هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

Program Specifications
(Postgraduate Degree)

Program Name: Doctor of Philosophy in Mathematics
Qualification Level: 8
Department: Mathematics and Statistics
College: Science
Institution: Imam Mohammad Ibn Saud Islamic University

A. Program Identification and General Information

1. Program Main Location:

Main Campus for the Male Section.

2. Branches Offering the Program:

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

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

i) **To participate in the scientific development of the Kingdom in line with 2030 Vision.**
ii) **To contribute in filling the shortage of mathematical sciences graduate study programs in the higher education system at Saudi Arabia.**
iii) **To provide the opportunity for our MSc program in Mathematics graduates for pursuing their higher studies at the university.**
iv) **To utilize local graduate studies in mathematical sciences for student's – especially females – whose for social or other reasons can't seek their graduate studies outside the kingdom.**
v) **To cover the needs of colleges, professional institutes, and universities in Saudi Arabia of qualified teaching staff in mathematical sciences.**
vi) **Graduate student of this program is expected to be well prepared for professional careers in disciplines which make use of the mathematical sciences.**
vii) **The graduate student of this program will be able to compete successfully for internship and employment positions in government, industry, and non-profit organizations.**
viii) **Graduates of this program will have the readiness for outreach toward application areas such as physical sciences, financial services, and social sciences and have the knowledge, experience, and motivation to bring the tools of mathematics to bear on real-world problems.**
ix) **The program will produce qualified assistant professors in the academic fields of mathematical sciences to cover the needs of universities in Saudi Arabia.**
x) **Graduates of this program will have the intellectual curiosity and flexibility to keep up with developing technology applied in science and with the new methods in contemporary mathematical fields.**

7. Total Credit Hours for Completing the Program: (66 Credit Hours)

8. Learning Hours: (99 Self-study Hours)
The time that a learner takes to complete learning activities that lead to achievement of program learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times)

9. Professional Occupations/Jobs:

- **331404 Statistics Assistant.**
- **121117 Statistics Manager.**
- **211102 Astronomy Specialist.**
- **212003 Statistician.**
- **231017 Mathematics and Statistics Professor.**

B. Mission, Goals, and Learning Outcomes

1. Program Mission:

Preparing a distinguished academic PhD program in mathematics to take part in developing the higher education system in Saudi Arabia, and to contribute to the economic and social development in Saudi Arabia.

2. Program Goals:

PG1. Providing students with a solid grounding in mathematics and specialty in one of the mathematical fields.

PG2. Providing students with the background necessary to conduct scientific research in the specialty field in order to contribute to the economic and social development in Saudi Arabia.

PG3. Fulfilling the needs of the universities and research centers in Saudi Arabia for faculty members and researchers in the area of mathematics.

PG4. Meeting the master graduates' growing demands to pursue their studies inside the country.

4. Graduate Attributes:

1. **Having deep mathematical skills,**
2. **Independent learner in Mathematics,**
3. **Experienced in doing mathematical research,**
4. **Having a god integration in careers that uses mathematics,**
5. **Having the ability to get jobs at national or international universities.**

C. Curriculum

1. Study Plan Structure

Program Structure		No. of Courses	Credit Hours	Percentage
Course	Required	**7**	**33**	**50 %**
	Elective	**3**	**15**	**23 %**
Graduation Project (if any)		**0**	**0**	**0 %**
Thesis (if any)		**1**	**18**	**27 %**
Field Experience (if any)		**0**	**0**	**0 %**
Others (.....)		**0**	**0**	**0 %**
Total		**11**	**66**	**100 %**

* Add a table for each track (if any)

2. Program Courses:

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours
Level 1	MAT 7111	Measure and Integration	Required	None	5 (4 0, 2)
	MAT 7121	Groups and Fields	Required	None	5 (4 0, 2)
Level 2	MAT 7113	Complex Analysis	Required	None	5 (4 0, 2)
	MAT 7122 or MAT 7131	Rings and Modules (PM track) or Advanced Partial Differential Equations (AM track)	Required	None	5 (4 0, 2)
Level 3	MAT 7115 or MAT 7141	Functional Analysis (PM track) or Advanced Numerical Analysis (AM track)	Required	None	5 (4 0, 2)
	MAT 7xxx	Elective Course 1 (List A or List B)	Elective	None	5 (4 0, 2)
Level 4	MAT 7xxx	Elective Course 2 (List A or List B)	Elective	None	5 (4 0, 2)
	MAT 7xxx	Elective Course 3 (List A or List B)	Elective	None	5 (4 0, 2)
Level 5	MAT 7291	Reading and Research (1)	Required	None	4 (4, 0, 0)
Level 6	MAT 7292	Reading and Research (1)	Required	None	4 (4, 0, 0)
Comprehensive Examination					
Level 7	MAT 7399	PhD Dissertation	Required	None	18
Level 8	MAT 7399	PhD Dissertation	Required	None	0
Level 9	MAT 7399	PhD Dissertation	Required	None	0
Level 10	MAT 7399	PhD Dissertation	Required	None	0
Level 11	MAT 7399	PhD Dissertation	Required	None	0
Level 12	MAT 7399	PhD Dissertation	Required	None	0

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

Elective Courses:

PM track List (List A):

1. MAT 7219: Harmonic Analysis;
2. MAT 7223: Theory of Numbers;
3. MAT 7224: Algebraic Number Theory;
4. MAT 7225: Galois Theory and Fields;
5. MAT 7226: Analytic Number Theory;
6. MAT 7227: Commutative Algebra;
7. MAT 7228: Group Representation;
8. MAT 7229: Homological Algebra;
9. MAT 7233: Ordinary Differential Equations and Dynamical Systems;

10. MAT 7251: Combinatorics;
11. MAT 7271: Algebraic Topology;
12. MAT 7273: Algebraic Geometry;
13. MAT 7275: Differential Geometry;
14. MAT 7277: Introduction to Manifolds;
15. MAT 7281: Selected Topics in Pure Mathematics (1);
16. MAT 7285: Selected Topics in Pure Mathematics (2).

AM track List (List B):

1. MAT 7201: Probability Theory;
2. MAT 7203: Stochastic Differential Equations;
3. MAT 7205: Random Dynamical Systems;
4. MAT 7215: Functional Analysis;
5. MAT 7233: Ordinary Differential Equations and Dynamical Systems;
6. MAT 7236: Integral Equations;
7. MAT 7237: Nonlinear Analysis;
8. MAT 7239: Calculus of Variations;
9. MAT 7243: Spectral Methods;
10. MAT 7245: Numerical Optimization;
11. MAT 7247: Approximation Theory;
12. MAT 7253: Combinatorial Optimization;
13. MAT 7255: Graph Theory and Applications;
14. MAT 7266: Mathematical Fluid Mechanics;
15. MAT 7283: Selected Topics in Applied Mathematics (1);
16. MAT 7287: Selected Topics in Applied Mathematics (2).