هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد
NCAAA

2024
TP-151

Program Specification
— (Bachelor)

Program: **Bachelor of Science in Actuarial and Financial Mathematics (BSc AFM)**	
Program Code (as per Saudi university ranking): **054203**	
Qualification Level: 6	
Department: **Mathematics and Statistics**	
College: **Science**	
Institution: **Imam Mohammad Ibn Saud Islamic University**	
Program Specification: **New** ☐ **Updated*** ☒	
Last Review Date: **N.A.**	

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A. Program Identification and General Information

1. Program's Main Location:
Main Campus.

2. Branches Offering the Program (if any):
None.

3. Partnerships with other parties (if any) and the nature of each:
None.

4. Professions/jobs for which students are qualified (https://eservices.masar.sa/UCG/"#)

- **242305 Compensation Specialist.**
- **241312 Government Revenue Specialist.**
- **241109 Inventory Control Specialist.**
- **241304 Financial Investigator.**
- **421101 Moneylender.**
- **241104 Treasurer.**
- **241106 Financial Controller.**
- **241101 Accountant.**
- **232001 Professional Trainer.**
- **412001 Manager Assistant.**
- **212003 Statistician.**
- **212002 Actuarial Specialist.**
- **331404 Statistician Assistant.**
- **241306 Insurance Specialist.**

5. Relevant occupational / Professional sectors:

- **Banking sector.**
- **Insurance sector.**
- **Human Resources.**
- **Financial Analysis sector.**
- **Statistics sector.**
- **Professional Training/Education sector.**

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

Major track/pathway	Credit hours (For each track)	Professions/jobs (For each track)

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

exit points/awarded degree	Credit hours
Diploma of Science in Statistics	**66** **After the completion of at least 25 credit hours of courses with codes STA/ECO/FIN/ACC/AFM**

Exit Point Professional Occupations/Jobs
• **331404 – Practitioner Statistical Assistant.** • **331401 – Practitioner Statistical controller.** • **331406 – Medical statistical Technician.**

8. (Program) Total credit hours:

136 Credit Hours

B. Mission, Objectives, and Program Learning Outcomes

1. Program Mission:

The mission of the undergraduate program in Actuarial and Financial Mathematics is to provide students with the necessary skills and knowledge to contribute to the socioeconomic development of the Kingdom of Saudi Arabia. Furthermore, the program aims to foster advancements in higher education within the subject of Actuarial Sciences and its practical implementations.

2. Program Objectives:

PG1. Demonstrate favorable dispositions, both in terms of national and institutional principles, regarding the field of actuarial sciences, with the aim of making a meaningful impact on a progressively evolving society.

PG2. Develop a strong ability to analyze and evaluate information, excel in finding solutions to complex problems, and effectively convey actuarial science principles and their applications address real-world challenges.

PG3. Sustain an essential knowledge of actuarial expertise following advancements in technology to establish a strong basis for continuous learning in the years to come.

PG4. Demonstrate an adequate set of professional abilities to guarantee a successful career in the field of actuarial sciences.

PG5. Promote students' creative potential through research.

3. Program Learning Outcomes*

Knowledge and Understanding

K1	Explain principles and methods of mathematics, statistics economics and finance.
K2	Demonstrate proficiency in using actuarial and financial software in analyzing complex data.
K3	Describe models of actuarial problems using concepts and theories of Actuarial and Financial Mathematics.

Skills

S1	Identify, formulate and solve complex problem of actuarial science using standard techniques of actuarial modelling.
S2	Assess financial risks in the insurance and finance fields, forecast the financial impact of uncertain future events and identify strategies to reduce the possibility of unfavorable outcome.
S3	Communicate, argue and defense on the work effectively both orally and in writing in actuarial and financial mathematics related topics.

Values, Autonomy, and Responsibility

V1	Work effectively as an individual, in teams on actuarial science related issues together with the capacity to undertake lifelong learning.
V2	Respect confidentiality, internal processes, policies and professional standards and solve conflict of interest problems in actuarial disciplines.

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

Exit Point Program Learning Outcomes	
Knowledge and Understanding	
K1	Understand principles, and concepts involved in applied statistics needed to enter the job force.
K2	A good working knowledge and understanding of processes, tools, methods, and practices based on some developments in applied statistics.
Skills	
S1	Apply the concepts, principles and theories involved in addressing issues and problems in a range of real life contexts.
S2	Critically evaluate knowledge and use it to provide solutions to some issues and problems in applied statistics.
S3	Practice statistical methods and analysis in investigating issues and case study research.
S4	Choose and use a digital technology, information, communication technology tools, and appropriate statistical software to process, analyze and produce data and 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.

C. Curriculum

1. Curriculum Structure

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Institution Requirements	Required	1	2	1.5%
	Elective	11	24	17.7%
College Requirements	Required	5	15	11%
	Elective	0	0	0%
Program Requirements	Required	28	79	58%
	Elective	2	6	4.5%
Capstone Course/Project		1	4	2.8%
Field Training/ Internship		1	6	4.5%
Residency year		0	0	0%
Others		0	0	0%
Total		49	136	100%

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

2. Program Courses

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours (Lec., Tut., Lab.)	Type of requirements (Institution, College, or Program)
Level 1	MAT 1104	Calculus (1)	Required	None	4(3, 2, 0)	College
	MAT 1152	Foundations of Mathematics	Required	None	3 (2, 2, 0)	Program
	STA 1104	Probability & Statistics (1)	Required	None	3 (2, 2, 0)	Program
	ECO 1206	Princ. of Microeconomics	Required	None	2 (1, 2, 0)	Program
	ENG 1140	English (1)	Required	None	2(1, 2, 0)	College
		University Requirement 1	Elective	None	2 (2, 0, 0)	Institution
		University Requirement 2	Elective	None	2 (2, 0, 0)	Institution
Level 2	MAT 1105	Calculus (2)	Required	MAT 1104	4 (3, 2, 0)	College
	STA 1105	Probability & Statistics (2)	Required	STA 1104	3 (2, 2, 0)	Program
	MAT 1244	Math Software	Required	None	3 (1, 2, 2)	Program
	ECO 1207	Princ. of Macroeconomics	Required	None	2 (1, 2, 0)	Program
	ENG 1195	English (2)	Required	None	2 (1, 2, 0)	College
		University Requirement 3	Elective	None	2 (2, 0, 0)	Institution
		University Requirement 4	Elective	None	2 (2, 0, 0)	Institution
Level 3	MAT 1206	Multivariable Calculus	Required	MAT 1105	3 (2, 2, 0)	Program
	STA 1205	Mathematical Statistics	Required	STA 1105	3 (2, 2, 0)	Program
	STA 1221	Introduction to Regression	Required	None	3 (2, 2, 0)	Program
	MAT 1224	Lin. Algebra & Diff. Equations	Required	MAT 1105	3 (2, 2, 0)	Program
	QUR 1001	Quran Kareem (University Requirement 5)	Required	None	2 (2, 0, 0)	Institution
		University Requirement 6	Elective	None	2 (2, 0, 0)	Institution
		University Requirement 7	Elective	None	2 (2, 0, 0)	Institution

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours (Lec., Tut., Lab.)	Type of requirements (Institution, College, or Program)
Level 4	MAT 1254	Intro. to Operation Research	Required	MAT 1224	3 (2, 2, 0)	Program
	AFM 1231	Financial Mathematics (1)	Required	MAT 1105	3 (2, 2, 0)	Program
	ACC 1319	Intro. to Fin. Accounting	Required	None	3 (2, 2, 0)	Program
	STA 1240	Statistical Packages	Required	STA 1105	3 (2, 0, 2)	Program
	CS 1248	Comp. Program. for Science	Required	MAT 1244	3 (2, 0, 2)	College
		Free Course	Elective	None	3	Institution
Level 5	AFM 1343	Actuarial Mathematics (1)	Required	AFM 1231	3 (2, 2, 0)	Program
	AFM 1333	Math. Fin. Derivatives	Required	AFM 1231	3 (2, 2, 0)	Program
	AFM 1344	Actuarial Maths Lab (1)	Required	MAT 1244	1 (0, 0, 2)	Program
	STA 1335	Stat. Methods for Actuaries	Required	None	3 (2, 2, 0)	Program
	FIN 1331	Financial Management	Required	None	3 (2, 2, 0)	Program
	ACC 1320	Intro. to Manag. Accounting	Required	None	3 (2, 2, 0)	Program
		University Requirement 8	Elective	None	2 (2, 0, 0)	Institution
Level 6	AFM 1334	Financial Mathematics (2)	Required	AFM 1333	3 (2, 2, 0)	Program
	AFM 1351	Actuarial Risk Theory	Required	STA 1335	3 (2, 2, 0)	Program
	STA 1352	Stochastic Proc. for Actuaries	Required	STA 1335	3 (2, 2, 0)	Program
	FIN 1334	Investments	Required	FIN 1331	3 (2, 2, 0)	Program
	AFM 1445	Actuarial Maths Lab (2)	Required	AFM 1344	2 (0, 2, 2)	Program
		University Requirement 9	Elective	None	2 (2, 0, 0)	Institution
		University Requirement 10	Elective	None	2 (2, 0, 0)	Institution
Level 7	AFM 1444	Actuarial Mathematics (2)	Required	AFM 1343	3 (2, 2, 0)	Program
	AFM 1454	Credibility Th. & Loss Distrib	Required	AFM 1351	3 (2, 2, 0)	Program
	STA 1427	Time Series Analysis	Required	STA 1335	3 (2, 2, 0)	Program
		Elective Course (1)	Elective	None	3 (2, 2, 0)	Program
		Elective Course (2)	Elective	None	3 (2, 2, 0)	Program
		Free Course	Elective	None	3	Institution
Level 8	AFM 1497	Field Training	Required	None	6	Program
	AFM 1499	Research Project	Required	None	4	Program

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

Exit Point: Diploma of Science in Statistics - 66 credit hours (After the completion of at least 25 credit hours of courses with codes STA/ECO/FIN/ACC/AFM)

LIST OF ELECTIVE COURSES

S	Course Code	Course Name	Credit Hours	Prerequisites
1	AFM 1411	Mathematical Modeling of Islamic Finance	3	
2	AFM 1412	Introduction to Financial Models	3	AFM 1333
3	AFM 1443	Pension Mathematics	3	AFM 1343
4	ECO 1414	Microeconomic Analysis	3	ECO 1206
5	ECO 1415	Macroeconomic Analysis	3	ECO 1207
6	AFM 1401	Selected Topics in AS & FM (1)	3	
7	AFM 1402	Selected Topics in AS & FM (2)	3	
8	MAT 1416	Real Analysis for Actuaries	3	MAT 1206
9	MAT 1445	Introduction to Numerical Optimization	3	MAT 1254
10	MAT 1446	Numerical methods for Actuaries	3	MAT 1224
11	STA 1422	Analysis of Variance for AFM	3	STA 1221
12	STA 1434	Survival Analysis	3	STA 1205

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	
	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	

Packages	Course Code	Course Name	Credit Hours	Rules
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 (T-104)

Courses Specifications (Attached)

University requirements (https://imamu.edu.sa/StudentGuide/Pages/default.aspx)

4. Program learning Outcomes Mapping Matrix:

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

Course code & No.	Program Learning Outcomes							
	Knowledge and understanding			Skills			Values, Autonomy, and Responsibility	
	K1	K2	K3	S1	S2	S3	V1	V2
MAT 1104	I		I			I	I	I
MAT 1152	I		I			I		I
ENG 1140			I			I	I	
MAT 1105	I		I			I		I
STA 1104	I		I	I	I	I		I
ENG 1195			I			I	I	
MAT 1206	I		I			I		I
STA 1105	I		I	I	I	I		I
MAT 1244		I	I	I		I	I	
STA 1205	I	I		I	I	I	I	I
MAT 1224	I		I			I	I	I
STA 1240		P	P	P		P	P	
ECO 1206	I	I			I			I
CS 1248		I			I		I	
STA 1221	P	P	P	P	P	P		P
QUR 1001							P	P
ECO 1207	I	I			I			I
MAT 1254	P		P			P		P
STA 1221	P	P	P	P	P	P		P
AFM 1231		P	P	P	P	P	P	P
ACC 1319	I	I	I		I			I
STA 1335	P	P	P	P	P	P		P
ACC 1320	P	P	P		P			P
FIN 1331		P	P	P	P	P	P	P
AFM 1333		P	P	P	P	P	P	P
AFM 1343			P	P	P		P	P
STA 1352	M	M	M	M	M	M		
FIN 1334		M	M	M	M	M	M	M
STA 1427	M	M	M	M	M	M		M
AFM 1351		M	M	M	M			M
AFM 1344		M	M	M		M	M	
AFM 1454		M	M	M		M	M	
AFM 1444			M	M	M		M	M
AFM 1499		M	M	M	M	M	M	M
AFM 1497		M	M	M	M	M	M	M

| Course code & No. | Program Learning Outcomes ||||||||
| | Knowledge and understanding ||| Skills ||| Values, Autonomy, and Responsibility ||
	K1	K2	K3	S1	S2	S3	V1	V2
MAT 1445	P		P			P		P
AFM 1411			M	M	M			M
AFM 1412			M	M	M			M
AFM 1443			M	M	M		M	M
ECO 1414	P	P			P			P
ECO 1415	P	P			P			P
AFM 1401			M	M	M		M	M
AFM 1402			M	M	M		M	M
MAT 1416	P		P			P		P
MAT 1446	P		P			P		P
STA 1422	P	P	P	P	P	P	P	P
STA 1434	P	P	P	P	P	P	P	P
Univ. Requirem.						I	I	I
Free Course						I	I	I

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

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

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

To achieve program learning outcomes, a variety of teaching and learning strategies, such as lectures, tutorials, and laboratory sessions, will be utilized alongside curricular and extra-curricular activities. This approach aims to create an engaging learning environment that connects theoretical knowledge with real-world applications. By promoting collaboration, critical thinking, and ethical engagement, the program prepares graduates to address complex challenges and make meaningful contributions to their communities and industries. This comprehensive strategy ensures students are equipped to meet the Program Learning Outcomes in knowledge, skills, values, autonomy, and responsibility.

5.1. Teaching and Learning Strategies.

5.1.1. Active Learning Techniques

- **Collaborative Group Projects: Students work in diverse teams to tackle complex mathematical problems. Each project requires them to analyze a real-world issue (e.g., climate modeling, economic forecasting) and develop solutions using mathematical concepts. This promotes analytical and problem-solving skills (S1) while enhancing teamwork and communication.**
- **Peer Teaching Sessions: Organize structured peer-led review sessions where students take turns explaining key concepts to their classmates. This method not only reinforces their understanding but also hones their ability to communicate mathematical ideas clearly and accurately (S4).**

5.1.2. Project-Based Learning

- **Real-World Problem Solving: Assign projects that require students to design mathematical models addressing current societal challenges, such as optimizing**

resource allocation in healthcare or predicting trends in social media. This approach integrates theoretical knowledge with practical application (S2).

- **Interdisciplinary Research Projects:** Encourage students to collaborate with peers from other disciplines (e.g., computer science, economics) to explore how mathematics can be applied across various fields, illustrating its versatility (K2). For example, a project might involve statistical analysis of economic data to forecast market trends.

5.1.3 Technology Integration

- **Software Training Workshops:** Offer hands-on workshops on using mathematical software tools e.g., MATLAB, R, Python, SPSS. Students learn to apply these tools for data analysis, simulations, and visualizing mathematical concepts, thereby developing their proficiency in utilizing technology (S5).
- **Online Collaboration Platforms:** Utilize platforms such as Google Workspace or Microsoft Teams to facilitate group work and discussions. Students can collaborate on projects, share resources, and provide peer feedback, enhancing their engagement and teamwork skills.

5.1.4. Inquiry-Based Learning

- **Research Assignments:** Assign students to conduct literature searches on specific mathematical topics, requiring them to critically appraise sources and synthesize findings into a cohesive report. This builds their research skills and ability to analyze diverse materials (S3).
- **Problem Posing and Exploration:** Create opportunities for students to formulate their own mathematical questions based on real-world scenarios. This approach encourages independent thinking and critical analysis (V2), allowing them to explore topics that pique their interest.

5.2. Curricular Activities

5.2. 1. Workshops and Seminars

- **Guest Lectures and Industry Panels:** Invite professionals from various fields to share their experiences and discuss how they use mathematics in their careers, including mathematical education subjects. This exposure helps students understand the relevance of their studies and the ethical considerations involved in applying mathematics (K2, V1).
- **Skill Development Workshops:** Provide workshops focused on specific skills, such as data visualization, mathematical programming, and ethical decision-making. These sessions can include case studies that prompt students to consider the societal impact of their mathematical work.

5.2. 2. Field Experience

- **Field Experience Opportunities:** Collaborate with local businesses and research institutions to provide Field training for students. Internships allow students to apply mathematical theories in practical settings, gain experience, and develop professional ethics (V1).
- **Field Trips:** Organize visits to companies or research centers where mathematics plays a crucial role, such as data analytics firms or engineering companies. These visits help students see the practical application of their studies and foster connections with potential employers.

5.2. 3. Assessment and Feedback

- **Formative Assessments:** Implement regular quizzes, homeworks, Exams, presentations, and project reviews to provide ongoing feedback to students. This helps them assess their understanding and encourages self-evaluation of their learning (V2).

- **Portfolio Development: Require students to create a portfolio documenting their projects, research papers, and reflections on their learning journey. This portfolio not only showcases their skills but also encourages reflective practice.**

5.3. Extra-Curricular Activities

5.3.1. Math/Science Clubs

- **Study Groups and Tutoring Programs: Establish student-led study groups and peer tutoring sessions. These initiatives create a supportive learning environment where students can collaborate on challenging topics and help each other succeed (V3).**
- **Outreach Initiatives: Organize community outreach programs, such as math tutoring for local high school students or workshops for underrepresented groups. This promotes responsible citizenship and ethical engagement with the community (V1).**

5.3.2. Conferences and Competitions or national specific exam

- **Participation in Math Competitions: Encourage students to enter national and international math competitions, fostering their analytical and creative problem-solving abilities (S1).**
- **Academic Conferences: Support students in attending and presenting at academic conferences, allowing them to share their research, network with professionals, and improve their communication skills (V3).**

5.3.3. Leadership Development

- **Mentorship Programs: Pair students with faculty or industry mentors who can provide guidance on academic and career choices. This helps students develop a sense of responsibility and ethical decision-making (V1).**
1) **Leadership Roles in Group Projects: Assign students' roles within their project teams that allow them to take on leadership responsibilities. This encourages adaptability and the development of leadership skills necessary for professional success (V3).**

6. Assessment Methods for program learning outcomes.

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

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

6.1. Direct Assessment Methods
6.1.1. Exams and Quizzes
Midterm and Final Exams: Each semester will include a midterm and a final exam. These assessments will test students' understanding of fundamental principles of mathematics (K1) and their ability to articulate mathematical concepts and apply them in various contexts (K2). The exams will consist of a mix of multiple-choice questions, problem-solving exercises, and theoretical questions, ensuring comprehensive coverage of the material.
Weekly homework/Quizzes: Short quizzes will be administered at the end of each week to evaluate students' grasp of recent topics. These quizzes will focus on analytical skills and problem-solving (S1), helping identify areas that may require further review before major exams.
6.1.2. Projects and Presentations
Actuarial and Financial Modeling Projects: In Year 2 and Year 4, students will work on projects that require them to design mathematical models addressing real-world problems, such as optimizing resource allocation in supply chains or analyzing population growth. Each project will culminate in a presentation, allowing students to demonstrate their communication skills (S4) and their ability to apply theoretical knowledge in practical scenarios (S2).
Research Papers: Assigned in last semester of Year 4, students will draft a research paper that involves conducting literature searches, critically appraising sources, and synthesizing findings related to a specific

mathematical topic or application. This assessment will gauge their research abilities (S3) and understanding of the historical context and applications of mathematics (K2).

6.1.3. Laboratory Assessments

Mathematical Software Labs: In Levels 3&4, students will participate in lab sessions focused on using mathematical software tools such as MATLAB, and Python. Assessments will include practical assignments where students demonstrate their ability to utilize these tools for data analysis, simulations, and mathematical modeling (S5). Lab reports will be graded based on accuracy, creativity, and clarity of presentation.

6.1.4. Peer and Self-Assessment

Peer Reviews: Throughout the program, students will engage in peer reviews for group projects and presentations. This method encourages collaborative learning and accountability while allowing students to practice critical evaluation (V3).

Self-Reflection Journals: Students will maintain journals (personal records) throughout the program to document their learning experiences, ethical considerations, and self-evaluations of their performance (V2). These journals will be submitted at the end of each academic year for assessment, focusing on personal growth and reflection.

6.2. Indirect Assessment Methods

6.2.1. Surveys and Questionnaires

Student Feedback Surveys: At the end of each semester, students will complete surveys assessing their learning experiences, perceived skill development, and the effectiveness of instructional methods. The feedback collected will be used to adjust the curriculum and teaching strategies. In addition, they will assess their ability regarding all PLOs.

Exit Surveys: Conducted during graduation, these surveys will ask students to reflect on their overall educational experience and how well the program prepared them for their careers, particularly regarding ethical behavior (V1) and their ability to self-evaluate (V2).

6.2.2. Focus Groups

Alumni Focus Groups: Organized every two years, these focus groups will involve recent graduates discussing the relevance of the skills and knowledge gained in the program to their professional lives. Insights from these discussions will help evaluate the program's effectiveness and inform future curriculum development.

6.2.3. Course Evaluations

End-of-Semester Evaluations: Conducted regularly at the end of each semester, these evaluations will assess course content, teaching effectiveness, and overall student satisfaction. The results will provide indirect insights into the achievement of learning outcomes and inform potential improvements.

6.3. Assessment Plan Overview Cycle Structure

6.3.1. Assessment Frequency:

Each PLO will be assessed at least twice throughout the program, with one additional assessment conducted in related degrees, ensuring a comprehensive evaluation including mapping PLOs to courses.

Year 1: Introductory courses, such as Calculus and Linear Algebra, will assess foundational knowledge (K1, K2) and analytical skills (S1). Direct assessments will include quizzes, exams, and a group project on mathematical concepts.

Year 2: Intermediate courses like Differential Equations and Probability will evaluate mathematical modeling (S2) and software proficiency (S5). Assessments will include projects and lab assignments.

Year 3: Advanced courses focusing on statistical methods and ethical considerations (V1) through research papers and peer evaluations.

Year 4: The Capstone course MAT1499 will assess literature search skills (S3) and will integrate knowledge and skills from the entire program, requiring students to complete a comprehensive project that synthesizes their learning. This final assessment will evaluate communication (S4), leadership in team settings (V3), and self-evaluation (V2) through presentations and reports.

Field Experience Assessment

In the program's final year, students must complete a field experience or internship related to their area of study. This practical component will allow students to apply their mathematical knowledge in real-world settings, reinforcing their understanding and enhancing their skill set.

6.3.2. Field Experience Evaluation:
Students will be assessed based on their performance in the field training (MAT 1497), including their ability to apply mathematical concepts to solve real-world problems. Evaluations will include supervisor assessments, which will focus on the student's analytical skills, problem-solving abilities, and ethical conduct (V1).

Students will submit a final report detailing their internship experiences, the projects they worked on, and the mathematical techniques they employed. This report will be graded on clarity, relevance, and the integration of learned concepts.

6.3.2. Reflective Analysis:
Students will also submit a reflective analysis that evaluates their personal growth, learning outcomes from the experience, and their ability to critically assess their contributions and responsibilities (V2). This analysis will encourage students to connect their practical experiences back to the theoretical frameworks studied throughout the program.

D. Student Admission and Support:

1. Student Admission Requirements

> **Admissions occur only once during the summer vacation through the Unified E-Admission Portal for public universities in the Riyadh region, with no admissions for the second semester. Students can apply to IMSIU University via this portal, allowing them to complete their applications electronically and select their academic major based on their qualifications, grades, and preferences without needing to visit the university.**
> **Admission into the program will be granted based on the student's GPA. The Deanship of Admission and Registration oversees the admissions process.**
> **Eligibility Requirement is stated in IMSIU Undergraduate Study and Examination.**
> **Please note that the Deanship for Registration provides an admission guide, available via the link Admission 1446**

2. Guidance and Orientation Programs for New Students

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

> **The Actuarial and Financial Mathematical Program provides comprehensive orientation for new students. It holds an orientation week (organized by the college) 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, professional, psychological and social)

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

- **Student admitted to the bachelor program will be assigned an academic advisor, responsible for pastoral support, guidance and counseling.**
- **The academic advisor assists students in developing educational plans that are consistent with their life goals.**
- **The academic advisor provides students with accurate information about academic progression and degree requirements.**
- **The academic advisor assists students in understanding academic policies and procedures.**
- **The academic advisor assists students in overcoming educational, social, and personal difficulties.**
- **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.**
- **Students can 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 students).

The Actuarial and Financial Mathematical 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 make 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 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. Faculty and Administrative Staff:

1. Needed Teaching and Administrative Staff

Academic Rank	Specialty		Special Requirements / Skills (if any)	Required Numbers		
	General	Specific		M	F	T
Professor	Actuarial / Fin. Math	Applied/ Pure	None	5	3	8
Associate Professor	Actuarial / Fin. Math	Applied/ Pure	None	8	5	13
Assistant Professor	Actuarial / Fin. Math	Applied/ Pure	None	15	12	27
Lecturer	Statistics / Maths	Applied/ Pure	None	10	10	20
Teaching Assistant	Statistics / Maths	Applied/ Pure	None	10	10	20
Technicians and Laboratory Assistant	Comp. Science Lab Techni.	-	Computer hardware and software, including applications and programming.	2	2	4
Administrative and Supportive Staff	Admin.	-	Communic., Word processing, Data entry, Organization.	2	2	4
Others (specify)	None	None	None	0	0	0

F. Learning Resources, Facilities, and Equipment:

1. Learning Resources

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

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, 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. Procedures to ensure a healthy and safe learning environment

(According to the nature of the program)

To maintain a healthy and safe environment in a university classroom, here are some arrangements that should be implemented, and it is under the responsibility of the General Directorate of Technical Affairs at the university:

1. **Adequate Ventilation:** Ensure proper ventilation in the classroom to maintain good air quality. Regularly clean and maintain air conditioning systems and provide proper ventilation to minimize the accumulation of dust and allergens. If possible, open windows to allow fresh air circulation.
2. **Proper Lighting:** Ensure that the classroom is well lit with appropriate lighting to create a comfortable learning environment. Use natural lighting whenever possible and provide adjustable artificial lighting to accommodate individual preferences.
3. **Comfortable Seating:** Provide comfortable and ergonomic seating arrangements that support good posture and minimize discomfort. Regularly inspect and maintain chairs to ensure they are in good condition.
4. **Classroom Layout:** Arrange desks and chairs in a way that allows for adequate spacing between students. Consider maintaining physical distancing guidelines to minimize the risk of spreading illnesses.
5. **Fire Safety Measures:** Install smoke detectors, fire extinguishers, and fire alarms in the classroom. Clearly mark emergency exits and ensure they are easily accessible and

unobstructed. **Conduct regular fire drills to familiarize students and staff with evacuation procedures.**

6. **Electrical Safety:** Regularly inspect electrical outlets, power cords, and other electrical equipment to ensure they are in good condition. Avoid overloading electrical circuits and encourage reporting of any electrical issues promptly.
7. **Hygiene Practices:** Promote good hygiene practices in the classroom, such as encouraging students and staff to clean their hands regularly. Provide hand sanitizers or handwashing facilities in accessible locations. Encourage proper respiratory etiquette, including covering coughs and sneezes with tissues or elbows.
8. **Regular Cleaning:** Implement a regular cleaning schedule for the classroom. Clean frequently touched surfaces, such as desks, chairs, door handles, and shared equipment. Use appropriate cleaning products and follow recommended protocols for disinfection.
9. **Safety Training:** Provide safety training to students and staff, including emergency procedures, evacuation drills, and awareness of potential hazards. Educate individuals about health and safety guidelines specific to the classroom environment.
10. **Communication and Signage:** Clearly communicate safety guidelines and protocols to students and staff. Display signage in visible locations to remind individuals of hygiene practices, physical distancing, and other safety measures.

To maintain a healthy and safe environment in a university classroom, here are some arrangements that should be implemented, and it is under the responsibility of the Deanship of Information Technology and E-Learning at the university:

1. **Adequate Ventilation:** Ensure proper ventilation in the classroom to maintain good air quality. Regularly clean and maintain air conditioning systems and provide proper ventilation to minimize the accumulation of dust and allergens. If possible, open windows to allow fresh air circulation.
2. **Proper Lighting:** Ensure that the classroom is well-lit with appropriate lighting to create a comfortable learning environment. Use natural lighting whenever possible and provide adjustable artificial lighting to accommodate individual preferences.
3. **Comfortable Seating:** Provide comfortable and ergonomic seating arrangements that support good posture and minimize discomfort. Regularly inspect and maintain chairs to ensure they are in good condition.
4. **Classroom Layout:** Arrange desks and chairs in a way that allows for adequate spacing between students. Consider maintaining physical distancing guidelines to minimize the risk of spreading illnesses.
5. **Fire Safety Measures:** Install smoke detectors, fire extinguishers, and fire alarms in the classroom. Clearly mark emergency exits and ensure they are easily accessible and unobstructed. Conduct regular fire drills to familiarize students and staff with evacuation procedures.
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9. **Safety Training: Provide safety training to students and staff, including emergency procedures, evacuation drills, and awareness of potential hazards. Educate individuals about health and safety guidelines specific to the classroom environment.**
10. **Communication and Signage: Clearly communicate safety guidelines and protocols to students and staff. Display signage in visible locations to remind individuals of hygiene practices, physical distancing, and other safety measures.**

G. Program Quality Assurance:

1. Program Quality Assurance System

Provide a link to Quality assurance manual.

> Quality Assurance link
>
> **Program quality is monitored through several procedures:**
> - **Courses reports are submitted to the program manager every semester.**
> - **The appropriate teaching staff committee oversees assessment and modification.**
> - **Prepare and monitor the annual program report.**
> - **Conduct and analyze survey's opinion of the students about the courses and the program.**
> - **Conduct and analyze survey's 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 every five years if necessary.**
> - **Annual KPIs reports.**
> - **Periodic evaluation by stakeholders: students, alumni, faculty members, job market representatives.**
> - **Periodic operational plan progress reports.**
> - **Benchmarking.**
> - **Academic accreditation.**
>
> **All the previous processes follow the Teaching\Learning Quality Assurance Process Diagram:**
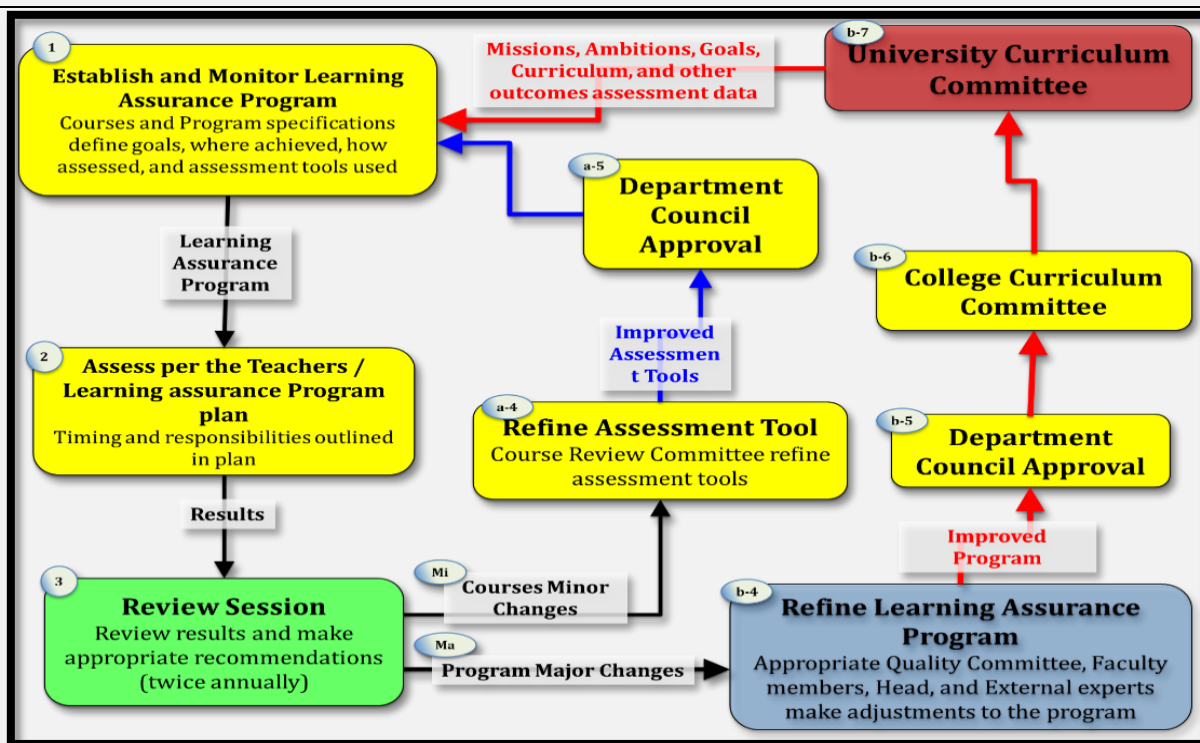
Figure 2 - Teaching\Learning Quality Assurance Process Diagram

These procedures provide multiple points of input that draw a reliable picture of the program's quality and guide improvement plans and initiatives. The reports and data generated from the above-mentioned procedures are reviewed at multiple levels of the university administration to ensure accountability for the implementation of improvement plans.

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

The quality of Actuarial and Financial Mathematical Program courses taught by other departments is monitored through end-of-semester course reports and student evaluation. These reports are reviewed by the department council and issues are dealt with through improvement plans.

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

The following arrangements are used to ensure the consistency between main campus and branches (including male and female sections):

- Centralized mechanism/policy for program and course development: Permission to introduce changes to the program specification, study plan, and course specifications are only given to the department council in main campus.

- Integration Committee: The integration committee plays a pivotal role in connecting main and satellite campuses to ensure changes to the program and courses are uniformly implemented across all sections and campuses.

- **Course Coordination:** Course coordination ensures that course coverage, teaching and learning activities, and assessment methods are comparable across all campuses and sections.
- **Annual Program Reports and End-of-Semester Reports:** These two reports are used to monitor any inconsistency between campuses and sections at the level of courses and the program as a whole. Students of all branches study the same program.
- The department chooses a coordinator for each course and for each branch at the beginning of the semester.
- The coordinators of branches ensure that solved exercises are the same for all branches.
- The final exam is common for all branches.

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

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 of 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 the form of report into account to document, analyze, and improve 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)	Stage 5 (one year)	Stage 6 (one year)
K1	✓	✓	✓			
K2	✓	✓	✓			
K3			✓	✓		
S1			✓	✓	✓	✓
S2			✓	✓	✓	✓
S3		✓	✓	✓	✓	✓
V1		✓	✓		✓	✓
V2		✓	✓		✓	✓

5. Program Evaluation Matrix

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
Leadership	Dean	Evaluation report	End of academic year

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
Effectiveness of teaching & Assessment	Program leader, faculty, independent reviewers, Students	Surveys, Interviews, Visits	End of the semester, During the semester
Learning resources	Employers, Faculty, Graduates, Students	Surveys, Interviews	End of the semester, During the semester

Evaluation Areas/Aspects (e.g., leadership, effectiveness of teaching & assessment, learning resources, services, partnerships, etc.)

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

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

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

6. Program KPIs*

The period to achieve the target (2) years.

No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
1	KPI-P-01	**Students' Evaluation of Quality of Learning Experience in the Program** (Average of the overall rating of final year students of the quality of learning experience in the program, satisfaction with the various services offered by the program (restaurants, transport, sports facilities, academic, vocational, psychological guidance...), student satisfaction with the adequacy and diversity of learning sources (references, periodicals, information databases... etc.) on a five-point scale in an annual survey.)	4.0 of 5.0	**Annual student survey (5-point scale)**	**End of academic year**
2	KPI-P-02	**Students' evaluation of the quality of the courses** (Average of students' overall rating for the quality of courses on a five-point scale in an annual survey.)	**Average rating for (two semesters) of 4.0/5.0**	**Annual student survey (5-point scale)**	**End of each semester**
3	KPI-P-03	**Completion rate** (The proportion of undergraduate students who completed the program in minimum time in each cohort)	**85% completion in minimum time**	**Program records and tracking**	**Annually at graduation**
4	KPI-P-04	**First-year students retention rate** (Percentage of first-year undergraduate students who continue at the program the next year to the total number of first-year students in the same year)	**75% retention rate**	**Comparison of first-year enrollment to second-year enrollment**	**Annually after first-year completion**
5	KPI-P-05	**Students' performance in the professional and/or national examinations** (Percentage of students or graduates who were successful in the professional and/or national examinations, or their score average and median (if any))	**80% pass rate**	**Analysis of examination results**	**Annually after examination results are published**
6	KPI-P-06	**Graduates' employability and enrolment in postgraduate programs** (Percentage of graduates from the program who within a year of graduation were: a. employed within 12 months, b. enrolled in postgraduate programs during the first year of their graduation to the total number of graduates in the same year.)	**70% employed or enrolled**	**Graduate follow-up survey and employment records**	**12 months post-graduation**
7	KPI-P-07	**Employers' evaluation of the program graduate's proficiency** (Average of the overall rating of employers for the proficiency of the program graduates on a five-point scale in an annual survey.)	**Average rating of 4.0/5.0**	**Annual employer survey (5-point scale)**	**Annually after graduation**

No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
8	KPI-P-08	**Ratio of students to teaching staff** (Ratio of the total number of students to the total number of full-time and full-time equivalent teaching staff in the program)	15:1 student-to-staff ratio	Program records	Annually
9	KPI-P-09	**Percentage of publications of faculty members** (Percentage of full-time faculty members who published at least one research paper during the year to total faculty members in the program.)	60% of faculty publishing	Faculty publication records	Annually
10	KPI-P-10	**Rate of published research per faculty member** (The average number of refereed and/or published research per each faculty member during the year (total number of refereed and/or published research to the total number of full-time or equivalent faculty members during the year).	1.5 publications per faculty member	Faculty publication records	Annually
11	KPI-P-11	**Citations rate in refereed journals per faculty member** (The average number of citations in refereed journals from published research per faculty member in the program (total number of citations in refereed journals from published research for full-time or equivalent faculty members to the total research published)	Average of 10 citations per faculty member	Citation analysis of published works	Annually
12	KPI-P-12	**Graduate Satisfaction with Career Preparation** (The average rating)	4.0 of 5	Annual graduate survey (5-point scale)	6 months post-graduation
13	KPI-P-13	**Assessment of Students' Research Skills** (The average rating)	4.0 of 5	Exit-survey	End of academic program

*including KPIs required by NCAAA

H. Specification Approval Data:

Council / Committee	MATHEMATICS AND STATISTICS DEPARTMENT COUNCIL
Reference No.	8/1446
Date	05/04/1446 (08/10/2024)