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T14

Program Specifications
(Postgraduate Degree)

Program Name: Master of Science in Mathematics	
Qualification Level: 7	
Department: Mathematics and Statistics	
College: Science	
Institution: Imam Mohammad Ibn Saud Islamic University	

Content

A. Program Identification and General Information

1. Program Main Location:

Main Campus for the Male Section.

2. Branches Offering the Program:

Branch 1. **King Abdullah City for the Female Section.**

3. Reasons for Establishing the Program:
(Economic, social, cultural, and technological reasons, and national needs and development, etc.)

- i) **To contribute in filling the shortage of mathematical sciences graduate study programs in the higher education system at Saudi Arabia.**
- ii) **To utilize local graduate studies in mathematical sciences for student's – especially females – that for social or other reasons - can't seek their graduate studies outside the kingdom.**
- iii) **Graduate student of this program is expected to be well prepared for professional careers in disciplines which make use of the mathematical sciences.**
- iv) **The graduate student of this program will be able to compete successfully for internship and employment positions in government, industry, and non-profit organizations.**
- v) **Graduates of this program will have the readiness for outreach toward application areas such as physical sciences, financial services, and social sciences and have the knowledge, experience, and motivation to bring the tools of mathematics to bear on real-world problems.**
- vi) **The program will produce qualified lecturers in the academic fields of mathematical sciences to cover the needs of community colleges and professional institutes in Saudi Arabia.**
- vii) **Graduates of this program will have the intellectual curiosity and flexibility to keep up with developing technology applied in science and with the new methods in contemporary mathematical fields.**
- viii) **Graduates of this program are expected to become sufficiently proficient in the core academic material to permit further study at the PhD level in pure and applied mathematics and related scientific fields in engineering disciplines and computer sciences.**

4. System of Study
    ☐ Coursework & Thesis   ■ Coursework

5. Mode of Study
    ■ On Campus   ☐ Distance Education   ☐ Others

6. Educational and Research Partnerships (if any) **None.**
- Partnership Arrangement:
- Type of Partnership:
- Duration of Partnership:

7. Total Credit Hours for Completing the Program: (51 Credit Hours)

8. Learning Hours: (153 Self-study Hours)
The time that a learner takes to complete learning activities that lead to achievement of program learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times)

9. Professional Occupations/Jobs:

- **331404 Statistics Assistant.**
- **121117 Statistics Manager.**
- **211102 Astronomy Specialist.**
- **212003 Statistician.**

10. Major Tracks/Pathways (if any): **N.A.**

Major Track/Pathway	Credit Hours (For each track)	Professional Occupations/Jobs (For each track)

11. Intermediate Exit Points/Awarded Degree (if any): **Yes**

Intermediate exit points/awarded degree	Credit hours
Higher Diploma in Mathematics	**30**

Exit Point Program Learning Outcomes

Knowledge and Understanding

K1	Demonstrate an understanding of advanced topics in Mathematics.
K2	Outline the areas of specialization in mathematics.

Skills

S1	Apply advanced mathematical knowledge to analyze problems.
S2	Develop critical skills with regard to literature searching, appraising and evaluating from a variety of sources.
S3	Communicate in a clear and concise manner orally, on paper and using IT.
S4	Make efficient use of computer for acquiring, analyzing and presenting information.

Values

V1	Demonstrate integrity, professional and academic ethics.
V2	Self-evaluate of the level of learning and performance, and make logical decisions supported by evidence and arguments independently.
V3	Lead teamwork with functional flexibility and effectiveness and take responsibility for professional development.

Exit Point Professional Occupations/Jobs

- **121117 Statistician Manager.**
- **134906 Manager of Weather Forecasting and Environment Control Station.**
- **211102 Astronomy Specialist.**
- **211201 Weather Forecasting Specialist.**
- **212003 Statistician.**
- **232001 Professional Trainer.**
- **331404 Statistician Assistant.**

B. Mission, Goals, and Learning Outcomes

1. Program Mission:

To prepare well qualified staff who will contribute effectively in economic and social developments of Saudi Arabia and who will work innovatively on enhancing the higher education system of the country in the field of mathematics and its applications to other disciplines.

2. Program Goals:

PG1. Developing the student's abilities and potentials to enhance their mathematical skills.

PG2. Providing the students with appropriate skills to become independent learners and be experienced in doing scientific research.

PG3. Providing a strong package of professional skills to assure good integration in careers that uses mathematics and to contribute to economic and social developments of Saudi Arabia.

PG4. Enhancing the student's scientific background, to continue graduate studies in the Ph.D. at national or international universities.

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

i) Sustaining the mission of the university in contributing through discovery, creation, and developing scientific knowledge to the kingdom of Saudi Arabia by teaching, doing seminars and workshops, and by publishing scientific papers.

ii) Providing opportunities for Saudi students to earn master's degrees in their selected fields of study.

iii) Assisting the university in providing good quality education and high quality research to the society and the nation.

iv) Enhancing the teaching mission of the university by offering high level academic courses in the fields of Mathematics

v) mathematical sciences.

vi) Enhancing the quality of the university faculty members by attracting distinguished professors in mathematical sciences to teach and supervise the master program students.

4. Graduate Attributes:

1. Having deep mathematical skills,

2. Independent learner in Mathematics,

3. Experienced in doing mathematical research,

4. Having a good integration in careers that uses mathematics,

5. Having the ability to continue graduate studies in the Ph.D. at national or international universities.

5. Program Learning Outcomes*

Knowledge:	
K1	Demonstrate a solid understanding of advanced topics in Mathematics.
K2	Outline the areas of specialization through studying specific topics relevant to research in mathematics.

Skills	
S1	**Apply advanced mathematical knowledge to analyze problems and develop innovative solutions.**
S2	**Develop critical skills with regard to literature searching, appraising and evaluating from a variety of sources and synthesizing the results.**
S3	**Communicate in a clear and concise manner orally, on paper and using IT.**
S4	**Make efficient use of computer for acquiring, analyzing and presenting information.**
Values	
V1	**Demonstrate integrity, professional and academic ethics, participation in finding constructive solutions to some societal issues, and a commitment to responsible citizenship.**
V2	**Self-evaluate of the level of learning and performance, insist on achievement and excellence, and make logical decisions supported by evidence and arguments independently.**
V3	**Lead teamwork with functional flexibility and effectiveness, and take responsibility for professional development, participating in developing the group's performance, and enhancing the quality of life.**

* 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	**7**	**35**	**69 %**
	Elective	**3**	**12**	**23 %**
Graduation Project (if any)		**1**	**4**	**8 %**
Thesis (if any)		**0**	**0**	**0 %**
Field Experience (if any)		**0**	**0**	**0 %**
Others (.....)		**0**	**0**	**0 %**
Total		**11**	**51**	**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	MAT 6121	Advanced Linear Algebra	Required	None	5 (4, 0, 2)
	MAT 6171	Topology	Required	None	5 (4, 0, 2)
Level 2	MAT 6111	Introduc. to Measure and Integration	Required	MAT 6171	5 (4, 0, 2)
	MAT 6141	Numerical Analysis	Required	None	5 (4, 0, 2)
Level 3	MAT 6113	Introduc. to Functional Analysis	Required	MAT 6171	5 (4, 0, 2)
	MAT 6123	Algebra (1)	Required	None	5 (4, 0, 2)
Level 4	MAT 6231	Partial Differential Equations	Required	MAT 6111 MAT 6113	5 (4, 0, 2)
	MAT 6xxx	Elective Course 1 (List A or List B)	Elective	None	4 (4, 0, 0)
Level 5	MAT 6xxx	Elective Course 2 (List A or List B)	Elective	None	4 (4, 0, 0)
	MAT 6xxx	Elective Course 3 (List A or List B)	Elective	None	4 (4, 0, 0)
Level 6	MAT 6299	Research Project	Required	None	4 (3, 0, 2)

* Include additional levels if needed
** Add a table for each track (if any)

Elective Courses:

List A
1. MAT 6215: Applied Functional Analysis;
2. MAT 6242: Numerical Methods for ODEs;
3. MAT 6245: Numerical Optimization;
4. MAT 6247: Statistical Theory and Inference;
5. MAT 6249: Finite Markov Chains and Applications;
6. MAT 6253: Combinatorial Optimization;
7. MAT 6261: Coding Theory & Cryptography;
8. MAT 6263: Mathematical and Computational Modeling;
9. MAT 6265: Mathematical Modeling and Infections;
10. MAT 6281: Selected Topics in Applied Mathematics (1);
11. MAT 6283: Selected Topics in Applied Mathematics (2).

List B
1. MAT 6217: Introduction to Operator Theory;
2. MAT 6219: Introduction to Ergodic Theory;
3. MAT 6224: Algebra (2);
4. MAT 6226: Number Theory;
5. MAT 6228: Group Representation;
6. MAT 6233: Ordinary Differential Equations;
7. MAT 6251: Graph Theory & Combinatorics;
8. MAT 6255: Algebraic Graph Theory;
9. MAT 6275: Differential Geometry;
10. MAT 6285: Selected Topics in Pure Mathematics (1);
11. MAT 6287: Selected Topics in Pure Mathematics (2).

3. Course Specifications

Insert hyperlink for all course specifications using NCAAA template

Attached

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		Skills				Values		
	K.1	K.2	S.1	S.2	S.3	S.4	V.1	V.2	V.3
MAT 6111	I	I	I	I	I	I	I	I	P
MAT 6121	I	I	I	I	I	I	I	I	P
MAT 6141	I	I	I	I	I	I	I	I	P
MAT 6113	I	I	I	I	I	I	I	I	P
MAT 6123	I	I	I	I	I	I	I	I	P
MAT 6231	I	I	I	I	I	I	I	I	P
MAT 6171	P	I	I	I	M	M	M	P	P
MAT 6215	M	P	P	P	M	M	M	P	P
MAT 6217	M	P	P	P	M	M	M	P	P
MAT 6219	M	P	P	P	M	M	M	P	P
MAT 6242	M	P	P	P	M	M	M	P	P
MAT 6243	M	P	P	P	M	M	M	P	P
MAT 6245	P	I	I	I	P	P	P	I	I
MAT 6247	P	I	I	I	P	P	P	I	I
MAT 6249	P	I	I	I	P	P	P	I	I
MAT 6253	P	I	I	I	P	P	P	I	I
MAT 6255	P	I	I	I	P	P	P	I	I
MAT 6261	P	I	I	I	P	P	P	I	I
MAT 6263	M	P	P	P	M	M	M	P	P
MAT 6265	M	P	P	P	M	M	M	P	P
MAT 6281	M	P	P	P	M	M	M	P	P
MAT 6283	P	I	I	P	M	M	M	P	P
MAT 6224	P	I	I	P	M	M	M	P	P
MAT 6226	M	P	P	P	M	M	M	P	P
MAT 6228	M	P	P	P	M	M	M	P	P
MAT 6233	M	P	P	P	M	M	M	P	P
MAT 6251	M	P	P	P	M	M	M	P	P
MAT 6275	M	P	P	P	M	M	M	P	P
MAT 6285	M	P	P	P	M	M	M	P	P
MAT 6287	M	P	P	P	M	M	M	P	P
MAT 6299	M	M	M	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.

According to College Strategic Plan, graduates will be active learners and bilingual students, with a scientific, technological, mathematical, background and ethical values. However, in order to achieve the Strategic Plan Goals the College developed thirteen initiatives:

The department ensures teaching quality standards through the following actions:

- At the beginning of each trimester the syllabi, are given to the students, containing courses detailed information, method of evaluation and grades, etc.
- The courses distribution is done according to the specialities of faculty staff and their wishes.
- At the beginning of each trimester two coordinators are nominated for each course, one in Female Branch and the other in Male Brach one, who are asked to communicate and coordinate between them.
- The duties of the course coordinator consist on:
  - Distribution of time according to the course contents.
  - The preparation of the exercises lists, the midterms and the final exam.
- The follow-up of good progress of the course in all the sections through the periodic meetings with course teachers and report.
- The evaluation of the teaching quality and benchmarking between parallel sections (groups) and the sections of the previous session of the same course.
- Collect the course report.
- Update the course folder.
- Annual report is prepared annually.
- Student surveys of all courses and program.
- Teaching staff evaluations of the program.
- Annual Faculty and Staff performance evaluation.

Supports for student independent work:

There are many supports for the independent scientific work of the students and here are some of them:

1) *Open Computer Labs*: The students can use these facilities to review independently a part of a course, to prepare a home work or an exam, or to access the (local) digital library;
2) *Digital library via open computer labs*: The students, in particular those preparing a Master degree, can access the (local) digital library to get free papers and theses. They read independently these resources and write reports on them;
3) *Materials provided via Blackboard platform*: The teachers use Blackboard to give students all kinds of materials related to the courses: syllabi, slides, list of exercises, solutions to exams and home works, etc... These materials can be used independently by students for a best management of the course;
4) At least six office hours provided by each teacher: Each teacher has to choose in his timetable at least six office hours in order to discuss all course issues with students;
5) Research or graduation project course: During this course, students have to work independently in order to write a report and to give an oral presentation at the end of the course;
6) Mini-projects and/or home works in some courses: The main goal of these assessment methods is to strength the independence work of students.

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.

Direct Assessment Methods:
- **National or regional exam results (developed outside the institution for use by a wide group of students using national or regional norms).**
- **Capstone Project or Course.**
- **Entrance/Exit Interviews/exams.**
- **Performance (participation in campus and/or community events, volunteer work, presentations, internships, art performances, etc).**
- **Course e-Portfolio.**

Indirect Assessment Methods:
- **Alumni Survey.**
- **Course Evaluation Survey.**
- **Employer/industry Survey.**
- **Program Advisory Committee minutes.**
- **Teaching staff surveys on the program.**
- **Observations (Information can be collected while observing "events" such as classes, social gatherings, activities, group work, study sessions, etc. Observation can provide information on student behaviours and attitudes).**
- **Syllabus Review.**
- **Second Examiner checklist (to improve it so that to include: course learning outcomes).**
- **Course report.**
- **External assessor report.**
- **Accreditation review.**

D. Thesis and Its Requirements (if any) N.A. (There is no thesis in the MSc of Mathematics nor a graduation project but just a course like any of its courses that initiate students to research)

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

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)

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)

E. Student Admission and Support:

1. Student Admission and Transfer Requirements, and Courses Equivalency

In addition to the conditions mentioned in the Chapter 5, article (13) p. 10 of the Unified Policies of Graduate Studies in Saudi Universities (UGSP) and Regulations Governing Postgraduate Studies in Universities - Issued by University Affairs Council Resolution No. 2/9/1444 (https://units.imamu.edu.sa/deanships/GRADUATE/circulations/Documents/Law1.pdf),

applicants to the Master Program should fulfil the followings:

- The applicant should have a B.Sc. degree in mathematics from an official local university or a recognized international university with a GPA equals or equivalent to 3.75 out of 5.
- The applicant should pass the entry exam set by the Mathematics Graduate Committee (MGC).
- The applicant should get a TOEFL score at least 400 or equivalent scores in other recognized international English tests.
- An applicant who was admitted for this program with his(her) B.Sc. in mathematics from a college other than the College of Science may be required to finish successfully some complementary undergraduate courses before registering any course of the master program.
- The complementary undergraduate courses mentioned in (d) are determined for each student by the Mathematics Graduate Committee and should be taken within three academic trimesters from his(her) enrolment in the program and being dealt on that according to article (18) of (UGSP).
- Students who are enrolled in another recognized mathematics master program having at least a GPA equal or equivalent to 3.75 out of 5 may be transferred to the program upon establishing all related conditions mentioned above and upon fulfilling the requirements mentioned in article (30) of (UGSP).
- Applicants who got a B.Sc. in a scientific major other than mathematics will be dealt case by case and an appropriate decision for them will be made.
- Students who are enrolled in another graduate program in Al-Imam University or in another recognized master program other than mathematics will be dealt case by case and an appropriate decision for them will be made according to article (31) of (UGSP).

2. Student Counseling Services
(academic, career, psychological and social)

- The lecturer for each course allocates 6 office hours per week advertised on his /her own timetable, and reserved as part of his/her teaching schedule to help the students on any academic problems/difficulties.
- The student is able to get individual consultation and academic advice appointment with teaching staff via e-mail or phone calls.
- A list of teaching staff members with their room numbers, their phone numbers and their e-mail addresses are given in the MSc Mathematics Handbook and Department website.
- Each admitted student in the program has an academic advisor who can help him (her) to select courses and locate resources.

- **Master Academic Advisors are assigned to admit students by MGC upon starting the program to guide and help him (her) throughout his (her) academic program.**
- **The Master Academic Advisor is trained to know all degree requirements from beginning to end, and can assist him (her) in planning courses in an appropriate sequence.**
- **In the second year, the student should take the Research Project course (MAT 6299) and chooses a research supervisor who will assist and guide him (her) in the compulsory research project.**
- **On the other hand, a departmental advisor can provide information, advice and support in relation to accommodation, emotional difficulties, assessment of needs and provision of support related to disability, student funding, general welfare, student discipline and complains and part-time work.**

3. Support for Special Need Students
(low achievers, disabled, gifted and talented)

Student with special needs or disabilities may be allowed to take only four courses (instead of six courses) in an academic year upon the consent of (MGC) and the supervisor.

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	**Mathematics**	**Pure/Applied**	**None**	**10**	**5**	**15**
Associate Professors	**Mathematics**	**Pure/Applied**	**None**	**10**	**5**	**15**
Assistant Professors	**Mathematics**	**Pure/Applied**	**None**	**5**	**5**	**10**
Technicians and Laboratory Assistants	**None**			**0**	**0**	**0**
Administrative and Supportive Staff	**None**			**0**	**0**	**0**
Others (specify)	**None**			**0**	**0**	**0**

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

One of the main tasks of MGC is:
- **Equipping new faculty members with the knowledge and skills that they will need in their first trimester in order to progress toward types of objectives, targeted skills, assessment methods, nature of research, role of funding and graduate students etc...**
- **Explaining to the new, visiting or part time teaching staff how to design, and deliver a course and assess the learning outcomes.**

- **Explaining to the new, visiting or part time teaching staff the nature of the university environment and constraints.**

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.)

- **Teaching staff are encouraged to attend trainings and workshops for improving their teaching and student assessment skills.**
- **Teaching staff members are encouraged to reflect on their teaching and research, in order to develop innovative teaching methods and knowledge of research.**
- **Indeed, each year University awards are presented to academic staff for outstanding contributions to teaching, research supervision and publishing.**

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.)

For the planning and acquisition of learning resources the MGC proceeds as follows:

STEP 1: For each course the MGC assigned a faculty members committee to do the followings:
- **Course description (preliminary syllabus),**
- **Recommend Lists of Required Textbooks, Essential References Materials (Journals, Reports, *etc.*), Recommended Textbooks and Reference Material (Journals, Reports, *etc.*), Electronic Materials (eg. Web Sites, social media, Blackboard, etc.), and other learning material such as computer-based programs/CD, professional standards or regulations and software.**

STEP 2: MGC collects learning resources of all courses and submits the required lists to the Head of the department to get the approbation of the department council.

STEP 3: After the department council approbation the Department Head asks the College Dean to provide the Required lists of Learning Resources through the University Central Library and/or the IT Deanship.

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

For the planning and acquisition resources for library, laboratories, and classrooms the MGC proceeds as follows:

STEP 1: Evaluation of the locals assigned for graduated programs: Library (equipped with textbooks and references provided by the Central Library), Laboratories (equipped with appropriate computers and software), and classrooms.

STEP 2: In the shortage case of supplies the MGC will report that to the Department Head in order to ask the College Dean to provide such supplies through the University Central Library and/or the IT Deanship.

3. Arrangements to Maintain a Healthy and Safe Environment (According to the nature of the program)
N.A.

H. Program Management and Regulations

1. Program Management
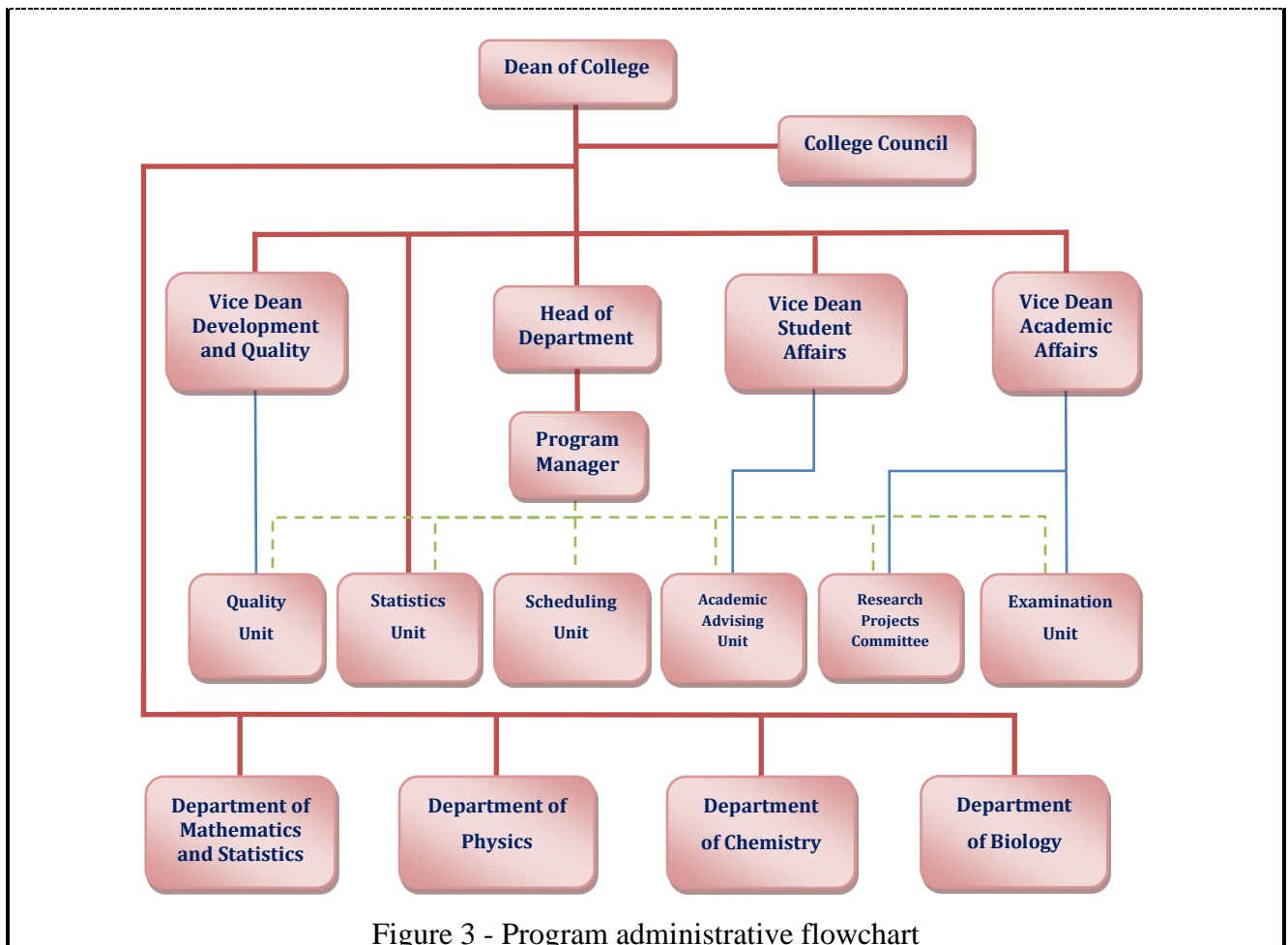**1.1 Program Structure**. (including boards, councils, units, committees, etc.)

Figure 3 - Program administrative flowchart

1.2 Stakeholders' Involvement
Describe the representation and involvement of stakeholders in the program planning and development. (students, professional bodies, scientific societies, alumni, employers, etc.)
- The department of Mathematics and Statistics has an Advisory committee who helps it to improve and develop the program. In this Advisory committee, there are representatives of faculty, employers, graduates and current students.   - Questionnaire of the graduated student employers of the program.
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.)
Same regulations as for the university higher studies procedures in addition of some regulations mentioned in students' rubric.

I. Program Quality Assurance

1. Program Quality Assurance System
Provide online link to quality assurance manual
https://imamuedusa-my.sharepoint.com/:b:/g/personal/alakhalil_cloud_imamu_edu_sa/EZA2RBjov-dFj1uzGyvHQN8BxmRp20mCEwZ1oWr8wJsbvQ?e=MhYenb
Program review and its development is periodically assessed through the following processes: - Courses reports are submitted to the program manager every trimester.   - Appropriate teaching staff committee is in the charge of assessment and modification.   - Prepare and monitor the annual program report.

- Conduct and analyze surveys opinion of the students about the courses and the program.
- Conduct and analyze surveys opinion of the employers about the program.
- Program manager reviews the proposals submitted by the previous committees and makes appropriate decision after approbation of the department council.
- Monitor a global review for the development of the program periodically each five years if necessary.

All the previous processes follow the Teaching\Learning Quality Assurance Process Diagram:
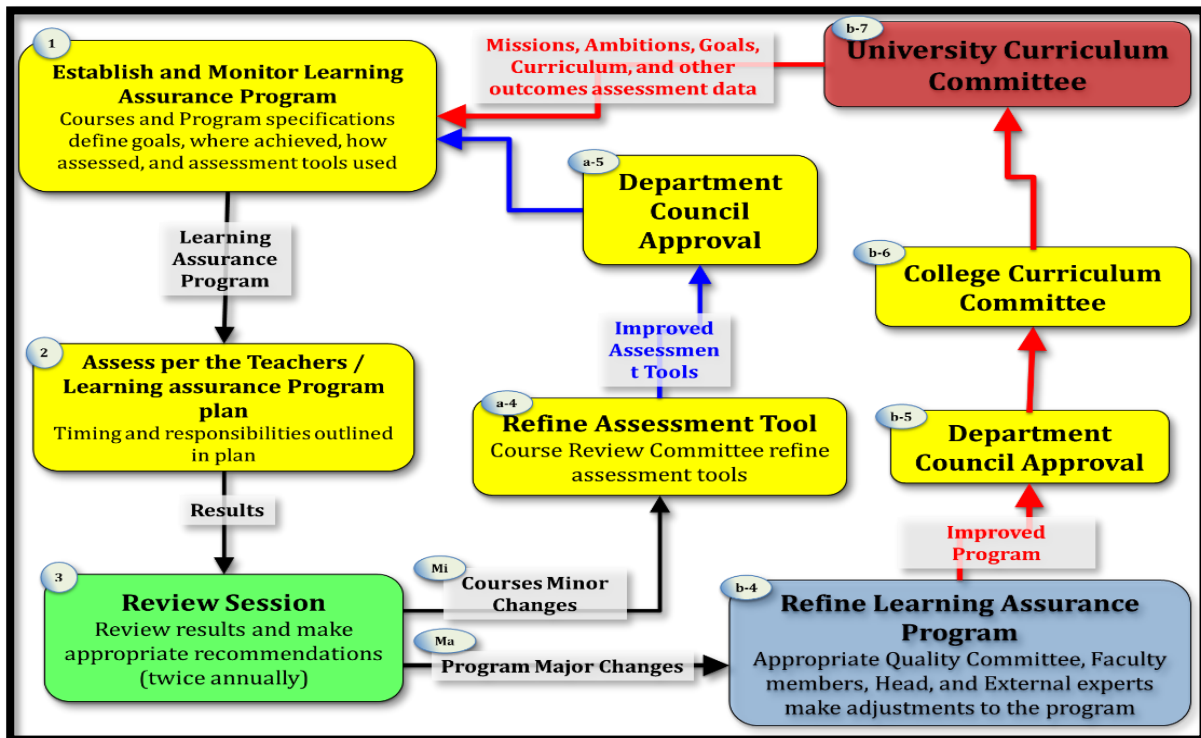

Figure 2 - Teaching\Learning Quality Assurance Process Diagram

2. Program Quality Monitoring Procedures

- **At the end of each trimester the course instructor should complete a course report, including a summary of student questionnaire responses appraising progress and identifying changes (course contents and/or textbooks and/or references) that need to be made if necessary. In the case where changes are recommended the MGC report that to the Department Head in order to take actions.**
- **Students are asked at the end of this course to fill in an anonymous questionnaire on their assessment of the course. The forms will be analyzed, and the summary of results will be reported to the Department Head for evaluation and then to take actions.**

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

N.A.

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

- **The students of both campuses are taught at the same time, in the same section, and by the same teacher.**
- **Furthermore, they have the same exams, homeworks, and required reports.**

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

N.A.

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

First, it "Mastered" level of performance with be a node of assessment of opportunity. The Mechanism, for demonstrating achievement of the learning outcomes, is an ongoing process which consists seven phases:

Phase 1. Data-collection Methodology: Direct and Indirect (listed in Section C.6. above)
Phase 2. Benefits and Drawbacks of Data-collection Methods
Phase 3. Evaluate the Choice of Data-collection Method
Phase 4. Collect data
Phase 5. Interpret evidence
Phase 6. Report the resulting information and document the analysis.
Phase 7. Identify Areas for Improvement and Enhancement.

At each stage (cycle of assessment), we use the resulting information in form of report into account to document, analyze, and improve the all components of the program based on the appropriate key performance indicators (KPIs). As follows a table summing the long run plan for assessing each track and All PLOs.

PLOs	Stage 1 (one year)	Stage 2 (one year)
K1	✓	✓
K2	✓	✓
S1	✓	✓
S2	✓	✓
S3		✓
S4		✓
V1		✓
V2		✓
V3		✓

7. Evaluation of Program Quality Matrix

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
leadership	dean	evaluation report	end of academic year
effectiveness of teaching & assessment	program leader, faculty, independent reviewers, students	surveys, interviews, visits	end of the trimester, during the trimester
learning resources	employers, faculty, graduates, students	surveys, interviews	end of the trimester, during the trimester

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 (.........) year.

No	KPIs Code	KPIs	Target	Measurement Methods	Measurement Time
1	KPI-PG-1	Percentage of achieved indicators of the program operational plan objectives	85%	Surveys, Department data	Yearly starting from the first promotion

No	KPIs Code	KPIs	Target	Measurement Methods	Measurement Time
2	KPI-PG-2	Students' Evaluation of quality of learning experience in the program	4.60	surveys	Twice per year
3	KPI- PG-3	Students' evaluation of the quality of the courses	4.50	surveys	Twice per year
4	KPI-PG-4	Students' evaluation of the quality of scientific supervision	4.60	surveys	Yearly starting from the first promotion
5	KPI-PG-5	Average time for students' graduation	3 years	Graduation data	Yearly starting from the first promotion
6	KPI-PG-6	Rate of students dropping out of the program	0.3	Graduation data	Yearly starting from the first promotion
7	KPI-PG-7	Graduates' employability	90%	Graduation Unit	Yearly starting from the first promotion
8	KPI-PG-8	Employers' evaluation of the program graduates' competency	4.80	surveys	Yearly starting from the first promotion
9	KPI-PG-9	Students' satisfaction with the provided services	4.60	surveys	Yearly
10	KPI-PG-10	Ratio of students to faculty members	14.1	Department data	Yearly
11	KPI-PG-11	Percentage of faculty members' distribution based on academic ranking	25% Assis. Prof. 35% Assoc. Prof 40% Prof.	Department data	Yearly
12	KPI-PG-12	Proportion of faculty members leaving the program	0.1	Department data	Yearly
13	KPI-PG-13	Satisfaction of beneficiaries with learning resources	4.60	surveys	Yearly
14	KPI-PG-14	Satisfaction of beneficiaries with research facilities and equipment	4.60	surveys	Yearly
15	KPI-PG-15	Percentage of publications of faculty members	80%	Department data	Yearly
16	KPI-PG-16	Rate of published research per faculty member	2.00-4.00	Department data	Yearly
17	KPI-PG-17	Citations rate in refereed journals per faculty member	60	Department data	Yearly
18	KPI-PG-18	Percentage of students' publication	30%	Department data	Yearly starting from the first promotion
19	KPI-PG-19	Number of patents, innovative products, and awards of excellence	1.00	Department data	Yearly

* including KPIs required by NCAAA

j. Specification Approval Authority

Council / Committee	MATHEMATICS AND STATISTICS DEPARTMENT COUNCIL
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