



Dr B R Ambedkar University Delhi (AUD)

MPhil in Mathematics

Programme Description

The MPhil programme aims to introduce students to already existing areas of research. While an MPhil student will not be required to produce original research, an exceptional student may do so. The goal however is to provide a platform where the students get immersed into research and research methods which may help them decide whether they would like to then pursue a doctoral programme.

A secondary aim of MPhil programme is also to create an environment that will enable research students to learn and immerse themselves into the pedagogical aspects of mathematics.

The MPhil programme in Mathematics will provide a prospective student a foundation in research and research techniques. It will also provide a base for practical teaching experience. However, an MPhil degree may or may not lead to a doctoral degree and that too not necessarily in the same area.

Programme Structure

A student admitted to the **MPhil programme** in Mathematics will have to complete four core courses, two elective courses and one Research Methodology Course.

The total coursework will be worth 16 credits. After successfully completing the course work a student will have to write and submit a Dissertation and also be involved in teaching undergraduates via the Teaching Practicum.

Semester	Semester I	Semester II			Semester III and IV
Course Work	4 Core Courses	Elective I	Elective II	Research Methodology	Teaching Practicum and Dissertation
Credits	8	3	3	2	

Teaching Practicum

A student admitted to the MPhil programme, will participate in teaching undergraduates under the mentorship of their assigned supervisor. This will take place typically during the 3rd and 4th semesters for an MPhil student after they have successfully completed their coursework. The student will have to make a presentation to the Mathematics Faculty (SLS) at the end of each semester, analysing their experience of teaching at the undergraduate level. Feedback will also be taken from the students of the UG course on the teaching performance of the MPhil student. While the teaching practicum is mandatory there is no credit weightage



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or assessment associated with it but will be treated as part of the essential requirements of completing an MPhil programme.

Broad research themes

The broad research areas are Algebra, Analysis, Algebraic Number Theory and Mathematical Modelling and Simulation. Within these broad areas, research can be pursued in sub-areas such as Group Theory, Ring Theory, Linear Algebra, Complex Analysis, Summability theory, Approximation theory, Valuation Theory, Artificial Neural Networks and Mathematical Modelling.

MPhil level courses

S. No.	Course Name	Core/Elective	Credits
1.	Group Theory	Core	2
2.	Commutative Algebra	Core	2
3.	Linear Algebra and Matrix Theory	Core	2
4.	Algebraic Number Theory	Core	2
5.	Module Theory	Core	2
6.	Functional Analysis	Core	2
7.	Differential and Integral Equations	Core	2
8.	Geometric Function Theory	Core	2
9.	Generalized Hypergeometric Functions and Fractional Calculus	Core	2
10.	Topology	Core	2
11.	Operator Theory	Core	2
12.	Representation Theory of Finite Groups	Elective	3
13.	Advanced Group Theory	Elective	3
14.	Generalized Inverses and Applications	Elective	3
15.	Valuation Theory	Elective	3
16.	Group Rings	Elective	3
17.	Lie Algebras	Elective	3
18.	Fractional Differential Equations	Elective	3
19.	Mathematical Inequalities	Elective	3
20.	Mathematical Modelling	Elective	3
21.	Numerical Analysis	Elective	3

The list of Core and Elective Courses can be expanded depending on research interests of the Mathematics Faculty. Each year, four courses will be offered from the two categories listed below with the caveat that, at least one course each, will certainly be offered from each of the two categories listed below.

Category 1: Core courses 1-5, **Category 2:** Core courses 6-11.