Program Specification
— (Bachelor)

Program:	**Bachelor of Science in Mathematics**
Program Code (as per Saudi university ranking):	**645**
Qualification Level:	**6**
Department:	**Mathematics**
College:	**Science**
Institution:	**King Khalid University**
Program Specification:	New ☐ updated* ☒
Last Review Date:	**31/8/2023**

*Attach the previous version of the Program Specification.

Table of Contents

A. Program Identification and General Information

1. Program's Main Location:

King Khalid University, Qara Campus
Female Branch, King Abdullah Rd. Campus

2. Branches Offering the Program (if any):

3. Partnerships with other parties (if any) and the nature of each:

4. Professions/jobs for which students are qualified

- Teacher
- Lecturer
- Research assistant
- Graduate students
- Banker and financial assistant
- Army research assistant

5. Relevant occupational/ Professional sectors:

- Education.
- Universities.
- Research institutions that require mathematical skills.
- Banks and financial institutions
- Statistics centers
- Military institutions associated with industrialization.
- Saudi Central Bank

6. Major Tracks/Pathways (if any):

Major track/pathway	Credit hours (For each track)	Professions/jobs (For each track)
1. Nil	Nil	Nil
2.		

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

exit points/awarded degree	Credit hours
1. Nil	Nil
2.	

8. Total credit hours: (126)

B. Mission, Objectives, and Program Learning Outcomes

1. Program Mission:

Qualifying graduates with knowledge and skills in mathematics and their applications to contribute to the service of society and achieving sustainable development.

2. Program Goals:

- Development of mathematical logic and analysis for problem-solving.
- Enhancing mathematical skills and optimal employment of mathematical software in real-life issues.
- Serving the community by providing scientific and practical solutions and experiences for individuals and institutions.
- Preparing qualified competencies for the requirements of the labor market and achieving sustainable development.
- Preparing the student to enroll in postgraduate studies.

3. Program Learning Outcomes*

Knowledge and understanding

K1	Outline the core concepts of mathematics, both theoretical and applied.
K2	Recognize different mathematical proofs and methods.
K3	List some real-world applications of mathematics and statistics.

Skills

S1	Analyze problem requirements by using suitable methods and techniques.
S2	Justify logically and mathematically the solving steps.
S3	Write mathematical procedure to solve some mathematical problems.
S4	Enhance the ability to self-learning and eLearning and acquire effective communication skills
S5	Work effectively, both independently and as a part of group.
S6	Use some mathematical and statistical software in solving problems.

Values, Autonomy, and Responsibility

V1	Adhere to ethical values and excellence in professional practices.
V2	Able to articulate awareness of and demonstrate personal characteristics and critical thinking that positively impact the learning process.
V3	Take full responsibility for initiating, identifying, amending, and achieving aims.

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

C. Curriculum

1. Curriculum Structure

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Institution Requirements	Required	9	23	18.25
	Elective	0	0	0
College Requirements	Required	5	18	14.28
	Elective	0	0	0
Program Requirements	Required	28	83	65.87
	Elective	0	0	0
Capstone Course/Project		1	2	1.58
Field Training/ Internship		0	0	0
Residency year		0	0	0
Others		0	0	0
Total		43	126	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	Type of requirements (Institution, College, or Program)
1	011ENG-6	Intensive English Program 1	Required	-	6	Institution
	101BIOL-4	General Biology	Required	-	4	College
	101MATH-3	Calculus - 1	Required	-	3	College
	111IC1-2	The Entrance to the Islamic Culture	Required	-	2	Institution
2	101CS-3	Introduction to Computer Science	Required	-	3	Institution
	101PHYS-4	Introduction to Physics	Required		4	College
	101CHEM-4	General Chemistry -1	Required	-	4	College
	110NGL-3	Scientific English for Science Students	Required	011ENG-6	3	College
	112IC1-2	Islamic Culture -2	Required		2	Institution
	201ARAB-2	Arabic Language Skills	Required		2	Institution
3	102CS-2	Computer Applications	Required	101CS-3	2	Institution
	113IC1-2	Islamic Culture -3	Required		2	Institution
	202MATH-3	Calculus 2	Required	101MATH-3	3	Program
	202ARAB-2	Arabic Editing	Required		2	Institution
	211STAT-3	Principles of Statistics & Probability	Required		3	Program
	232MATH-3	Foundations of Mathematics	Required	101MATH-3	3	Program
4	114IC1-2	Islamic Culture -4	Required		2	Institution
	203MATH-3	Calculus 3	Required	202MATH-3	3	Program
	212STAT-3	Mathematical Statistics	Required	211STAT-3	3	Program
	242MATH-3	Linear Algebra 1	Required	232MATH-3	3	Program
	251MATH-2	Programming for Mathematics	Required	101CS-3 & 102CS-2	2	Program
	263MATH-3	Introduction to Differential Equations	Required	202MATH-3	3	Program
	304MATH-3	Vector Analysis	Required	203MATH-3	3	Program

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
5	322MATH-3	Real Analysis 1	Required	203MATH-3	3	Program
	343MATH-3	Linear Algebra 2	Required	242MATH-3	3	Program
	344MATH-3	Number Theory	Required	242MATH-3 232MATH-3	3	Program
	361MATH-3	Applied Mathematics	Required	202MATH-3	3	Program
6	313STAT-3	Probability Theory 1	Required	211STAT-3 203MATH-3	3	Program
	323MATH-3	Real Analysis 2	Required	322MATH-3	3	Program
	345MATH-3	Group Theory	Required	344MATH-3 232MATH-3	3	Program
	352MATH-3	Numerical Analysis	Required	242MATH-3 263MATH-3	3	Program
	363MATH-3	Mathematical Methods	Required	263MATH-3 343MATH-3	3	Program
7	423MATH-3	Functions of Complex Variables	Required	203MATH-3 322MATH-3	3	Program
	445MATH-3	Rings And Fields	Required	345MATH-3	3	Program
	464MATH-3	Theory of Differential Equations	Required	263MATH-3 343MATH-3	3	Program
	481MATH-3	Introduction to Topology	Required	322MATH-3	3	Program
	490MATH-2	Special Topics	Required	322MATH-3	2	Program
	491MATH-3	Research Project	Required	322MATH-3 313STAT-3 363MATH-3 345MATH-3	3	Program
8	414STAT-3	Probability Theory 2	Required	313STAT-3 323MATH-3	3	Program
	424MATH-3	Analysis in Several Variables	Required	323MATH-3	3	Program
	432MATH-3	Introduction to Graph Theory and Combinatorics	Required	344MATH-3	3	Program
	453MATH-3	Mathematical Programming	Required	203MATH-3	3	Program
	472MATH-3	Differential Geometry	Required	203MATH-3 304MATH-3	3	Program

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

3. Course Specifications:

Insert hyperlink for all course specifications using NCAAA template (TP-153)

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	S4	S5	S6	V1	V2	V3
101MATH-3	I	I	I	I	I	I	I	I	I	I	I	I
202MATH-3	I	I	I	I	I	I	I	I	I	I	I	I
232MATH-3	I	I	I	P	I	I	P	P	I	P	P	P
203MATH-3	P	P	P	P	P	I	P	P	I	P	P	P

Course code & No.	Program Learning Outcomes											
	Knowledge and understanding			Skills						Values, Autonomy, and Responsibility		
	K1	K2	K3	S1	S2	S3	S4	S5	S6	V1	V2	V3
211STAT-3	I	I	I	I	I	I	I	I	I	I	I	I
212STAT-3	P	P	P	P	P	P	P	P	P	P	P	P
242MATH-3	P	P	P	P	P	P	P	P	P	P	P	P
251MATH-2	P	P	P	P	P	P	P	P	P	P	P	P
263MATH-3	P	P	P	P	P	P	P	P	P	P	P	P
304MATH-3	P	P	P	P	P	I	P	P	I	P	P	P
343MATH-3	P	P	P	P	P	P	P	P	I	P	P	P
361MATH-3	P	P	P	P	P	P	P	P	P	P	P	P
313STAT-3	M	M	P	M	M	P	M	M	P	M	M	M
322MATH-3	M	M	P	M	M	I	M	M	I	M	M	M
344MATH-3	M	M	P	M	M	I	M	M	I	M	M	M
363MATH-3	M	M	P	M	M	I	M	M	M	M	M	M
323MATH-3	M	M	P	M	M	I	M	M	I	M	M	M
345MATH-3	M	M	P	M	M	I	M	M	P	M	M	M
352MATH-3	M	M	P	M	M	P	M	M	M	M	M	M
423MATH-3	M	M	P	M	M	I	M	M	I	M	M	M
445MATH-3	M	M	P	M	M	I	M	M	I	M	M	M
481MATH-3	M	M	P	M	M	I	M	M	I	M	M	M
490MATH-2	M	M	P	M	M	I	M	M	M	M	M	M
414STAT-3	M	M	P	M	M	P	M	M	M	M	M	M
432MATH-3	M	M	P	M	M	P	M	M	M	M	M	M
453MATH-3	M	M	P	M	M	P	M	M	M	M	M	M
464MATH-3	M	M	P	M	M	P	M	M	M	M	M	M
424MATH-3	M	M	P	M	M	I	M	M	I	M	M	M
472MATH-3	M	M	P	M	M	I	M	M	I	M	M	M
491MATH-3	M	M	M	M	M	M	M	M	M	M	M	M

* 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.

Lectures, Practical, Tutorial, Discussion, Virtual Labs, Homework, E-Learning, Cooperative Learning, Independent Studies, Problem Solving, Teaching Practices (as a Model), University Extra-Curricular Activities, Group Working, Self-Learning.

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).

Written, oral and practical tests, Exercises and homework, Discussion, Preparation of research work using communication and informatic tools, critical assessment, Rubrics.

D. Student Admission and Support:

1. Student Admission Requirements

- Obtaining a high school diploma (less than 5 years since obtention), or its equivalent.
- Entry of the necessary tests for the major.
  $Qualifying\ percentage =$
  $30\ \%\ GPA\ of\ high\ school + 30\ \%\ Capabilities\ Exam + 40\ \%\ Achievement\ Exam$
- Obtaining the national identity.
- No previous admission to King Khalid University.

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).

- Forming a committee to welcome new students and explaining the operation of the department and the college.
- Appointing an academic advisor in the department.
- Declaration of office hours for each faculty member.
- Availability of full information about the department and its members and ways to contact them, especially electronically through Blackboard.
- The department's guide is available on the website of the Department.

KKU guides:
- Student's guides
  https://www.kku.edu.sa/sites/default/files/2020-10/Student_Guide.pdf
- Student's rights and duties guides
  https://www.kku.edu.sa/sites/default/files/general_files/pdf/Administration/guide.pdf
- FAQ
  https://faq.kku.edu.sa
- The executive rules for the study regulations and exams
  https://dar.kku.edu.sa/sites/dar.kku.edu.sa/files/general_files/files/laeha.pdf
- Electronical services guide
  https://bit.ly/3dodwuA
- Ethical framework
  https://www.kku.edu.sa/portfolio/5264

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).

- Assign a **program coordinator**.
- Assign an academic advisor from faculty members for each group of students from the enrollment until graduation.
- Monitoring the academic performance of students through the Academic Guidance Unit in the Department.
- Provide students with the necessary advice on specialization and employment after graduation, providing personal, social, and educational counseling, and contribute to the development of appropriate solutions to academic problems encountered by students.
- Will continuously monitor and evaluate the program.
- Assign specific office hours in each faculty member's weekly schedule and announce them in a clear and dedicated place for students to provide academic assistance and guidance.
- The Department is committed to the Student Rights Policy approved by the King Khalid University.

- The establishment of the Academic Guidance and Student Affairs Committee in the Department, whose task is to study students' complaints and find appropriate solutions.

4. Special Support

(Low achievers, disabled, gifted, and talented students).

The Department is committed to the Special Need Student Rights Policy approved by the King Khalid University.

Student's rights and duties guides
https://www.kku.edu.sa/sites/default/files/general_files/pdf/Administration/guide.pdf

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	--	6	Analysis Algebra Applied Mathematics Statistics and Probability	4	2	6
Associate Professor	--	8		6	2	8
Assistant Professor	--	26		18	8	26
Lecturer	--	--	--	--	--	--
Teaching Assistant	--	--	--	--	--	--
Technicians and Laboratory Assistant	--	--	2 ITs	1	1	2
Administrative and Supportive Staff	--	--	3	2	1	3
Others (specify)	--	--	--	--	--	--

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.)

- Coordinating with the Deanship of Library Affairs to provide books, references, and e-learning resources in the field of specialization.
- The use of books and references appropriate to the content with the description of the courses, with the continuous update of those references periodically by the educational committee in the department.
- Encouraging the translation of specialized books and supporting joint authoring between members of the department and members of the same specialization in other Saudi colleges and universities.

2. Facilities and Equipment

(Library, laboratories, classrooms, etc.)

Coordinate with the Deanship of the college to provide the required laboratories, studios, and classrooms.

3. Procedures to ensure a healthy and safe learning environment

(According to the nature of the program)

The department is committed to the Healthy and Safe Environment Policy approved by the University.

G. Program Quality Assurance:

1. Program Quality Assurance System

Provide a link to the quality assurance manual.

The department of Mathematics is committed to the King Khalid University Quality Standards
https://quality.kku.edu.sa/ar/publications

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

The Department will coordinate with these department through quality and development committee.

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

- Coordination between quality and development committees.
- Common program coordinator.
- Coordination between male and female sections in part of final exams.

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

The bachelor committee will collect feedback from:
- Results of academic achievement.
- Cases of excellence.
- Extracurricular activities.
- Self-assessment by the student through an objective evaluation model.
- Evaluation by the Deanship of Academic Development and Quality at the University.
- Evaluation by the National Assessment and Accreditation Authority.
- Evaluation by the Deanship of Student Affairs.
- Review of suggestions from employers to address deficiencies in graduates.

The bachelor committee will use the following strategies:
- Information and data obtained from evaluation models.
- Evaluation by the MSc committee of the department for the extent to which learning outcomes have been achieved in the program.
- Preparation and review of various evaluation models.
- Setting timetables for evaluations.
- The quality and development committee in the department monitors the evaluation and quality of the program.
- Study the proposals submitted by students, graduates, and employers to improve and evaluate the program.

5. Program Evaluation Matrix

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
effectiveness of teaching & assessment	Students and Faculty	Surveys & Interviews	At the end of each semester.
Learning outcomes	Students and Faculty	Surveys & Interviews	At the end of each semester.

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
Learning resources	Students and Faculty	Surveys & Interviews	At the end of each semester.
Objectives of the operational plan	Students and Faculty	Surveys & Interviews	At the end of each 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 (4) year(s).

No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
1	KPI-P-01	Students' Evaluation of Quality of learning experience in the Program	3/5	Survey of student's opinions.	At the end of each academic year.
2	KPI-P-02	Students' evaluation of the quality of the courses	25%	Numeric comparison	Yearly
3	KPI-P-03	Completion rate	75%	Numeric comparison	Yearly
4	KPI-P-04	First-year students retention rate	75%	Students results.	At the end of each 1st year of a batch.
5	KPI-P-05	Students' performance in the professional and/or national examinations	25%	Numeric comparison	Yearly
6	KPI-P-06	Graduates' employability and enrolment in postgraduate programs	25%	Numeric comparison	Yearly
7	KPI-P-07	Employers' evaluation of the program graduate's proficiency	4	Survey	Yearly
8	KPI-P-8	Ratio of students to teaching staff	1/1	Numeric comparison	Yearly
9	KPI-P-9	Percentage of publications of faculty members	80%	Ratio of teaching staff publishing 1 paper to the other teaching staff.	Yearly
10	KPI-P-10	Rate of published research per faculty member	2 each	Average number of publications.	Yearly
11	KPI-P-11	Citations rate in refereed journals per faculty member	10	Average number of citations per published paper.	Yearly

*including KPIs required by NCAAA

H. Specification Approval Data:

Council / Committee	Q&D Committee
Reference No.	01/45
Date	03/09/2023

Council / Committee	Department Council
Reference No.	08/45
Date	25/04/1445

Council / Committee	College Council
Reference No.	08/45
Date	01/05/1445