Program Specification

(Bachelor)

Program:	**Bachelor of Biomedical Equipment Technology**
Program Code (as per Saudi university ranking):	**071901, 071902**
Qualification Level:	**Bachelor (Level 6 - NQF)**
Department:	**Medical Equipment Technology**
College:	**College of Applied Medical Sciences**
Institution:	**Majmaah University**
Program Specification:	New ☐ updated* ☒
Last Review Date:	22 August 2023

*Attach the previous version of the Program Specification.

Table of Contents

A. Program Identification and General Information

1. Program's Main Location :
Majmaah University-Main Campus – Building Number 5
2. Branches Offering the Program (if any):
Only in the Main Campus of CAMS and no other branches offering this program
3. Partnerships with other parties (if any) and the nature of each:
No Partnership
4. Professions/jobs for which students are qualified
Medical Device Technologist, Biomedical Engineer
5. Relevant occupational/ Professional sectors:
Healthcare institute/ Regulatory Affairs /Academic/ Research
6. Major Tracks/Pathways (if any):

Major track/pathway	Credit hours (For each track)	Professions/jobs (For each track)
1. None		
2.		
3.		
…		

7. Exit Points/Awarded Degree (if any):	
exit points/awarded degree	**Credit hours**
1. None	
2.	
3.	
8. Total credit hours: (140 Credit Hours)	

B. Mission, Objectives, and Program Learning Outcomes

1. Program Mission:

Offer a premier biomedical Equipment Technology program that makes the graduates highly competent and enhances the quality of life in their society by leveraging scientific research, to achieve sustainable development.

2. Program Goals:

1. Preparing graduates with core concepts, relevant practice, skillsets, and values in the Biomedical Equipment Technology profession.

2. Providing an appropriate environment for scientific research, community service and sustainable development.

3. Program Learning Outcomes*

Knowledge and understanding	
K1	knowledge of the impact of biomedical engineering technology solutions in societal and global context
K2	an ability to select and apply knowledge of mathematics, science, engineering, and technology to biomedical engineering technology problems that require the application of principles and applied procedures or methodologies
Skills	
S1	an ability to design systems components, or processes for broadly defined engineering technology problems appropriate to Biomedical Equipment Technology program educational objectives
S2	an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to biomedical engineering technology activities
S3	an ability to identify, analyze and solve biomedical engineering technology problems
S4	an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes
S5	an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature
Values, Autonomy, and Responsibility	
V1	an ability to function effectively as a member or leader on a technical team;
V2	an understanding of the need for and an ability to engage in self-directed continuing professional development;
V3	an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;
V4	a commitment to quality, timeliness, and continuous improvement.

* Add a table for each track or exit Point (if any)

C. Curriculum

1. Curriculum Structure

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Institution Requirements	Required	00	00	0%
	Elective	06	12	8.57%
College Requirements	Required	01	02	1.43%
	Elective	02	04	2.86%
Program Requirements	Required	33	85	60.71%
	Elective	03	06	4.29%
Capstone Course/Project	Required	01	02	1.43%
Field Training/ Internship	Required	Two Semesters	N/A	N/A
Residency year	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Others	Required	09	29	20.71%
Total		55	140	100%

* Add a separated table for each track (if any).

MU Elective Course

SALM 101	Introduction to Islamic Culture	2	Student should study any 3 out of 4
SALM 102	Islam and Society Development	2	
SALM 103	Islamic Economic System	2	
SALM 104	Fundamentals of Islamic Politics	2	
ARAB 101	Arabic Language Skills	2	The student should study any 1 out of 2
ARAB 103	Arabic Editing	2	
ENG 101	English Language	2	The student should study any 2 out of 7
SOCI 101	Contemporary Societal Issues	2	
HAF 101	Fundamentals of Health and Physical Fitness	2	
ENT 101	Entrepreneurship	2	
LHR 101	Legislations and Human Rights	2	
FCH 101	Family and Childhood	2	
VOW 101	Voluntary Work	2	

CAMS Elective Course

CAMS 232	Medical Terminology	2	The student should study any 2 out of 3
CAMS 233	Biostatistics	2	
CAMS 234	Quality of Health Care	2	

MET Elective Course

MET 485	Reverse engineering in medical equipment	2	The student should study 1 out of 2
MET 486	Medical Equipment Design	2	
MET 595	Molecular Sensors & Nano-Scale Devices	2	The student should study 2 out of 4
MET 596	Introduction to Telemedicine	2	
MET 597	Artificial Intelligence	2	
MET 598	Pattern Recognition	2	

2. Program Courses

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Level 1	PENG 111	English (1) for Preparatory Year	Required		8	Deanship of Preparatory year
	PMTH 112	Introduction to Mathematics (1)	Required		2	
	PCOM 113	Computer Skills	Required		2	
	PSSC 114	Learning and Communication Skills	Required		2	
Level 2	PENG 121	English (2) for Preparatory Year	Required		6	Deanship of Preparatory year
	PENG 122	English for Medical Specialties	Required		2	
	PCHM 124	Introduction to Chemistry	Required		2	
	PPHS 125	Physics for Health Purposes	Required		2	
	PBIO 126	Biology Science	Required		3	
Level 3	MET 231	Basics of Physiology	Required		2	Department
	MET 232	Fundamentals of Anatomy	Required		2	
	MET 233	Basic Mathematics	Required		2	
	MET 234	Bio-Physics	Required		3	
	MET 235	Bio-Mechanics	Required		2	
	CAMS 231	Emergency Care	Required		2	College
	CAMS***	CAMS Elective Course	Elective		2	
	MU***	MU Elective Course	Elective		2	University
Level 4	MET 241	Applied Mathematics 1	Required	MET 233	2	Department
	MET 242	Physics for Medical Equipment	Required	MET 234	3	
	MET 243	Electrical Circuits	Required	MET 233	3	
	MET 244	Electrical Skills	Required	MET 233	2	
	MET 245	Computer & Systems	Required	MET 233	2	
	MET 246	Bio-Materials	Required	MET 235	2	
	CAMS***	CAMS Elective Course	Elective		2	College
Level 5	MET 351	Applied Mathematics 2	Required	MET 241	2	Department
	MET 352	Basic Analogue Electronics	Required	MET 243	3	
	MET 353	Medical Electrical Measurements	Required	MET 243 MET 244	3	
	MET 354	Basic Digital Electronics	Required	MET 241 MET 243	3	
	MET 355	Biomedical Mechanical Equipment	Required	MET 242	3	
	MET 356	Computer Programming	Required	MET 245	2	

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Level 6	MET 361	Medical Analogue Signal Processing	Required	MET 351 MET 352	2	Department
	MET 362	Advanced Medical Analogue Electronics	Required	MET 352	3	
	MET 363	Advanced Medical Digital Electronics	Required	MET 354	3	
	MET 364	Electromechanical & Pneumatic Equipment	Required	MET 355	3	
	MET 365	Advanced Medical Mechanical Equipment	Required	MET 355	3	
	MU***	MU Elective Course	Elective		2	University
Level 7	MET 471	Medical Digital Signal Processing	Required	MET 361	3	Department
	MET 472	Medical Electronic Equipment	Required	MET 362 MET 361	3	
	MET 473	Medical Imaging Systems	Required	MET 355	3	
	MET 474	Medical Equipment Management & Maintenance	Required	MET 365 MET 364	2	
	MU***	MU Elective Course	Elective		2	University
	MU***	MU Elective Course	Elective		2	
Level 8	MET 481	Computer Applications for Biomedical Systems	Required	MET 356	3	Department
	MET 482	Advanced Medical Imaging Systems	Required	MET 475	3	
	MET 483	Optical & Laboratory Medical Equipment	Required	MET 242 MET 472	3	
	MET 484	Advanced Medical Electronic Equipment	Required	MET 472	3	
	MET ***	MET Elective Course	Elective		2	
	MU ***	MU Elective Course	Elective		2	University
Level 9	MET 591	Project	Required	MET 473 MET 484	2	Department
	MET 592	Digital Image Processing	Required	MET 482 MET 471	2	
	MET 593	Control of Biomedical Systems	Required	MET 363	3	
	MET 594	Safety in Hospital	Required	MET 482	2	
	MET ***	MET Elective Course	Elective		2	
	MET ***	MET Elective Course	Elective		2	
	MU***	MU Elective Course	Elective		2	University
Internship		Two semesters	Compulsory			

* Include additional levels (for three semesters option or if needed).
** Add a table for the courses of each track (if any)

3. Course Specifications:

Insert hyperlink for all course specifications using NCAAA template (T-104)

CS 2023-2024

4. Program learning Outcomes Mapping Matrix:

Align the program learning outcomes with program courses, according to the following desired levels of performance *(I = Introduced & P = Practiced & M = Mastered).*

Course code & No.	Program Learning Outcomes										
	Knowledge and understanding		Skills					Values, Autonomy, and Responsibility			
	K1	K2	S1	S2	S3	S4	S5	V1	V2	V3	V4
MET 231	I				I				I		
MET 232	I						I	I			
MET 233	I				I				I		
MET 234	I					I			I		
MET 235	I			I					I		
MET 241	I				I						I
MET 242		I				I			I		
MET 243		I		I				I			
MET 244		I	I			I					
MET 245		I				I					I
MET 246		I			I				I		
MET 351	P				P				P		
MET 352		P			P	P					
MET 353		P				P				P	
MET 354		P	P			P					
MET 355	P			P				P			
MET 356	P		P					P			
MET 361		P		P							P
MET 362		P					P		P		
MET 363		P		P					P		
MET 364	P					P			P		
MET 365		P				P			P		
MET 471		P		P					P		
MET 472	P				P			P			
MET 473		P		P				P			
MET 474		P	P			P	P				
MET 481		P				P					P
MET 482		P		P						P	
MET 483		P	P								P

Course code & No.	Program Learning Outcomes										
	Knowledge and understanding		Skills					Values, Autonomy, and Responsibility			
	K1	K2	S1	S2	S3	S4	S5	V1	V2	V3	V4
MET 484	P					P				P	
MET 485		P		P					P		
MET 486		P				P			P		
MET 591		M	M				M		M		
MET 592	M			M					M		
MET 593		M	M						M		
MET 594		M					M			M	M
MET 595	M				M			M			
MET 596	M				M				M		
MET 597		M			M						M
MET 598	M		M						M		
Internship		M	M		M				M		M

* Add a separated table for each track (if any).

5. Teaching and learning strategies applied to achieve program learning outcomes.

Describe teaching and learning strategies, including curricular and extra-curricular activities, to achieve the program learning outcomes in all areas.

The program uses modern teaching and learning strategies as mentioned below.

Program Learning Outcomes		Teaching strategies
K1	knowledge of the impact of biomedical engineering technology solutions in societal and global context	Passive Learning, Active Learning
K2	an ability to select and apply knowledge of mathematics, science, engineering, and technology to biomedical engineering technology problems that require the application of principles and applied procedures or methodologies	Passive Learning, Active Learning
S1	an ability to design systems components, or processes for broadly defined engineering technology problems appropriate to Biomedical Equipment Technology program educational objectives	Active Learning, Project-Based Learning, Experiential Learning,
S2	an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to biomedical engineering technology activities	Active Learning, Project-Based Learning, Experiential Learning,
S3	an ability to identify, analyze and solve biomedical engineering technology problems	Active Learning, Project-Based Learning, Experiential Learning,

S4	an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes	Active Learning, Project-Based Learning, Experiential Learning,
S5	an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature	Active Learning, Project-Based Learning, Experiential Learning,
V1	an ability to function effectively as a member or leader on a technical team;	Active Learning, Project-Based Learning, Experiential Learning,
V2	an understanding of the need for and an ability to engage in self-directed continuing professional development;	Active Learning, Project-Based Learning, Experiential Learning,
V3	an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;	Active Learning, Project-Based Learning,
V4	a commitment to quality, timeliness, and continuous improvement.	Active Learning, Project-Based Learning, Experiential Learning,

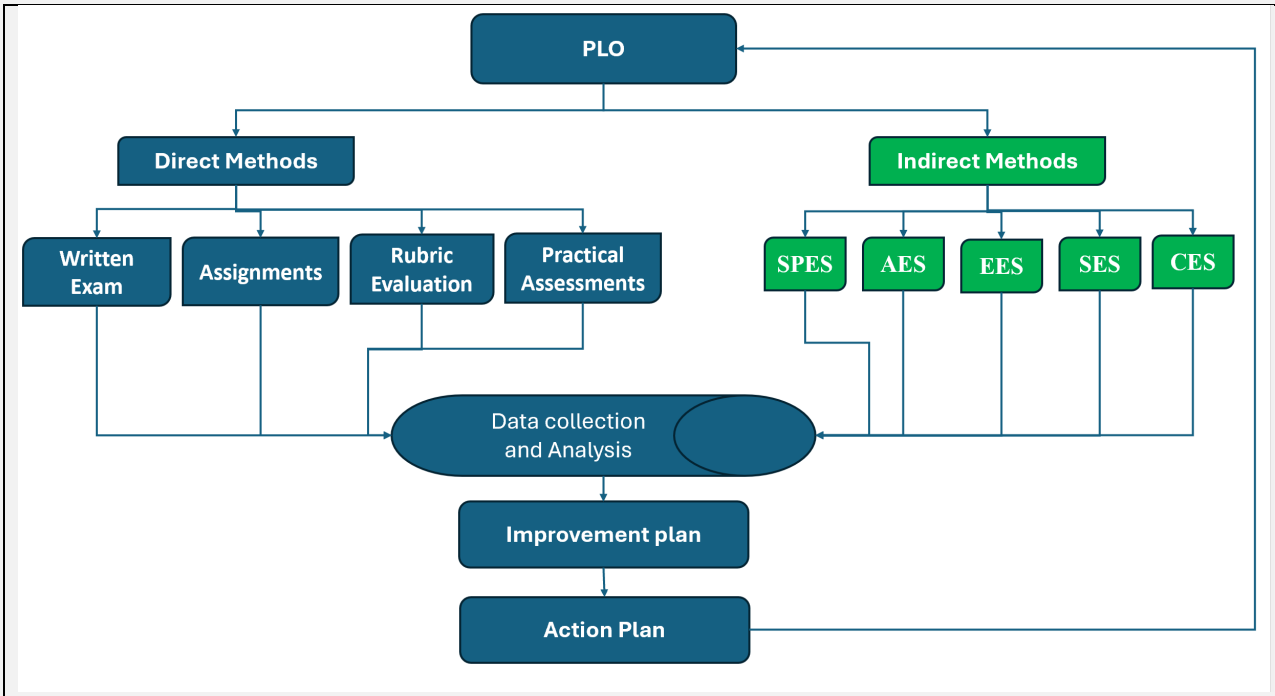
Teachings and learning strategies applied to achieve the program learning outcomes of a Bachelor of Biomedical Equipment Technology :

General Teaching Strategy	**Specific Teaching Strategies**
Passive Learning	- Direct Instruction (Lectures)
	- online Teaching
Active Learning	- Brainstorming
	- Group Discussions
	- Case-Based Learning
Experiential Learning	- Simulation-based Learning
	- Laboratory-based Experiments
Project-Based Learning	- Problem-Based Learning
	- Capstone Projects

6. Assessment Methods for program learning outcomes.

Describe assessment methods (Direct and Indirect) that can be used to measure the achievement of program learning outcomes in all areas.

The program should devise a plan for assessing Program Learning Outcomes (all learning outcomes should be assessed at least twice in the bachelor program's cycle and once in other degrees).



A framework for assessing Program Learning Outcomes (PLOs) using both direct and indirect assessments, followed by data collection and analysis to inform an improvement plan and an action plan.
Program Learning Outcomes (PLOs): These are the core educational outcomes expected from students in the program.
1. Direct Assessment:
O Includes various direct measurement methods to assess students' achievement of PLOs, such as:

- Written Exams: Testing knowledge through traditional examinations.
- Assignments: Evaluation based on tasks that require students to demonstrate their understanding.
- Rubric Evaluation: Scoring based on predefined criteria, often used for projects or presentations.
- Practical Assessments: Hands-on assessments, likely to include lab work, clinical tasks, or other practical exercises.

2. Indirect Assessment: Includes methods that gather feedback on students' experiences and self-reported achievements. The abbreviations likely represent:

SPES – Student program evaluation survey
AES – Alumni Evaluation Survey
EES – Employee Evaluation Survey
SES – Stakeholder Evaluation Survey
CES – Course Evaluation Survey

3. Data Collection and Analysis:
Both direct and indirect assessments feed into a centralized process of data collection and analysis, identifying gaps or areas of improvement.
4. Improvement Plan:
Based on the analysis, an improvement plan is developed to address deficiencies or areas needing enhancement in achieving the PLOs.

5. Action Plan:
This step outlines specific actions to be implemented to improve program outcomes based on the improvement plan.
This framework provides a comprehensive approach to continuous improvement in education by integrating direct measures of student performance with indirect feedback from stakeholders such as students, alumni, and employers. It ensures data-driven decision-making for program enhancement.

Program Learning Outcomes		Assessment Methods	
		Direct	Indirect
K1	knowledge of the impact of biomedical engineering technology solutions in societal and global context	**Written Exams - Assignment**	SPES Q(1, 2)AES Q(1, 2)EES Q(1, 2)SES Q(1, 2)CES Q(1, 2, 3)
K2	an ability to select and apply knowledge of mathematics, science, engineering, and technology to biomedical engineering technology problems that require the application of principles and applied procedures or methodologies	**Written Exams - Assignment**	SPES Q(2, 5)AES Q(2, 5)EES Q(2, 5)SES Q(2, 5)CES Q(1, 2, 3)
S1	an ability to design systems components, or processes for broadly defined engineering technology problems appropriate to Biomedical Equipment Technology program educational objectives	**Written Exams - Rubric Evaluation - Practical Assessments**	SPES Q(6, 3)AES Q(6, 3)EES Q(6, 3)SES Q(6, 3)CES Q(1, 2, 3)
S2	an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to biomedical engineering technology activities	**Written Exams - Rubric Evaluation - Practical Assessments**	SPES Q(24, 3)AES Q(13, 3)EES Q(13, 3)SES Q(13, 3)CES Q(1, 2, 3)
S3	an ability to identify, analyze and solve biomedical engineering technology problems	**Written Exams - Rubric Evaluation- Assignment - Practical Assessments**	SPES Q(19, 3)AES Q(11, 3)EES Q(11, 3)SES Q(11, 3)CES Q(1, 2, 3, 4)
S4	an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes	**Written Exams - Rubric Evaluation- Assignment - Practical Assessments**	SPES Q(7, 3)AES Q(7, 3)EES Q(7, 3)SES Q(7, 3)CES Q(1, 2, 3, 4)
S5	an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature	**Rubric Evaluation- Assignment - Practical Assessments**	SPES Q(8, 3)AES Q(8, 3)EES Q(8, 3)SES Q(8, 3)CES Q(1, 2, 3, 5)

V1	an ability to function effectively as a member or leader on a technical team;	**Rubric Evaluation- Assignment - Practical Assessments**	SPES Q(9, 4)AES Q(9, 4)EES Q(9, 4)SES Q(9, 4)CES Q(6, 3)
V2	an understanding of the need for and an ability to engage in self-directed continuing professional development;	**Rubric Evaluation- Assignment - Practical Assessments**	SPES Q(22, 4)AES Q(12, 4)EES Q(12, 4)SES Q(12, 4)CES Q(3)
V3	an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;	**Rubric Evaluation- Assignment - Practical Assessments**	SPES Q(25, 26, 4)AES Q(14, 15, 4)EES Q(14, 15, 4)SES Q(14, 15, 4)CES Q(3)
V4	a commitment to quality, timeliness, and continuous improvement.	**Rubric Evaluation- Assignment - Practical Assessments**	SPES Q(10, 4)AES Q(10, 4)EES Q(10, 4)SES Q(10, 4)CES Q(3)

D. Student Admission and Support:

1. Student Admission Requirements

The following requirements have been established for admission to the Applied Medical Sciences programs at CAMS including BMET program:

1- An applicant must have a Saudi Secondary School Certificate - Science Section (SSSCSS) or its equivalent. The secondary school certificate should not be more than five years old. The Rector of the University may grant an exemption from this condition.
2- An applicant must have an Aptitude Test Certificate (ATC) administered by the National Center for Assessment in Higher Education. The minimum qualifying scores for the SSSCSS and ATC tests are a total equivalent percentage of 75% (based on 30% from the SSSCSS, 30% from the ATC, and 40% from the cumulative basic Science of SSSCSS).
3- An applicant must not have been dismissed from another university for disciplinary reasons.
4- When applicants exceed availability, priority is given to those with higher grades.

Distribution of Students among Various Fields of Applied Medical Sciences:

All students at CAMS are required to complete a common preparatory year before admitted to their chosen program in level three. To be eligible for the admission to BMET program, students must achieve a minimum GPA of 3.0/5 during the preparatory year. The allocation process to various programs at CAMS is carried out according to the interest of the students and the capacity

of each program after meeting the required GPA. When applicants exceed availability, priority is given to those with higher grades. The final status of all students is submitted to the Deanship of Admission and Registration within a pre-specified period each Term.

Registration Procedure:

At the beginning of each term, the student is automatically registered for a set number of credit hours according to the BMET program study plan. For elective courses, students may register online via the Edugate portal.

Withdrawal:

The student has the right to withdraw from an academic semester within the withdrawal period announced in the academic calendar for that semester. No withdrawal is allowed during the last five weeks before the final examination. The college vice dean for academic affairs approve the withdrawal request after reviewing the authenticity of the students' reasons for withdrawal.

2. Guidance and Orientation Programs for New Students

(Include only the exceptional needs offered to the students of the program that differ from those provided at the institutional level).

The Vice Deanship for Academic Affairs, in collaboration with the departments of the BMET program, prepares an orientation program for newly enrolled students. The program covers topics such as the structure and requirements of the program curricula, study systems, available resources and facilities, and graduate employment opportunities.

3. Student Counseling Services

(Academic, professional, psychological and social)
(Include only the exceptional needs offered to the students of the program that differ from those provided at the institutional level).

Academic Advising is an essential and central element in the educational system. it is an objective response to the academic and social variables.

built into the system and philosophy of education, as well as being responsive to the needs of the student to Communicate with university education, which represents a necessary national development to achieve humanity innovation and excellence requirements.

Tasks of the Academic Advising Unit Coordinator There is an academic advising unit in each faculty headed by a member of the faculty staff. Such coordinator has the following tasks:

1. General supervision of the work of academic advisors and follow up the cases referred to him/her.

2. Welcome new students on the first day of study and introduce them to the university regulations.

3. Allocate students in a fair manner between faculty staff taking into consideration all psychological, social and linguistic factors.

4. Receive reports about students' issues in addition to the reports sent by the academic advisors, solve their problems or refer them to Vice Dean for Academic Affairs or to Dean if needed.

5. Organize counselling meetings, seminars and workshops to advance the academic advising efforts.

6. Facilitate the tasks of the academic advisors and prepare students' files and forms.

7. Discuss with the faculty council (the Dean or heads of departments) all new developments related to students and suggest solutions and ways for development.

Academic advisor refers the student to those who can answer his social, academic or even psychological queries if not acquainted by the academic advisor (Referral to the appropriated and concerned authorities at the university).

The students were able to add/remove any course according to the instructions provided by the academic advisor. Academic advising instruction are notified to the students by various means of displays includes websites, Edugate messages and televisions.

4. Special Support

(Low achievers, disabled, gifted, and talented students).

1. The Biomedical Equipment Technology program closely monitors student performance through course instructors and academic advisors. If any students are identified as low achievers, they will be provided with additional counseling and guidance.

2. There are no general rules governing the compensation for students with disabilities and chronic illnesses. Decisions regarding such cases are taken on the merit of individual case, by the relevant department. (Guide for the students with special needs).

3. The Biomedical Equipment Technology program prepares graduates for an applied profession which demands that all enrolled students are physically and mentally fit for the purpose of safe practice.

4. The Biomedical Equipment Technology program does not have any restrictions for applicants with disabilities.

5. In building where MET program is running is a mammoth building with all facilities for disabled students like elevators, ramp in the main entrance of the building, separate vehicle parking space, specially designed toilets for disabled people etc.,

6. The program motivates good performers and talented students through supporting their innovations, participation in seminars, workshops and conferences held outside the campus.

7. Talented students are given flexible access to the laboratories to conduct their experiments.

8. The department has an 'innovations lab' that is available for talented students to use for their own projects.

E. Faculty and Administrative Staff:

1. Needed Teaching and Administrative Staff

Academic Rank	Specialty		Special Requirements / Skills (if any)	Required Numbers		
	General	Specific		M	F	T
Professor	2	2		4	0	0
Associate Professor	2	2		4	0	4
Assistant Professor	2	4		6	0	6
Lecturer	0	0		0	0	0
Teaching Assistant						
Technicians and Laboratory Assistant	3	0		3	0	3
Administrative and Supportive Staff	0	0		0	0	0
Others (specify)						

F. Learning Resources, Facilities, and Equipment:

1. Learning Resources

Learning resources required by the Program (textbooks, references, and e-learning resources and web-based resources, etc.)

Learning resources required by the Program (textbooks, references, and e-learning resources and web-based resources, etc.)

Majmaah University has subscription to many of the periodicals related to the medical laboratories' profession. In addition, of subscribing several Electronic Library full-text databases, the students and faculty members also have the access to Saudi digital library (SDL) http://sdl.edu.sa/SDLPortal/EN/Publishers.aspx.

Each course coordinator provides a list of related reference books for his courses at the first pages of the module guide. The whole list for all courses and submits it to the vice dean of academic affairs for approval and then sent to the University central library for purchase. Faculty and teaching staff follow the institutional process for planning and acquisition of any resources needed

for library, laboratories, and classrooms, this procedure generally start by submitting their requests in appropriate forms to the department heads, Who forwarded to the Lab and equipment committee for study and recommendation then the final list of equipment has to be approved in the department council. Then the collective lists will be submitted to the vice dean of academic affairs. Upon approval, these lists will take its track through college administration and then to the concerned university administrations.

The student has the opportunity to evaluate the adequacy of the textbooks, reference and other resource in several places (group discussion in the class's sessions and in the course evaluation surveys). The evaluation of the adequacy of textbooks, reference and other resources is done by faculty and teaching staff at the end of each semester, they write theirs recommendation in the course report form based on the feedback from students (surveys and focus groups), the internal and external evaluation of the course (quality committee + advisory Committee) and also on the new trends emerging in the field of study.

2. Facilities and Equipment

(Library, laboratories, classrooms, etc.)

The BMET curriculum includes laboratory courses in biomedical instrumentations, basics electronics, biomedical optics, digital electronics and microprocessor, biomedical simulation, signal processing, mechanical equipment and biomechanics.

BMET department maintains all its laboratories with up-to-date equipment and ensures CAMS safety instructions. The laboratories are open to students during the working hours when the technicians are available. However, there is a schedule for each lab stating the times for each of the courses. For a specific course, only students of that course should use the laboratories during the allotted time for that course. The students can also use the laboratories under the supervision of lab instructors for course, project, or other experimentation whenever the laboratories are free.

Biomedical Equipment Technology Department in the College of Applied Medical Sciences at Majmaah University has eight laboratories for handling the practical part of the courses. They are as follows:

Laboratories	Room Number	اسم المعمل عربي	م
Medical Devices Workshop Advanced Medical Electronics Lab	2A12 (005-1-3-12) 2A11 (005-1-3-11)	- ورشة الأجهزة الطبية - معمل الإلكترونيات الطبية المتقدمة	1
Computer lab	2A8 (005-1-3-7)	- معمل الحاسب الآلي	2
Advanced Medical Devices Lab		معمل الأجهزة الطبية المتقدمة	3
Radiological Sciences and Medical Imaging Lab Bio-Physics Lab	2A7 (005-1-3-6)	- معمل علوم الأشعة والتصوير الطبي - معمل الفيزياءالحيوية	4
Electrical Skills Lab	2A5 (005-1-3-5)	معمل المهارات الإلكترونية	5
Bio-Signals Processing Lab	2A4 (005-1-3-5)	معمل معالجة الإشارات الحيوية	6

7	معمل القوى الكهربائية	2A6 (005-1-3-5)	Electric Power Lab
8	معمل لوحات الدوائر المطبوعة	2A3 (005-1-3-5)	Printed Circuit Boards lab
9	معمل الإلكترونيات الطبية	2A2 (005-1-3-2)	Medical Electronics Lab

3. Procedures to ensure a healthy and safe learning environment

(According to the nature of the program)

Good communication within each faculty, department or work area is vital for the success of the environmental health and safety program. The laboratory committee endorses organized safety committees at the laboratory, building, department or faculty level to provide a forum for CAMS employees to express their needs and concerns for safety, and to resolve such issues and concerns in conformance with the University environmental health and safety program. The responsibility for the management of laboratory safety and adherence to safe lab practices rests within the

department. All personnel, including Faculties, Students, Administrator, Doctors, Supervisors, Staffs and Visitors have a duty to fulfill their obligations with respect to maintaining a healthy and safe work environment. To ensure that the laboratory meets accepted safety standards is the second part of the safety program. This includes attention to proper labelling of chemicals, proper earthing of electrical equipment, and provision of means for proper handling and disposal of bio-hazardous materials, including all patient specimens.

College of Applied Medical Sciences will implement an effective safety and health program for the employees and Students. All staff will be educated to report and manage exposure to infectious and hazardous materials. Training programs will be held to prevent injuries. All staff will report exposure to potentially infectious material to their supervisor so as to initiate action to protect the employee, Students and Researchers patient in the College.

G. Program Quality Assurance:

1. Program Quality Assurance System

Provide a link to quality assurance manual.

QMS

2. Procedures to Monitor Quality of Courses Taught by other Departments

QMS

3. Procedures Used to Ensure the Consistency between Main Campus and Branches (including male and female sections).

Not Applicable

4. Assessment Plan for Program Learning Outcomes (PLOs),

Program Learning Outcomes		Assessment Methods	
		Direct	**Indirect**
K1	knowledge of the impact of biomedical engineering technology solutions in societal and global context	**Written Exams - Assignment**	SPES Q(1, 2)AES Q(1, 2)EES Q(1, 2)SES Q(1, 2)CES Q(1, 2, 3)
K2	an ability to select and apply knowledge of mathematics, science, engineering, and technology to biomedical engineering technology problems that require the application of principles and applied procedures or methodologies	**Written Exams - Assignment**	SPES Q(2, 5)AES Q(2, 5)EES Q(2, 5)SES Q(2, 5)CES Q(1, 2, 3)
S1	an ability to design systems components, or processes for broadly defined engineering technology problems appropriate to Biomedical	**Written Exams - Rubric Evaluation -**	SPES Q(6, 3)AES Q(6, 3)EES Q(6, 3)SES Q(6, 3)CES Q(1, 2, 3)

	Equipment Technology program educational objectives	**Practical Assessments**	
S2	an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to biomedical engineering technology activities	**Written Exams - Rubric Evaluation - Practical Assessments**	SPES Q(24, 3)AES Q(13, 3)EES Q(13, 3)SES Q(13, 3)CES Q(1, 2, 3)
S3	an ability to identify, analyze and solve biomedical engineering technology problems	**Written Exams - Rubric Evaluation- Assignment - Practical Assessments**	SPES Q(19, 3)AES Q(11, 3)EES Q(11, 3)SES Q(11, 3)CES Q(1, 2, 3, 4)
S4	an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes	**Written Exams - Rubric Evaluation- Assignment - Practical Assessments**	SPES Q(7, 3)AES Q(7, 3)EES Q(7, 3)SES Q(7, 3)CES Q(1, 2, 3, 4)
S5	an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature	**Rubric Evaluation- Assignment - Practical Assessments**	SPES Q(8, 3)AES Q(8, 3)EES Q(8, 3)SES Q(8, 3)CES Q(1, 2, 3, 5)
V1	an ability to function effectively as a member or leader on a technical team;	**Rubric Evaluation- Assignment - Practical Assessments**	SPES Q(9, 4)AES Q(9, 4)EES Q(9, 4)SES Q(9, 4)CES Q(6, 3)
V2	an understanding of the need for and an ability to engage in self-directed continuing professional development;	**Rubric Evaluation- Assignment - Practical Assessments**	SPES Q(22, 4)AES Q(12, 4)EES Q(12, 4)SES Q(12, 4)CES Q(3)
V3	an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;	**Rubric Evaluation- Assignment - Practical Assessments**	SPES Q(25, 26, 4)AES Q(14, 15, 4)EES Q(14, 15, 4)SES Q(14, 15, 4)CES Q(3)
V4	a commitment to quality, timeliness, and continuous improvement.	**Rubric Evaluation- Assignment - Practical Assessments**	SPES Q(10, 4)AES Q(10, 4)EES Q(10, 4)SES Q(10, 4)CES Q(3)

5. Program Evaluation Matrix

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
Leadership	All faculty	Surveys	End of academic year
Effectiveness of Teaching	All students	Surveys	End of semesters
Effectiveness of assessment	All students	Course Coordinator physical verification	End of semesters
Learning Resources	students, graduates, alumni, faculty	Surveys	End of academic year
Program Outcome	All graduates	Surveys	End of academic year
Employer Survey	Employers	Surveys	End of academic year
Program SSR	independent reviewers	Physical verification	Whenever required
Faculty Satisfaction	All faculty	Surveys	End of academic year

Evaluation Areas/Aspects (e.g., leadership, effectiveness of teaching & assessment, learning resources, services, partnerships, etc.)
Evaluation Sources (students, graduates, alumni, faculty, program leaders, administrative staff, employers, independent reviewers, and others.
Evaluation Methods (e.g., Surveys, interviews, visits, etc.)
Evaluation Time (e.g., beginning of semesters, end of the academic year, etc.)

6. Program KPIs*

The period to achieve the target (**2023-2024**) year(s).

KPI	Description	Target Benchmark
KPI-P-01	Students' Evaluation of quality of learning experience in the program	4.5/5
KPI-P-02	Average of students' overall rating for the quality of courses on a five-point scale in an annual survey	4.5/5
KPI-P-03	The proportion of undergraduate students who completed the program in minimum time in each cohort.	%90
KPI-P-04	Percentage of first-year undergraduate students who continue at the program the next year to the total number of first-year students in the same year.	100%
KPI-P-05	Students' performance in the professional and/or national examinations	NA
KPI-P-06	a. Percentage of graduates from the program who within a year of graduation were employed within 12 months	91%
KPI-P-06	b. Percentage of graduates from the program who within a year of graduation were enrolled in postgraduate programs during the first year of their graduation to the total number of graduates in the same year.	2%
KPI-P-07	Average of the overall rating of employers for the proficiency of the program graduates on a five-point scale in an annual survey.	4/5
KPI-P-08	Ratio of the total number of students to the total number of full-time and full-time equivalent teaching staff in the program	4:01
KPI-P-09	Percentage of full-time faculty members who published at least one research paper during the year to total faculty members in the program	90%
KPI-P-10	The average number of refereed and/or published research per each faculty member during the year (total number of refereed and/or published research to the total number of full-time or equivalent faculty members during the year).	4.2
KPI-P-11	The average number of citations in refereed journals from published research per faculty member in the program (total number of citations in refereed journals from published research for full-time or equivalent faculty members to the total research published).	70:01
MU-P-01	Average rating of beneficiaries' satisfaction with the community services provided by the program on a five-level scale in an annual survey	4.6/5
MU-P2	The percentage of students who received a warning or more in the program to the total number of students in the program.	0%
MU-P3	The percentage of students who were denied entry to the final examination of the course exceeding the legally permitted percentage of the total number of students in the program.	0%
MU-P-05	The percentage of full-time faculty members who provided professional development activities inside or outside the university during the year to the total teaching staff in the program	60%

*including KPIs required by NCAAA

H. Specification Approval Data:

Council / Committee	**MET Council**
Reference No.	**Meeting Number 1**
Date	**28 August 2023**