



Program Specification

Program Name:	MATHEMATICS
Qualification Level :	Level 6
Department:	Mathematics
College:	College Of Science And Humanities, Alkharj
Institution:	Prince Sattam Bin Abdulaziz University, Alkharj

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A. Program Identification and General Information

1. Program Main Location:	
Department Of Mathematics, College Of Science And Humanities In Alkharj PRINCE SATTAM BIN ABDULAZIZ UNIVERITY (MAIN CAMPUS)	
2. Branches Offering the Program:	
NIL	
3. Reasons for Establishing the Program: (Economic, social, cultural, and technological reasons, and national needs and development, etc.)	
<p>Economic Reasons:</p> <ul style="list-style-type: none"> ➤ To prepare the students as Mathematicians and Statisticians in various public and private sectors of the Kingdom. ➤ More teachers are required to teach mathematics as the number of schools have increased in the Kingdom ➤ Program is designed to prepare the graduates to be contributing members for achieving the KSA Vision 2030 of moving away from oil based economy. <p>Social :</p> <ul style="list-style-type: none"> ➤ To overcome unemployment and underemployment issues in various domain areas such as Education, IT, Acturial Science, Finance etc. <p>Technological:</p> <ul style="list-style-type: none"> ➤ To prepare the youth with analytical and problem solving skills required for the Re-engineering process. 	
4. Total Credit Hours for Completing the Program: (184)	
5. Professional Occupations/Jobs:	
Normally the students are prepared to enter into a graduate program leading to Ph D in mathematics from any university of international repute. However after completion of the program the students can also go for careers in a variety of fields, including:	
Job Title	Saudi Job Classification code
Middle and Highschool Teacher	233012
Teachers at Primary Schools	234101,234105
Mathematical Assistant	331402
Statistician	212003
Actuary	212002
Mathematical Science Specialist	212001
Planning and Development Managers	121310
Actuarial Manager	121118
Statistical Manager	121117
Armed Forces Officers	Zero Group
Statistical Assistant	331403
Statistical Surveyor	331404

6. Major Tracks/Pathways (if any): There are no tracks are pathways in this Bachelor Program in Mathematics

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

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

Intermediate exit points/awarded degree	Credit hours
NIL	NOT APPLICABLE

B. Mission, Goals, and Learning Outcomes

1. Program Mission:

Providing an intellectually stimulating academic environment for education and research in the various branches of mathematics and its applications to serve the labour market and community, and thereby inculcating human values in students so that well-qualified and competent graduates can be brought out as per national and international standards

2. Program Goals:

1. Providing quality education in mathematics that is both relevant to present-day changes and challenges and comparable to similar programs offered by universities of national and international repute.
2. Developing students' logical and analytical thinking, quantitative reasoning, and problem-solving skills.
3. Preparing students to take up graduate programs and research in mathematics.
4. Grooming students to become eligible for professions by means of helping them acquire professional license and to meet the labour-market needs.
5. Offering adequate facilities for proper teaching and learning of mathematics.
6. Encouraging students to serve the community at both social and economic levels.

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

Mission of University: *Delivering distinct education, developing ground-breaking research, enhancing partnerships and social responsibility through a stimulating academic environment, great-caliber human resources, cutting-edge technology, effective strategic partnerships and a supportive administrative system.*

Mission of College: Providing distinguished education in the fields of science and humanities, preparing competitive graduates, and producing practical research that can serve society and help realize the Kingdom's Vision through optimal investment of human and technical resources, and providing a motivating and enticing learning environment, along with academic programs that are in line with national and global standards, and building effective strategic relationships

Mission of Program: Providing an intellectually stimulating academic environment for education and research in the various branches of mathematics and its applications to serve the labour market and community, and thereby inculcating human values in students so that well-qualified and competent graduates can be brought out as per national and international standards

RELEVANCE OF MISSION

Program Mission	Mission of College	Mission of Universtiy
Providing Stimulating Academic Environment	Motivating and enticing learning environment	Providing Stimulating Academic Environment
Research	Research	Research
National and International Standards	National and gobal Standard	Distinguished education
Serve community inculcating human values	Community service	Social responsibility

It can be ascertained from the above table that the mission of the program is in line with the mission of the college and PSAU.

RELEVANCE OF GOALS OF PROGRAM

PROGRAM GOALS-PG	GOALS OF COLLEGE-CG						GOALS OF PSAU- IG		
<p>1. Providing quality education in mathematics that is both relevant to present-day changes and challenges and comparable to similar programs offered by universities of national and international repute.</p> <p>2. Developing students' logical and analytical thinking, quantitative reasoning, and problem-solving skills.</p> <p>3. Preparing students to take up graduate programs and research in mathematics.</p> <p>4. Grooming students to become eligible for professions by means of offering them the professional license to meet the labour-market needs.</p> <p>5. Offering adequate facilities for proper teaching and learning of mathematics.</p> <p>6. Encouraging students to serve the community at both social and economic levels.</p>	<p>1. Program development for academic distinction and research.</p> <p>2. Reinforcing the skills and abilities of the students and graduates.</p> <p>3. Attracting distinguished faculty and employees and providing them with services.</p> <p>4. Development of research systems and practical intermediate research labs to achieve the Kingdom's 2030 vision.</p> <p>5. Development of postgraduate programs that serve the job market.</p> <p>6. Development of the college's own financial resources.</p> <p>7. Building effective strategic relationships locally and globally.</p> <p>8. Building a supportive administrative structure.</p> <p>9. Continual development to apply quality standards.</p>						<p>1. Boosting the University status locally and globally.</p> <p>2. Empowering students to compete in the labor market.</p> <p>3. Attracting and developing distinguished human resources.</p> <p>4 Continuous improvement of teaching and learning processes.</p> <p>5. Developing graduate studies and academic research programs.</p> <p>6. Continuous improvement of quality practices and applications.</p> <p>7. Establishing effective strategic partnerships.</p> <p>8. Sustainability of the financial resources of the University.</p> <p>9. Improving a supportive administrative structure.</p> <p>10. Developing programs to support social responsibility.</p>		
	CG1	CG2	CG3	CG4	CG5	CG6	CG7	CG8	CG9
PG1	✓								✓
PG2		✓							
PG3				✓	✓				
PG4			✓						
PG5			✓			✓		✓	
PG6							✓		

	IG1	IG2	IG3	IG4	IG5	IG6	IG7	IG8	IG9	IG10
PG1	✓			✓		✓				
PG2						✓				
PG3					✓					
PG4		✓								
PG5								✓	✓	
PG6	✓	✓					✓			✓

It is evident from the above tables, that the Program Goals are in alignment with the goals of the College as well as PSAU.

4. Graduate Attributes:

1. Take initiative in identifying and resolving problems and issues both individually and in group situations exercising leadership in pursuit of innovative and practical solutions.
2. Apply the theoretical concepts from their field of study in considering issues and problems in other contexts
3. Able to investigating and proposing solutions to simple practical issues
4. Participate in activities to keep up to date with developments in their academic or professional field and continue to enhance their own knowledge and understanding
5. Consistently demonstrate a high level of ethical and responsible behavior and provide leadership in academic professional and community environments
6. Behave in ways that are consistent with Islamic values and beliefs, and reflect high levels of loyalty, responsibility, and commitment to service to society.
7. Develop enthusiasm for lifelong scientific inquiry, learning, and creativity

Key words	Attributes of the Graduates of Mathematics Program
Breadth of Knowledge	The graduates will apply the mathematical concepts in considering issues and problems in other contexts
Depth of Knowledge	Using acquired knowledge in identifying the various aspects of the latest development of mathematics and its relevance in other fields
Critical and creative thinking	Able to investigate and propose analytical solutions to simple practical mathematical problems
Research skills	Participate in activities to keep up to date with developments in their academic or professional field and continue to enhance their own knowledge and understanding
Technical skills	Acquire the required software skills to develop simple applications
Communication skills and	Consistently demonstrate a high level of ethical and responsible behavior and provide leadership in academic professional and community environment
Self-directed Lifelong learning	Develop enthusiasm for lifelong scientific inquiry, learning, and creativity
Career Skills	Take initiative in identifying and resolving problems and issues both individually and in group situations exercising leadership in pursuit of innovative and practical solutions
Ethical responsibilities	Understanding and committing to practice the established ethical principles.
Social Responsibilities	Contributing one's knowledge and skills to meet the needs of the society.
Confidence and Adaptability	Believing in one's acquired knowledge and skills and demonstrating the ability to adjust to new conditions.

Program learning Outcomes*	
Knowledge and Understanding: At the end of the Program, the students will be able to	
K1	Recall the scope, application, history, problems, methods, usefulness of Mathematics and Statistics to mankind both as a science and as an intellectual discipline
K2	Reproduce the algorithms and results proved in various branches of mathematics/statistics and also construct mathematical proof as appropriate.
K3	Recognize the relationship and interdependency between Mathematics /Statistics and other scientific fields.
K4	Describe appropriate method to solve mathematical and statistical problems both manually as well as using software
Skills : At the end of the Program, the students will be able to:	
S1	Analyze the problems in relation to the associated mathematical and statistical concepts
S2	Use appropriate methods/software to reconstruct and solve mathematical and statistical problems
S3	Sketch the graph and prepare reports both manually and through software
Values At the end of the Program, the students will be able to:	
V1	Apprise the contribution of mathematics to the society in various fields
V2	Acquire professional responsibilities coupled with Islamic belief and practice
V3	Work in Group and make a defense on a topic before forums of public interest.

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

C. Curriculum

1. Curriculum Structure

Requirements	No. of Courses	Credit Hours
Preparatory Year	16	46**
University Requirement	4	8
Department Requirement (Core Courses)	21	81
Department Requirement (Elective Courses)	5	20
Compulsory Courses from other Departments	4	17
Elective Courses From other Departments	1	4
Free Courses	3*	6
Field Training	1	2
Total Courses and Credit Hours	55	184

* Three Free courses adding to 6 credit hours must be chosen by the students from any branch / college of his interest within PSAU.

** The Student is eligible for enrollment in a Program only after acquiring 46 credit hours of Preparatory Year Program

2. Program Study Plan

Level	Course Code	Course Title	Required or Elective	* Pre-Requisite Courses	Credit Hours	Type of requirements
Level 1	Islam 101	Introduction of Islamic Culture	Required	Nil	2 (2, 0,0)	Institution
	Math 1050	Differential Calculus	Required	Nil	4(4,0, 0)	College
	Eng 1210	English Reading skills	Required	Nil	5 (5, 0,0)	College
	Eng 1220	English Writing Skills	Required	NIL	5 (5, 0,0)	College
Level 2	TC 1400	Computer Skills	Required	Nil	3 (2, 0,1)	College
	Eng 1230	English Conversation and listening skills	Required	Nil	5 (5, 0,0)	College
	Arab 101	Arabic Language skills	Required	Nil	2 (2, 0,0)	Institution
	Math 1060	Integral Calculus	Required	Nil	4(4,0, 0)	College
Level 3	Phys 1010	General Physics (1)	Required	Nil	5 (4,1, 1)	College
	Comm 1400	Communication skills	Required	NIL	2 (2, 0,0)	College
	Eng 1604	Scientific English Language	Required	Nil	5 (4, 0,1)	College
	Eng 1606	English for Academic Purpose	Required	Nil	4(4,0,0)	
Level 4	Math 2311	Infinite Series and Calculus Applications	Required	Math 1060	4(4,0,0)	Program
	Math 2240	Algebra and Analytic Geometry	Required	Math 1060	4(4,0,0)	Program
	Stat 2010	Elementary Probability and Statistics	Required	Math 1060	4(4,0,0)	Program
	Phys 2180	General Physics for Students of Mathematics (2)	Required	Phys 1010	3(3,0,1)	Program
Level 5	Math 2301	Visual Programming of Mathematical Problem	Required	TC 1400	4(3,0,1)	Program
	Islam 102	Islam and Society	Required		2(2,0,0)	Institution
	Stat 2040	Statistical Methods	Required	Stat 2010	4(4,0,0)	Program
	Math 2250	Linear Algebra- I	Required	Math 2240	4(4,0,0)	Program
	Math 2290	Mechanics	Required	Math 1060	4(4,0,0)	Program

Level 6	Math 2321	Actuarial Mathematics-I	Required	Math 1060	4(4,0,0)	Program
	Math 2455	Group Theory	Required	Math 2240	4(4,0,0)	Program
	Islam 103	The Economic System in Islam	Required		2(2,0,0)	Institution
	Stat 3280	Statistical Package	Required	Stat 2040	4(4,0,0)	Program
	XXX	Free Course	Required	--	2(2,0,0)	Program
Level 7	Math 3280	Linear Algebra- II	Required	Math 2250	4(4,0,0)	Program
	Math 3320	Multivariable Calculus	Required	Math 1060	4(4,0,0)	Program
	Math 3330	Ordinary Differential Equation- I	Required	Math 2250 + Math 2311	4(4,0,0)	Program
	Islam 104	The foundations of Political Systems of Islam	Required	--	2(2,0,0)	Institution
	XXX	Free Course	Required	--	2(2,0,0)	Program
Level 8	Math 3340	Ordinary Differential Equation –II	Required	Math 3330 + Math 3320	4(4,0,0)	Program
	Math 3370	Numerical Analysis	Required	Math 2250 + Math 2311	4(4,0,0)	Program
	Math 3350	Vector Analysis	Required	Math 3320	4(4,0,0)	Program
	Math 3460	Real Analysis- I	Required	Math 3330 + Math 2240 + MAT 3320	4(4,0,0)	Program
Level 9	Math 3510	Mathematical Package	Required	Math 3330 + Math 2301	4(4,0,0)	Program
	Math 4455	Rings & Fields	Required	Math 2455	4(4,0,0)	Program
	Math XXX	Elective Course from within the Department of Mathematics	Elective		4(4,0,0)	Program
		Elective Course from outside the Department of Mathematics	Elective	Depending on the chosen course	4(3,1,0)	Program
Level 10	Math 4590	Field Training	Required	95 Credit hours	2(0,2,0)	Program
	Math 4620	Ethics	Required	Math 3460	2(2,0,0)	Program
	Arab 103	Arab Language Editing	Required		2(2,0,0)	Institution
	Math XXX	Elective Course from outside the Department of Mathematics	Elective	Depending on the chosen course	4(4,0,0)	Program

	Free Course	Required			Institution	
Level 11		Elective Course from within the Department of Mathematics	Elective	Depending on the chosen course	4(4,0,0)	Program
	Math 4360	Introduction to Partial Differential Equations	Required	Math 3330 + Math 3320	4(4,0,0)	Program
	Math 4430	Introduction to Topology	Required	Math 3460	4(4,0,0)	Program
	Math 4590	Field Training	Required	After completion of 130 hours	2(0,0,2)	Institution
		Free Course	Elective		2(2,0,0)	Institution
Level 12	Math 4350	Complex Analysis	Required	Math 3330 + Math 3320	3(3,1,0)	Program
	Math 4820	Graduation Project	Required	Acquiring 155 credit hours	3(2,1,0)	Program
		Elective Course from within the Department of Mathematics	Elective	Depending on the chosen course	4(4,0,0)	Program
		Elective Course from within the Department of Mathematics	Elective	Depending on the chosen course	4(4,0,0)	Program

2. Details of Program Requirement:

(I) Preparatory Year (46 credits):

(II) University Requirement (8 credits):

Course Code	Course Name	Credit Hours	Prerequisite
IC 102	Islam and Society	2 (2, 0,0)	---
IC 103	The Economic System in Islam	2 (2, 0,0)	---
IC 104	The Foundations of the Political System in Islam	2 (2, 0,0)	---
Arab 103	Language Editing	2 (2, 0,0)	---
Total hours		8(8, 0, 0)	

(III) (A) Department Requirements (Core Courses) (81 credits):

Course Code	Course Name	Credit Hours	Prerequisite
Math 2240	Algebra and Geometry	4 (4,0, 0)	Math 1060
Math 2250	Linear Algebra-I	4 (4,0, 0)	Math 2240
Math 2290	Mechanics	4 (4,0, 0)	Math 1060
Math 2301	Visual Programming of Mathematical Problems	4(3,0,1)	MC1400 (Computer Skills)

Math 2311	Infinite Series and Calculus Applications	4 (4,0, 0)	Math 1060
Math 2321	Actuarial Mathematics -I	4 (4,0, 0)	Math 1060
Math 2455	Group theory	4 (4,0, 0)	Math 2240
Math 3280	Linear Algebra-II	4 (4,0, 0)	Math 2250
Math 3320	Multivariable Calculus	4 (4,0, 0)	Math 1060
Math 3330	Ordinary Differential Equations-I	4 (4,0, 0)	Math 2311
Math 3340	Ordinary Differential Equations-II	4 (4,0, 0)	Math 3320 + Math 3330
Math 3350	Vector analysis	4 (4,0, 0)	Math 3320
Math 3370	Numerical Analysis	4 (4,0, 0)	Math 2250
Math 3460	Real Analysis-I	4 (4,0, 0)	Math 3320 + Math 3330
Math 3510	Mathematical Packages	4(3,0,1)	Math 3330 + Math 2301
Math 4350	Complex Analysis	4 (4,0, 0)	Math 3320 + Math 3330
Math 4360	Introduction to Partial Differential Equations	4 (4,0, 0)	Math 3320 + Math 3330
Math 4430	Introduction to topology	4 (4,0, 0)	Math 3460
Math 4455	Rings and Fields	4 (4,0, 0)	Math 2455
Math 4620	Ethics of Mathematicians	2 (2,0, 0)	Math 3460
Math 4820	Graduation Project	3 (2,0, 1)	After completing 155 Credit hours
Total	21 Courses 81 Units	81(78,0, 3)	

(B) Compulsory Courses from Other Departments (17 credits):

Course Code	Course Name	Credit Hours	Prerequisite
Stat 2010	Principles of statistics and probability	4 (4,0, 0)	Math 1060
Phys 2180	General Physics for students of Mathematics-II	5(4,0,1)	Phys 1010
Stat 2040	Statistical methods	4(4,0, 0)	Stat 2010
Stat 3280	Statistical packages	4(3,0,1)	Stat 2040
Total Hours		17 (15,0, 2)	

(C) Department Requirement (Elective Courses)(20 Credits Hours)

Five courses to be chosen from the following two groups of elective courses: **(The student chooses two courses from one group and three courses from the other group.)**

Group 1

Course Code	Course Name	Credit Hours	Prerequisite
Math 3270	Number Theory	4(4,0, 0)	Math 2311

Math 3240	Actuarial Mathematics -II	4(4,0, 0)	Math 2321
Math 4390	Differential Geometry	4(4,0, 0)	Math 3320 + Math 3330
Math 4420	Introduction to Functional Analysis	4(4,0, 0)	Math 3280 + Math 3460
Math 4470	Real Analysis-II	4(4,0, 0)	Math 3460
Math 4520	Calculus of Variations	4(4,0, 0)	Math 3320 + Math 3330
Math 4530	Methods of Optimization	4(4,0, 0)	Math 3260 + Math 3320
Math4580	Special Functions	4(4,0, 0)	Math3340

Group 2

Course Code	Course Name	Credit Hours	Prerequisite
Math 3260	Mathematical Programming	4(4,0, 0)	Math 2250
Math 4380	Non-linear Dynamics	4(4,0, 0)	Math 3340 + Math 3320
Math 4400	Fluid Mechanics	4(4,0, 0)	Math 2290 + Math 4360
Math 4410	Classical Mechanics	4(4,0, 0)	Math 2290 + Math 4360
Math 4480	Principles of Automatic Control	4(4,0, 0)	Math 2250 + Math 3320 + Math 3340
Math 4490	Applications of Continuum Mechanics	4(4,0, 0)	Math 3350 + Math 4360
Math 4500	Numerical Methods to Solve Partial differential equations	4(4,0, 0)	Math 4360 + Math 3370
Math 4540	Computational Geometry	4(4,0, 0)	Math 3320 + Math 3340
Math 4550	Wavelet and Signal Processing	4(4,0, 0)	Math 3340+Math3280
Math 4560	Dynamics of the Rigid Body	4(4,0, 0)	Math 2290 + Math 3330
Math4570	Quantum Mechanics	4(4,0, 0)	Math3340+Math4360

(D) Elective Courses From Other Departments (4 Credits Hours)

One course to be chosen from the following courses:

Course Code	Course Name	Credit Hours	Prerequisite
Comp 2510	Databases	4(4,0, 0)	Math 2301
Comp 2300	Visual Programming 2	4(4,0, 0)	Math 2301
Phys 2140	Classical Mechanics 1	4(4,0, 0)	Phys 1010
Phys 2230	Modern Physics	4(4,0, 0)	Phys 1010
Phys 2410	Thermodynamics	4(4,0, 0)	Phys 1010 + Math 1060
Stat 2150	Probability 1	4(4,0, 0)	Stat 2040

(E) Free Courses (6 Units)

One or more courses of total 6 credit hours to be chosen from among the courses offered within the college or outside the college, provided they meet the prerequisites.

(F) Field Training:

As a partial fulfillment for the award of degree of Bachelor of Science in Mathematics, every student will have to undergo field training after completion of 125 credit hours and submit a report.

Math4590	Field Training	2 (0,0,6)	After completion of 130 hours
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3. Course Specifications

Insert hyperlink for all course specifications using NCAAA template

Course Specifications - Trimester system
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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		
	K.1	K.2	K.3	K.4	S.1	S.2	S.3	V1	V2	V3
MATH 1050	I			I	I	I				
MATH 1060	I				I	I		I		
MATH 2240	I	I			I	I				
MATH 2311	I			I	I	I				
STAT 2010		I		I	I	I				
MATH 2301		I		I	I	I		I		
STAT 2040			I			I		I		
MATH 2250	I	I			I	I				
MATH 2321	I		I		I	I		I		I
MATH 2455	I	I			I	I				
MATH 2290	I		I		I		I	I		
MATH 3280	P	P			P	P		P		
MATH 3320			P	P		P	P	P	I	
MATH 3330	P			P	P	P		P	I	
MATH 3340	P			P	P	P		P	P	
MATH 3350	P		P		P	P		P		
MATH 3370	P			P	P	P		P	P	
STAT 3280	P		P	P	P		P	P		P
MATH 3460	P	P			P	P		P	P	
MATH 3510	P		P	P	P		P	P	P	P
MATH 4360	M		M	M	M	M		P		P
MATH 4430	M	M			M	M		M	P	
MATH 4455	M	M			M	M		M		M

MATH 4350	M	M		P	M	M	P	M	P	
MATH 4620	P			M	P			M	M	M
MATH 4820	M	M	M	M	M	M	M	M	M	M
MATH 4590			M	M	M	M	M	M	M	M
Electives										
MATH 3260	P			P		P	P	P		P
MATH 3270	P	P		P		P	P	P		
MATH 4390	M		M	M	M		M	M		
MATH 4420	M	M			M	M			M	
MATH 4520	M			M	M		M	M	M	
MATH 4530	M		M			M	M		M	M
MATH 4500	M	M			M	M		M		

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.

Policies:

- To graduate in the Mathematics Program, a student requires to complete 138 credit hours, in 8 levels/ semesters (4 years).
- Each Academic year has 2 regular semesters and a summer, if available.
- There are a total of 34 Core courses, 5 Electives 1 Field Training and 1 graduation project University compulsory requirement of 16 credit hours and University Free requirements of 6 credit hours.
- All courses offered in each semester/ level are in conformity with the approved Study Plan.
- The duration of each semester is not less than fifteen weeks and this period does not include the periods of registration and final exams.
- The duration of the summer semester is not less than eight weeks where the teaching time allocated for each course is doubled.
- A student graduates after successfully completing the graduation requirements in accordance with the study plan, provided his/her cumulative average is not less than 2 (Pass)

Teaching Strategies

Code	Learning Outcome	Teaching Strategies
K1	Recall the scope, application, history, problems, methods, usefulness of Mathematics and Statistics to mankind both as a science and as an intellectual discipline	<ol style="list-style-type: none"> 1. Class Room Lectures 2. Tutorial Sessions 3. Interactive Session
K2	Reproduce the algorithms and results proved in various branches of mathematics/statistics and also construct mathematical proof as appropriate.	
K3	Recognize the relationship and interdependency between Mathematics /Statistics and other scientific fields.	
K4	Describe appropriate method to solve mathematical and statistical problems both manually as well as using software	

Code	Learning Outcome	Teaching Strategies
S1	Analyze the problems in relation to the associated mathematical and statistical concepts	1. Class Room Lectures 2. Tutorial Sessions 3. Interactive Session/Group Discussion
S2	Use appropriate methods/software to reconstruct and solve mathematical and statistical problems	
S3	Sketch the graph and prepare reports both manually and through software	
Code	Learning Outcome	Teaching Strategies
V1	Apprise the contribution of mathematics to the society in various fields	1. Lectures 2. Group Discussion / task 3. Brain storming
V2	Acquire professional responsibilities coupled with Islamic belief and practice	
V3	Work in groups and make a defense on a topic before forums of public interest.	

Learning Experience: The program strives to provide a useful and productive learning environment to learners. Besides interactive classroom activities, the students attend Computer lab, participate in workshop for graduates with regard to Graduation Project, Facing Interview and various extra and co-curricular activities. This helps to develop their academic skills and acquire a learning style appropriate to the program. These activities also encourage student – instructor contact, cooperation among students, active learning, prompt feedback, and provide opportunities of developing diverse talents and new ways of learning.

Learning Activities The program conducts numerous curricular and extra-curricular activities, to name only a few:

- Conducting special sessions for enhancing mathematical foundation through Coaching Unit of the Department
- Encouraging the students take part in various Interdepartmental sports and cultural events
- Field training preparation workshops
- Research Poster Days
- Workshops on subjects like „Facing Interview“; „Graduation Project Guidelines“ etc

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 Methods :

- Written Exams
- Homework / Assignment
- Presentations
- Quizzes
- Practical Exams
- Report Writing (Graduation Project / Field Experience)
- Defense / Discussion (Graduation Project)
- Class observations
- Class discussions

Indirect Methods:

KPIs and their analysis

Students Evaluation of Program (teaching, learning, facilities and Equipment)

Alumni Survey

Surveys and questionnaires

Assessment Methods			
Code	Learning Outcome	Direct	Indirect
K1	Recall the scope, application, history, problems, methods, usefulness of Mathematics and Statistics to mankind both as a science and as an intellectual discipline	Exams Homework / Assignment Quiz	Course Evaluation
K2	Reproduce the algorithms and results proved in various branches of mathematics/statistics and also construct mathematical proof as appropriate.		Alumni Survey
K3	Recognize the relationship and interdependency between Mathematics /Statistics and other scientific fields.		Program Evaluation Survey
K4	Describe appropriate method to solve mathematical and statistical problems both manually as well as using software		Peer Review
Code	Learning Outcome	Direct	Indirect
S1	Analyze the problems in relation to the associated mathematical and statistical concepts	Exams Homework Quiz	Alumni Survey
S2	Use appropriate methods/software to reconstruct and solve mathematical and statistical problems		Program Evaluation Survey
S3	Sketch the graph and prepare reports both manually and through software	Poster Presentation Report writing	
Code	Learning Outcome	Direct	Indirect
V1	Apprise the contribution of mathematics to the society in various fields	Class discussions Poster Presentation Defense of Reports	Program Evaluation and Alumni Survey
V2	Acquire professional responsibilities coupled with Islamic belief and practice		
V3	Make defense on a topic before forums of public interest.		

D. Student Admission and Support:

1. Student Admission Requirements

Admission Requirements

A student is admitted to the program after he/she has met the admission requirements set by the Students' Registration and Admission Department. (Handbook attached as Appendix)

Before enrolling in the Program, the student must have completed the Preparatory Year Program offered by Deanship of Preparatory Studies and acquired 31 credits

He must apply for admission through the University Electronic Academic System (e-Register) hosted by the Deanship of Electronic Transactions and Communications for enrollment in Preparatory Year Program.

A student is required to access the academic system by using the link:

<http://edugate.sau.edu.sa> and register for a username and a password.

Upon online registration, a student is given a unique university Roll Number and directly

For re-registration, in subsequent semesters, a student is also entitled to add and drop courses during the first week of teaching within the study load limit correlating student's current GPA.

The following table shows the student's permitted study load in a semester as per his/ her GPA:

GPA 2 2.5 3 3.5 4 4.5 5 Hours allowed for registration 14 15 16 17 18 19 20 The average and cumulative GPA are calculated every semester for the student automatically by the system.

GPA	2	2.5	3	3.5	4	4.5	5
Load	14	15	16	17	18	19	20

2. Guidance and Orientation Programs for New Students

In the beginning of every semester, the new students are given an Orientation about the Program outline and requirements and all students are guided throughout the period of study Accordingly the department organizes orientation session through the Academic Advising Committee. They give presentations to the students about the various aspects of the Program and what is expected of the students. Moreover, the college also organizes an orientation program to the students, where in all the new students are briefed on various aspects and rules of the Program and University such as Registration, Course Drop, vacation (in case of emergency), grading policy, attendance, appeals etc. Each new student enrolled in the program is assigned to some faculty member so that the student gets academic guidance and support during his study.

3. Student Counseling Services

(academic, career, psychological and social)

- At the beginning of each semester, the students enrolled in the program are distributed amongst the faculty members for providing adequate academic guidance to the students.
- In order to provide adequate assistance to the students, each faculty member earmarks two or three exclusive office hours for the purpose apart from the usual five office hours for providing tutorial and doubt clearing assistance to the students.
- The Faculty members are actively involved providing all types of academic assistance to the students such as planning, selection and registration of courses. In addition to choosing elective courses within the Program and the courses provided by other departments, field training etc.
- Also, where required, the students are provided with assistance with regard to their future career planning by the Academic Advisor in coordination with the Employment Committee.

4. Special Support

(low achievers, disabled, gifted and talented)

Low Achievers:

- The Academic Advisors of the respective students after consulting with the course instructor advises and guides the students so that they are able to perform better.
- The course instructors motivate the students by assisting them in the topics where the student finds difficult during Office hours.
- The Program Manager (HoD) also arranges for special lectures for the low achievers through the Academic Advising committee of the department.

Disabled Students:

- The University and college have special facilities for disabled students such as separate parking lots
- The entire lecture halls and labs have access through wheelchairs
- The department has specialized toilet facilities for disabled students.
- Special arrangement / support service during examinations.

Gifted and talented Students:

- The talented students are permitted to register up to 3 credit hours over and above their entitled course load with approval of Vice Dean Academics / Dean of College
- Extra marks are awarded for students who represent the Department of Mathematics / Program in various extra and co-curricular activities.

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		Pure and Applied		8	8	16
Associate Professors		Pure and Applied		12	12	24
Assistant Professors		Pure and Applied		16	16	32
Lecturers	Master of Science in Mathematics			4	6	10
Teaching Assistants	Bachelor of Science in Mathematics			8	10	18
Technicians and Laboratory Assistants	NA	NA		0	0	0
Administrative and Supportive Staff		Secretarial		1	1	2
Others (specify)						

(The Requirement of staff is determined based on three factors : (a) Staff Student ratio (b) Total teaching load (c) Maintaining Pyramidal structure in Hierarchy.

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

- The newly recruited faculty members undergo an orientation program organized by the Deanship of Faculty Administration and Deanship of Quality and Development..
- At College Level, the Vice Dean of Academic Affairs conducts workshop in the beginning of every semester to the faculty members so that they are well aware of their roles and responsibilities.
- At Department Level, the Program Coordinator nominates a group of senior faculty members to assist the newly recruited faculty members in getting familiar with their day to day activities such as scheduling of lectures as per course description and course specification of courses they teach and also get knowledge of the committees they are nominated to etc. and also scheduling of the office hours for meeting students and prioritizing the activities etc.

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.)

(a) Teaching and Learning:

- The Deanship of Quality and Development as well as Faculty Administration conduct periodical workshop to the faculty members for improvement of teaching skills.
- The DDQ and the QAAC organizes workshop /training for new faculty members in assessment of Learning Outcomes, preparation of course reports etc.
- All Teaching staff are provided with free subscription to Digital Library and other Scientific Websites so that the teaching staff can interact with scientific community.

(b) Research and Development:

- The faculty members are encouraged to take part in research activities through funding by the University.
- Also the University grant awards to meritorious publications made by the faculty members every year.
- At College and Department Level, the faculty members are encouraged to deliver lectures in Seminars about their research findings and reports there on, there by inter disciplinary research activities are encouraged.
- Many of the staff members are involved in cooperated research within the University as well as with faculty members of other universities within the Kingdom as well as outside the Kingdom.
- Moreover, staff members are encouraged to attend and present papers in International Conferences periodically

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.)

Teaching Resources:

- The Department Council has formed a sub-committee entrusted with a specific task of collection of reference materials for each course. The sub-committee has collected the details of all reference materials required for continued process of teaching and learning of all courses taught by the Department which should be made available in libraries.
- Whenever a new course is introduced or an existing course is reviewed or redesigned, the reference materials and text books are also updated by the committee. The information thus collected is sent to the senior management of the faculty / university through the Program Coordinator / HoD.
- At the beginning of each semester, the course instructors give a brief introduction to the course to be taught along with the prescribed text books for the students.

- Also the faculty members prepare detailed lecture notes on the course content to be taught during the term and provide to the students in the form of Lecture / Tutorial Notes. The notes are made available to the students through soft and hard copy.
- Apart from the above, the course instructors also inform the students about the available ebooks and the websites from where the books could be downloaded for reference.
- At the end of each semester, survey is conducted from the stake holders (faculty members and the students) with regard to the quantity and quality of the learning resources provided .

2. Facilities and Equipment

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

- The Department Council has also formed a subcommittee to look after the scheduling of lectures, practical sessions and make available the Lecture Halls and Labs.
- At college level, separate computer laboratory has been earmarked for each department for teaching program specific computer courses. It is also pertinent to mention that separate computer labs exist for all departments including preparatory year programs. The Scientific Resources Sub Committee, collects information from the faculty regarding the details of software and packages required for course delivery and the same is forwarded through proper channel (Program Coordinator and Dean of College) to the Deanship of IT, SAU, for providing the same.
- **Medical facilities**
 - Students' labs contain first aid.
 - There is an outpatient clinic for students at the Faculty of Medicine.
- The University Hospital provides all medical services to students as well as to faculty, staff and their families
- Similarly, separate wings of Lecture Halls have been earmarked for each department for delivering lectures and the subcommittee periodically inspects the available infrastructure such as Smart Boards and their functioning, furniture and fixtures etc and ensures undisturbed teaching and learning process
- At the end of each semester, survey is conducted from the stake holders (faculty members and the students) with regard to the quantity and quality of the facilities and equipment available for the teaching and learning process. .

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

- As most of the course delivery is done through traditional class room lectures, lecture halls with adequate seating capacity (atleast 30 students) with provisions for meeting extreme weather conditions are required.
- Most of the courses taught in the program are theoretical (mathematical courses), as such general safety of the building and lecture hall to be maintained. However, specific instructions for safety are provided at Computer Labs and other Labs where courses involving practical training are taught.
- Also every lecture hall / floor needs to be fitted with firefighting equipment and also an emergency exit in case of any fire hazard takes place.
- The Safety and Security unit in the University provides security systems and safety to the facilities, Cameras are available in the building 24 hours. Fire evacuation policy and fire drills are practiced in all places. First aid kits are available in all faculties. The College has emergency plans, safety signs, emergency exit signs and laboratory safety manuals.

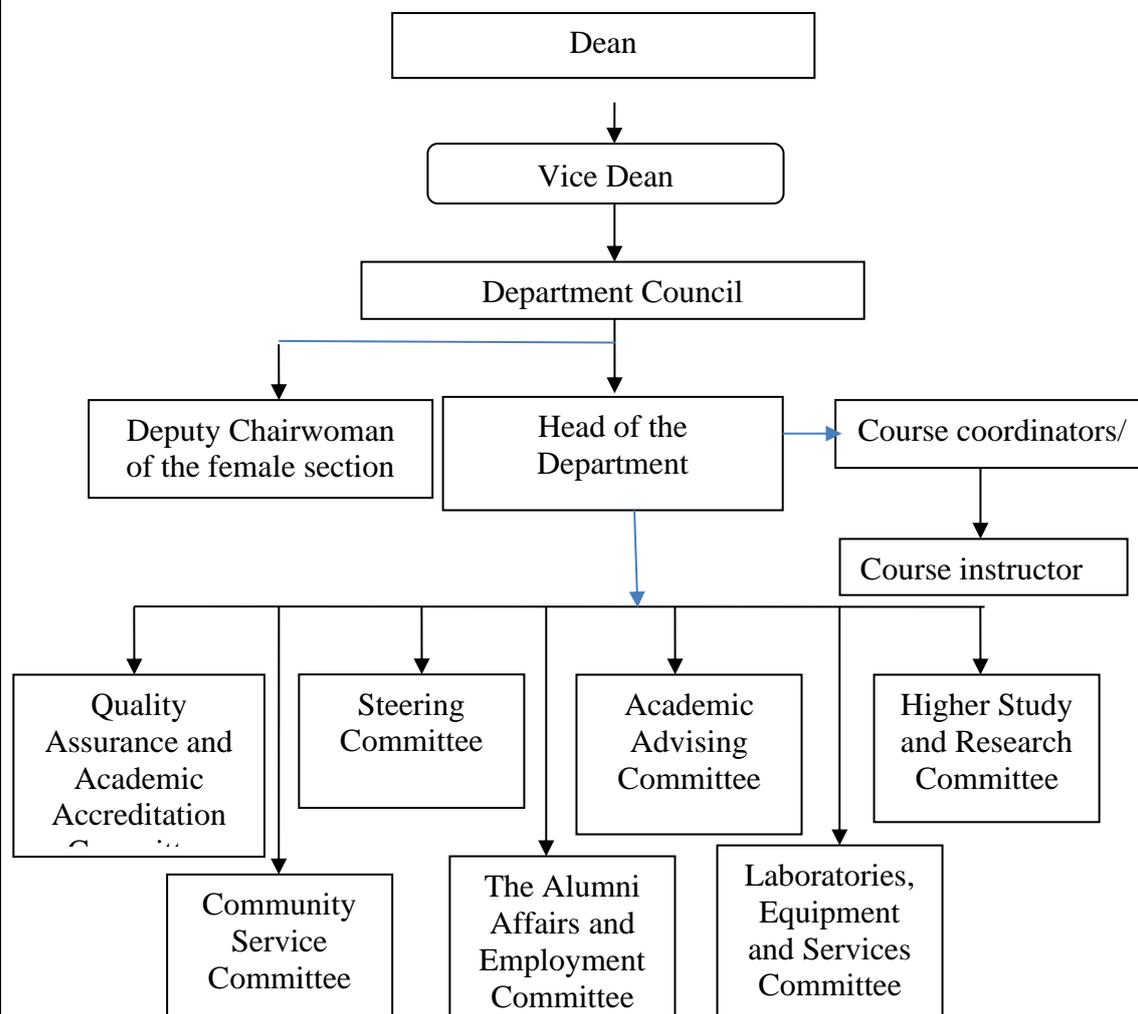
G. Program Management and Regulations

1. Program Management

1.1 Program Structure

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

The Program is administered in line with the following hierarchy:



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.)

- Faculty are entrusted with the task of coordinating various academic and administrative functions such as Study plan, Quality assurance, Textbooks, Academic advising, Alumni matters, Field Training and graduation projects,
- At the end of every semester, feedback is obtained from the student with regard to individual course delivery, overall program learning experience and also available resources. Apart from the feedback of the students, the faculty members also provide feedback covering various areas of teaching and research.
- Employers contribute by judging the quality of program based upon the performance of its graduates. They provide feedback on program contents, curriculum, program management and alumni performance at their workplaces.

- The individual faculty members provide course report through the course coordinator with regard to the course delivery. All this feedback is analyzed by the Steering Committee / Committee for Quality Assurance and Academic Accreditation and developmental action deemed necessary are suggested and submitted to DDQ through the Deanship of the College.
- The Program study plan also gets periodically reviewed by external stake holder / academic experts outside the Department/ University. In the recent past the study plan was reviewed by external reviewers and the Plan modified accordingly.
- Moreover, advice/suggestion of external academic quality regulators are also considered and implemented (such as revising the credits for Graduation Project, awarding credit to Field Experience etc).
- Alumni also participate in making the program a success. They assess and judge the education received by them and its utility in the work place. They help in identifying the strengths and weaknesses 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.)

Admission

The admission to the Mathematics program takes place after completing the Preparatory year, which is mandatory for all students of the College of Science and Humanitarian Studies. The admission to the degree program is subject to Grade Point Average (GPA).

The applications for admission are considered by the Deanship of admissions and registration affairs according to the following conditions:

- The student must hold the General Secondary Certificate (i.e., a High School Diploma) (or equivalent) from inside or outside the Kingdom of Saudi Arabia.
- This certificate (or equivalent), mentioned above, must not be more than five years old.
- The student must be able demonstrate good behavior and conduct.
- The student must be medically fit.
- The student must obtain his/her employer's approval if he/she works in the public or private sector.
- The student must meet any conditions assigned by the Senate at the time of registration.
- The student should not have previously been expelled from any university for disciplinary or academic reasons.
- Any student who already holds a Bachelor's degree will not be admitted to study for another such degree. However, exceptions may be allowed by the Senate.

Study and exams

The program regulations about the study and exams are published in more details in the handbook of the Mathematics program available in the Department Website.

Recruitment

Recruitment for Saudis in different degrees is based on the need of the department through the announcement of these jobs under the supervision of the Vice-Rectorate for Graduate Studies and Scientific Research. The program conducts a written examination as well as a personal interview with applicants for the degree of teaching assistant and a personal interview with holders of a doctorate.

On the other hand, non-Saudis are also appointed based on the needs of the department in different disciplines, after sorting the biographies submitted to the department and selecting the members of the teaching staff with great experience, whether in the field of teaching or scientific research .

Appeals and complaint regulations

- Policies and regulations of student appeal on academic matters including: final grade appeal, academic probation and transfer are outlined in the student handbook “Study and exams operational rules”. It can be also accessed through the Deanship of Admissions and Registration Affairs homepage. The policy describes criteria for appeal, timeline and personnel involved.
- <http://sau.edu.sa/emada/30/675>
- <http://sau.edu.sa/emada/37/623>
- <http://sau.edu.sa/sites/default/files/page/1287410301.pdf>

- Disciplinary regulations for male and female students is published on the following web site
<https://dsa.psau.edu.sa/ar/rules-regulations/1-81>
- Document of the rights and obligations of the students at Prince Sattam bin Abdulaziz University is published on the following web site
<https://dsa.psau.edu.sa/ar/rules-regulations/1-83>

- Appeal and grievance procedures are carried out by an independent committee in the department, if the student’s grievance about their grades.
- The committee of student’s issues in the department is responsible for the solution of the student’s problems.

- In addition, there is a steering committee at the level of college to investigate all issues of the students.
- All the decisions of the steering committee are discussed through the meeting of College council.
- The by-laws and sanctions are applied transparently

H. Program Quality Assurance

1. Program Quality Assurance System

Provide online link to quality assurance manual

[Mathematics Department - Quality Assurance Manual](#)

- Periodical interaction with the students by the Quality Assurance Committee of the Department and also by the Course Coordinator ensures that the Planned strategies of the course specification are followed. If there is any deviation, the same is communicated to the Program Coordinator through the course coordinator elaborating the reasons for the same and necessary approval or remedial action is executed
- The Quality Wing of the department as per the advice of the Program Coordinator conducts Peer Review of the Class Room Session for conformity with the lecture schedule and teaching strategies specified in the Course specifications apart from the didactic techniques adapted by the concerned faculty members and submits its report to the Program Coordinator for his perusal and necessary action wherever required.
- The course report submitted by the course coordinator is being evaluated by a team of senior faculty members. The results and shortcomings and the deviations from the course specification if any, reported thereon, are reviewed and suggestions given by the course coordinator are noted and submitted to the Program Coordinator for his suggestion / necessary action.
- At the end of the academic year the Quality and Academic Accreditation Committee submits Program Report, which is reviewed and approved by the Department and College Council and submitted to DDQ for perusal and approval.
- The teaching skills of the faculty members are periodically evaluated through various surveys conducted amongst the students at Department Level, College Level and University Level and where ever improvement is needed the same is communicated to the concerned faculty members.
- The question paper and answer scripts of the students are evaluated by two faculty members apart from the course instructor to ensure unbiased assessment of the students learning outcomes.
- The faculty members furnish their research findings to the department periodically, there by their research skills are evaluated. Necessary support is given to the faculty members for continued research

Evaluations:

- from current students and graduates of the program:
 - Periodical Interaction with the students by the Members of the Quality Assurance Committee.
 - Conduct of Survey by the Department, College and University (Course Evaluation, Program Evaluation)
 - Online Survey by Deanship of Development and Quality of PSAU (DDQ)
- from independent advisors and/or evaluator (s)?
 - The Program Course Plan and the Course Content has been subjected to external review and the comments from the external reviewer have been discussed and necessary modifications made periodically.
 - The Course content has been compared with University of Calgary, Canada at International Level and King Saud University at the national level for maintaining the International Standards of Teaching and Learning.

(iii) from Faculty Members, Employers, Advisory Committee, and/or other stakeholders.

- Survey conducted by the Quality Assurance Department.
- Feedback from the establishment where the students undergo Field Training.

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

One of the Program Learning outcomes and the graduate attributes of the Program is to make the students gain knowledge about the interdependency of subjects of Physical Science and in order to achieve the same, the Program has ensured that the students require to undertake certain compulsory elective courses from other departments such as Statistics, Physics, Chemistry. Apart from this, for the students to have a flair of education imparted by other departments the students must take at least two free courses (6 credit hours) of their choice from any department of the university. In order to achieve the desired PLOs the Program Coordinator of the Department of Mathematics have periodical interaction with the program coordinators of the departments offering the compulsory elective courses regarding the course content, course delivery and the assessment methods being adopted so that the desired results are achieved. Not only the above, at college level, the Vice Dean (Academics) and the Dean also follow the study plan and ensures that there is a rationale between the content and delivery of the elective course offered by other department with reference to the program goals.

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

1. The curriculum and the Program Study Plan is common for both male and female branches. Hence the course specification is also common for both male and female branches.
2. At the beginning of each semester, the course instructors teaching the courses in various branches and sections hold discussion in the presence of the Course Coordinator and draft the common teaching plan (lecture / exercise etc).
3. Uniformity in course delivery is ensured through periodic meetings / interactions between the faculty members teaching the course in both campus
4. All direct assessments (Internal and Final examination) are conducted uniformly across all campus at the same time and the results are published at the same time/
5. At the end of the semester, the students participate in survey conducted both by the department as well as the University (online survey) with regard to their learning experience of the course including the course delivery.

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

At present, the Program provides opportunities for visiting students from other universities of the Kingdom to undertake courses in this department. Similarly, the program permits the students to undertake certain courses from other universities within the Kingdom like summer term etc., whenever an equivalency could be established with the courses taught. From time to time, DSR, PSAU notifies the terms for International collaborative research by awarding special research grants.

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

There are various measurement methods to assess the attainment of PLOs and using the outcome for further program improvement. These methods include :
Direct Assessment:

Internal / Mid Term Examination - 6 th and 12th Week - 15% each
Quiz (Atleast Two) - 3 rd and 9th Week - 5% each
Homework / Assignment - Continuous Assessment - 10% each
Final / End Semester Examination - 15th /16th Week - 50%

Evaluation and Assessment:

The following are broad guidelines that are adopted at the program level:

- Stating program goals (general aims), objectives (what students are expected to know/do by the end of the program) and outcomes (what students are able know/do by the end of the program)
- Aligning program learning outcomes with courses learning outcomes (mapping matrix)
- Collecting evidence which may be (1) direct: such as samples of students' work from courses or other scholarly activities, students' evaluation rubrics, setting benchmarks, etc.; or (2) indirect: such as perceptions and opinions based on surveys administered to students, alumni, stakeholders, job placement statistics, etc.
- Interpreting and evaluating collected evidence
- Developing a plan for ongoing improvement: On reading into the collected evidence, changes (e.g. curricular, instructional, or program) can be done

Attainment of PLO-CLO through Direct Assessment :

At the end of each semester, a CLO-PLO assessment evaluation is made by a committee headed by the Vice Academics to see the level of attainment of ILOs of individual courses as well as Program as a whole, with reference to pre-set benchmarks. Attainment results are discussed with the Head of the Department so that necessary modifications in course and program delivery is made in order to achieve desired level of attainment of Learning outcomes.

Indirect Assessment:

Conduct annual surveys related to all courses, teaching methodologies, program assessment strategies, etc. The findings are included in the course reports and suggestions, if any, are emphasized for implementation in the next semester



Program Specification

ASSESSMENT PLAN FOR PLOS – DIRECT AND INDIRECT

Knowledge and understanding	Assessment Method	Source of Data	Assessment Tool	Target	Assessment Cycle	Assessment Time	Responsible	
K1	Recall the scope, application, history, problems, methods, usefulness of Mathematics and Statistics to mankind both as a science and as an intellectual discipline .	Direct	MATH 2240	Written exams, quizzes and assignment Project report	At least 50% of the students appearing in final exam score 75% marks and above in this domain	Every Semester	The end of 3rd level	Course coordinator
			MATH 2311				The end of 4th level	Course coordinator
			MATH 2250					
			MATH 2290					
			MATH 2321					
			Math 2455					
			MATH 3280					
			MATH 3330					
			MATH 3340					
			MATH 3350					
			MATH 3370					
			MATH 3460					
			MATH 3510					
			MATH 4360					
			MATH 4430					
			MATH 4455					
			MATH 4350					
			MATH 4620					
			MATH 4820					
		MATH 3260						
MATH 3270								
MATH 4390								
MATH 4420								
MATH 4520								
MATH 4530								
MATH 4500								
Indirect	Students	Evaluate students' quality of learning experiences in the program	3.5 from 5	Every semester	Course coordinator			
K2	Reproduce the algorithms and results proved in various branches of mathematics/statistics and also construct mathematical proof as appropriate	Direct	MATH 2240	Written exams, quizzes and assignment And Project report	At least 50% of the students appearing in final exam score 75% marks and above in this domain	Every Semester	Level 3	Course coordinator
			STAT 2010				End of Level 4	Course coordinator
			MATH 2301					
			MATH 2250					
			MATH 2455					

			MATH 3280				End of Level 5	Course coordinator
			MATH 3460				The end of 6th level	Course coordinator
			MATH 3510				The end of 7th level	Course coordinator
			MATH 4430				The end of 8th level	Course coordinator
			MATH 4455				Elective courses	Course coordinator
			MATH 4350				The end of 4th level	Quality unit
			MATH 4820					
			MATH 3270					
			MATH 4420					
MATH 4500								
		Indirect	Students	Evaluate students' quality of learning experiences in the program	3.5 from 5			
K3	Recognize the relationship and interdependency between Mathematics /Statistics and other scientific fields..	Direct	STAT 2040	Written exams, quizzes and assignment	At least 50% of the students appearing in final exam score 75% marks and above in this domain .	Every semester	The end of 4th level	Course coordinator
			MATH 2290				The end of 5th level	Course coordinator
			MATH 2321				End of 6 th level	Course coordinator
			MATH 3320				End of 7 th level	
			MATH 3350				The end of 8th level	Course coordinator
			STAT 3280					
			MATH 3340					
			MATH 3510					
			MATH 3370					
			MATH 4360					
			MATH 4820					
			MATH 4590					
		MATH 4390						
MATH 4530								
		Indirect	Students	Evaluate students' quality of learning experiences in the program	3.5 from 5		Every semester	Quality unit

K4	Describe appropriate method to solve mathematical and statistical problems both manually as well as using software	Direct	MATH 2311	Written exams, quizzes and assignment	At least 50% of the students appearing in final exam score 75% marks and above in this domain	Every semester	Level 3	Course coordinator
			MATH 2301				Level 5	Course coordinator
			STAT 2010 MATH 3330				Level 6	Course coordinator
			MATH 3340				Level 8	Course coordinator
			MATH 3370					
			STAT 3280					
			MATH 3510					
			MATH 4620					
		MATH 4590						
Indirect	Students	Evaluate students' quality of learning experiences in the program	3.5 from 5	Every Semester	Quality Unit			
Skills	Assessment Method	Source of Data	Assessment Tool	Target	Assessment Cycle	Assessment Time	Responsible	
S1	Analyze the problems in relation to the associated mathematical and statistical concepts	Direct	MATH 2240	Written exams, quizzes and assignment	At least 50% of the students appearing in final exam score 75% marks and above in this domain	Every semester	The end of 3rd level	Course coordinator
			MATH 2311				The end of 4th level	Course coordinator
			STAT 2010				End of 5 th level	Course coordinator
			MATH 2301				End of 6 th level The end of 8th level	Course coordinator
			MATH 2250				Course coordinator	
			MATH 2321					
			MATH 2455					
			MATH 2290					
			MATH 3280					
			MATH 3330					
			MATH 3340					
			MATH 3350					
			MATH 3370					
STAT 3280								

			MATH 3460								
			MATH 3510								
			MATH 4360								
			MATH 4430				End of 6th level The end of 7th level	Course coordinator			
			MATH 4455								
			MATH 4350				End of 6th level The end of 8th level	Course coordinator			
			MATH 4620				Field Trg				
			MATH 4820								
			MATH 4590								
			MATH 4390				Elective courses	Course coordinator			
			MATH 4420								
			MATH 4520								
			MATH 4500								
		Indirect	Students	Evaluate students' quality of learning experiences in the program	3.5from 5		Every semester	Quality unit			
S2	Use appropriate methods/software to reconstruct and solve mathematical and statistical problems	Direct	MATH 2240	Written exams, quizzes and assignment	At least 50% of the students appearing in final exam score 75% marks and above in this domain	Evert semester	The end of 3rd level	Course coordinator			
			MATH 2311								
			MATH 2301								
			STAT 2010								
			MATH 2455								
			STAT 3280							The end of 4th level	Course coordinator
			MATH 2321								
			MATH 3320							End of 5th level	Course coordinator
			MATH 3330								
			MATH 3340								
			MATH 3350								
			MATH 3370								
			MATH 3460							End of 6th level	Course coordinator
			MATH 3510								

			MATH 4360						The end of 7th level	Course coordinator
			MATH 4430						The end of 8th level	Course coordinator
			MATH 4455						Elective courses	Course coordinator
			MATH 4350							
			MATH 4820							
			MATH 4590							
			MATH 3260							
			MATH 3270							
			MATH 4420						Every Semester	Quality unit
		MATH 4500								
MATH 4530	Indirect	Students	Evaluate students' quality of learning experiences in the program	3.5 from 5						
S3	Sketch the graph and prepare reports both manually and through software	Direct	MATH 2290	Written exams, quizzes and assignment	At least 50% of the students appearing in final exam score 75% marks and above in this domain	Every semester			End of Level 4	Course coordinator
			MATH 3320						End of Level 5	Course Coordinator
			STAT 3280						End of Level 6	Course Coordinator
			MATH 3510						End of Level 8	Course coordinator
			MATH 4350							
			MATH 4820							
			MATH 4590							
			MATH 3260						Elective courses	Course coordinator
			MATH 3270							
			MATH 4390							
			MATH 4520						Every Semester	Quality unit
		MATH 4500								
		Indirect	Students	Evaluate students' quality of learning experiences in the program	3.5 from 5					

Values		Assessment Method	Source of Data	Assessment Tool	Target	Assessment Cycle	Assessment Time	Responsible
V1	Apprise the contribution of mathematics to the society in various fields	Direct	MATH2301	Project, Poster Presentation Oral Discussion Assignment Value based Questions	At least 50% of the students appearing in final exam score 75% marks and above in this domain	Every semester	End of Level 3	Course Coordinator
			MATH 2321				End of Level 4	Course Coordinator
			STAT 2040					
			MATH 2290					
			MATH 4620					
			MATH 4820					
			MATH 4590					
			MATH 3260					
			Math 4530					
			Elective Course	Coourse Coordinator				
MATH 4530								
	Indirect	Students	Evaluate students' quality of learning experiences in the program	3.5 from 5	Every Seemster	Quality unit		
V2	Acquire professional responsibilities coupled with Islamic belief and practice	Direct	MATH 4620	Group Project Group Assignment Presentation	At least 50% of the students appearing in final exam score 75% marks and above in this domain	Every semester	End of Level 8	Course Coordinator
			MATH 4590					
			Stat 3280					
			Math 4530					
			Math 4820					
			Indirect	Students	Evaluate students' quality of learning experiences in the program	3.5 from 5	Every semester	Quality unit

V3	Make defense on a topic before forums of public interest	Direct	Math 3510	Project Presentation Preparing Application Oral discussion	Atleast 50% At least 50% of the students appearing in final exam score 75% marks and above in this domain	Every semester	End of Level 5	Course Coordinator
			Math 4620				End of Level 6	Course Coordinator
			MATH 4820				End of Level 7	Course Coordinator
			MATH 4590				Elective Courses	Course Coordinator
			MATH 3260					
		MATH 4530						
		Indirect	Students	Evaluate students' quality of learning experiences in the program	3.5 from 5	Every Semester	Quality unit	

1. The PLO will be assessed based on the attainment of K, S, V in the following courses.

- Stat 3280 - Statistical Packages
- Math 3340 - Differential Equations II
- Math 3350 - Vector Analysis
- Math 3510 - Mathematical Packages
- Math 4350 - Complex Analysis
- Math 4360 – Introduction of PDE
- Math 4430 - Introduction to Topology
- Math 4530 - Optimization
- Math 4455 – Rings and Fields
- Math 4620 – Ethics for Mathematician
- Math 4820 - Graduation Project
- Math 4590 - Field Training

7. Program Evaluation Matrix

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
Effectiveness of Teaching	Students Faculty	Survey of Students and Faculty Members	End of the Semester
	Program Leaders	Peer Review	Middle of Semester
Learning Resources	Students and Faculty	Survey	End of Semester
	Graduates	Program Evaluation	
Facilities and Equipment	Graduates, Students and Faculty	Survey and Interview	End of Semester
Academic Advising	All Students	Survey and Interview	End of Semester

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.)

Program Specification

8. Program KPIs*

The period to achieve the target (4) years.

No	KPIs Code	KPIs	Target	Measurement Methods	Measurement Time
1	P-01	Percentage of achieved indicators of the program operational plan objectives	70%	Based on Operational Plan Report	Annually
2	P-02	Students' Evaluation of quality of learning experience in the program	3.5	Program Evaluation Survey	Every Semester
3	P-03	Students' evaluation of the quality of the courses	3.5	Course and Program Evaluation	Every semester
4	P-04	Completion rate	40%	Result Stat and Cohort Analysis	Annually
5	P-05	First-year students retention rate	50%	Apparent completion rate	
6	P-06	Students' performance in the professional and/or national examinations	50%	Results on various competitive exams and cohort	
7	P-07	Graduates' employability and enrolment in postgraduate programs	60%	Alumini Survey	Every Semester
8	P-08	Average number of students in the class	20	Total registered students in all courses to the	Annually

No	KPIs Code	KPIs	Target	Measurement Methods	Measurement Time
				number of courses offered	
9	P-09	Employers' evaluation of the program graduates proficiency	3	Survey conducted from employers	Annually
10	P-10	Students' satisfaction with the offered services	3.5	Program Evaluation Survey	Semester wise
11	P-11	Ratio of students to teaching staff	20:1	Ratio of total registered students in an year to the staff	Annually
12	P-12	Percentage of teaching staff distribution	Ph D holders must be 90%		Annually
13	P-13	Proportion of teaching staff leaving the program	Below 5%	Except retirement	Annually
14	P-14	Percentage of publications of faculty members	100%	Atleast 50% of publication in th College	Annually
15	P-15	Rate of published research per faculty member	Atleast 5 papers per year	List of Publications	Annually
16	P-16	Citations rate in refereed journals per faculty member	125	WEB OF SCIENCE	Annually
17	P-17	Satisfaction of beneficiaries with the learning resources	3.5	Program Evaluation	Semester wise

* including KPIs required by NCAAA

I. Specification Approval Data

Council / Committee	
Reference No.	
Date	