

## 1. THE SCHEME OF STUDIES FOR BS IN MATHEMATICS

<b>Degree Awarded:</b>	BS Mathematics
<b>Entrance Requirements:</b>	HSSC with Mathematics or equivalent with at least 45% marks
<b>Duration of the Program:</b>	4 years (8 Semesters) Maximum duration allowed-six academic years
<b>Total Credit Hours:</b>	136
<b>Total Marks:</b>	4500

### SCHEME OF STUDIES (Semester-Wise Breakdown)

#### 1<sup>st</sup> Semester

S. No.	Course Code	Course Title	Marks	Credit Hours
1	PS-311	Pakistan Studies	50	2(2-0)
2	ENG-312	Functional English	100	3(3-0)
3	MGC-313	Physics-I	100	3(3-0)
4	BCS-314	Introduction to Computers	100	3(3-0)
5	MCC-315	Discrete Mathematics	100	3(3-0)
6	MCC-316	Elements of Set Theory and Mathematical Logic	100	3(3-0)
<b>Total</b>			<b>550</b>	<b>17</b>

#### 2<sup>nd</sup> Semester

S. No.	Course Code	Course Title	Marks	Credit Hours
7	ISL-321	Islamic Studies/Ethics	50	2(2-0)
8	BCS-322	Software Packages	100	3(2-1)
9	MGC-323	Physics-II	100	3(3-0)
10	MGC-324	Statistics	100	3(3-0)
11	MFC-325	Calculus-I	100	4(4-0)
12	ENG-326	Communication Skills	100	3(3-0)
<b>Total</b>			<b>550</b>	<b>18</b>

#### 3<sup>rd</sup> Semester

S. No.	Course Code	Course Title	Marks	Credit Hours
13	ENG-431	Technical Writing and Presentations Skills	100	3(3-0)
14	BCS-432	Computer Programming	100	3(2-1)

15	MFC-433	Algebra-I	100	3(3-0)
17	MGC-434	Physics-III	100	3(3-0)
18	MFC-435	Calculus-II	100	3(3-0)
<b>Total</b>			<b>600</b>	<b>15</b>

#### 4<sup>th</sup> Semester

S. No.	Course Code	Course Title	Marks	Credit Hours
19	MFC-441	Affine Euclidean Geometry	100	3(3-0)
20	MGC-442	Accounting	100	3(3-0)
21	MGC-443	Physics-IV	100	3(3-0)
22	MFC-444	Linear Algebra	100	3(3-0)
23	MFC-445	Calculus-III	100	4(4-0)
24	MGC-446	Economics	100	3(3-0)
<b>Total</b>			<b>600</b>	<b>19</b>

#### 5<sup>th</sup> Semester

S. No.	Course Code	Course Title	Marks	Credit Hours
25	MFC-551	Algebra-II (Rings and Fields)	100	3(3-0)
26	MMC-552	Real Analysis-I	100	3(3-0)
27	MFC-553	Ordinary Differential Equations	100	3(3-0)
28	MMC-554	Vector and Tensor Analysis	100	3(3-0)
29	MMC-555	Differential Geometry	100	3(3-0)
30	MMC-556	Topology	100	3(3-0)
<b>Total</b>			<b>600</b>	<b>18</b>

#### 6<sup>th</sup> Semester

S. No.	Course Code	Course Title	Marks	Credit Hours
31	MMC-561	Number Theory	100	3(3-0)
32	MMC-562	General Topology	100	3(3-0)
33	MFC-563	Complex Analysis	100	3(3-0)
34	MMC-564	Classical Mechanics	100	3(3-0)
35	MMC-565	Partial Differential Equations	100	3(3-0)
36	MMC-566	Real Analysis-II	100	3(3-0)
<b>Total</b>			<b>600</b>	<b>18</b>

#### 7<sup>th</sup> Semester

S. No.	Course Code	Course Title	Marks	Credit Hours
37	MMC-671	Functional Analysis	100	3(3-0)
38	MMC-672	Numerical Analysis	100	4(3+1)
39	MMC-673	Mathematical Methods	100	3(3-0)
40	----	Elective-I	100	3(3-0)
41	----	Elective-II	100	3(3-0)
<b>Total</b>			<b>500</b>	<b>16</b>

#### 8<sup>th</sup> Semester

S. No.	Course Code	Course Title	Marks	Credit Hours
42	MMC-681	Probability Theory	100	3(3-0)

43	MFC-682	Integral Equation	100	3(3-0)
44	----	Elective-III	100	3(3-0)
45	----	Elective-IV	100	3(3-0)
46	----	Project	100	3(3-0)
<b>Total</b>			<b>500</b>	<b>15</b>

**NOTE:**

MCC means Mathematics Compulsory Course

MGC means Mathematics General Course

MFC means Mathematics Foundation Course

MMC means Mathematics Major Course

MEC means Mathematics Elective Course

**ELECTIVE COURSES**

S. No	Course Code	Course Name	Credit hours
1	MEC-674	Mathematical Modeling	03
2	MEC-675	Advanced Group Theory	03
3	MEC-676	Optimization Theory	03
4	MEC-677	Measure Theory	03
5	MEC-678	Fluid Mechanics	03
6	MEC-679	Stochastic Processes	03
7	MEC-683	Quantum Mechanics	03
8	MEC-684	Heat and Mass Transfer	03
9	MEC-685	Advanced Number Theory	03
10	MEC-686	Analytical Dynamics	03
11	MEC-687	Difference Equations	03
12	MEC-688	Convex Analysis	03
13	MEC-689	Econometrics	03

**2. Master Program in Mathematics (Semester System)**

Duration 2-Years

Total Semester 04

No of Courses in First and Fourth Semester 05

No of Course in Second and Third Semestr 06

Each course have 03 credit hours.

Total Cr. Hrs 66(15+18+18+15)

Total Marks 2000

### **Eligibility Criteria for M.Sc Program in Mathematics**

BSc (Second Division) with Maths A and Maths B.

### **SCHEME OF STUDIES FOR MATHEMATICS TWO YEARS M. Sc PROGRAMME:**

#### **Revised List of Courses and Content Approved by Academic Council:**

A student is required to select six courses in third semester and five courses in fourth semester from a variety of courses offered (subject to the availability of expertise).

Total Credit Hours = 66(15+18+18+15).

#### **First Semester**

<b>Course Code</b>	<b>Course</b>	<b>Credit Hours</b>
MAT-501	Real Analysis-I	3
MSC-516	Programming in C	3
MAT-502	General Topology	3
MAT-503	Algebra-I	3
MAT-504	Ordinary Differential Equations	3
Total Credit Hours		15

#### **Second Semester**

<b>Course Code</b>	<b>Course</b>	<b>Credit Hours</b>
MAT-505	Numerical Analysis-I	3
MAT-506	Dynamics	3
MAT-507	Complex Analysis	3
MAT-508	Linear Algebra	3
MAT-509	Set Theory & Math. Logic	3
MAT-510	Partial Differential Equations	3
Total Credit Hours		18

#### **Third Semester**

<b>Course Code</b>	<b>Course</b>	<b>Credit Hours</b>
MAT-601	Real Analysis-II	3
MAT-602	Mathematical Statistics-I	3
MAT-603	Functional Analysis-I	3
MAT-604	Algebra-II	3
MAT-605	Analytical Mechanics-I	3

MAT-606	Quantum Mechanics-I	3
MAT-607	Measure Theory-I	3
MAT-608	Algebraic Topology-I	3
MAT-609	Relativity-I	3
MAT-610	Fluid Mechanics-I	3
MAT-611	Electromagnetic Theory-I	3
MAT-612	Astronomy-I	3
MAT-613	Homological Algebra-I	3
MAT-614	Operations Research-I	3
MAT-615	Graph Theory	3
MAT-616	Applied Algebra-I	3
MAT-617	History of Mathematics-I	3
MAT-618	Riemannian Geometry	3
MAT-619	Integral Equations	3
MAT-620	Optimization Theory-I	3

#### Fourth Semester

Course Code	Course	Credit Hours
MAT-621	Numerical Analysis-II	3
MAT-622	Mathematical Statistics-II	3
MAT-623	Functional Analysis-II	3
MAT-624	Ring Theory	3
MAT-625	Analytical Mechanics-II	3
MAT-626	Quantum Mechanics-II	3
MAT-627	Measure Theory-II	3
MAT-628	Algebraic Topology-II	3
MAT-629	Relativity-II	3
MAT-630	Fluid Mechanics-II	3
MAT-631	Electromagnetic Theory-II	3
MAT-632	Astronomy-II	3
MAT-633	Homological Algebra-II	3
MAT-634	Operations Research-II	3
MAT-635	Advanced Topology	3
MAT-636	Applied Algebra-II	3
MAT-637	History of Mathematics-II	3
MAT-638	Lie Algebra	3
MAT-639	Optimization Theory-II	3
MAT-640	Category Theory	3
MAT-641	Reliability Analysis, Quality and Safety	3

### 3. M. Phil Program

**SCHEME OF STUDIES/COURSE CONTENTS FOR MASTER OF PHILOSOPHY IN MATHEMATICS.**

**Degree Awarded:** Master of Philosophy in Mathematics (M.Phil in Mathematics)

**Master of Philosophy in Mathematics**

**Entrance Requirements:** AS per HEC criteria.

**Total Credit Hours:** As per SBBU Byelaws.

**SCHEME OF STUDIES  
(Semester-Wise Breakdown)**

**1<sup>th</sup> Semester**

S. No.	Course Code	Course Title	Marks	Credit Hours
1	MAT-	Core-I	100	3(3-0)
2	MAT-	Core –II	100	3(3-0)
3	MAT-	Core –III	100	3(3-0)
4	MAT-	Core-IV	100	3(3-0)
<b>Total</b>			<b>400</b>	<b>12</b>

**2<sup>th</sup> Semester**

S. No.	Course Code	Course Title	Marks	Credit Hours
5	MAT-	Elective-I	100	3(3-0)
6	MAT-	Elective-II	100	3(3-0)
7	MAT-	Elective-III	100	3(3-0)
8	MAT-	Elective-IV	100	3(3-0)
<b>Total</b>			<b>400</b>	<b>12</b>

**CORE COURSES**

S. No	Course Code	Course Name	Credit hours
1	MAT-801	Advanced Real Analysis	03
2	MAT-802	ODEs and Computational Linear Algebra	03
3	MAT-803	Mathematical Techniques	03
4	MAT-804	Partial Differential Equations	03
5	MAT-805	Integral Equations	03

6	MAT-806	Group Theory	03
7	MAT-807	Functional Analysis	03
8	MAT-808	Numerical Methods	03
9	MAT-809	Riemannian Geometry	03
10	MAT-810	Advanced Mathematical Physics	03
11	MAT-811	Metric Fixed Point Theory	03
12	MAT-812	Fractional Differential Equations	03
13	MAT-813	Computational Fluid	03
14	MAT-814	Ring Theory and Applications	03
15	MAT-815	Impulsive Differential Equations	03
16	MAT-816	Fixed Point Theory in Modular Function Spaces	03

### ELECTIVE COURSES

S. No	Course Code	Course Name	Credit hours
1	MAT-817	Graph Theory	03
2	MAT-818	Applied Dimensional Analysis and Modeling	03
3	MAT-819	Fractional Calculus	03
4	MAT-820	Numerical Solutions of Differential Equations	03
5	MAT-821	Dynamical Systems and Ergodic Theory	03
6	MAT-822	Mathematical Modeling in Physical Sciences	03
7	MAT-823	Methods of Mathematical Physics	03
8	MAT-824	Dynamical Systems and Control Theory	03
9	MAT-825	Topological Fixed Point Theory	03
10	MAT-826	Fuzzy Fixed Point Theory	03
11	MAT-827	Fuzzy Sets and their Applications	03
12	MAT-828	Applications of Fixed Point Theory in Generalized Spaces	03
13	MAT-829	Advance Mathematical Methods	03
14	MAT-830	Mathematical Methods For Arbitrary order Differential Equations	03
15	MAT-831	Theory of Majorization	03
16	MAT-832	Fuzzy Algebra	03
17	MAT-833	Nonlinear Analysis and its Applications	03

18	MAT-834	Near Rings	03
19	MAT-835	Topological Algebra	03
20	MAT-836	Nilpotent And Soluble Groups	03
21	MAT-837	Nonlinear Dynamics and Nonlinear Waves Phenomena	03
22	MAT-838	Advanced Optimization Theory	03
23	MAT-839	Dynamical System Theory	03
24	MAT-840	Biomechanics	03
25	MAT-841	Applied Numerical Analysis	03
26	MAT-842	Mathematical Biology	03
27	MAT-843	Graph Labeling	03
28	MAT-844	LA-semi groups	03
29	MAT-845	Lebesgue Spaces with Variable Exponent	03
30	MAT-846	Advanced Measure Theory	03
31	MAT-847	Semi group Theory	03
32	MAT-848	Fuzzy Group Theory	03
33	MAT-849	Approximation Theory	03
34	MAT-850	<u>Finite Element Methods</u>	03
35	MAT-851	Fourier Analysis	03
36	MAT-852	Numerical Methods for Partial Differential Equations	03
37	MAT-853	Bio-Mathematics	03
38	MAT-854	Advanced Fluid Mechanics	03
39	MAT-855	Introduction To Computational Soft wares and Research Methodology	03
40	MAT-856	Mathematical Inequalities And Applications	03
41	MAT-857	Advance Convex Analysis	03
42	MAT-858	Theory of Semirings	03
43	MAT-859	MPhil Dissertation	18
44	MAT-860	PhD Dissertation	36



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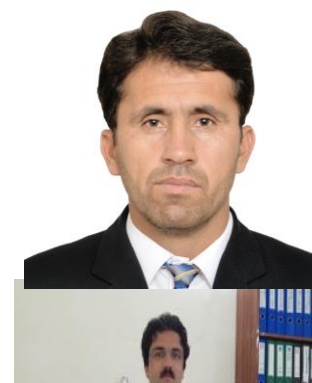


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