
Total Cr. Hrs.		143	169	140	160	240	128	71
Total Years		4 years	4 years	4 years	4 years	4 years	3 years	3 years
Level 1								
Semester	No	Course Name	Course Name	Course Name	Course Name	Course Name	Course Name	Course Name
1	1	English 101	English Language Skills	English Language	Materials Engineering Principles and Practice	Fundamental mechanics	Critical Reading and Expository Writing	Basic English I
	2	Arabic 101	Introduction to Mathematics	Introduction to Mathematics 1	Design and Make4	Electricity and electronics	ENGL 1020 - Critical Thinking and Argumentation	Mathematics for Electronic Technicians
	3	Islamic Culture	Computer skills	Computer Skills	Engineering Calculus	Calculus and ordinary differential	Introduction to Communication	Anatomy And Physiology

University		21 September University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University
						equations	Studies	
	4	National Culture	MC 140 Communication Skills	PSSC 114 Communication Skills	MA1512 Differential Equations for Engineering	Core University English	ENGL 2030 - Literary Heritage	EETE143 Electrotechnology
	5	Fundamentals of Nursing		PCHM 124 Introduction to chemistry	BN1111 Biomedical Engineering Principles and Practice I	University Common Core Course	ARTH 2010 - Art History Survey I	EETE101 Introduction to Computing
	6	Medical Terminology		PPHS 125 Biophysics	GE 1			EETE113 Properties of Electronic Materials
	7	Math 1		PBIO 126 Biology				
	8	Introduction to Biomedical Equipment's Technology						
	9	Computer principles and programming						

University		21 September University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University
		--	--	--	--	--	--	--
2	1	English 102	CHM 145 Introduction to Organic Chemistry	CAMS 231 Emergency care	MA1513 Linear Algebra with Differential Equations	Fundamentals of chemistry and biology for biomedical engineering	ENTC 3020 - Technology and Society	ENGL162 Basic English II
	2	Arabic 102	PHYS 145 General Physics	MET 231 Anatomy for Bioengineering	CS1010E Programming Methodology	Electricity and electronics	ANTH 1240 - Introduction to Cultural Anthropology	EETE132 Electronics - I
	3	Arabic Israeli Conflict	ZOOL 145 Biology	MET 232 Biomedical Physiology for Engineering	ES1531 Critical Thinking & Writing	Computer programming I	ECON 2220 - Principles of Microeconomics	EETE134 Digital Electronics
	4	Principle of Health Management	ENGL 145 English for Medical Purposes	MET 233 Basic mathematics	PC1432 Physics IIE	Linear algebra, probability& statistics	HIST 2010 - The United States to 1877	EETE152 Computer Applications
	5	Anatomy and Physiology	STAT 145 Biostatistics	MET 234 Bio-Physics	BN2111 Biomedical Engineering Principles and Practice II	University Common Core Course	HIST 2020 - The United States since 1877	BMET112 Medical Instrumentation - I

University		21 September University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University
	6	Communication skills and Presentation		MET 235 Bio-mechanics	GER1000 Quantitative Reasoning (GE 2)			BMET168 Medical Communication
	7	Math ٢		CAMS Faculty Elective				BMET200 Summer Practice
	8	Programming 2		University Elective				
	9	Physics						
--		--	4	--	--	--	--	--
Level 2								
Semester	No	Course Name	Course Name	Course Name	Course Name	Course Name	Course Name	Course Name
1	1	Electrical Circuits ١	BMT 211 Biomedical Electronics (I)	MET 241 Applied Mathematics 1	EE2211 Introduction to Machine Learning	Thermofluid mechanics	PHYS 2010 - General Physics I- Noncalculus	EETE231 Electronics II
	2	Biostatistics	BMT 227 Principles of Computing	MET 242 Physics for medical Equipment's	BN2201 Quantitative Physiology for Bioengineers	Engineering in biology and medicine	PHYS 2011 - General Physics Laboratory I- Noncalculus	EETE233 Microprocessors
	3	Fundamentals of Microbiology	BMT 222 Applied	MET 243 Electrical	BN2403 Fundamentals of Biosignals	Life sciences I (Biochemistry)	CHEM 1110 - General	BMET251 Medical

University		21 September University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University
			Mathematics for BMT (I)	circuits	Processing and Bioinstrumentation		Chemistry Lecture I	Instrumentation II
	4	Math 3	BMT 221 Basic Mechanical Skills	MET 244 Electrical skills	CM1501 Organic Chemistry for Engineers	Biomedical signals and linear systems	CHEM 1111 - General Chemistry Laboratory I	BMET252 Fault Analysis in Biomedical Systems
	5	Digital Logic Design	BMT 224 Applied Physics for BMT	MET 245 Computer and systems	GEQ1000 (GE 3)	University Common Core Course	MATH 1530 - Probability and Statistics – Noncalculus	BMET253 Medical Imaging Systems
	6	Object-Oriented Programming	CLS 224 Rehabilitation Procedures	MET 246 Bio-materials	GE4		ENTC 2170 - CADD (Computer Aided Design Drafting)	EETE271 Occupational Terminology
	7	Engineering Drawing		CAMS Faculty Elective				
	8	Computer Network						
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2	1	Electrical	BMT 212	MET 351 Applied	BN2102	Engineering	ENTC 3030 -	BMET262

University		21 September University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University
		Circuits 2	Biomedical Electronics (II)	Mathematics 2	Bioengineering Data Analysis	training	Technical Communication	Biomedical Signal Processing
	2	Biomedical Measurements and Instrumentations	BMT 225 Measurement Techniques	MET 352 Basic analog electronics	BN2204 Fundamentals of Biomechanics	Life sciences II (Cell Biology & Physiology)	ENTC 4017 - Industrial Supervision	BMET264 Medical Applications
	3	Statics	BMT 226 Electrical Skills (I)	MET 353 Medical electrical measurements	BN2301 Biochemistry and Biomaterials for Bioengineers	Engineering management and society	ENTC 4060 - Project Scheduling	HIST280 Atatürk's Principles And History Of Turkish Reforms
	4	Dynamics	BMT 223 Applied Mathematics for BMT (II)	MET 354 Basic digital electronics	EG2401A Engineering Professionalism	Multivariable calculus and partial differential equations	ENTC 4600 - Technical Practicum	
	5	Principles of Marketing	BMT 228 Introduction to Biomechanics	MET 355 Biomedical mechanical Equipments	IE2141 Systems Thinking and Dynamics	University Common Core Course	ENTC 1510 - Student in University	

University		21 September University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University
	6	Special Topics on Biomedical Equipment's Technology	BMT 232 Principles of Mechanical Biomedical Instrumentation	MET 356 Computer Programming	GE5			
	7	Operating System						
	8	Advanced Programming						
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		Level 3						
Semester	No	Course Name	Course Name	Course Name	Course Name	Course Name	Course Name	Course Name
1	1	Biomedical Electronics 1	BMT 313 Biomedical Electronics (III)	MET 361 Medical analog signal processing	EG3611A Industrial Attachment	Biomechanics for biomedical engineering	ENTC 2310 - Electrical Principles	ELET311 Microprocessor Applications
	2	Total Quality Management	BMT 333 Electrical Machines in Medical Instrumentation	MET 362 Advanced Medical analog electronics	UE 1	Life sciences III (Physiology)	ENTC 2320 - Electronics I	ELET315 Industrial Electronics
	3	Biomedical Equipment's 1	BMT 323 Electrical Skills (II)	MET 363 Advanced Medical digital electronics	BN3101 Biomedical Engineering Design	Biomedical engineering laboratory	ENTC 2330 - Network Systems	BMET301 Laser and Medical Applications
	4	System Analysis	BMT 336 Optical	MET 364 Electro	UE 1	Statistics and	ENTC 3310 -	BMET303

University		21 September University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University
		and Design	Biomedical Instrumentation	Mechanical & pneumatic Equipment's		mathematical analysis for biomedical engineering	Circuit Analysis	Hospital Organization And Management
	5	Software Engineering	BMT 337 Biomaterials	MET 365 Advanced Medical Mechanical Equipment's	UE 2	Technical English for biomedical engineering	ENTC 3320 - Electronics II	AE01 Technical Elective
	6	Biomaterials	BMT 335 Mechanical Biomedical Instrumentation	University Elective	UE 3			
	7	Biomechanics	IC 106 Medical Jurisprudence		Technical Elective 1			
	8							
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2	1	Biomedical Electronics 2	BMT 314 Biomedical Electronics (IV)	MET 471 Medical Digital signal processing	BN3101 Biomedical Engineering Design	Biomaterials science and engineering	ENTC 3370 - Electronics- Digital Circuits	BMET302 Medical Training
	2	Biomedical Equipment's 2	BMT 315 Introduction to Bioelectrical Instrumentation	MET 472 Medical electronic Equipment's	UE 2	Medical imaging	ENTC 4277 - Instrumentation and Process Control	BMET304 Laboratory Support Equipment

Annex- 18, Survey of Course Names per Academic Semesters of Similar Programs

University		21 September University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University
	3	Biomedical signals processing	BMT 367 Hospital Safety	MET 473 Imaging systems	UE 3	Integrated project	ENTC 4337 - Microprocessors	BMET306 Diagnosis and Tracking Devices
	4	Microcontroller and Microprocessor	BMT 334 Biomedical Imaging Equipment	MET 474 Medical Equipment's management & maintenance	UE 4	Practical Chinese for engineering students	ENTC 4347 - Digital Signal Processors	
	5	Rehabilitation Procedures	BMT 338 Introduction to Bioengineering Design	University Elective	Technical Elective 1	Common Core Course	ENTC 3331 - RF Fundamentals	
	6	Clinical Engineering	RHS 372 Audiology II	University Elective	EG3611a Industrial Attachment	Professional training (Internship)		
	7	Research methodology	ARAB 103 Expository Writing		UE 4			
	8							
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Level 4								
Semester	No	Course Name	Course Name	Course Name	Course Name	Course Name	Course Name	Course Name
1	1	Mobile Application	BMT 413 Biomedical	MET 481 Computer	BN4101	Final year project	ENTC 4350 -	

Annex- 18, Survey of Course Names per Academic Semesters of Similar Programs

University		21 September University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University
		Development	Electronics (V)	application for biomedical systems	B.Eng. Dissertation		Biomedical Instrumentation I	
	2	Biomedical Equipment's Maintenance and Management 1	BMT 415 Biomedical Signal Processing	MET 482 Advanced imaging systems	Technical Elective 2	Elective Course	ENTC 4390 - Medical Imaging Equipment Technology	
	3	Safety for Biomedical Equipment's Technology Specialists	BMT 432 Special Topics on Biomedical Instrumentation	MET 483 Optical & laboratory medical Equipment's	Pathway Elective 1	Common Core Course	HSCI 2010 - Anatomy and Physiology I	
	4	Artificial Intelligent	BMT 437 Control Systems in Biomedical Equipment	MET 484 Advanced medical electronic Equipment's	UE 5	Control and instrumentation	HSCI 2011 - Anatomy and Physiology Laboratory I	
	5	Artificial Organs and Extremities	BMT 484 Automation in Clinical Laboratory	MET *** Elective specialty courses	UE 6	Biomedical instrumentation and systems	HSCI 2020 - Anatomy and Physiology II	
	6	Project 1		University Elective				
	7							

University		21 September University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University
	8							
		--	--	--	--	--	--	--
2	1	Project 2	BMT 414 Biomedical Electronics (VI)	MET 591 Project	BN4101 B.Eng. Dissertation	Final year project	HSCI 2021 - Anatomy and Physiology Laboratory II	
	2	Biomedical Equipment's Maintenance and Management ٢	BMT 485 Biomedical Computing	MET 592 Digital image processing	Pathway Elective 2	Elective Course	MATH 1840 - Analytic Geometry and Differential Calculus	
	3	Entrepreneurship	BMT 468 Clinical Practice / Project	MET 593 Control of biomedical systems	UE 7	Biomedical ultrasonics: principles and applications	MATH 1850 - Integral Calculus for Technology	
	4	Special studies (Seminars and Case Study) in Biomedical Equipment Technology	BMT 465 Maintenance Management	MET 594 Safety in hospitals	UE8	Magnetic resonance imaging: principles, technology and applications		
	5	Machine Learning	RHS 422 Rehabilitation Procedures	MET *** Elective specialty courses		Biomedical signals processing and modeling in		

University		21 September University	King Saud University	Majmaah University	National University of Singapore	The University of Hong Kong	East Tennessee State University	Eastern Mediterranean University
						medical applications		
	6	Occupational Ethics	CHS 243 Basic Emergency Care	MET *** Elective specialty courses				
	7			University Elective				
	8							
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Annex- 19, Comparison of Program Courses and Similar Programs Courses

#	King Saud University					Majmaah University					National University of Singapore					The University of Hong Kong					East Tennessee State University					Eastern Mediterranean University					21 September University				
	Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours			
		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P
Level 1																																			
1	ENGL 140 English Language Skills	8				PENG 111 English Language	8				MLE1010 Materials Engineering Principles and Practice	4				Fundamental mechanics	6				ENGL 1010 - Critical Reading and Expository Writing	3				ENGL161 Basic English I	3				English 101	2			
2	MATH 140 Introduction to Mathematics	2				PMTH 112 Introduction to Mathematics 1	2				EG1311 Design and Make4	4				Electricity and electronics	6				ENGL 1020 - Critical Thinking and Argumentation	3				MATE117 Mathematics for Electronic Technicians	3				Arabic 101	2			
3	CT 140 Computer skills	3				PCOM 113 Computer Skills	2				MA1511 Engineering Calculus	2				Calculus and ordinary differential equations	6				SPCH 1300 - Introduction to Communication Studies	3				BMET111 Anatomy And Physiology	3				Islamic Culture	2			
4	MC 140 Communica	2				PSSC 114 Communica	2				MA1512 Differential	2				Core University	6				ENGL 2030 - Literary	3				EETE143 Electrotechnol	3				National Culture	2			

#	King Saud University					Majmaah University					National University of Singapore					The University of Hong Kong					East Tennessee State University					Eastern Mediterranean University					21 September University				
	Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours			
		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P
	tion Skills					tion Skills					Equations for Engineering					English					Heritage					ogy									
5						PCHM 124 Introduction to chemistry	2				BN1111 Biomedical Engineering Principles and Practice I	4				University Common Core Course	6				ARTH 2010 - Art History Survey I	3				EETE101 Introduction to Computing	3				undamentals of Nursing	2			
6						PPHS 125 Biophysics	2				GE 1	4															EETE113 Properties of Electronic Materials	3				Medical Terminology	2			
7						PBIO 126 Biology	2																									Math 1	2			
8																														Introduction to Biomedical Equipment's Technology	2			
9																														Computer principles and programming	٣			
1	CHM 145 Introduction to Organic Chemistry	2				CAMS 231 Emergency care	2				MA1513 Linear Algebra with Differential Equations	2				Fundamentals of chemistry and biology for biomedical engineering	6				ENTC 3020 - Technology and Society	3				ENGL162 Basic English II	3				English 102	2			

#	King Saud University					Majmaah University					National University of Singapore					The University of Hong Kong					East Tennessee State University					Eastern Mediterranean University					21 September University				
	Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours			
		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P
2	PHYS 145 General Physics	3				MET 231 Anatomy for Bioengineering	2				CS1010E Programming Methodology	4				Electricity and electronics	6				ANTH 1240 - Introduction to Cultural Anthropology	3				EETE132 Electronics - I	3				Arabic 102	2			
3	ZOOL 145 Biology	3				MET 232 Biomedical Physiology for Engineering	2				ES1531 Critical Thinking & Writing	4				Computer programming I	6				ECON 2220 - Principles of Microeconomics	3				EETE134 Digital Electronics	3				Arabic Israeli Conflict	2			
4	ENGL 145 English for Medical Purposes	8				MET 233 Basic mathematics	2				PC1432 Physics IIE	4				Linear algebra, probability& statistics	6				HIST 2010 - The United States to 1877	3				EETE152 Computer Applications	3				Principle of Health Management	2			
5	STAT 145 Biostatistics	2				MET 234 Bio-Physics	2				BN2111 Biomedical Engineering Principles and Practice II	4				University Common Core Course	6				HIST 2020 - The United States since 1877	3				BMET112 Medical Instrumentation - I	3				Anatomy and Physiology	2			
6						MET 235 Bio-mechanics	2				GER1000 Quantitative Reasoning (GE 2)	4															BMET168 Medical Communication	3				Communication skills and Presentation	٢			
7						CAMS Faculty Elective	2																				BMET200 Summer Practice	10				Math ٢	2			
8						University Elective	2																										Programming 2	٣			
9																																Physics	2			

Annex- 19, Comparison of Program Courses and Similar Programs Courses

Department Head Faculty Dean Quality Unit President

#	King Saud University					Majmaah University					National University of Singapore					The University of Hong Kong					East Tennessee State University					Eastern Mediterranean University					21 September University				
	Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours			
		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P
1	BMT 211 Biomedical Electronics (I)	4				MET 241 Applied Mathematics 1	2				EE2211 Introduction to Machine Learning	4				Thermofluid mechanics	6				PHYS 2010 - General Physics I- Noncalculus	3				EETE231 Electronics II	3				Electrical Circuits ١	3			
2	BMT 227 Principles of Computing	2				MET 242 Physics for medical Equipment's	3				BN2201 Quantitative Physiology for Bioengineers	4				Engineering in biology and medicine	6				PHYS 2011 - General Physics Laboratory I- Noncalculus	1				EETE233 Microprocessors	3				Biostatistics	2			
3	BMT 222 Applied Mathematics for BMT (I)	2				MET 243 Electrical circuits	3				BN2403 Fundamentals of Biosignals Processing and Bioinstrumentation	4				Life sciences I (Biochemistry)	6				CHEM 1110 - General Chemistry Lecture I	4				BMET251 Medical Instrumentation II	3				Fundamentals of Microbiology	3			
4	BMT 221 Basic Mechanical Skills	3				MET 244 Electrical skills	2				CM1501 Organic Chemistry for Engineers	4				Biomedical signals and linear systems	6				CHEM 1111 - General Chemistry Laboratory I	0				BMET252 Fault Analysis in Biomedical Systems	3				Math 3	2			
5	BMT 224 Applied Physics for BMT	4				MET 245 Computer and systems	2				GEQ1000 (GE 3)	4				University Common Core Course	6				MATH 1530 - Probability and Statistics – Noncalculus	3				BMET253 Medical Imaging Systems	3				Digital Logic Design	2			
6	CLS 224 Rehabilitation Procedures	3				MET 246 Bio-materials	2				GE4	4									ENTC 2170 - CADD (Computer Aided Design Drafting)	4				EETE271 Occupational Terminology	3				Object-Oriented Programming	٣			
7						CAMS Faculty	2																										Engineering Drawing	2			

Annex- 19, Comparison of Program Courses and Similar Programs Courses

#	King Saud University					Majmaah University					National University of Singapore					The University of Hong Kong					East Tennessee State University					Eastern Mediterranean University					21 September University				
	Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours			
		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P
						Elective																													
8																															Computer Network	3			
1	BMT 212 Biomedical Electronics (II)	4				MET 351 Applied Mathematics 2	2				BN2102 Bioengineering Data Analysis	4				Engineering training	6				ENTC 3030 - Technical Communication	3				BMET262 Biomedical Signal Processing	3				Electrical Circuits 2	٣			
2	BMT 225 Measurement Techniques	2				MET 352 Basic analog electronics	3				BN2204 Fundamentals of Biomechanics	4				Life sciences II (Cell Biology & Physiology)	6				ENTC 4017 - Industrial Supervision	3				BMET264 Medical Applications	3				Biomedical Measurements and Instrumentations	٣			
3	BMT 226 Electrical Skills (I)	2				MET 353 Medical electrical measurements	3				BN2301 Biochemistry and Biomaterials for Bioengineers	4				Engineering management and society	6				ENTC 4060 - Project Scheduling	3				HIST280 Atatürk's Principles And History Of Turkish Reforms	2				Statics	٢			
4	BMT 223 Applied Mathematics for BMT (II)	2				MET 354 Basic digital electronics	3				EG2401A Engineering Professionalism	2				Multivariable calculus and partial differential equations	6				ENTC 4600 - Technical Practicum	4									Dynamics	2			
5	BMT 228 Introduction to Biomechanics	2				MET 355 Biomedical mechanical Equipments	3				IE2141 Systems Thinking and Dynamics	4				University Common Core Course	6				ENTC 1510 - Student in University	2									Principles of Marketing	٢			
6	BMT 232 Principles	3				MET 356 Computer	2				GE5	4																			Special Topics on	٢			

#	King Saud University					Majmaah University					National University of Singapore					The University of Hong Kong					East Tennessee State University					Eastern Mediterranean University					21 September University				
	Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours			
		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P
	of Mechanical Biomedical Instrumentation					Programming																									Biomedical Equipment's Technology				
7																															Operating System	2			
8																															Advanced Programming	2			
1	BMT 313 Biomedical Electronics (III)	3				MET 361 Medical analog signal processing	2				EG3611A Industrial Attachment	10				Biomechanics for biomedical engineering	6				ENTC 2310 - Electrical Principles	4				ELET311 Microprocessor Applications	٣				Biomedical Electronics 1	٣			
2	BMT 333 Electrical Machines in Medical Instrumentation	2				MET 362 Advanced Medical analog electronics	3				UE 1	4				Life sciences III (Physiology)	6				ENTC 2320 - Electronics I	4				ELET315 Industrial Electronics	3				Total Quality Management	2			
3	BMT 323 Electrical Skills (II)	2				MET 363 Advanced Medical digital electronics	3				BN3101 Biomedical Engineering Design	6				Biomedical engineering laboratory	6				ENTC 2330 - Network Systems	3				BMET301 Laser and Medical Applications	3				Biomedical Equipment's 1	٢			
4	BMT 336 Optical Biomedical Instrumentation	3				MET 364 Electro Mechanical & pneumatic	3				UE 1	4				Statistics and mathematical analysis for biomedical engineering	6				ENTC 3310 - Circuit Analysis	3				BMET303 Hospital Organization And Management	٣				System Analysis and Design	٣			

Annex- 19, Comparison of Program Courses and Similar Programs Courses

#	King Saud University					Majmaah University					National University of Singapore					The University of Hong Kong					East Tennessee State University					Eastern Mediterranean University					21 September University				
	Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours			
		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P
						Equipment's																													
5	BMT 337 Biomaterials	2				MET 365 Advanced Medical Mechanical Equipment's	3				UE 2	4				Technical English for biomedical engineering	6				ENTC 3320 - Electronics II	4				AE01 Technical Elective	٣				Software Engineering	2			
6	BMT 335 Mechanical Biomedical Instrumentation	3				University Elective	2				UE 3	4																				Biomaterials	٢			
7	IC 106 Medical Jurisprudence	2									Technical Elective 1	4																				Biomechanics	2			
8																																			
1	BMT 314 Biomedical Electronics (IV)	3				MET 471 Medical Digital signal processing	3				BN3101 Biomedical Engineering Design	6				Biomaterials science and engineering	6				ENTC 3370 - Electronics-Digital Circuits	4				BMET302 Medical Training					Biomedical Electronics 2	3			
2	BMT 315 Introduction to Bioelectrical Instrumenta	2				MET 472 Medical electronic Equipment's	3				UE 2	4				Medical imaging	6				ENTC 4277 - Instrumentation and Process Control	4				BMET304 Laboratory Support Equipment	3				Biomedical Equipment's 2	٢			

#	King Saud University					Majmaah University					National University of Singapore					The University of Hong Kong					East Tennessee State University					Eastern Mediterranean University					21 September University				
	Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours			
		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P
	tion																																	
3	BMT 367 Hospital Safety	2				MET 473 Imaging systems	3				UE 3	4				Integrated project	6				ENTC 4337 - Microprocessors	4				BMET306 Diagnosis and Tracking Devices	٣				Biomedical signals processing	٣			
4	BMT 334 Biomedical Imaging Equipment	3				MET 474 Medical Equipment's management & maintenance	2				UE 4	4				Practical Chinese for engineering students	6				ENTC 4347 - Digital Signal Processors	4									Microcontroller and Microprocessor	٣			
5	BMT 338 Introduction to Bioengineering Design	2				University Elective	2				Technical Elective 1	4				Common Core Course	6				ENTC 3331 - RF Fundamentals	3									Rehabilitation Procedures	٢			
6	RHS 372 Audiology II	2				University Elective	2				EG3611a Industrial Attachment	10				Professional training (Internship)															Clinical Engineering	2			
7	ARAB 103 Expository Writing	2									UE 4	4																				Research methodology	٢			
8																																		
1	BMT 413 Biomedical Electronics (V)	3				MET 481 Computer application for biomedical systems	3				BN4101 B.Eng. Dissertation	4				Final year project	6				ENTC 4350 - Biomedical Instrumentation I	4									Mobile Application Development	٣			

#	King Saud University					Majmaah University					National University of Singapore					The University of Hong Kong					East Tennessee State University					Eastern Mediterranean University					21 September University				
	Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours			
		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P
2	BMT 415 Biomedical Signal Processing	3				MET 482 Advanced imaging systems	3				Technical Elective 2	4				Elective Course	6				ENTC 4390 - Medical Imaging Equipment Technology	3									Biomedical Equipment's Maintenance and Management 1	3			
3	BMT 432 Special Topics on Biomedical Instrumentation	4				MET 483 Optical & laboratory medical Equipment's	3				Pathway Elective 1	4				Common Core Course	6				HSCI 2010 - Anatomy and Physiology I	4									Safety for Biomedical Equipment's Technology Specialists	2			
4	BMT 437 Control Systems in Biomedical Equipment	2				MET 484 Advanced medical electronic Equipment's	3				UE 5	4				Control and instrumentation	6				HSCI 2011 - Anatomy and Physiology Laboratory I	0									Artificial Intelligent	2			
5	BMT 484 Automation in Clinical Laboratory	3				MET *** Elective specialty courses	2				UE 6	4				Biomedical instrumentation and systems	6				HSCI 2020 - Anatomy and Physiology II	4									Artificial Organs and Extremities	2			
6						University Elective	2																									Project 1	2			
7																																			
1	BMT 414 Biomedical Electronics (VI)	3				MET 591 Project	2				BN4101 B.Eng. Dissertation	4				Final year project	6				HSCI 2021 - Anatomy and Physiology Laboratory II	0									Project 2	2			

Annex- 19, Comparison of Program Courses and Similar Programs Courses

#	King Saud University					Majmaah University					National University of Singapore					The University of Hong Kong					East Tennessee State University					Eastern Mediterranean University					21 September University				
	Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours				Course	Course Hours			
		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P		CH	L	T	P
2	BMT 485 Biomedical Computing	4				MET 592 Digital image processing	2				Pathway Elective 2	4				Elective Course	6				MATH 1840 - Analytic Geometry and Differential Calculus	3									Biomedical Equipment's Maintenance and Management ٢	٣			
3	BMT 468 Clinical Practice / Project	3				MET 593 Control of biomedical systems	3				UE 7	4				Biomedical ultrasonics: principles and applications	6				MATH 1850 - Integral Calculus for Technology	3									Entrepreneurship	2			
4	BMT 465 Maintenance Management	2				MET 594 Safety in hospitals	2				UE8	4				Magnetic resonance imaging: principles, technology and applications	6														Special studies (Seminars and Case Study) in Biomedical Equipment Technology	2			
5	RHS 422 Rehabilitation Procedures	2				MET *** Elective specialty courses	2									Biomedical signals processing and modeling in medical applications	6														Machine Learning	2			
6	CHS 243 Basic Emergency Care	2				MET *** Elective specialty courses	2																									Occupational Ethics	2			
7						University Elective	2																													

Annex- 20, Matrix of Mapping Program PILO's with Courses

I =Introduction; E=Extension; A=Application

#	Year المستوى الدراسي	Term الفصل الدراسي	Course Name اسم المقرر	Course Code رمز المقرر	Credit Hours الساعات المعتمدة				Program Intended Learning Outcomes (PILOs) رمز ورقم مخرجات التعلم											
									A. Knowledge and understanding المعرفة والفهم				B. Intellectual Skills المهارات الذهنية				C. Practical & Professional Skills المهارات العملية				D. Transferrable Skills المهارات الانتقالية			
					L	T	P	Total	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
1	1	1	English 101		2			2													√		√	
2	1	1	Arabic 101		2			2															√	
3	1	1	Islamic Culture		2			2															√	√
4	1	1	National Culture		2			2															√	√
5	1	1	Fundamentals of Nursing		2			2						√	√	√						√		
6	1	1	Medical Terminology		2			2	√	√		√												
7	1	1	Math 1		2			2	√	√													√	
8	1	2	Introduction to Biomedical Equipment's Technology		2			2	√	√				√	√									
9	1	1	Computer principles and programming		٢		١	٣	√												√		√	
10	1	2	English 102		2			2															√	
11	1	2	Arabic 102		2			2													√		√	

12	1	2	Arabic Israeli Conflict		2			2															√		
13	1	2	Principle of Health Management		2			2	√	√		√													
14	1	2	Anatomy and Physiology		2			2	√	√	√								√	√					
15	1	2	Communication skills and Presentation		2			٢	√				√		√							√			
16	1	2	Math 2		2			2	√													√		√	
17	2	1	Programming 2		2		١	٣	√	√	√								√	√					
18	2	1	Physics		2			2	√																
19	2	1	Electrical Circuits 1		2		1	3	√	√		√										√		√	
20	2	1	Biostatistics		2			2	√	√				√	√										
21	2	1	Fundamentals of Microbiology		2		1	3	√	√															
22	2	1	Math 3		2			2	√					√	√										
23	2	1	Digital Logic Design		2		١	2														√		√	
24	2	1	Object-Oriented Programming		2		١	٣	√			√	√		√	√	√	√							
25	2	2	Engineering Drawing		٢			2	√			√	√		√	√	√	√							
26	2	2	Computer Network		2		1	3	√	√				√	√										

27	2	2	Electrical Circuits 2		2		١	٣	√	√	√	√	√		√	√	√	√	√	√			√
28	2	2	Biomedical Measurements and Instrumentations		2		١	٣		√				√	√	√					√			√
29	2	2	Statics		2			٢	√		√	√			√	√	√	√	√	√	√	√			√
30	2	2	Dynamics		٢			2	√	√	√	√	√		√	√	√	√	√	√	√				√
31	2	2	Principles of Marketing		2			٢	√	√		√													
32	2	2	Special Topics on Biomedical Equipment's Technology		2			٢			√			√	√			√	√	√					
33	3	1	Operating System		2			2	√		√		√	√			√								
34	3	1	Advanced Programming		2			2	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	
35	3	1	Biomedical Electronics 1	07.02.721	2		١	٣									√	√	√						
36	3	1	Total Quality Management	05.01.709	2			2	√												√		√		
37	3	1	Biomedical Equipment's 1	07.02.722	2			٢	√		√	√					√		√	√					
38	3	1	System Analysis and Design	07.02.720	2		١	٣	√	√				√	√								√		
39	3	1	Software Engineering	07.02.721	2			2	√												√		√		
40	3	1	Biomaterials	07.02.723	2			٢	√					√	√	√					√	√	√		

41	3	2	Biomechanics	07.02.724	2			2	√	√	√	√	√		√	√	√	√	√	√	√			√
42	3	2	Biomedical Electronics 2	07.02.725	2		1	3	√	√	√		√	√	√									
43	3	2	Biomedical Equipment's 2	07.02.726	2			٢	√	√		√												
44	3	2	Biomedical signals processing	07.02.727	2		١	٣	√	√		√		√	√									
45	3	2	Microcontroller and Microprocessor	07.02.728	2		١	٣	√	√				√	√								√	√
46	3	2	Rehabilitation Procedures	07.02.729	2			٢	√	√	√	√	√		√	√	√	√	√		√			√
47	3	2	Clinical Engineering	07.02.730	2			2	√		√		√								√			
48	3	2	Research methodology	05.02.710	2			٢	√	√	√	√	√		√	√		√	√		√			√
49	4	1	Mobile Application Development	07.02.722	2		١	٣			√	√	√	√	√	√	√	√	√	√	√	√	√	√
50	4	1	Biomedical Equipment's Maintenance and Management 1	07.02.731	2		1	3	√	√	√	√	√		√	√	√	√	√		√			√
51	4	1	Safety for Biomedical Equipment's Technology Specialists	07.02.732	2			2	√				√								√			
52	4	1	Artificial Intelligent	07.02.723	٢			2	√	√			√	√	√									
53	4	1	Artificial Organs and Extremities	07.02.733	2			2	√	√	√	√	√		√	√	√	√	√		√			√

Annex- 20, Matrix of Mapping Program PILO's with Courses

54	4	1	Project 1	07.02.734	2			2	√				√	√	√	√	√						
55	4	2	Project 2	07.02.735	2			2	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
56	4	2	Biomedical Equipment's Maintenance and Management 2	07.02.736	٢		١	٣		√				√	√							√		
57	4	2	Entrepreneurship	07.02.724	2			2	√												√			√
58	4	2	Special studies (Seminars and Case Study) in Biomedical Equipment Technology	07.02.737	٢			2	√	√	√	√	√		√	√	√	√	√		√			√
59	4	2	Machine Learning	07.02.725	2			2	√	√	√		√	√							√			
60	4	2	Occupational Ethics	05.02.711	2			2					√	√	√	√	√	√	√	√	√	√	√	√

Program Intended Learning Outcomes (PILOs): Biomedical Equipment's Technology Program at IUTT

A. Knowledge and Understanding:

Upon successful completion of the Program, the graduates will be able to:

A5 Demonstrate an understanding of appropriate models, theories, mathematical foundations, and techniques related to Biomedical Equipment's Technology discipline.

A6 Identify user and Healthcare needs to provide BET based solutions to real-world problem.

A7 Demonstrate a profound knowledge in utilizing and adapting BET tools, techniques, practices, and methods for solving biomedical equipment's problems in Health environment.

A8 Demonstrate a sound understanding the biomedical equipment's technology concept related to analysis, design, implementation, and evaluation of Biomedical equipment's system.

B. Cognitive/ Intellectual Skills:

Upon successful completion of the Program, the graduates will be able to:

B5. Critically analyse complex biomedical equipment's problems and propose appropriate biomedical equipment's technology based solutions and integrate them effectively into the uses and organization Health.

B6. Analyze the impacts of biomedical equipment's technology on Health objectives and customer needs, and consider them during the selection, integration, configuration and administration of biomedical equipment's systems.

B7. Explore variety of challenges and problems related to biomedical equipment's technology to select the optimal solution.

B8. Evaluate biomedical equipment's technology based solution to meet a given set of Health requirements in the context of biomedical equipment's technology discipline.

C. Practical and Professional Skills:

Upon successful completion of the Program, the graduates will be able to:

C5. Employ effectively the concepts, principles of engineering, maintenance and evaluation tools, techniques used for the analysis and troubleshooting of medical equipment's faults of varying complexity.

C6. Design, implement, and test an equipment-based solution to meet a given set of engineering requirement in the context of biomedical equipment's technology.

C7. Use systematic approaches to select, develop, apply integrates, and administrate maintenance of biomedical equipment's technologies to accomplish user and Health goals.

C8. Use current techniques, skills, and tools necessary for biomedical equipment's maintenance practices.

D. General and Transferable Skills:

Upon successful completion of the Program, the graduates will be able to:

D5. Function effectively as an individual, as a member, or leader of a team engaged in activities appropriate to the biomedical equipment's technology discipline to accomplish a common goal.

D6. Commit to professional ethics, responsibilities, and norms of professional biomedical equipment's technology practices.

D7. Communicate effectively in writing and orally in a variety of professional contexts.

D8. Engage in continuing professional development and lifelong learning as an biomedical equipment's technology professional.

Annex- 21, CVs for the Preparation Committee

Attached separately.

Approved by

Department Head	Faculty Dean	Quality Unit	Vice President