



**Revision of Curriculum
&
Scheme of Studies**

**MS Mathematics
&
PhD Mathematics**

Department of Mathematics
Faculty of Basic & Applied Sciences

July 2024

DR. IFFAT ZEHRA
Tenured Associate Professor
Chair Department of Mathematics
Air University PAF Complex
E-9, Islamabad

Program Details

MS Mathematics (Fall-2024 & onwards)

Semester wise Breakdown

First Year					
Semester I			Semester II		
S. No.	Course Title	Cr. Hrs	S. No.	Course Title	Cr. Hrs
1	Core-I	3-0-3	1	Elective-I	3-0-3
2	Core-II	3-0-3	2	Elective-II	3-0-3
3	Core-III	3-0-3	3	Elective-III	3-0-3
4	Core-IV	3-0-3	4	Elective-IV	3-0-3
5	Research Methodology	1-0-1			
Total		13			12

Second Year		
MA 799	Thesis	6 Credit Hours



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Academic officer
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Program Details

Ph.D. Mathematics (Fall - 2024 & Onwards)

First Year					
Semester I			Semester II		
S. No.	Course Title	Cr. Hrs	S. No.	Course Title	Cr. Hrs
1	Elective-I	3-0-3	1	Elective-IV	3-0-3
2	Elective-II	3-0-3	2	Elective-V	3-0-3
3	Elective-III	3-0-3	3	Elective-VI	3-0-3
4	Research Methodology	1-0-1			
Total		10			9

Semester III and Onward		
Course Code	Course Title	Credit Hours
MA 899	Thesis	30

1. A Ph.D. student must select at least 50% courses of 800 level in course work.
2. All the Students must pass the Comprehensive Examination within one semester of the completion of course work.

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List of Core Courses for MS Mathematics

(Fall-2024 Onwards)

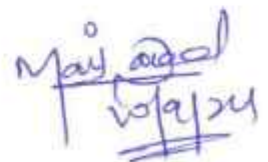
Serial No.	Course Code	Course Title	Credit Hour
1.	MA 622	Geometric Function Theory	3
2.	MA 634	Riemannian Geometry	3
3.	MA 637	Fixed Point Theory and Applications	3
4.	MA 638	Rings and Modules	3
5.	MA 639	Graph Theory with Applications	3
6.	MA 644	Advanced Engineering Mathematics	3
7.	MA 645	Advanced Numerical Techniques	3
8.	MA 670	Approximation Theory	3
9.	MA 680	Applied Partial Differential Equations	3
10.	MA 688	Applied Linear Algebra	3



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List of Elective Courses for MS & Ph.D. Mathematics (Fall-2024 & onwards)

Serial No.	Course Code	Course Title	Credit Hour
11.	MA 501	Quantitative Analysis and Techniques	3
12.	MA 502	Numerical Methods	3
13.	MA 524	Advanced Group Theory	3
14.	MA 525	Advanced Ring Theory	3
15.	MA 564	Advanced Functional Analysis	3
16.	MA 610	Fractional Calculus and Applications	3
17.	MA 623	Symmetry Methods for Differential Equations	3
18.	MA 624	Hilbert Space Methods	3
19.	MA 625	Variational Inequality & Convex Analysis	3
20.	MA 626	Algebraic Number Theory and its Applications	3
21.	MA 627	Commutative Algebra	3
22.	MA 636	Advanced Algebraic Topology	3
23.	MA 648	Field Extension & Galois Theory	3
24.	MA 650	Finite Element Methods for Partial Differential Equations	3
25.	MA 665	Machine Learning	3
26.	MA 671	Applied Cryptography	3
27.	MA 684	Mathematical Methods	3

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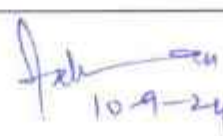
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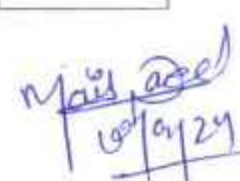
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(Fall-2024 onwards)

28.	MA 686	Stochastic Differential Equations	3
29.	MA 700	Computational Fluid Dynamics	3
30.	MA 701	Rough Set Theory and its Applications	3
31.	MA 702	Fuzzy Set Theory and its Applications	3
32.	MA 711	Advanced Convex Analysis	3
33.	MA 724	Homological Algebra	3
34.	MA 734	Information Geometry-I	3
35.	MA 737	Algebraic Geometry-I	3
36.	MA 738	Algebraic Coding Theory	3
37.	MA 741	Advanced Statistical Techniques	3
38.	MA 742	Optimization Techniques	3
39.	MA 744	Deterministic Operation Research	3
40.	MA 748	Algebraic Cryptography	3
41.	MA 761	Non-Newtonian Fluid Mechanics-I	3
42.	MA 765	Banach Algebras and C^* -Algebra	3
43.	MA 766	Advanced Topics in Deep Learning	3
44.	MA 767	Statistical and Mathematical Methods for Data Science	3
45.	MA 768	Advanced Mathematical Techniques in Data Science	3
46.	MA 770	Modeling and Simulations of Dynamical Systems	3
47.	MA 771	Elliptic Curves in Cryptography	3


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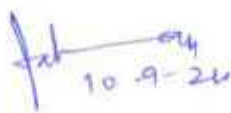

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(Fall- 2024 & onwards)

48.	MA 772	Algorithmic Cryptography	3
49.	MA 773	Perturbation Methods	3
50.	MA 775	Numerical Solutions of Differential Equations	3
51.	MA 776	Analytical Number Theory and its Applications	3
52.	MA 780	Solid Mechanics	3
53.	MA 781	Variational Inequalities and its Applications	3
54.	MA 782	Topics in Fluid Mechanics	3
55.	MA 783	Advanced Mathematical Methods	3
56.	MA 784	Mathematical Methods for Signal Processing	3
57.	MA 786	Waves and Compressible Flows	3
58.	MA 787	Particulate Flows	3
59.	MA 788	Advanced Computational Methods	3
60.	MA 807	Stochastic Operational Research	3
61.	MA 811	Nonlinear Dynamics and Chaos	3
62.	MA 815	Magneto hydro dynamics	3
63.	MA 817	Monte Carlo & Quasi Monte Carlo Methods	3
64.	MA 818	Advanced Integral Equations	3
65.	MA 820	Advanced Dynamics	3
66.	MA 821	Number Theory	3
67.	MA 823	Modern Algebra and Applications	3
68.	MA 824	Differential Subordination Theory and Applications	3


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(Fall - 2024 Onwards)

69.	MA 825	Convolution in Geometric Function Theory and Applications	3
70.	MA 834	Advanced Algebraic Coding Theory	3
71.	MA 835	Information Geometry-II	3
72.	MA 838	Algebraic Geometry-II	3
73.	MA 843	Nonlinear Optimization	3
74.	MA 851	Theory and Applications of Lattice Boltzman Method	3
75.	MA 854	Mathematical and Numerical Aspects of CFD Codes	3
76.	MA 857	Numerical Simulations of Turbulent and Multiphase Flows	3
77.	MA 861	Heat Transfer in Fluids	3
78.	MA 862	Non-Newtonian Fluid Mechanics II	3
79.	MA 873	Advanced Cryptography	3
80.	MA 875	Quantum Cryptography	3
81.	MA 876	Advanced Topics in Number Theory	3
82.	MA 882	Numerical Methods for Variational Inequalities	3



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