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2020

Program Specification

Program Name: Bachelor of Science in Applied Mathematics	
Qualification Level: 6	
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.)

Mathematics plays a critical role in our efforts to understand the nature of the physical universe and in the continuing development of our technological society. There is also a long tradition that recognizes the value of mathematics for its aesthetic appeal to the human spirit. Many students decide to study mathematics for one or both of these reasons. Students also study mathematics in order to develop critical reasoning skills that can significantly contribute to many personal goals. Of course, the study of mathematics can lead directly to interesting employment opportunities in the mathematical sciences and to future study in graduate school. Within the last few years, the frenetic pace of research and development in computers and high technology has led to strong new imperatives for more mathematical expertise, and the need to nurture a new generation of mathematically competent men and women has never been more crucial for the development of our kingdom. For these reasons, TODAY, there is a growing demand of teachers and researchers in mathematics who are able to combine between Mathematics and other disciplines.

4. Total Credit Hours for Completing the Program: **(174 Credit Hours)**

5. 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.**

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

Major track/pathway	Credit hours (For each track)	Professional Occupations/Jobs (For each track)

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

Intermediate exit points/awarded degree	Credit hours
Diploma of Science in Mathematics	**87**

Exit Point Program Learning Outcomes	
Knowledge and Understanding	
K1	**Outline the basics of Mathematics.**
K2	**Describe the development of the application of Mathematics in a wide range of situations.**
Skills	
S1	**Develop critical abilities of an analytical, creative and problem-solving nature.**
S2	**Design basic mathematical models of real-life problems.**
S3	**Develop critical skills.**
S4	**Communicate mathematical ideas orally and in writing.**
S5	**Use computer technology and software for solving mathematical problems.**

Program Specification

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.**

Professional Occupations/Jobs

- **412001 Administrative Assistant.**
- **335101 Ports Inspector.**

Program Specification

B. Mission, Goals, and Learning Outcomes

1. Program Mission:

The mission of the undergraduate program in Applied Mathematics is to prepare students for participating in the economic and social development of the Kingdom of Saudi Arabia, and leading innovation in higher education in the field of Mathematics and its applications.

2. Program Goals:

G1. Exhibit positive attitudes and national and institutional values toward applied mathematics, to contribute to an increasingly dynamic society.

G2. Think critically, master problem-solving skills and communicate clearly applied mathematics concepts and their impact to solve real-life problems.

G3. Maintain the essence of mathematical knowledge in line with technological changes to provide a solid foundation for lifelong learning in the future.

G4. Have an appropriate package of professional skills to ensure a productive career that uses mathematics.

G5. Develop the creative potential of the students through research.

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

The bachelor's degree in applied mathematics is a locomotive that leads to Imam University of openness on the natural and applied sciences. Furthermore, the university requirements courses included in the program curriculum are designed to reflect the intention of the program to reinforce Imam University mission, goals and values in terms of the Kingdom Identity.

4. Graduate Attributes:

1. Competent and well-equipped instructors to teach mathematics in college;

2. Prepared for mathematics-oriented career in industry, business and public administration; and

3. Having the foundation for further research for a career as a research mathematician in a whole range of application areas.

5. Program learning Outcomes*

Knowledge and Understanding	
K1	Understand the fundamentals of Mathematics as a rigorous living discipline in its own right.
K2	Describe and outline the development of the application of Mathematics as a language in a wide range of situations relevant to research and industry.

Skills	
S1	Develop critical abilities of an analytical, creative and problem-solving nature.
S2	Design mathematical models of real-life problems.
S3	Develop critical skills with regard to literature searching, appraising and evaluating from a variety of sources and synthesizing the results.
S4	Communicate mathematical ideas orally and in writing, with precision and clarity.
S5	Make efficient use of computer technology and software in solving mathematical problems.

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 and exit Point (if any)

C. Curriculum

1. Curriculum Structure

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Institution Requirements	Required	1	2	1.1%
	Elective	9	18	10.3%
College Requirements	Required	5	21	12.1%
	Elective	0	0	0%
Program Requirements	Required	25	111	63.8%
	Elective	2	8	4.7%
Capstone Course/Project	Required	1	4	2.3%
Field Experience/ Internship	Required	1	4	2.3%
Others	Required	3	6	3.4%
Total		**44**	**174**	**100%**

2. Program Study Plan

Level	Course Code	Course Title	Required or Elective	Pre-Requisite / Co-Requiste Courses	Credit Hours	Type of requirements (Institution, College or Department)
Level 1	MAT 1101	Calculus (1)	Required	None	5	College
	PHY 1101	General Physics (1)	Required	None	5	College
	ENG 1140	English 1	Required	None	3	College
		University Requirement 1	Elective	None	2	Institution
Level 2	MAT 1102	Calculus (2)	Required	MAT 101	5	Department
	CHM 1101	General Chemistry (1)	Required	None	5	College
	ENG 1195	English 2	Required	None	3	College
		University Requirement 2	Elective	None	2	Institution
Level 3	MAT 1151	Foundation of Mathematics	Required	None	5	Department
	STA 1101	Probability & Statistics (1)	Required	MAT 1102	4	Department
	PHY 102	General Physics (2)	Required	PHY 101	4	Program
		University Requirement 3	Elective	None	2	Institution
Level 4	MAT 1203	Calculus (3)	Required	MAT 102	5	Program
	MAT 1223	Linear Algebra	Required	MAT 151	5	Department
	MAT 1241	Math Software	Required	MAT 101	3	Department
		University Requirement 4	Elective		2	Institution
Level 5	STA 1202	Probability & Statistics (2)	Required	MAT 1203, STA 1101	5	Department
	MAT 1231	Introduction to Diff. Equations	Required	MAT 1102, MAT 1223	5	Program

Level	Course Code	Course Title	Required or Elective	Pre-Requisite / Co-Requiste Courses	Credit Hours	Type of requirements (Institution, College or Department)
	CS 1249	Computer Program. for Science	Required	MAT 1241	4	Department
Level 6	MAT 1225	Introduction to Number Theory	Required	MAT 1151	3	Program
	MAT 1253	Introduction to Operations Research	Required	MAT 1223	4	Program
		Free Course 1*	Elective	None	2	Institution
	QUR 1001	University Requirement 5 - Quran	Required		2	Institution
		University Requirement 6	Elective		2	Institution
Level 7	MAT 1311	Real Analysis	Required	MAT 1203	4	Program
	MAT 1332	Mathematical Methods	Required	MAT 1203, MAT 1231	5	Program
	ECO 1100	Principles of Economics	Required	None	3	Department
		Free Course 2*	Elective			Institution
Level 8	MAT 1321	Modern Algebra	Required	MAT 1223, MAT 1225	5	Program
	MAT 1341	Numerical Analysis (1)	Required	MAT 1231, CS 1249	5	Program
	MAT 1371	Financial Mathematics	Required	MAT 102	4	Program
Level 9	MAT 1334	Introduction to Partial Differential Equations	Required	MAT 332	5	Program
	MAT 1353	Combinatorics and Graphs	Required	MAT 1102, MAT 1223	4	Department
		Elective Course (1)	Elective	Upon specifying the course	4	Program
		Free Course 3*	Elective			Institution
Level 10	MAT 1412	Complex Variables	Required	MAT 1311	5	Program
	MAT 1442	Numerical Analysis (2)	Required	MAT 1341, MAT 1334	4	Program
	MAT 1461	Introduction to Cryptography and Coding	Required	MAT 1321	4	Program
		University Requirement 7	Elective	None	2	Institution
Level 11	MAT 1415	Introduction to Topology	Required	MAT 1311	5	Program
	MAT 1463	Modeling and Simulation	Required	MAT 1334	4	Program
		Elective Course (2)	Elective	Upon specifying the course	4	Program
		University Requirement 8	Elective	None	2	Institution
Level 12	MAT 1497	Field Training	Required		4	Program
	MAT 1499	Research Project	Required		4	Program
		University Requirement 9	Elective	None	2	Institution
		University Requirement 10	Elective	None	2	Institution

* The total hours of the free courses are (6) hours, which are mandatory to finish the program.

LIST OF ELECTIVE COURSES

Course Code	Course Name	Credit Hours	Prerequisites
MAT 1444	**Introduction to Numerical Optimization**	3	MAT 1253 MAT 1341
MAT 1465	**Discrete Simulation**	3	STA 202
MAT 1472	**Financial Mathematics (2)**	3	MAT 1371
MAT 1474	**Actuarial Mathematics**	3	MAT 1371
MAT 1382	**Advanced Euclidean Geometry**	3	MAT 1223
MAT 1384	**Introduction to Differential Geometry**	3	MAT 1203 MAT 1223
MAT 1491	**Selected Topics in Applied Mathematics (1)**	4	
MAT 1493	**Selected Topics in Applied Mathematics (2)**	4	
STA 1203	**Mathematical Statistics**	4	STA 1202
STA 1321	**Introduction to Regression**	4	STA 1202
STA 1351	**Introduction to Stochastic Processes**	4	STA 1202, MAT 1223
ME 1222	**Fluid Mechanics**	4	MAT 1334
PHY 1250	**Modern Physics**	4	MAT 1102
PHY 1312	**Quantum Mechanics (1)**	4	PHY 1102
CS 1449	**Oriented Object Programming**	4	CS 1249

University Requirements courses from (1) to (10)

University Requirements courses (1)-(10) should be chosen from the following packages and the following the appropriate rules indicated inside the table:

Packages	Course Code	Course Name	Credit Hours	Rules
Islamic knowledge and values	QUR 1001	Quran	2	The student chooses two courses, one of which should be the Quran course.
	HAD 1001	Studies in the Sunnah	2	
	JRS 1001	Objectives of Shariah	2	

Packages	Course Code	Course Name	Credit Hours	Rules
	IDE 1001	Creed	2	
	JR 1001	Jurisprudence of Worship and Family	2	
Historical, national, and social knowledge and values	HST 1001	Studies in the Prophet's biography	2	The student chooses two courses.
	HST 1002	National History	2	
	SOS 101	Voluntary Work Skills	2	
	CUL 1001 CIS 101	Jurisprudence of Rights and Duties	2	
	GEO 1011	Environment and Sustainable Growth	2	
Professional skills and labor market	RHB 1001	Work Value and Ethics	2	The student chooses two courses.
	BUS 1001	Innovation and Entrepreneurship	2	
	EDM 1001	Leadership Skills	2	
	FIN 1001	Financial Planning Skills	2	
	ENG 1001	English Language Skills	2	
Communicative and personal skills	BC 1001	Communications Skills	2	The student chooses two courses.
	ARB 1001	Linguistic Skills	2	
	ART 1001	Editing and Speech Skills	2	
	PSY 1001	Mental Health	2	
	BIO 1001	General Knowledge of Health Care	2	
Academic skills	TCM 1001	University Education Skills	2	The student chooses two courses.
	RHE 1001	Reading Skills	2	
	IT 1001	Technical Skills	2	
	EDP 1001	Thinking Skills	2	
	STA 1001	Basics of Statistics	2	

3. Course Specifications
Insert hyperlink for all course specifications using NCAAA template

Attached with this document.

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.	Knowledge and understanding		Skills					Values		
	K1	K2	S1	S2	S3	S4	S5	V1	V2	V3
MAT 1101	I	I	I	I	I	I	I	I	I	I
PHY 1101				I				I	I	I
CHM 1101				I				I	I	I
ENG 1140								I	I	I
ENG 1195								I	I	I
MAT 1102	I	I	I	I	I	I	I	I	I	I
MAT 1151	I	I	I	I	I	I	I	I	I	I
STA 1101	I	I	I	I	I	I	I	I	I	I
PHY 1102				I				I	I	I
MAT 1203	I	I	I	I	I	I	I	I	I	I
MAT 1223	I	I	I	I	I	I	I	I	I	I
STA 1206	I	I	I	I	I	I	I	I	I	I
MAT 1241	I	I	I	I	I	I	I	I	I	I
MAT 1225	P	P	P	P	P	P	P	P	P	P
MAT 1231	P	P	P	P	P	P	P	P	P	P
MAT 1253	P	P	P	P	P	P	P	P	P	P
CS 1249				P				P	P	P
MAT 1311	P	P	P	P	P	P	P	P	P	P
MAT 1332	P	P	P	P	P	P	P	P	P	P
MAT 1341	P	P	P	P	P	P	P	P	P	P
MAT 1371	P	P	P	P	P	P	P	P	P	P
ECO 1100				P				P	P	P
MAT 1321	P	P	P	P	P	P	P	P	P	P
MAT 1334	P	P	P	P	P	P	P	P	P	P
MAT 1353	P	P	P	P	P	P	P	P	P	P
MAT 1412	M	M	M	M	M	M	M	M	M	M
MAT 1442	M	M	M	M	M	M	M	M	M	M
MAT 1461	M	M	M	M	Skills	M	M	M	Values	M
MAT 1415	M	M	M	M	M	M	M	M	M	M
MAT 1463	M	M	M	M	M	M	M	M	M	M
MAT 1497	M	M	M	M	M	M	M	M	M	M
MAT 1499	M	M	M	M	M	M	M	M	M	M
MAT 1444	M	M	M	M	M	M	M	M	M	M
MAT 1465	M	M	M	M	M	M	M	M	M	M
MAT 1472	M	M	M	M	M	M	M	M	M	M
MAT 1474	M	M	M	M	M	M	M	M	M	M
MAT 1482	M	M	M	M	M	M	M	M	M	M
MAT 1484	M	M	M	M	M	M	M	M	M	M
MAT 1491	M	M	M	M	M	M	M	M	M	M
MAT 1493	M	M	M	M	M	M	M	M	M	M

Program Specification

Course code & No.	Program Learning Outcomes									
	Knowledge and understanding		Skills					Values		
	K1	K2	S1	S2	S3	S4	S5	V1	V2	V3
STA 1203	M	M	M	M	M	M	M	M	M	M
STA 1321	M	M	M	M	M	M	M	M	M	M
STA 1351	M	M	M	M	M	M	M	M	M	M
ME 1221			M	M	M	M	M	M	M	M
PHY 1250			M	M	M	M	M	M	M	M
PHY 1312			M	M	M	M	M	M	M	M
CS 1449			M	M	M	M	M	M	M	M
University Requirements						P		P	P	P

* Add a table for each track (if any)

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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, Mathematics and Statistics\Physics\Chemistry, 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 term 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 term 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:
  o Distribution of time according to the course contents.
  o The preparation of the exercise 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 classrooms*: The teachers use Blackboard classrooms 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: All programs have a research or graduation project. 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:

D1. **National or regional exam results (developed outside the institution for use by a wide group of students using national or regional norms).**

D2. **Capstone Project or Course.**

D3. **Satisfaction of students in entrance/exit surveys.**

D4. **Performance (participation in campus and/or community events, volunteer work, presentations, internships, art performances, etc).**

D5. **Percentage of success in all courses.**

Indirect Assessment Methods:

I1. **Satisfaction of stakeholder surveys.**

I2. **Satisfaction of Program Advisory Committee.**

I3. **Average of the graduate GPA's.**

D. Student Admission and Support:

1. Student Admission Requirements

The admissions take place only once on summer vacation, through the Unified E-Admission Portal at the public universities in Riyadh region. There are no admissions for the second semester. The application for admission is through the Unified E-admissions Portal for Students.

Students can apply for admission to IMSIU University through the Unified E-Admissions Portal for public universities in Riyadh region. In fact, it enables the applicant to fill the admission application electronically and to choose an academic major according to his/her certifications, grades and priorities determined by himself/herself without the need of his/her presence at the university.

According to his/her GPA, the student will be accepted directly into the scientific program that he/she wishes to enrol in after passing the preparatory program successfully.

The admission of students at university is part of the responsibility of the Deanship of Admission and Registration.

1. Applicant must be holding a General Secondary Certificate or Secondary Certificate or equivalent from KSA or outside.

2. The applicant must be of good conduct and behaviour.

3. Applicant must be medically fit.

4. The applicant must obtain approval from his reference to study if he works in any governmental or private entity.

5. To successfully pass any test or personal interview deemed by the University Council.

6. Admission is limited to high school graduates from natural sciences track.

7. The calculation of compound ratios is computed as following:

No	Exam Type	Acceptance criterion (compound/equivalent ratio)
1	High school diploma	30%
2	General Aptitude Test (GAT)	30%
3	Academic Achievement Test	40%

2. Guidance and Orientation Programs for New Students

The Applied Mathematics Program provides comprehensive orientation for new students. It holds an orientation week for new students in the beginning of every academic year. During the orientation week, students have the opportunity to:

- Meet other new students, current student leaders, faculty, and staff.

- Learn their way around campus.

- Find out about all the student services and academic programs at the University of Imam Mohammad Ibn Saud Islamic University.

- Address their individual needs and get their questions answered.

During the orientation week, students are given manuals and brochures which help them to understand and to familiarize themselves with the university environment, programs, services, facilities, rights, and duties. In addition to the orientation week, an orientation meeting is held for new students at the beginning of each semester. In this meeting, new students are provided with the necessary information they need during their years of study. This meeting is attended by all the new students as well as the College Dean, Vice Dean for Academic affair and the department academic advisor. During this meeting, the chair of the department, the department's coordinator of academic advising and the department's coordinator of academic affairs address the new students and

give them all the necessary academic information they need. Moreover, they answer all the questions raised by the students during the meeting. In addition, the University Deanship of Student Affairs provides new students with the necessary guidance and orientation programs.

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

- **Student admitted to the bachelor program will be assigned an academic advisor, responsible for pastoral support, guidance and counseling.**
- **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.**
- **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 Department website.**
- **University support services include careers, financial advice, housing, counseling etc.**
- **Excellent library facilities.**
- **University, college and department handbooks provide information about the course structure and University regulations etc.**
- **Feedback is provided for all assessments.**

4. Special Support
(low achievers, disabled, gifted and talented)

The Applied Mathematics Program (via the head of the department) and the University of Imam Mohammad Ibn Saud Islamic university provide care and support for the low achievers and the disabled students. Furthermore, the deanship for academic affairs has established a Center Special Needs Services (CSNS). As for the underachieving students, they are identified and provided with remedial programs to help them overcome the difficulties hindering their progress into the program. These students are distributed among the academic advisors at the department and are given due interest. They are met on regular basis by their academic advisors who are asked by the academic advising coordinator (after the coordination with the CSNS) to take an appointment. During these meetings, the students are provided with advice, and guidance to help the students make decisions, related to registration decisions, deletion, addition, grievance or even transfer to another program. Furthermore, the program has established the Student Academic Support Center (SASC) that offers several specialized courses for underachieving students, so that they can finish graduation requirements and catch up with their colleagues. These students are also offered several programs, lectures, and workshops on selected topics in which they can develop and strengthen their knowledge and language skills. This process of following up these underachieving students continues until their graduation.

 Both program and institution pay due attention to students of special needs (e.g. disabled students). They are provided with special care. Their special needs are

taken into consideration for the access of the building and specially during the exams.

For the gifted and talented students, the university has established a department for creativity and talent to identify and to develop the abilities of these students named Department of Gifted and Talented Care. This is achieved through holding several extracurricular activities to attract and to encourage the talented students to develop their abilities and gifts.

E. 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	8	5	13
Associate Professors	Mathematics	Pure/Applied	None	15	10	25
Assistant Professors	Mathematics	Pure/Applied	None	20	15	35
Lecturers	Mathematics	Pure/Applied	None	10	10	20
Teaching Assistants	Mathematics	None	None	10	10	20
Technicians and Laboratory Assistants	None	None	None	0	0	0
Administrative and Supportive Staff	None	None	None	0	0	0
Others (specify)	None	None	None	0	0	0

2. Professional Development

2.1 Orientation of New Teaching Staff
Describe briefly the process used for orientation of new, visiting and part-time teaching staff

One of the main tasks of the manager of the program are:
- Equipping new faculty members with the knowledge and skills that they will need in their first term 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.**

F. Learning Resources, Facilities, and Equipment

1. Learning Resources.

Mechanism 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 department proceeds as follows:

STEP 1: For each course the department 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: A committee 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

(Library, laboratories, medical facilities, classrooms, etc.).

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

STEP 1: Evaluation of the locals assigned for the program: 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, a committee 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.

G. Program Management and Regulations

1. Program Management

1.1 Program Structure

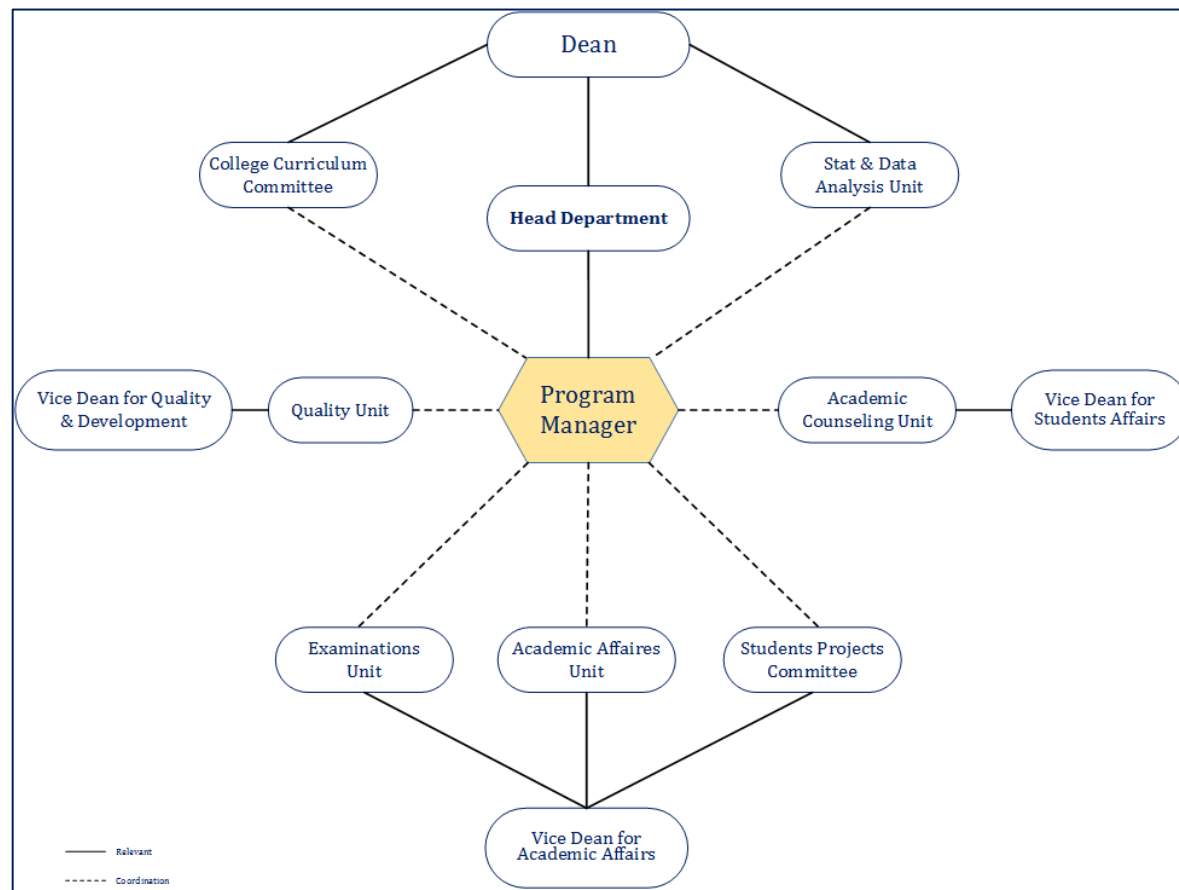(including boards, councils, units, committees, etc.)

Figure 1 - 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 Board who helps it to improve and develop the program.**
- **In this Advisory Board, 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.)

As University Bachelor regulations and see section D1.

H. Program Quality Assurance

1. Program Quality Assurance System

Provide online link to quality assurance manual

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:
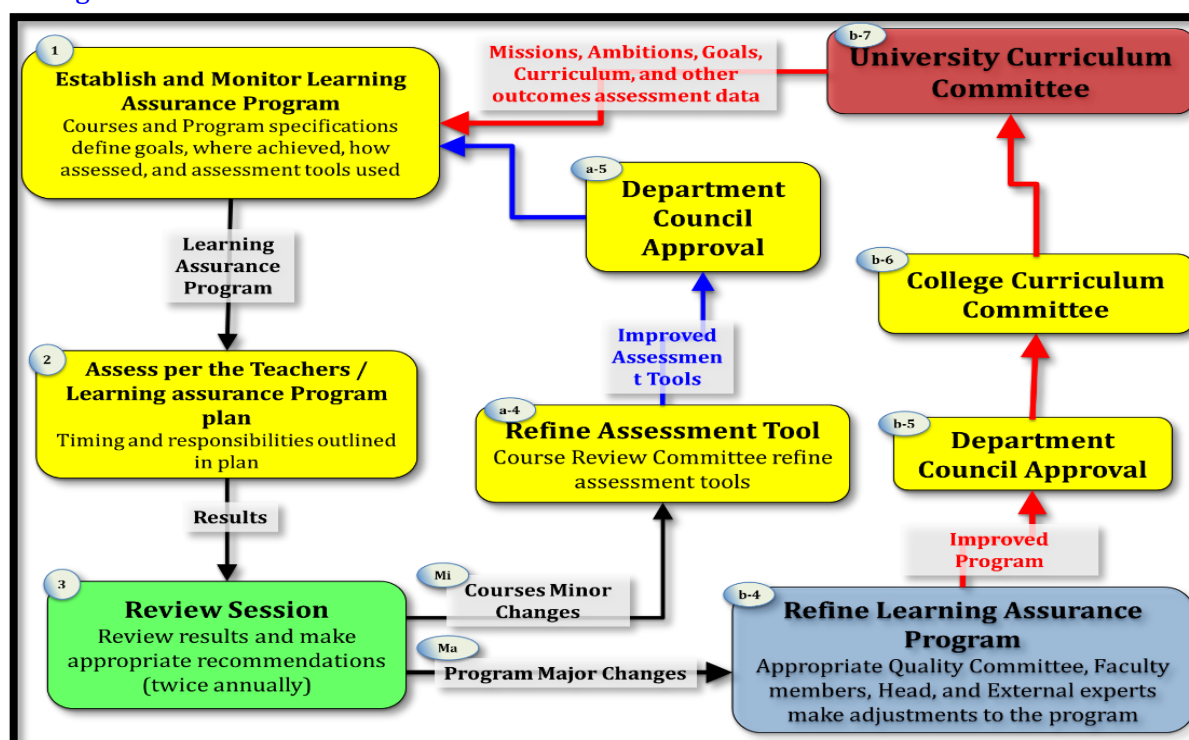

Figure 2 - Teaching\Learning Quality Assurance Process Diagram

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)	Stage 3 (one year)	Stage 4 (one year)
K1	✓	✓		
K2	✓	✓		
S1	✓	✓		
S2			✓	✓
S3				✓
S4				✓
S5		✓	✓	
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

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
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 is (2) years.

No	KPIs Code	KPIs	Target	Measurement Methods	Measurement Time
1	KPI-UG-1	Percentage of achieved indicators of the program operational plan objectives	80%	Surveys, Department data	Yearly starting from the first promotion
2	KPI-UG-2	Students' Evaluation of quality of learning experience in the program	3.5/5	surveys	Twice per year
3	KPI-UG-3	Students' evaluation of the quality of the courses	3.5/5	surveys	Twice per year
4	KPI-UG-4	Completion rate	40%	Graduation data	Yearly starting from the first promotion
5	KPI-UG-5	First-year students retention rate	30%	Graduation data	Yearly starting from the first promotion
6	KPI-UG-6	Students' performance in the professional and/or national examinations	First 10%	Department data	Yearly
7	KPI-UG-7	Graduates' employability and enrolment in postgraduate programs	55%	Department data	Yearly
8	KPI-UG-8	Average number of students in the class	15	Department data	Yearly
9	KPI-UG-9	Employers' evaluation of the program graduate's proficiency	3.5/5	surveys	Yearly starting from the first promotion
10	KPI-UG-10	Students' satisfaction with the offered services	3.5/5	surveys	Yearly
11	KPI-UG-11	Ratio of students to teaching staff	12	Department data	Yearly
12	KPI-UG-12	Percentage of teaching staff distribution	15% Prof. 25% Assoc. Prof. 50% Assis. Prof. 10% Other	Department data	Yearly
13	KPI-UG-13	Proportion of teaching staff leaving the program	1%	Department data	Yearly
14	KPI-UG-14	Percentage of publications of faculty members	60%	Department data	Yearly
15	KPI-UG-15	Rate of published research per faculty member	0.8	Department data	Yearly
16	KPI-UG-16	Citations rate in refereed journals per faculty member	100	Department data	Yearly

No	KPIs Code	KPIs	Target	Measurement Methods	Measurement Time
17	KPI-UG-17	*Satisfaction of beneficiaries with the learning resources*	3/5	surveys	Yearly

* including KPIs required by ETEC (ex-NCAAA)

I. Specification Approval Data

Council / Committee	MATHEMATICS AND STATISTICS DEPARTMENT COUNCIL
Reference No.	11/1444
Date	22/04/1444 (16/11/2022)