

# DEPARTMENT OF MATHEMATICS

Mathematics is the backbone of many scientific and engineering fields. It provides a strong theoretical knowledge and techniques essential to understand the fundamentals of areas such as physics, engineering, space science, biotechnology and computer science. With a firm grasp of mathematics, one will have the widest possible base to launch explorations of the related disciplines.

The MPhil and PhD programs offered by the Mathematics Department focus on preparing academicians and researchers with command on modern mathematical tools and knowledge. The students are expected to benefit not only from a full spectrum of Mathematics courses but also from the courses offered by other departments of the university.



# MPhil Mathematics

## ■ Admission Requirements

- (i) A minimum of 16 years of education leading to BS/MSc degree in Mathematics or equivalent
- (ii) Minimum 2.00/4.00 CGPA or 50% marks
- (iii) Admission Test/HEC Approved Test

## ■ Degree Requirements

A student admitted in this program will have to complete the degree requirements by following any one of the options given below:

- (i) 24 Cr. Hrs. course work with 6 Cr. Hrs. Thesis
- (ii) 30 Cr. Hrs. course work only (10 Courses)

There are no core courses and the students are required to register courses offered by the department from the list appended below:-

## ■ Elective Courses

Course Title	Code	Cr. Hrs.
Advanced Partial Differential Equations	MT5013	3
Advanced Wave Mechanics	MT5023	3
Integral Equations	MT5033	3
Celestial Mechanics	MT5043	3
Advanced Mathematical Analysis	MT5123	3
Topics in Complex Analysis	MT5133	3
Advanced Functional Analysis	MT5143	3
Fixed Point Theory	MT5153	3
Advanced Numerical Techniques	MT5213	3
Finite Element Methods	MT5233	3
Finite Difference Methods	MT5243	3
Advanced Group Theory	MT5303	3
Computational Algebra	MT5313	3
Non Commutative Algebra	MT5323	3
Algebraic Cryptography	MT5343	3
Advanced Fluid Dynamics	MT5513	3
Non-Newtonian Fluid Mechanics	MT5533	3
Computational Fluid Dynamics	MT5543	3
Optimization Techniques	MT5613	3

Linear System Theory	MT5623	3
Nonlinear Control Systems	MT5633	3
Applied Cryptography	MT5643	3
Stochastic Processes	MT5653	3
Financial Mathematics	MTxxxx	3
Operational Research	MT5723	3
General Relativity	MT5813	3
Special topics in Mathematics	MT5xx3	3
Perturbation Methods	MT5063	3
Heat and Mass Transfer	MT5553	3
Electromagnetic Wave Theory	MT5043	3
Banach Algebra	MT5173	3
Approximation Theory	MT5163	3
Topological Vector Spaces	MT5183	3

### ■ Research Thesis

Course Title	Code	Cr. Hrs.
Research Thesis Part-I	MT5913	3
Research Thesis Part-II	MT5923	3

### ■ CGPA Requirement

A student is required to earn a minimum 3.00/4.00 CGPA on the completion of his/her degree requirements.

### ■ Program Duration

This is normally a two years program comprising of 4 semesters. There will be a Fall and Spring semester in each year. The maximum duration to complete MPhil in Mathematics is 4 years.

## PhD Mathematics

Through the PhD program in Mathematics, we emphasize on bringing the creative abilities of the researchers to the level where they can produce novel ideas to solve an existing problem. To choose a research area, a scholar will have a sufficiently good number of options available in the Department. The interest of scholars in the collaborative work of mathematical nature with other departments of the university will also be encouraged.

### ■ Admission Requirements

- (i) MPhil/MS degree in a relevant discipline
- (ii) Minimum CGPA 3.0/4.0 (Semester System) or 60% marks (Annual System)
- (iii) Admission Test/GAT General/HEC Test
- (iv) Interview

### ■ Degree Requirements

A PhD candidate shall be awarded degree on successful completion of the following requirements:

- (i) 18 Cr. Hrs. Course Work with minimum CGPA 3.00/4.00
- (ii) Comprehensive Examination
- (iii) 30 Cr. Hrs. Research Work
- (iv) Synopsis Defense
- (v) Dissertation Foreign Reviews
- (vi) Publication of research paper(s) in HEC approved journal.
- (vii) Dissertation Final Defense

**Note:** PhD scholars are required to comply with the following timeline:

Activity	Preferred Time	Maximum
Course Work	2 Semesters	3 Semesters
Comprehensive Exam	3 Semesters	6 Semesters
Synopsis Qualification	4 Semesters	6 Semesters
Thesis Submission	6 Semesters	10 Semesters







