



Program Specifications (Postgraduate Degree)

Program Name: Master of Science in Biomedical Engineering (MSc BME)
Qualification Level: Level 7
Department: Medical Equipment Technology
College: College of Applied Medical Sciences
Institution: Majmaah University

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A. Program Identification and General Information

1. Program Main Location:			
Building Number 5, Majmaah University Main Campus			
2. Branches Offering the Program:			
Program offered for only Male and in only one campus			
3. Reasons for Establishing the Program:			
(Economic, social, cultural, and technological reasons, and national needs and development, etc.)			
<p>The College of Applied Medical Sciences (CAMS), being one of thirteen colleges at Majmaah University (MU) was established in 2009 to meet the need in the Kingdom of Saudi Arabia for skilled health care professionals. Since its establishment, it has been playing a significant role in providing both the private and the public health sectors with highly competent professional graduates who are equipped with the most recent knowledge and skills in their respective health care fields. CAMS currently operates four various graduate programs running under four academic departments. The Master of Science in Biomedical Engineering Program, BME, was established two years ago. BME was established in order to cover the need to specialists in biomedical technology that is needed in all health institutions and companies. Since our Country's national priority is "Living healthy and being healthy", The knowledge which students gain from this program will help to build technical and domain specific skills. There are very few people across the world works in this domain and hence it will improve the opportunities in healthcare industries which will directly boost towards economic growth.</p> <p>The International Bureau of Labor Statistics (BLS) projects 10% growth in life, physical, and social science occupations by 2026, with 100,000 new jobs flowing into the economy. The boom in life science occupations means that the industry needs more educated professionals to work in these positions. For students interested in medicine and technology, biomedical engineering combines both fields into one compelling industry. A biomedical engineering master's degree increases earning potential and makes workers more attractive to employers. This degree also teaches employees innovative skills to help them design the next generation of medical equipment. Workers who want to take the next step in their careers must find the right master's program in biomedical engineering.</p>			
4. System of Study			
<input checked="" type="checkbox"/> Coursework & Thesis <input type="checkbox"/> Coursework			
5. Mode of Study			
<input checked="" type="checkbox"/> On Campus <input type="checkbox"/> Distance Education <input type="checkbox"/> Others			
6. Educational and Research Partnerships(if any)			
- Partnership Arrangement: - Type of Partnership: - Duration of Partnership:			
7. Total Credit Hours for Completing the Program: (39 Credit Hours)			
8. Professional Occupations/Jobs:			
Biomedical Engineering Specialists in Hospitals, Governing Bodies, Research labs, Higher Studies			
9. Major Tracks/Pathways (if any):			
	Major Track/Pathway	Credit Hours (For each track)	Professional Occupations/Jobs (For each track)
1.	None		
2.			
10. Intermediate Exit Points/Awarded Degree (if any):			
	Intermediate Exit Points/Awarded Degree	Credit Hours	
1.	None		
2.			

B. Mission, Goals, and Learning Outcomes

1. Program Mission:

To prepare competencies in the Biomedical Engineering field through an educational environment supportive of scientific research and community service to cope with the evolution of health care systems and techniques.

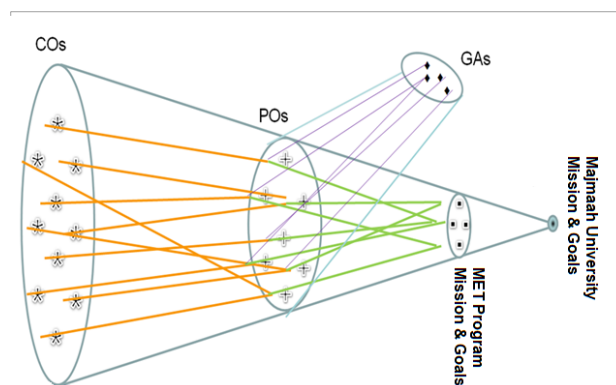
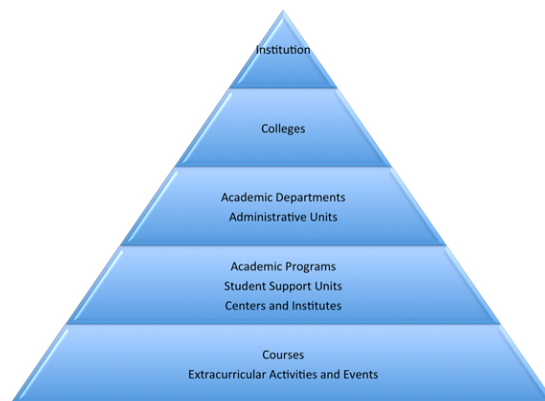
2. Program Goals:

Master of Science in Biomedical Engineering Program in Majmaah University will enable graduates in,

1. Applying principles and tools from the physical sciences and engineering to biology, physiology and medicine;
2. Translating knowledge and innovations to clinical practice;
3. Maintaining a nationally recognized and rigorous graduate program;
4. Training biomedical engineers to work effectively in a wide range of settings, from academia to industry; and,
5. Advocating and disseminating BME to the public at large scale.

3. Relationship between Program Mission and Goals and the Mission and Goals of the Institution/College.

The University mission and strategic plan provide the framework upon which the institutional effectiveness process operates. The institutional effectiveness process permeates all entities including colleges, academic departments and programs, administrative and student support units, as well as centers and institutes. Each unit is required to articulate its support of the mission and strategic plan through a concise statement of purpose.



4. Graduate Attributes:	
1- Analytical Thinking Undertake problem identification, formulation, and solution through analytical thinking.	
2- Creativity and innovation Capacity for novelty in biomedical engineering technologies	
3- Gained Knowledge Gained Knowledge of science and biomedical engineering fundamentals	
4- Collaborative and communicative Communicates effectively in a range of context in various forms (oral, written, visual)	
5- Professional Ethics, Duties: An understanding of the roles and responsibilities of the professional engineer in society.	
5. Program Learning Outcomes* (MSc BME – Single Track)	
Knowledge and Understanding	
A1	To recognize the main concepts, principles and theories of biomedical engineering applications.
A2	To determine the effect of biomedical engineering knowledge in developing research and professional practice.
Skills	
B1	To apply practical and theoretical knowledge of biomedical engineering to deal with novel and unpredictable professional contexts.
B2	To identify, formulate and solve biomedical engineering problems
B3	To develop significant novel ideas about biomedical engineering aspects
B4	To plan and execute a major research by applying practical and theoretical knowledge.
Values	
C1	To apply ethical principles and commit to professional ethics, responsibilities and norms of biomedical engineering practice
C2	To function effectively as a member or leader in diverse teams in multi-disciplinary settings.
C3	Ability to understand and prepare effective reports.
C4	Ability to produce project documentation.
C5	Ability to communicate effectively with different kinds of audiences

* Add a table for each track or Exit Points/Awarded Degree (if any)

C. Curriculum

1. Study Plan Structure

Program Structure		No. of Courses	Credit Hours	Percentage
Course	Required	14	31	79.48 %
	Elective			
Graduation Project (if any)		1	2	5.14 %
Thesis (if any)		1	6	15.38 %
Field Experience(if any)				
Others (.....)				
Total				100%

* Add a table for each track (if any)

2. Program Courses:

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours
Level 1	BME 611	Mathematical Methods for Biomedical Engineers	Required	Nil	2
	BME 612	Cellular and Molecular Biology	Required	Nil	2
	BME 613	Human Anatomy & Physiology for Biomedical Engineers	Required	Nil	2
	BME 614	Biomedical Sensors and Instrumentation	Required	Nil	3
	BME 615	Research methodology	Required	Nil	2
Level 2	BME 621	Biosignal Processing	Required	Nil	3
	BME 622	Biomechanics and Biodynamics	Required	Nil	2
	BME 623	Physiological Modelling	Required	Nil	2
	BME 624	Healthcare Technology Management	Required	Nil	2
	BME 625	Research Project	Required	Nil	2
Level 3	BME 631	Applied Medical Image Processing (2D and 3D)	Required	Nil	3
	BME 632	Rehabilitation Engineering (Prosthetics and Orthotics)	Required	Nil	2
	BME 633	Design Standards and Regulations for Medical Devices	Required	Nil	2
	BME 634	Biomaterials and Artificial Organs	Required	Nil	2
	BME 635	Hospital Planning, Organization and Management	Required	Nil	2
Level 4	BME 641	Thesis (Individual Student need to do research work along with a supervisor in the department. The Outcome of this work shall lead to develop novel devices, processess for the benefit of society and shall lead to a publication in a reputed periodical.	Required	Nil	2

* Include additional levels if needed

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

3. Course Specifications

Insert hyperlink for all course specifications using NCAAA template

Course Specifications

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 & Understanding		Skills				Values				
	A.1	A.2	B1	B2	B3	B4	C1	C2	C3	C4	C5
BME 611	I		I	I		I				I	

Course code & No.	Program Learning Outcomes										
	Knowledge & Understanding		Skills				Values				
	A.1	A.2	B1	B2	B3	B4	C1	C2	C3	C4	C5
BME 612	I		I			I		I			
BME 613	I		I			I		I			
BME 614	P		P						P		
BME 615	P	P	P		P	P	P				
BME 621	P	P	P	P					P		
BME 622	P		P	P							
BME 623	P	P		P	P			P			
BME 624	P	P			P		P				P
BME 625	P			P			P				
BME 631	M	M	M	M					M		
BME 632	M		M								
BME 633	M	M	M	M			M				
BME 634	M	M	M		M						M
BME 635	M	M		M	M			M			
BME 641		M				M	M		M	M	M

* Add a table for each track (if any)

5. Teaching and Learning Strategies to Achieve Program Learning Outcomes

Describe policies, teaching and learning strategies, learning experience, and learning activities, including curricular and extra-curricular activities, to achieve the program learning outcomes.

The classroom is a dynamic environment, bringing together students from different backgrounds with various abilities and personalities. Being an effective teacher therefore requires the implementation of creative and innovative teaching strategies in order to meet students' individual needs. The strategies aim to promote critical and reflective thinking, research and evaluation skills that will help students to take positive action to protect, enhance and advocate for their own and other's health, wellbeing and safety.

Technology in the classroom

Incorporating technology into our teaching is a great way to actively engage our students, especially as digital media surrounds young people in the 21st century.

Interactive whiteboards or audio-visual devices can be used to display images and videos, which helps students visualize new academic concepts. Learning can become more interactive when technology is used as students can physically engage during lessons as well as instantly research their ideas, which develops autonomy.

Students use personal and social capability to work collaboratively with others in learning activities, to appreciate their own strengths and abilities and those of their peers and develop a range of interpersonal skills such as communication, negotiation, teamwork, leadership and an appreciation of diverse perspectives.

Giving "Good" Student Feedback

Good feedback ensures that students are able to move forward efficiently on future work. The best feedback is specific, actionable, timely and respectful: find out how to incorporate these characteristics into your teaching practice.

Mid-semester Feedback

Gathering mid-semester feedback allows instructors to gain insight into how students are navigating the learning environment. The feedback can be used to understand what approaches are working within the class, and any alterations that could be made to continually improve the learning environment.

Group Work

The design of group work activities and projects can help students develop many attributes, including problem-solving abilities, planning and organization, and communication skills; yet, group work can present many challenges for both the students and the instructor. There are considerations to keep in mind as you include group work into your course and assessments.

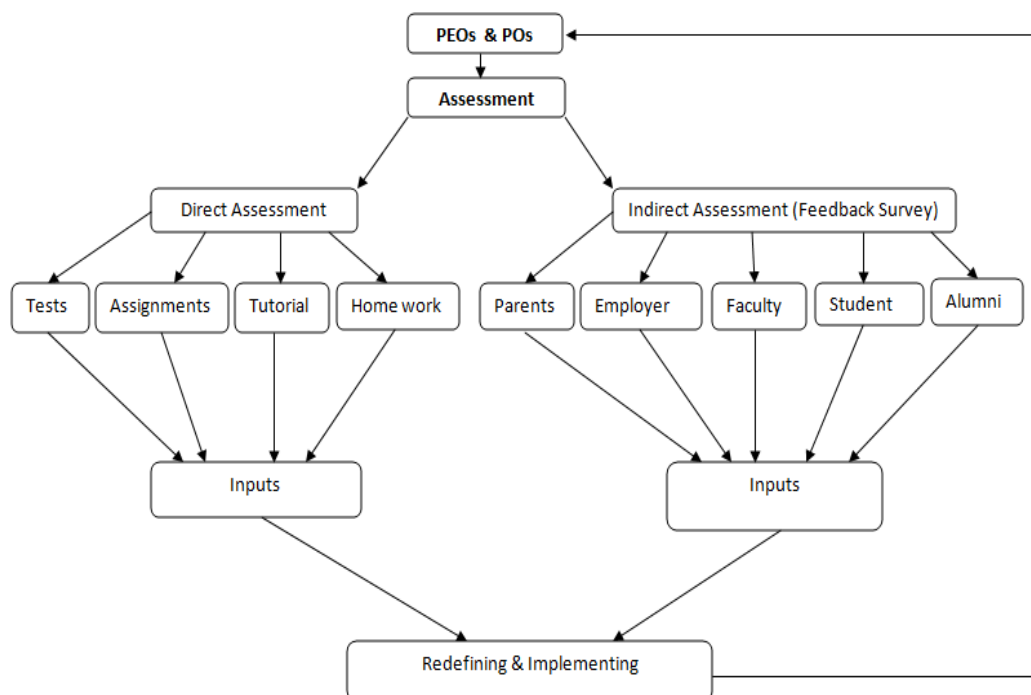
Most of the courses have practicals and the experiments are demonstrated by course instructors and students will try to learn the concepts and methodologies experimentally.

By the end of the thesis, the student should be able to:

- Identify the project in the biomedical area based on the knowledge acquired during the program of study and relevant to the society.
- Describe the management plan and budget to complete the project within the stipulated period of time.
- Design the project systems.
- Participate as a member of project team in the various activities of the project.
- Recognize the ethical responsibilities related to the project.
- Analyze and solve engineering technology problems related to the selected project.
- Use the datasheets of electronic components for the design of the proposed solution.
- Select the best tools and procedures in context of a project.
- Write thesis dissertation.
- Experiment different block diagram to select and improve the best solution.
- Engage in self-directed continuing professional development.

6. Assessment Methods for Program Learning Outcomes.

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



D. Thesis and Its Requirements (if any)

1. Registration of the thesis:

(Requirements/conditions and procedures for registration of the thesis as well as controls, responsibilities and procedures of scientific guidance)

On joining the program, each graduate student should be assigned an academic advisor. The advisor will guide and help the student to choose the subject of the thesis/dissertation and research plan according to the regulations approved by the University Board, as per recommendations of the Council of the Deanship of Graduate Studies. Individually each student needs to work along with a supervisor in the department. The Outcome of this work shall lead to develop novel devices, processes for the benefit of society. The quality of the work shall lead to a publication in a reputed periodical. Progress of the work will be monitored by an expert team twice in a semester.

After passing all the admission requirements and completing at least 50% of the required courses, with a minimum cumulative GPA of "C", the graduate student should submit his/her thesis/dissertation proposal, if any, to the department concerned. If the proposal is approved, the Department Council will assign either a thesis advisor, and co-advisor if required, or thesis committee members and its chairman. Subsequently, this information should be submitted to the Council of the Deanship of Graduate Studies for approval, as per the recommendations of the College Council.

After nomination of the Thesis supervisor, and approval of the suggested title of the thesis, and after passing the comprehensive exam (if any), the Deanship of Graduate Studies is to register/record all credit hours of the Student for the thesis.

2. Scientific Supervision:

(The regulations of the selection of the scientific supervisor and his/her responsibilities, as well as the procedures/mechanisms of the scientific supervision and follow-up)

Supervision is a recognized aspect of the academic duty of teaching. Supervision involves responsibilities on the part of both the supervisor and supervisee. The thesis/dissertation advisors must be of professorial or an associate professorial rank who are faculty members of the University. An assistant professor may be a master's thesis advisor, if he has spent at least two years in the University as assistant professor and has at least two papers published or accepted for publication in his field of specialty in refereed journals. A professor or associate professor from the same department can participate and help in supervision. The assistant professor can participate and help in supervision for master's thesis if he has spent at least one year as an assistant professor and has at least one paper published or accepted for publication (in his field of specialization) in a refereed journal.

A faculty member can be a thesis advisor or co-advisor for a maximum of four master's thesis dissertations simultaneously. If it is highly and deeply necessary, the number can be raised to five following the recommendations of the Department Council concerned and the approval of the College Council, and the Council of the Deanship of Graduate Studies. For the purpose of calculating a faculty-member's teaching load, the supervision of a thesis/dissertation will be counted as one credit hour, whether the faculty member is the sole advisor or the major advisor. If the advisor cannot continue supervising the thesis/dissertation, or if his service to the University is discontinued, the Department concerned should suggest a replacement, to be approved by the College Council and the Council of the Deanship of Graduate Studies. By the end of each semester, the advisor should report, in detail, to the Chairman of the Department, about the progress of the student's work. A copy of the report should be sent to the Dean of Graduate Studies. Student completion of the thesis/dissertation must be reported by the advisor to the Chairman of the Department concerned, in order to initiate the completion of the procedure determined by the Council of the Deanship of Graduate Studies.

3. Thesis Defense/Examination:

(The regulations for selection of the defense/examination committee and the requirements to proceed for thesis defense, the procedures for defense and approval of the thesis, and criteria for evaluation of the thesis)

Student completion of the thesis/dissertation must be reported by the advisor to the Chairman of the Department concerned, in order to initiate the completion of the procedure determined by the Council

of the Deanship of Graduate Studies. The dissertation should be examined by the Head of the Department or one of the staff members of the department. The dissertation is to be sent to the Academic Council to give approval for debate and defense.

Based on the recommendations of the Department and College Councils concerned, a Defense Committee is formed by the Council of the Deanship of Graduate Studies. The debate and defense meeting should be held no later than one semester, starting from the date of the decision of the Deanship of Graduate studies to form the defense committee.

The Master's Thesis Defense Committee must fulfill the following requirements:

1. It must comprise an odd number of members, chaired by the thesis advisor.
2. The Committee must comprise at least three members. The advisor and co-advisor if any should not constitute a majority in the Committee.
3. The Committee members should meet the conditions of the thesis supervision.
4. At least one member of the Committee must be a professor or an associate professor.
3. Decisions of the Committee should be based on a majority vote of at least two thirds of the total number of members.

After approval to form the defense committee, the Faculty Dean should notify the external member of the committee, and a copy of the dissertation is to be sent to the member.

2. The Head Department or his deputy should attend the debate and defense meeting, representing the Deanship of graduate studies, besides the members of the defense committee, approved by the Council of the Deanship of Graduate Studies.
3. The representative of the Deanship of graduate Studies is not considered a member of defense committee.

A report is prepared and signed by all members of the thesis/dissertation committee. The report must be submitted to the Department Chairman concerned within one week of the date of the public defense. The report must include one of the following recommendations:

1. The thesis/dissertation is accepted and recommended for the award of the degree.
2. The thesis/dissertation is accepted with some modifications, without a re-defense being necessary. A member of the committee is delegated to recommend awarding of the degree after ensuring that the required modifications are implemented within three months from the date of the first public defense. This period can be waived by the University Board.
3. Further work is recommended on the thesis/dissertation, followed by a second defense within a certain period of time to be decided by the Council of the Deanship of Graduate Studies, based on the recommendations of the Department Council concerned. This period must not exceed one year from the date of the first defense.
4. The thesis/dissertation is rejected.

Each committee member has the right to submit his own comments or reservations in a separate report both to the Department Chairman concerned and the Dean of Graduate Studies, within two weeks of the date of the defense.

The Department Chairman concerned must submit the report of the Thesis/Dissertation Committee to the Dean of Graduate Studies not later than three weeks after the date of the defense.

The defense committee report must be raised by the Head of the Department to the Dean of Graduate Studies through the College Dean. The Dean of Graduate Studies must submit the recommendations to award the degree to the University Board for approval.

E. Student Admission and Support:

1. Student Admission and Transfer Requirements, and Courses Equivalency

Required Documents

1. Copy of the graduation document and the original upon matching.
2. A complete copy of the academic record.
3. Two scientific recommendations from the faculty members who hold a doctorate, stamped from the department or college (prepared when matching data)
4. A copy of the test of the abilities of the university

Admission requirements

1. The applicant should have a bachelor's degree in biomedical engineering or medical device technology, in addition to general engineering disciplines such as Electrical Engineering, Electronic Engineering and Mechanical Engineering with a high (good) grade.
2. Pass the interview and written test conducted by the department.
3. Attach the result of the abilities test for undergraduates.
4. The applicant must have STEP score or equivalent.
5. Completion of the concession period for applicants graduating from medical specialties
6. A copy of the national identity or family register (for female students) or a copy of the residence permit for non-Saudi nationals.
7. Copy of the language test result.
8. Copy of the certificate of completion of the year of excellence for medical specialties.
9. The equivalence of the certificate from the Ministry of Education for certificates issued from outside Saudi Arabia.

Supporting Documents:

Two reference letters from academics/professionals who can provide appropriate references

Personal Interview:

Candidates will be personally interviewed by committee of the program administrators and faculty

2. Student Counseling Services

(academic, career, psychological and social)

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.

3. Special Support

(low achievers, disabled, gifted and talented)

1. 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).
2. The Master of Science in Biomedical Engineering program prepare graduates for an applied profession which demands that all enrolled students are physically and mentally fit for the purpose of safe practice.
3. Master of Science in Biomedical Engineering program does not have any restrictions for applicants with disabilities.
4. In building where Master of Science in Biomedical Engineering 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,
5. The program also motivates good performers and talented students through supporting their innovations, participation in seminars, workshops and conferences held outside the campus.
6. Talented students are given open timing in the laboratories to do their thought provoking experiments.

F. Teaching and Administrative Staff

1. Needed Teaching and Administrative Staff

Academic Rank	Specialty		Special Requirements / Skills (if any)	Required Numbers		
	General	Specific		M	F	T
Professors	1			1		1
Associate Professors		1		1		1
Assistant Professors						
Technicians and Laboratory Assistants		2		2		2
Administrative and Supportive Staff	1			1		1
Others (specify)						

2. Professional Development

2.1 Orientation for New Teaching Staff

Describe briefly the process used for orientation of new, visiting and part-time teaching staff

All College staffs are encouraged to regularly attend training and professional development workshops held either within the University, or at other national and international institutions. Career and personal development programs at the University provide opportunities to build productive and satisfying careers while contributing to the achievement of the University 's mission. The University has established a Deanship for Quality and Skills Development that plays a major role not only in organizing the workshops and seminars, but also in identifying the staff needs and setting strategies to meet those needs. MU provides a wide range of opportunities for professional development to all

its faculty members. The Deanship of quality & Skills Development hosts a series of skills development workshops and training courses offered by renowned speakers. MET faculty members actively participate in various workshops and training courses that fit their teaching (teaching and assessment strategies) quality, and research skills. Last year seven MET faculties attended a total of 25 skills development workshops/training courses.

Towards the end of each academic year, departments are required to submit a request that outlines the additional staffing needs of the department. This request is discussed in College council meeting and then process the request to University Vice-rector for Academic and Educational Affairs if the teaching staff from outside the university.

2.2 Professional Development for Teaching Staff

Describe briefly the plan and arrangements for academic and professional development of teaching staff (e.g., teaching & learning strategies, learning outcomes assessment, professional development, etc.)

All College staff members are encouraged to regularly attend training and professional-development workshops held either within University, by the Deanship of Quality and Skills Development, or at other national and international institutions. The College has a policy to reward outstanding academic, technical and administrative performance. Such rewards include recognition of their merit by announcing on the website the name of the employee of the month in recognition of his/her outstanding performance.

Each year, at the beginning of the first semester, the college arranges orientation and induction program for the new full time faculties. The program agenda divided into two main tracks; the first one focused on the educational issues which includes:

- Preparation of course specification
- Preparation of course report
- Preparation of course portfolio
- Assessment methods of CLOs
- Academic Advising
- Teaching strategies

The second one focused on the administrative issues which includes:

- Correspondence tracking system
- Committee and council system

G. Learning Resources, Facilities, and Equipment

1. Learning Resources.

Policies and Procedure for providing and quality assurance of learning resources (textbooks, references and other resource materials, including electronic 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 their 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

Policies and Procedure for providing and quality assurance of Facilities and Equipment (Library, laboratories, medical facilities, classrooms, etc.).

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:

No	Laboratory Name
1	Medical Electronics
2	Bio-Signals Processing
3	Electrical Skills
4	Medical Imaging
5	Medical Devices Workshop
6	Radiology
7	Bio-Physics
8	Advanced Medical Devices





3. Arrangements to Maintain a Healthy and Safe 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 Safety 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.

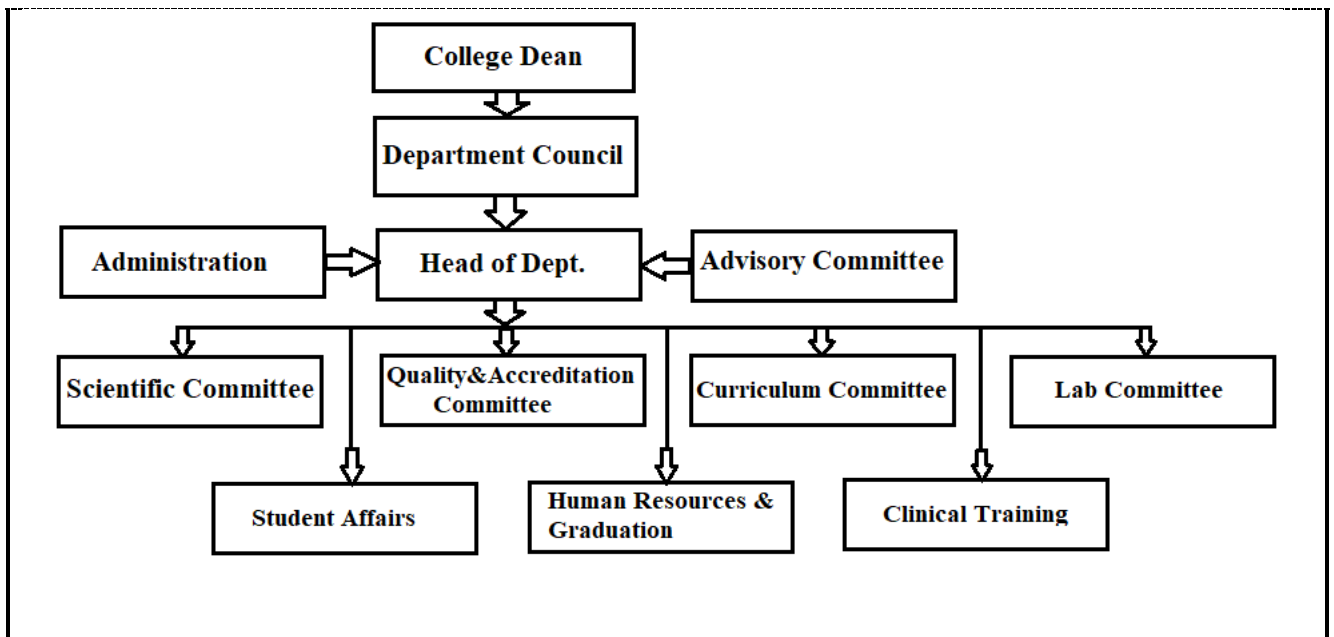
College of Applied Medical Sciences will implement an effective safety and health program for the employees and Students. All staff will be educated to report and manage exposure to infectious and hazardous materials. Training programs will be held to prevent injuries. All staff will report exposure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

H. Program Management and Regulations

1. Program Management

1.1 Program Structure

(including boards, councils, units, committees, etc.)



1.2 Stakeholders' Involvement

Describe the representation and involvement of stakeholders in the program planning and development. (students, professional bodies, scientific societies, al

The program Stakeholders includes **Department Council**

1) **Students:** They are the primary input to our program. It is expected that students become technically qualified, knowledgeable, and productive engineers upon graduation.

2) **Department faculty:** Faculty consists of members of the department teaching staff who are responsible for connecting the program objectives to outcomes during the teaching process.

3) **Alumni:** This group includes students who have earned their degree from our department and are currently working in various industries.

4) **Employers:** This group expects that graduates achieve the program criteria such as being competent, effective team member, have social and environmental awareness and gained good communication skills. The employers range from public to private sectors and from small to large firms and include, among others, research institutes, governmental agencies and industrial companies. The role of each of these stakeholders consists in the establishment and in the continuous assessment of the educational objectives through surveys and periodic meetings.

5) **Parents:** Regular parent teachers meetings are organized in the campus and their valuable suggestions for improvement are noted. Structured questionnaire is distributed to the parents and their feedback is obtained during graduation day function.

- Formal and informal feedbacks from the stake-holders of the programme-students, parents, alumni, industries, advisory committee members etc
- Department Advisory Board (DAB) will meet once in a year, wherein POs will be defined for the programme.
- The initial draft POs were discussed in the faculty and staff meetings and were fine-tuned.
- Dissemination of POs to various stake holders such as Students representatives, Alumni, Employers will be done through various modes of communication.
- After disseminating POs to various stake holders, feedback will be obtained. Based on the suggestions POs will be redefined if necessary.

2. Program Regulations

Provide a list of related program regulations, including their link to online version: admission, study and exams, recruitment, appeals and complaint regulations, etc.)

Deanship of Admission and Registration seeks to communicate with the student while studying at the high school level through visits, meetings, distribution of brochures and manuals in order to introduce students to the faculties of the university. Their vision is to provide academic services to students and complete the admission and registration procedures based on modern techniques and usage of advanced electronic means. Their mission is to provide adequate academic information about the university & scientific faculties and specializations, and to provide academic services to students, completion of Admission & Registration using modern technology means, developing and improving the work performance mechanism, simplify the procedures, clarify the rules & regulations and increase awareness of its applications.

The Executive Principles of Majmmah University, approved by the decree of the university council, on its sixth session, held on 1/3/1342 H. Requirements of Admission are,

1. He should have obtained a Bachelor degree or its equivalent from within or without the Kingdom of Saudi Arabia.
2. He should be of a good conduct.
3. He should successfully pass any test or interview assigned by the University Council.
4. He should be medically fit.
5. He should provide a permission for study from his reference, if he works in government or private sector
6. He should satisfy any other conditions the University Council determines, announced during application.
7. He should not be dismissed from any other university for disciplinary or academic reasons. If that became clear after his, his acceptance shall be deemed cancelled from the day of his admission.
8. A student dismissed from the university for academic reasons may be enrolled in some programs that do not award a Master Degree, as decided by the University Council, or whoever it delegates. This shall not be allowed for the transitional program.
9. Those who already had obtained a Master Degree or its equivalent shall not be admitted to obtain another Master degree. The University Rector has the right for exceptions.
10. A student registered for another university degree or below, shall not be admitted, either in the selfsame university or another.

The college determines an academic supervisor for every student to help him in matters related to the university system and his educational progress such as choice of specialization, registration of courses and other academic affairs. The student assumes the responsibility of knowing and following up the academic system and the regulating by-laws, including the requirements of graduation.

The student is graded in accordance with the courses he passes successfully within the approved academic program. He becomes eligible for graduation if he completes the requirements of graduation. The academic program is designed as equivalent to at least eight semesters for the university level. The student may complete the requirements of graduation in less than that period.

The University system covers both the students at the university stage and the transitional stage. General requirements for Master's degree holders: Based on international guidelines, a minimum of 39 credit hours beyond those required for the Master's degree, of which a minimum of 31 credit hours must be in graduate level course work and 6 credits of thesis work which is partial fulfillment of the

requirements for the degree of Master of Biomedical Engineering. Requirements also allow a maximum of 2 credits for research methodology and 2 credits for research project out of 39 credits.

The students who got admitted may be from any undergraduate engineering stream and hence the curriculum is planned to meet the course requirements in three different levels of courses. The course work is distributed as follows:

Sl. No	Nature of Courses and Level of Coverage	Weightage (Credits)
1	Mathematics and Basic Science Courses	6
2	Biomedical engineering graduate level courses	12
3	Advanced Biomedical engineering graduate level courses	11
4	Research Methodology and Research Project	4
5	Thesis	6
	Total	39

<https://www.mu.edu.sa/en/deanships/deanship-graduate-studies/established-programs>

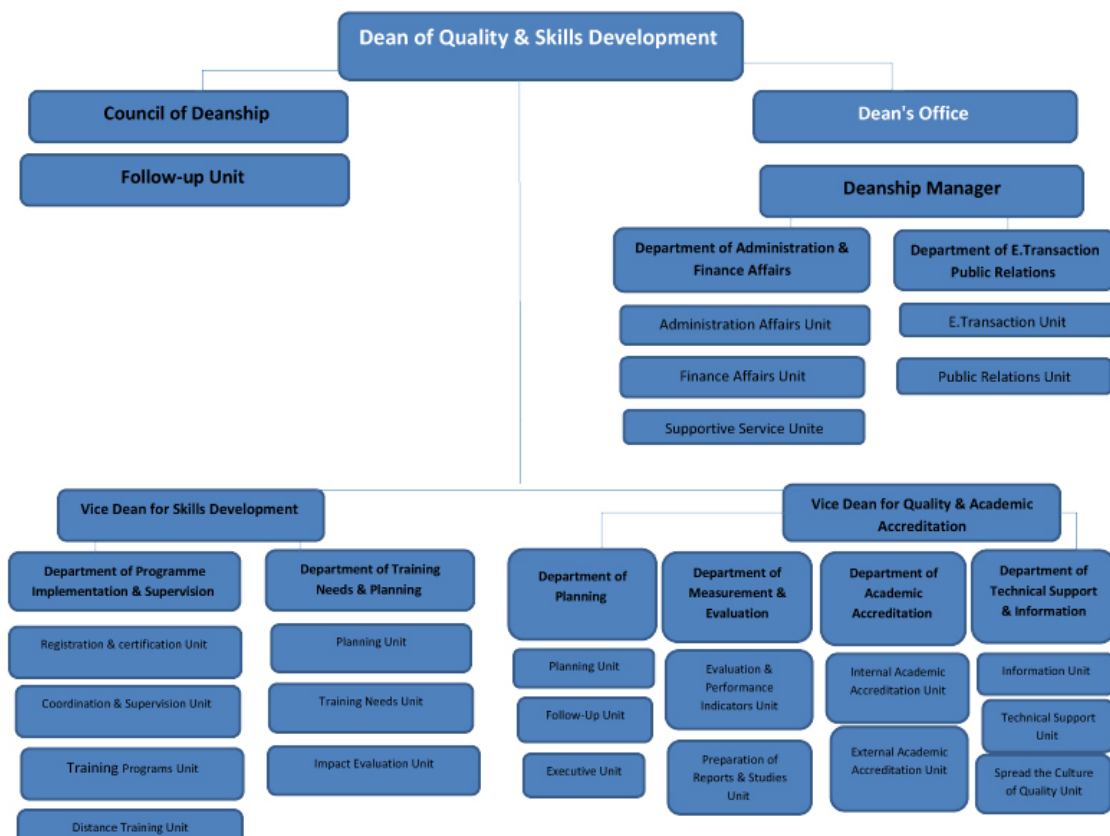
I. Program Quality Assurance

1. Program Quality Assurance System

Provide online link to quality assurance manual

[MBME Master Program Quality assurance Manual Revised2022.pdf](#)

2. Program Quality Monitoring Procedures



3. Arrangements to Monitor Quality of Courses Taught by other Departments.

Biomedical Equipment technology program assessment strategies ensure the achievement of particular course learning outcome in the areas of knowledge, skills and competencies. Course coordinators and course instructors had prepared the blue print to justify the assessment of the intended learning outcomes biomedical Equipment technology program applies the direct and indirect assessment methods such as student exams, projects, group facilitation, presentations, self-assessment exercises, multiple choice, quizzes, Direct assessment sheet, statistical analysis, quality report assessment through responses to feedback. Quality and assurance committee done assessment by the aggregates from the course learning outcomes assessments. The appropriate Teaching strategies and assessment methods that are aligned with the intended learning outcomes.

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

Not Applicable

5. Arrangements to Apply the Institutional Regulations Governing the Educational and Research Partnerships (if any).

The program has been applying the institutional regulations governing the educational and research partnerships with College of Engineering under our university (5-1). Since the program is interdisciplinary in nature, our university has permitted educational and research partnerships with Department of Mathematics, Department of Electrical Engineering and department of mechanical engineering. Faculty members from these departments also teach courses in the program and exchange teaching and learning resources. The program can bring expert faculty from outside the program and college to give expertise knowledge to its students in handling courses and supervising thesis. Effectiveness of such collaborations and joint initiatives in educational aspect will be monitored by course coordinators and Head of the department and assessed by direct methods such as exams.

Graduation Projects Support Program: An initiative by the Deanship of Scientific Research provides funding to promote a culture of scientific research in Majmaah University and encourages an initiative for students to do scientific research under the supervision of faculty members in all fields. It aims to improve the scientific environment by emphasizing publications and strengthening communication between researchers, students, and faculty members. <https://m.mu.edu.sa/en/deanships/deanship-of-scientific-research/74651>.

Outstanding Research Program: The Research Center or the Deanship of Scientific Research is designed to allow faculty members who embark on research that is not funded by the Research Center or the Deanship of Scientific Research, yet they can still be funded provided the research is published under Majmaah University (MU). [Outstanding Research Program | Majmaah University \(mu.edu.sa\)](https://m.mu.edu.sa/en/deanships/outstanding-research-program).

Abdullah Bin Tuwajri Stroke Chair provides research grant in applied fields of stroke cases for faculty members <https://m.mu.edu.sa/en/departments/vice-rector-graduate-studies-and-scientific-research/11375>.

The program provides a mechanism to support research cooperation with universities and distinguished research centers by participating in research groups of faculty members. The Deanship of Scientific Research develops the necessary strategies for forming research groups and reviews and approves research proposals through the committees formed by the Deanship. In general,

distinguished research groups are supported according to the mechanism determined by the university.

6. Assessment Plan for Program Learning Outcomes (PLOs), and Mechanisms of Using its Results in the Development Processes

#	Program Learning Outcomes	Assessment Methods (Direct assessment)	Assessment Methods (Indirect assessment)
A1	To recognize the main concepts, principles, and theories of biomedical engineering applications.	Written examinations Assignment rubric Concept/learning (essay writing) etc.	• Feedback, Surveys & other indirect Indicators.
A2	To determine the effect of biomedical engineering knowledge in developing research and professional practice.		
B1	To apply practical and theoretical knowledge of biomedical engineering to deal with novel and unpredictable professional contexts.	Written Exams, Practical Skills, demonstration of equipments, lab reports, graphs, viva, group reports, assignments, project report, etc. or learning paper rubric	• Feedback, Surveys & other indirect Indicators.
B2	To identify, formulate and solve biomedical engineering problems.		
B3	To develop significant novel ideas about biomedical engineering aspects		
B4	To plan and execute a major research by applying practical and theoretical knowledge.		
C1	To apply ethical principles and commit to professional ethics, responsibilities and norms of biomedical engineering practice	Group project rubric Oral presentation rubric	• Feedback, Surveys, GPA, Enrolment & Graduation Stats, employment rate etc.
C2	To function effectively as a member or leader in diverse teams in multi-disciplinary settings.	Project presentation Assignment	

C3	Ability to understand and prepare effective reports.	Oral presentation rubrics Written examination Group project rubric	• Feedback, Surveys, GPA, Enrolment & Graduation Stats, employment rate etc.
C4	Ability to produce project documentation.	Project presentation rubric Oral presentation rubric	• Feedback, Surveys, GPA, Enrolment & Graduation Stats, employment rate etc.
C5	Ability to communicate effectively with different kinds of audiences		• Feedback, Surveys, GPA, Enrolment & Graduation Stats, employment rate etc.

The students are considered the most important aspect of the whole teaching and learning at the department therefore they play a very active role in the program development, therefore their feedbacks are taken at various level of program during their tenure. Most important among them are;

1. Course Evaluation Survey
2. Program Evaluation Survey &
3. Program Satisfaction Survey.

Based on the mission and objectives of the program the program learning outcomes were developed. All the course was then aligned to these program learning outcomes, for each outcome appropriate performance indicators were decided which became the basis for all teaching and assessment activities.

The assessment measures are designed to evaluate the effectiveness of teaching methods for delivering the intended program outcomes. A range of assessments strategies that matches all aspects of the instructional plans are being used for different modules. The assessment strategies are planned to match the instructional goals and objectives at the beginning of the semester, and implemented throughout the semester. The selection of appropriate assessments also matches courses and program objectives.

All the modules of the physical therapy program have specific learning objectives that are aligned with the program outcomes. Each module has 3-5 specific module outcomes, which are evaluated by appropriate assessment methods. Both direct and indirect assessment techniques are utilized to ensure that the desired program outcomes are achieved. The process of assessment is carried out by using combinations of course work such as quizzes, exams, projects, presentations, homework, etc., Where the grades on these exercises are directly tied to the course outcomes.

At the end of each academic year these performance indicators are measured, and their overall consistence is evaluated. Based on the result of this process recommendation for improvement is prepared which are made part of next year's improvement plan.

7. Evaluation of Program Quality 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

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
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, partnerships, etc.)

Evaluation Sources (students, graduates, alumni, faculty, program leaders, administrative staff, employers, independent reviewers, and others (specify))

Evaluation Methods (e.g., Surveys, interviews, visits, etc.)

Evaluation Time (e.g., beginning of semesters, end of academic year, etc.)

8. Program KPIs*

The period to achieve the target (2022-2023) year.

No	KPIs Code	KPIs	Target	Measurement Methods	Measurement Time
1	KPI-PG-1	Percentage of achieved indicators of the program operational plan objectives: Percentage of performance indicators of the operational plan objectives of the program that have achieved the targeted annual level to the total number of indicators targeted for these objectives in the same year.	70%	Data	End of the academic year
2	MU-P-01	Evaluation of Community Services: Average rating of beneficiaries' satisfaction with the community services provided by the program on a five-level scale in an annual survey	4.2	Surveys	End of the academic year
3	KPI-PG-2	Students' Evaluation of quality of learning experience in the program: Average of overall rating of final year students for the quality of learning experience in the program on a five point scale in an annual survey.	3.8	Surveys	End of the academic year
4	-KPI PG-3	Students' evaluation of the quality of the courses: Average students' overall rating of the quality of courses on a five- point scale in an annual survey.	3.9	Surveys	End of the academic year
5	KPI-PG-4	Students' evaluation of the quality of scientific supervision: Average students' overall rating of the quality of scientific	4.1	Data	End of the academic year

No	KPIs Code	KPIs	Target	Measurement Methods	Measurement Time
		supervision on a five point scale in an annual survey.			
6	KPI-PG-5	Average time for students' graduation: Average time (in semesters) spent by students to graduate from the program.	5 Semesters	Data	End of the academic year
7	KPI-PG-6	Rate of students dropping out of the program: Percentage of students who did not complete the program to the total number of students in the same cohort.	10%	Data	End of the academic year
8	KPI-PG-7	Graduates' employability: Percentage of graduates from the program who within a year of graduation were employed to the total number of graduates in the same year.	%90		
9	KPI-PG-8	Employers' evaluation of the program graduates' competency: Average of overall rating of employers for the competency of the program graduates on a five point scale in an annual survey.	3.9	Surveys	End of the academic year
10	KPI-PG-9	Students' satisfaction with the provided services: Average of students' satisfaction rate with the various services provided by the program (food, transportation, sport facilities, academic advising, ...) on a five point scale in an annual survey.	3.8	Data	End of the academic year
11	MU-P-02	Students receive warning: The percentage of students who received a warning or more in the program to the total number of students in the program.	10%	Data	During the academic year
12	MU-P-03	Students denied entry to final exam: The percentage of students who were denied entry to the final examination of the course for exceeding the legally permitted percentage of the total number of students in the program.	0%	Data	During the academic year
13	KPI-PG-10	Ratio of students to faculty members: Ratio of the total number of students to the total number of full-time and fulltime equivalent faculty	4:1	Data	During the academic year

No	KPIs Code	KPIs	Target	Measurement Methods	Measurement Time
		members participating in the program. (Faculty – 11 Students – 42)			
14	KPI-PG-11	Percentage of faculty members' distribution based on academic ranking: Percentage distribution of faculty members participating in the program based on academic ranking.		Data	End of the academic year
		Professor - 1	30	Surveys	End of the academic year
		Associate Professor - 6	35	Surveys	End of the academic year
		Assistant Professor - 4	53	Data	End of the academic year
15	KPI-PG-12	Proportion of faculty members leaving the program: Proportion of faculty members leaving the program annually for reasons other than age retirement to the total number of faculty members.	%15	Data	End of the academic year
16	KPI-PG-13	Satisfaction of beneficiaries with learning resources: Average of beneficiaries' satisfaction rate with learning resources on a five-point scale in an annual survey in terms of: a. Their adequacy and diversity (references, journals, databases... etc.) b. The support services provided for their utilization.	3.7	Data	End of the academic year
17	KPI-PG-14	Satisfaction of beneficiaries with research facilities and equipment: Average of beneficiaries' satisfaction rate with research facilities and equipment (depending on the nature of the program) on a five-point scale in an annual survey.	3.8	Data	End of the academic year
18	KPI-PG-15	Percentage of publications of faculty members: Percentage of faculty members participating in the program with at least one research publication during the year to total faculty members in the program.	95%	Data	End of the academic year
19	KPI-PG-16	Rate of published research per faculty member: The average number of refereed and/or published research per	4:1	Data	End of the academic year

No	KPIs Code	KPIs	Target	Measurement Methods	Measurement Time
		each faculty member participating in the program during the year (total number of refereed and/or published research to the total number of faculty members during the year)			
20	KPI-PG-17	Citations rate in refereed journals per faculty member: The average number of citations in refereed journals from published research (total number of citations in refereed journals from published research for faculty members to the total published research)	135:1	Data	End of the academic year
21	KPI-PG-18	Percentage of students' publication: Percentage of students who: a. published their research in refereed journals	15%	Data	During the academic year
		b. presented papers in conferences to the total number of students in the program during the year.	5/22	Data	During the academic year
22	KPI-PG-19	Number of patents, innovative products, and awards of excellence: Number of:	1	Data	During the academic year
		a. Patents and innovative products			
		b. National and international excellence awards obtained annually by the students and staff of the program.	1	Data	End of the academic year
23	MU-P-04	Students' publications in conferences: The number of student papers that have been published or presented in scientific conferences during the past year.	5	Surveys	End of the academic year
24	MU-P-05	Faculty attended professional development activities: 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	97%	Surveys	End of the academic year

* including KPIs required by NCAAA

j. Specification Approval Authority

Council / Committee	MET DEPARTMENT COUNCIL
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Reference No.	MEETING NUMBER 3
Date	7 SEP 2022