Program Specification

(Bachelor)

Program:	**Bachelor of Biomedical Equipment Technology**
Program Code (as per Saudi university ranking):	**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:	28 August 2024

*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:

- Healthcare institutions (Hospitals and clinics)
- Medical equipment manufacturer
- Government and Medical Regulatory bodies

4. Professions/jobs for which students are qualified

- Medical device technologist
- Biomedical engineer
- Medical device design engineer
- Clinical Engineer
- Healthcare technology manger
- Medical device sales representative
- Regulatory affairs specialist
- Research assistant

5. Relevant occupational/ Professional sectors:

- Healthcare institutions
- Medical Companies
- Regulatory Affairs
- Academia
- Research centers

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	

8. Total credit hours: (133 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	Demonstrate relevant knowledge of fundamental sciences
K2	Exhibit an understanding of engineering sciences, theories, principles, and concepts related to the field of Biomedical technology.
K3	Acknowledge the utilization of biomedical engineering technology and its regulations, on the economy, community health, and environment locally and globally
Skills	
S1	Apply basic and engineering sciences, principles, and concepts in various contexts, related to biomedical technology
S2	Utilize contemporary instruments and software proficiently for various applications within biomedical technology.
S3	Execute standard tests, measurements, and experimentation to design and develop appropriate solutions
S4	Effectively communicate technical and non-technical information through written, oral, and graphical mediums within broad contexts.
Values, Autonomy, and Responsibility	
V1	Demonstrate effective communication and function effectively as a proactive member or a leader on work teams.
V2	Demonstrate commitment to professional and ethical responsibilities, quality, and life-long 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	2	4	3.0%
	Elective	4	8	6.0%
College Requirements	Required	3	6	4.5%
	Elective	0	0	0%
Program Requirements	Required	26	75	56.4%
	Elective	3	6	4.5%
Capstone Course/Project	Required	1	4	3.0%
Field Training	Required	1	2	1.5%
Internship	Required	Two Semesters	Not Applicable	Not Applicable
Residency year	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Others (First Foundation Year for Health Colleges)	Required	8	28	21.1%
Total		48	133	100%

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

MU Elective Course

University requirements: The student must register for 12 hours, divided into two groups, the first (ladder) of 4 hours are mandatory in First Foundation Year for Health Colleges * , the second group is elective student choose of 8 hours (expect *).		
Course code	Course name	Credit hours
First group Mandatory 2 Courses		
ULS 100*	مهارات الحياة الجامعية University Life Skills	2
SOS 100*	المهارات المجتمعية Community Skills	2
Second group Choose 4 Courses		
SALAM 101	Introduction to Islamic culture	2
SALAM 102	Islam and community-building	2
SALAM 103	Economic System in Islam	2
ARAB 103	Arabic Writing	2
SOCI 101	Contemporary Societal Issues	2
ENT 101	Entrepreneurship	2
HAF 101	Principles of Health and Fitness	2
NIHD 100	National Identity in Its Historical Depth	2
PLS 100	Practical Life's Skills	2

CAMS Elective Course

CAMS 231	Emergency Healthcare	2	The student must study the 3 courses
CAMS 234	Healthcare Quality	2	
CAMS 235	Healthcare Standards and Regulations	2	

BMET Elective Courses

BMET 365	Medical Device Manufacturing	2	The student should study any 3 out of these courses.
BMET 366	Rehabilitation Engineering	2	
BMET 367	Medical Internet of Things	2	
BMET 476	Quality and Regulation in Healthcare	2	
BMET 477	Implantable Medical Devices and Sensory Aids	2	
BMET 478	Reverse engineering in medical Equipment	2	
BMET 486	Human Factor Engineering	2	
BMET 487	Biomedical Image Processing	2	
BMET 488	Machine Learning and Pattern Recognition	2	
BMET 489	Introduction to telemedicine	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 100	English (1)	Required		5	First Foundation Year for Health Colleges
	PCOA 100	Digital Sciences	Required		2	
	PBIO 100	Human Biology Science	Required		4	
	STA 100	Biostatistics	Required		3	
	ULS 100	University Life Skills	Required		2	University
Level 2	PENG 101	English (2)	Required		5	First Foundation Year for Health Colleges
	PENG 102	Medical Terminology	Required		2	
	PCHM 100	Biochemistry	Required		4	
	PPHS 100	Biophysics	Required		3	
	SOS 100	Community Skills	Required		2	University
Level 3	BMET 231	Anatomy and Physiology for Medical Equipment Technology	Required		2	Department
	BMET 232	Mathematics for Medical Equipment Technology 1	Required		4	
	BMET 233	Physics for Medical Equipment Technology 1	Required		3	
	BMET 234	Computer Programming	Required		2	
	CAMS 231	Emergency Healthcare	Required		2	College
	CAMS 234	Healthcare Quality	Elective		2	
	MU***	University Elective	Elective		2	University
Level 4	BMET 241	Mathematics for Medical Equipment Technology 2	Required	BMET 232	3	Department
	BMET 242	Physics for Medical Equipment Technology 2	Required	BMET 233	3	
	BMET 243	Electrical Circuits for Medical Equipment Technology	Required	BMET 232 – BMET 233	4	
	BMET 244	Biomechanics	Required	BMET 233	3	
	BMET 245	Networks and Medical Cybersecurity	Required		3	
	CAMS 235	Healthcare Standards and Regulations	Elective		2	College
Level 5	BMET 351	Biomaterials	Required		2	Department
	BMET 352	Basic Analog Electronics	Required	BMET 243	3	
	BMET 353	Medical Measurements and Sensors	Required	BMET 243	3	
	BMET 354	Basic Digital Electronics	Required	BMET 243	3	
	BMET 355	Medical Device Design	Required		3	
	MU***	University Elective	Elective		2	University
	MU***	University Elective	Elective		2	

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Level 6	BMET 361	Medical Analog Signal Processing	Required	BMET 241	3	Department
	BMET 362	Advanced Medical Analog Electronics	Required	BMET 352	3	
	BMET 363	Advanced Medical Digital Electronics	Required	BMET 354	3	
	BMET 364	Advanced Medical Mechanical Equipment	Required	BMET 242	3	
	BMET 4**	Elective Specialty Course	Elective		2	
	MU***	University Elective	Elective		2	University
Level 7	BMET 471	Medical Digital signal processing	Required	BMET 361	3	Department
	BMET 472	Medical Electronic Equipment	Required	BMET 363 - BMET 362	3	
	BMET 473	Medical Imaging Systems	Required	BMET 242	3	
	BMET 474	Medical Equipment Maintenance and Safety	Required		3	
	BMET 475	Clinical Research Methods and Practice	Required	BMET 364	2	
	BMET ***	Elective Specialty Course	Elective		2	
Level 8	BMET 481	Project	Required	BMET 475	4	Department
	BMET 482	Health Technology Management	Required		2	
	BMET 483	Optical & laboratory Medical Equipment	Required	BMET 242	3	
	BMET 484	Biomedical Control System	Required	BMET 471	3	
	BMET 485	Sales and Marketing in the Biomedical Industry	Required		2	
	BMET ***	Elective Specialty Course	Elective		2	
Internship		One Year	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)

https://majmaah-my.sharepoint.com/:f:/g/personal/met_mu_edu_sa/En7Nz-lIRR1CjLJD_u0bM2cBhiWf8PTogGM9Sl2I9zsGyw?e=otZZs5

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	K3	S1	S2	S3	S4	V1	V2
CAMS 231			I			I			I
CAMS 234			I			I			I
CAMS 235			I			I			I
PENG 100	I						I	I	
PCOA 100		I			I				I
PBIO 100	I			I				I	
STA 100		I				I			I
PENG 101	I						I	I	
PENG 102	I						I	I	
PCHM 100	I			I				I	
PPHS 100		I			I			I	
BMET 231	I			I				I	
BMET 232		I				I		I	
BMET 233	I			I				I	
BMET 234		I			I			I	
BMET 241	I				I			I	
BMET 242		I				I			I
BMET 243		I				I		I	
BMET 244	I			I				I	
BMET 245	I						I		I
BMET 351	I			I				I	
BMET 352		I				I	I		
BMET 353		I				I			I
BMET 354		I			I		I		
BMET 355			I		I				I
BMET 361		P				P			P
BMET 362	P				P		P		
BMET 363		P					P	P	
BMET 364			P			P	P		
BMET 471		P			P			P	
BMET 472		P				P		P	
BMET 473		P					P		P
BMET 474			P			P			P
BMET 475				P			P		P
BMET 481		M			M		M	M	
BMET 482			M				M		M
BMET 483	M				M		M		
BMET 484		M		M					M

Course code & No.	Program Learning Outcomes								
	Knowledge and understanding			Skills				Values, Autonomy, and Responsibility	
	K1	K2	K3	S1	S2	S3	S4	V1	V2
BMET 485		M		M					M
BMET 365	M					M			M
BMET 366	M				M				M
BMET 367			M			M			M
BMET 476			M		M				M
BMET 477		M		M					M
BMET 478			M		M			M	
BMET 486			M			M			M
BMET 487	M					M			M
BMET 488		M				M			M
BMET 489		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.		
PLO Code	**PLO**	**Teaching and Learning strategies**
K1	**Demonstrate** relevant knowledge of fundamental sciences	Passive Learning, Active Learning
K2	**Exhibit** an understanding of engineering sciences, theories, principles, and concepts related to the field of Biomedical technology.	
K3	**Acknowledge** the utilization of biomedical engineering technology and its regulations, on the economy, community health, and environment locally and globally	
S1	**Apply** basic and engineering sciences, principles, and concepts in various contexts, related to biomedical technology	Active Learning, Project-Based Learning, Experiential Learning,
S2	**Utilize** contemporary instruments and software proficiently for various applications within biomedical technology.	
S3	**Execute** standard tests, measurements, and experimentation to design and develop appropriate solutions	
S4	Effectively **communicate** technical and non-technical information through written, oral, and graphical mediums within broad contexts.	

V1	**Demonstrate effective communication** and function effectively as a proactive member or a leader on work teams.	Active Learning, Project-Based Learning, Experiential Learning, Internships/Externships
V2	**Demonstrate commitment to professional and ethical responsibilities**, quality, and life-long improvement.	

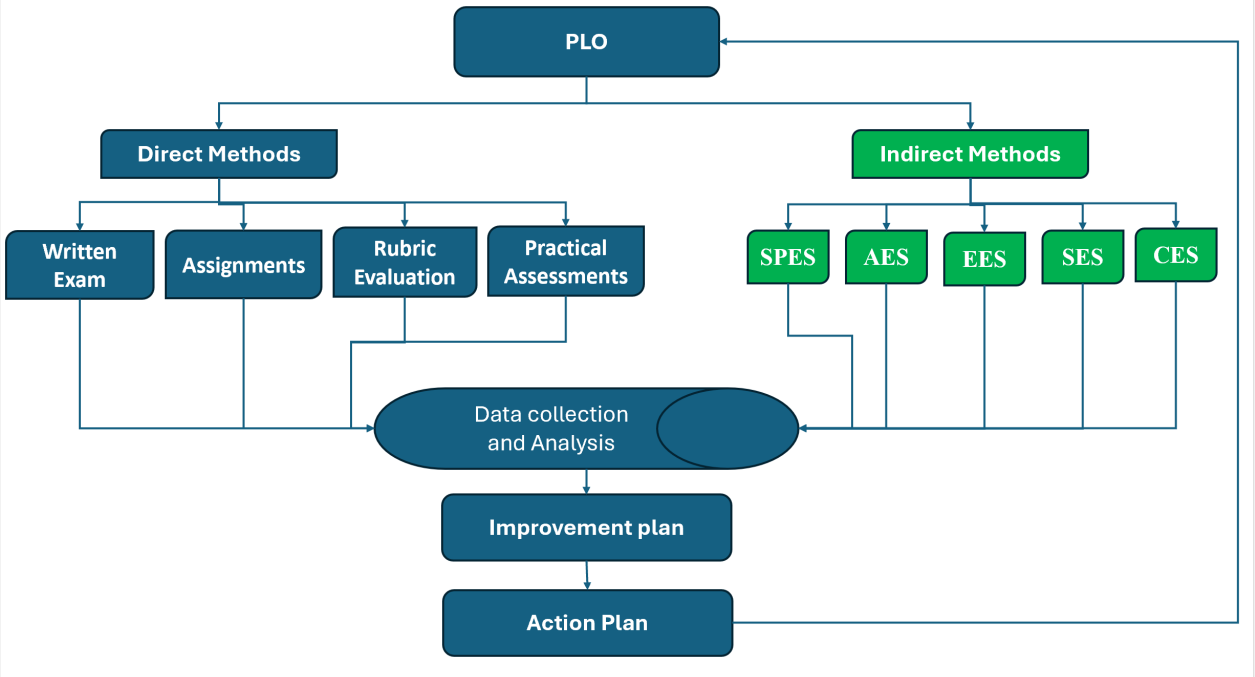
Teachings and learning strategies applied to achieve the program learning outcomes of a Bachelor of Biomedical Equipment Technology :

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.

NCAAA Domains	Program Learning Outcomes		Assessment Method	
			Indirect	Direct
Knowledge and Understanding	K1	**Demonstrate** relevant knowledge of fundamental sciences	SPES Q(1, 2)AES Q(1, 2)EES Q(1, 2)SES Q(1, 2)CES Q(1, 2, 3)	Written Exam, Oral Exam Assignments, and Reports.
	K2	**Exhibit** an understanding of engineering sciences, theories, principles, and concepts related to the field of Biomedical technology.	SPES Q(2, 5)AES Q(2, 5)EES Q(2, 5)SES Q(2, 5)CES Q(1, 2, 3)	
	K3	**Acknowledge** the utilization of biomedical engineering	SPES Q(8, 3)AES Q(8, 3)EES Q(8,	

		technology and its regulations, on the economy, community health, and environment locally and globally	3)SES Q(8, 3)CES Q(1, 2, 3, 5)	
Skills	**S1**	**Apply** basic and engineering sciences, principles, and concepts in various contexts, related to biomedical technology	SPES Q(6, 3)AES Q(6, 3)EES Q(6, 3)SES Q(6, 3)CES Q(1, 2, 3)	Standardized exams, practical examination, Oral Exam, Assignment, case studies, and Projects
	S2	**Utilize** contemporary instruments and software proficiently for various applications within biomedical technology.	SPES Q(24, 3)AES Q(13, 3)EES Q(13, 3)SES Q(13, 3)CES Q(1, 2, 3)	
	S3	**Execute** standard tests, measurements, and experimentation to design and develop appropriate solutions	SPES Q(19, 3)AES Q(11, 3)EES Q(11, 3)SES Q(11, 3)CES Q(1, 2, 3, 4)	
	S4	Effectively **communicate** technical and non-technical information through written, oral, and graphical mediums within broad contexts.	SPES Q(7, 3)AES Q(7, 3)EES Q(7, 3)SES Q(7, 3)CES Q(1, 2, 3, 4)	
Values	**V1**	**Demonstrate effective communication** and function effectively as a proactive member or a leader on work teams.	SPES Q(9, 4)AES Q(9, 4)EES Q(9, 4)SES Q(9, 4)CES Q(6, 3)	Assignments, reports, presentations, case studies, Oral Exam
	V2	**Demonstrate commitment to professional and ethical responsibilities**, quality, and life-long improvement.	SPES Q(25, 26, 4)AES Q(14, 15, 4)EES Q(14, 15, 4)SES Q(14, 15, 4)CES Q(3)	

D. Student Admission and Support:

1. Student Admission Requirements

1. **Secondary School Certificate:**
   - Applicant must have a Saudi Secondary School Certificate - Science Section (SSSCSS) or its equivalent.
   - The certificate should not be more than five years old.
   - The University Rector may grant an exemption to this condition.
2. **Aptitude Test Certificate (ATC):**
   - Applicant must have an Aptitude Test Certificate (ATC) administered by the National Center for Assessment in Higher Education.

- The qualifying score for admission is an equivalent percentage of 75%, calculated as:
    - 30% from the SSSCSS score,
    - 30% from the ATC score,
    - 40% from the cumulative basic science GPA of the SSSCSS.

3. **Disciplinary Record:**
    - Applicant must not have been dismissed from another university for disciplinary reasons.
4. **Priority for Admission:**
    - When the number of applicants exceeds program availability, priority is given to those with higher grades.
5. **Distribution of Students Among Fields:**
    - All CAMS students must complete a common preparatory year before admission to their chosen program at Level Three.
    - To be eligible for the BMET program, students must achieve a minimum GPA of 3.0/5 during the preparatory year.
    - The allocation of students to various programs is based on their interests, program capacity, and GPA.
    - When applicants exceed availability, priority is given to those with higher grades.
6. **Final Student Status:**
    - The final allocation of students is submitted to the Deanship of Admission and Registration within a pre-specified period each term.

Registration Procedure:

1. **Automatic Registration:**
    - At the start of each term, students are automatically registered for a set number of credit hours based on the BMET program study plan.
2. **Elective Course Registration:**
    - Students can register for elective courses online via the Edugate portal.

Withdrawal Procedure:

3. **Withdrawal from Semester:**
    - Students may withdraw from an academic semester within the withdrawal period announced in the academic calendar.
4. **Restriction:**
    - No withdrawal is permitted during the last five weeks before final exams.
5. **Approval:**

- The college vice dean for academic affairs must approve the withdrawal request after verifying the validity of the student's reasons.

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).

Preparation:

- The Vice Deanship for Academic Affairs collaborates with the BMET program departments to organize the orientation program.

Program Content:

- The orientation covers the following topics:
  - Structure and requirements of the BMET program curricula.
  - Study systems and academic expectations.
  - Available resources and facilities for student support.
  - Graduate employment opportunities.

Execution:

- The orientation program is delivered to newly enrolled students to help them understand the academic and career paths associated with the BMET program.

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).

1. **Role of Academic Advising:**

- Academic advising is an essential element of the educational system, aimed at addressing academic and social variables and supporting students in their university education journey.

2. **Coordinator Responsibilities:**

- **Supervision:** General supervision of academic advisors, including monitoring cases referred to the coordinator.
- **Welcoming New Students:** Greet new students on the first day of study and introduce them to university regulations.
- **Student Allocation:** Fairly allocate students among faculty staff, considering psychological, social, and linguistic factors.
- **Student Issues:** Receive and review reports about student issues and take necessary actions or refer them to the Vice Dean or Dean.
- **Organizing Events:** Organize counselling meetings, seminars, and workshops to enhance academic advising efforts.
- **Facilitation:** Support academic advisors by preparing students' files and forms and ensuring smooth operations.

- **Development Discussions:** Engage with the faculty council (Dean or heads of departments) to discuss new developments related to students and propose solutions.

3. **Student Support and Referrals:**

- If academic advisors cannot resolve a student's query, they will refer the student to the appropriate social, academic, or psychological support at the university.

4. **Course Management:**

- Students can add or remove courses in accordance with the academic advisor's instructions. These instructions are communicated through various channels, including websites, Edugate messages, and television displays.

4. Special Support

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

1. **Monitoring Student Performance:**

- The Medical Equipment Technology program monitors student performance through course instructors and academic advisors.
- Identified low achievers are provided with additional counseling and guidance.

2. **Support for Students with Disabilities or Chronic Illnesses:**

- There are no general rules for compensating students with disabilities or chronic illnesses.
- Each case is handled individually, with decisions made by the relevant department, following the guidelines in the "Guide for Students with Special Needs."

3. **Fitness for Practice:**

- The program prepares graduates for an applied profession that requires all enrolled students to be physically and mentally fit for safe practice.

4. **Admission of Students with Disabilities:**

- The Medical Equipment Technology program does not impose any restrictions on applicants with disabilities.

5. **Motivation and Support for Talented Students:**

- Talented and high-achieving students are encouraged to pursue their innovations and are supported in participating in seminars, workshops, and conferences outside the campus.
- Talented students are granted flexible access to laboratories to conduct their experiments.

6. **Innovations Lab:**

- The department has an "Innovations Lab" available for talented students to use for their own projects and experiments.

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	0	0		0	0	0
Associate Professor	0	2		2	0	2
Assistant Professor	3	2		2	3	5
Lecturer	0	0		0	0	0
Teaching Assistant						
Technicians and Laboratory Assistant	3	0		3	0	3
Administrative and Supportive Staff	3	0		3	0	3
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.

MET 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.

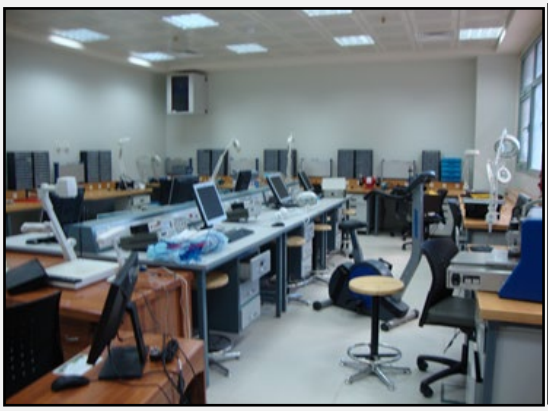
Medical Equipment Technology Department in the College of Applied Medical Sciences at Majmaah University has eight laboratories for handling the practical part of the courses. They are as follows:

قسم تقنية الأجهزة الطبية		
الاسم	الترميز	رقم المكتب
الطبية الإلكترونيات معمل Medical Electronic Lab	2A2	005-1-3-2
الحيوية الإشارات معالجة معمل Biosignal Processing Lab	2A3	005-1-3-3
الإلكترونية المهارات معمل Electrical Skills Lab	2A4	005-1-3-3
الكهربائية القوى معمل Electrical Power Lab	2A5	005-1-3-3
الطبي التصوير معمل Medical Imaging Lab	2A6	005-1-3-6
الطبية الأجهزة معمل Medical Devices Lab	2A7	005-1-3-7
المتقدمة الطبية الرقمية الإلكترونيات معمل Advanced Medical Digital Electronic Lab	2A11	005-1-3-12
الطبية الأجهزة ورشة	2A10	005-1-3-11

		Medical Devices Workshop
005-1-3-3	2AI2	الطلابية والأبحاث الابتكارات معمل Student Innovation and Research Lab
005-1-3-3	2AS3	المطبوعة الدو ائر لوحات معمل Printed Circuit Boards Lab
005-1-3-15	2A12	غرفة الاستذكار الطلابية Student Study Room








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 department is responsible for managing laboratory safety and adhering to safe lab practices. 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),

Knowledge and Understanding (K)

PLO K1: Demonstrate relevant knowledge of fundamental sciences.

- Assessment Method: Written exams, quizzes, or assignments
- Criteria: Students demonstrate understanding of fundamental sciences (e.g., biology, chemistry, physics) relevant to biomedical technology.

- Evaluation: Assess students' ability to apply scientific principles in solving problems related to biomedical technology.

PLO K2: Exhibit an understanding of engineering sciences, theories, principles, and concepts related to the field of Biomedical technology.

- Assessment Method: Project-based assessments, case studies
- Criteria: Students exhibit an understanding of engineering theories, principles, and concepts specific to biomedical technology.
- Evaluation: Evaluate students' ability to apply engineering knowledge to real-world scenarios in the field.

PLO K3: Acknowledge the utilization of biomedical engineering technology and its regulations, on the economy, community health, and environment locally and globally.

- Assessment Method: Research papers, presentations
- Criteria: Students acknowledge the impact of biomedical engineering technology on the economy, community health, and environment (both locally and globally).
- Evaluation: Assess students' ability to critically analyze and communicate the implications of biomedical technology.

Skills (S)

PLO S1: Apply basic and engineering sciences, principles, and concepts in various contexts, related to biomedical technology.

- Assessment Method: Laboratory experiments, practical assessments
- Criteria: Students apply basic and engineering sciences in various contexts related to biomedical technology.
- Evaluation: Evaluate students' hands-on skills and problem-solving abilities.

PLO S2: Utilize contemporary instruments and software proficiently for various applications within biomedical technology.

- Assessment Method: Practical exams, software projects
- Criteria: Students demonstrate proficiency in using instruments and software relevant to biomedical technology.
- Evaluation: Assess students' ability to operate tools commonly used in the field.

PLO S3: Execute standard tests, measurements, and experimentation to design and develop appropriate solutions.

- Assessment Method: Lab reports, design projects
- Criteria: Students execute standard tests, measurements, and experimentation to develop solutions.
- Evaluation: Review students' ability to design and implement experiments effectively.

PLO S4: Effectively communicate technical and non-technical information through written, oral, and graphical mediums within broad contexts.

- Assessment Method: Written reports, oral presentations
- Criteria: Students communicate technical and non-technical information effectively.
- Evaluation: Assess clarity, organization, and presentation skills.

Values (V)

PLO V1: Demonstrate effective communication and function effectively as a proactive member or a leader on work teams.

- Assessment Method: Group projects, team evaluations
- Criteria: Students demonstrate effective communication and function as proactive team members or leaders.
- Evaluation: Assess collaboration, leadership, and interpersonal skills.

PLO V2: Demonstrate commitment to professional and ethical responsibilities, quality, and life-long improvement.

- Assessment Method: Ethical case studies, reflective essays
- Criteria: Students demonstrate commitment to professional ethics, quality, and continuous improvement.
- Evaluation: Evaluate students' understanding of ethical dilemmas and their ability to make informed decisions.

NCAAA Domains	Program Learning Outcomes		Assessment Method	
			Indirect	Direct
Knowledge and Understanding	K1	**Demonstrate** relevant knowledge of fundamental sciences	SPES Q(1, 2)AES Q(1, 2)EES Q(1, 2)SES Q(1, 2)CES Q(1, 2, 3)	Written Exam, Oral Exam Assignments, and Reports.
	K2	**Exhibit** an understanding of engineering sciences, theories, principles, and concepts related to the field of Biomedical technology.	SPES Q(2, 5)AES Q(2, 5)EES Q(2, 5)SES Q(2, 5)CES Q(1, 2, 3)	
	K3	**Acknowledge** the utilization of biomedical engineering technology and its regulations, on the economy, community health, and environment locally and globally	SPES Q(8, 3)AES Q(8, 3)EES Q(8, 3)SES Q(8, 3)CES Q(1, 2, 3, 5)	
Skills	S1	**Apply** basic and engineering sciences, principles, and concepts in various contexts, related to biomedical technology	SPES Q(6, 3)AES Q(6, 3)EES Q(6, 3)SES Q(6, 3)CES Q(1, 2, 3)	Standardized exams, practical examination, Oral Exam, Assignment, case studies, and Projects
	S2	**Utilize** contemporary instruments and software proficiently for	SPES Q(24, 3)AES Q(13,	

		various applications within biomedical technology.	3)EES Q(13, 3)SES Q(13, 3)CES Q(1, 2, 3)	
	S3	**Execute** standard tests, measurements, and experimentation to design and develop appropriate solutions	SPES Q(19, 3)AES Q(11, 3)EES Q(11, 3)SES Q(11, 3)CES Q(1, 2, 3, 4)	
	S4	Effectively **communicate** technical and non-technical information through written, oral, and graphical mediums within broad contexts.	SPES Q(7, 3)AES Q(7, 3)EES Q(7, 3)SES Q(7, 3)CES Q(1, 2, 3, 4)	
Values	**V1**	**Demonstrate effective communication** and function effectively as a proactive member or a leader on work teams.	SPES Q(9, 4)AES Q(9, 4)EES Q(9, 4)SES Q(9, 4)CES Q(6, 3)	Assignments, reports, presentations, case studies, Oral Exam
	V2	**Demonstrate commitment to professional and ethical responsibilities**, quality, and life-long improvement.	SPES Q(25, 26, 4)AES Q(14, 15, 4)EES Q(14, 15, 4)SES Q(14, 15, 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 (**2024-2025**) 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 2024**