

**DEPARTMENT OF MATHEMATICS
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**

Teaching Scheme

Program Code : **312 Integrated M.Sc. (Applied Mathematics)**

Department Code: **MA MATHEMATICS**

Yea	Credits in Autumn	Credits in Spring Semester	Credits (year-wise)
1	21	24	45
2	19	24	43
3	20	18	38
4	18	20	38
5	17	15	32
Total	98	100	196

Program Code : 312 Integrated M.Sc. (Applied Mathematics)

Department : Department of Mathematics

Year : I

Teaching Scheme					Contact Hours/Week			Exam Duration (Hrs.)		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
Autumn														
1.	MAN-001	Mathematics-I	BSC	4	3	1	0	3	0	25	-	25	50	-
2.	PHN-001	Mechanics	BSC	4	3	0	2	3	0	15	25	20	40	-
3.	CEN-105	Introduction to Environmental Studies	GSC	3	3	0	0	3	0	25	-	25	50	-
4.	HSN-001A	Communication Skills (Basic)	HSSMEC	2	1	0	2	2	0	25	-	25	50	-
	HSN-001B	Communication Skills (Advance)												
5.	HSN-002	Ethics and Self Awareness	HSSMEC	2	1	1	0	2	0	25	-	25	50	-
6.	MAN-101	Introduction to Mathematical Sciences	DCC	2	2	0	0	-	-	-	-	-	100	-
7.	MAN-103	Introduction to Computer Programming	ESC	4	3	0	2	3	0	15	25	20	40	-
Total				21	16	2	6							
Spring														
1.	MAN-004	Numerical Methods	BSC	4	3	1	0	3	0	25	-	25	50	-
2.	PHN-008	Electromagnetic Theory	BSC	4	3	1	0	3	0	25	-	25	50	-
3.	MAN-102	Linear Algebra	DCC	4	3	1	0	3	0	25	-	25	50	-
4.	MAN-104	Real Analysis I	DCC	4	3	1	0	3	0	25	-	25	50	-
5.	MAN-106	Data Structures	DCC	4	3	0	2	3	0	15	25	20	40	-
6.	ECN-102	Fundamental of Electronics	ESC	4	3	1	0	3	0	25	-	25	50	-
Total				24	18	5	2							

Program Code : 312 Integrated M.Sc. (Applied Mathematics)

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Year : II

Teaching Scheme					Contact Hours/Week			Exam Duration (Hrs.)		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
Autumn														
1.	CEN-102	Solid Mechanics	ESC	4	3	1	0	3	0	25	-	25	50	-
2.	MAN-201	Complex Analysis I	DCC	4	3	1	0	3	0	25	-	25	50	-
3.	MAN-203	Discrete Mathematics	DCC	4	3	1	0	3	0	25	-	25	50	-
4.	MAN-205	Ordinary and Partial Differential Equations	DCC	4	3	1	0	3	0	25	-	25	50	-
5.	MAN-291	Design and Analysis of Algorithms	DCC	3	3	0	0	3	0	25	-	25	50	-
		Total		19	15	4	0							
Spring														
1.	HSN-ELE	HSS Elective Course	HSSMEC	4										
2.	CEN-142	Fluid Mechanics	ESC	4	3	1	0	3	0	25	-	25	50	-
3.	MAN-202	Transform Techniques	DCC	4	3	1	0	3	0	25	-	25	50	-
4.	MAN-204	Database Management System	DCC	4	3	1	0	3	0	25	-	25	50	-
5.	MAN-206	Graph Theory	DCC	4	3	1	0	3	0	25	-	25	50	-
6.	MAN-208	Number Theory	DCC	4	3	1	0	3	0	25	-	25	50	-
		Total		24	15	5	0							

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Year : III

Teaching Scheme					Contact Hours/Week			Exam Duration (Hrs.)		Relative Weights (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
Autumn														
1.	MAN-301	Abstract Algebra I	DCC	4	3	1	0	3	0	25	-	25	50	-
2.	MAN-303	Mathematical Statistics	DCC	4	3	1	0	3	0	25	-	25	50	-
3.	MAN-305	Linear Programming	DCC	4	3	1	0	3	0	25	-	25	50	-
4.	MA-ELE1	Department Elective I	DEC	3	3	0	0	3	0	25	-	25	50	-
5.	BM-ELE1	Management Elective Course	HSSMEC	3	3	0	0	-	-	25	-	25	50	-
6.	MAN-391	Technical Communication	DCC	2	2	0	0	-	-	25	-	25	50	-
		Total		20	17	3	0							
Spring														
1.	MAN-300	Project	DCC	4	-	-	-	-	-	-	-	30	70	-
2.	MAN-302	Math. Modeling & Simulation	DCC	4	3	1	0	3	0	25	-	25	50	-
3.	MAN-304	Theory of Computation	DCC	4	3	1	0	3	0	25	-	25	50	-
4.	MA-ELE2	Department Elective II	DEC	3	3	0	0	3	0	25	-	25	50	-
5.	OEC-1	Open Elective-I	OEC	3	3	0	0							
6.	MSC-1	Minor Specialization Course	MSC	3/4	3	-	-	3	0	-	-	-	50	-
7.	MAN-391	Educational Tour	DCC	0	-	-	-	-	-	-	-	-	-	-
		Total		18/22	15	0/1	0							

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Year : IV

Teaching Scheme					Contact Hours/Week			Exam Duration (Hrs.)		Relative Weights (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
Autu														
1.	MAN-501	Theory of Ordinary Differential Equations	DCC	3	3	0	0	3	0	25	-	25	50	-
2.	MAN-503	Real Analysis II	DCC	3	3	0	0	3	0	25	-	25	50	-
3.	MAN-505	Topology	DCC	3	3	0	0	3	0	25	-	25	50	-
4.	MAN-507	Statistical Inference	DCC	3	3	0	0	3	0	25	-	25	50	-
5.	MA-ELE3	Department Elective III	DEC	3	3	0	0	3	0	25	-	25	50	-
6.	OEC-2	Open Elective II	OEC	3	3	-	-	3	-	-	-	-	-	-
7.	MSC-2	Minor Specialization Course	MSC	3/4	3	-	0	3	-	-	-	-	50	-
		Total		18-24	2	-	-							
Spring														
1.	MAN-502	Advanced Numerical Analysis	DCC	4	3	1	0	3	0	25	-	25	50	-
2.	MAN-504	Abstract Algebra II	DCC	3	3	0	0	3	0	25	-	25	50	-
3.	MAN-506	Nonlinear Programming	DCC	4	3	1	0	3	0	25	-	25	50	-
4.	MAN-508	Theory of Partial Differential Equations	DCC	3	3	0	0	3	0	25	-	25	50	-
5.	MAN-510	Complex Analysis II	DCC	3	3	0	0	3	0	25	-	25	50	-
6.	MA-ELE4	Department Elective IV	DEC	3	3	0	0	3	0	25	-	25	50	-
7.	MSC-3	Minor Specialization Course	MSC	3/4	3	-	-	3	0	-	-	-	-	-
		Total		20-24*	18/21	-	-							

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Year : V

Teaching Scheme					Contact Hours/Week			Exam Duration (Hrs.)		Relative Weights (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
Autumn														
1.	MAN-601	Fluid Dynamics	DCC	3	3	0	0	3	0	25	-	25	50	-
2.	MAN-603	Tensors and Differential Geometry	DCC	3	3	0	0	3	0	25	-	25	50	-
3.	MAN-605	Functional Analysis	DCC	3	3	0	0	3	0	25	-	25	50	-
4.	MAN-699	Seminar	DCC	2	-	-	-	-	-	-	-	30	70	-
5.	MA-ELE5	Department Elective V	DEC	3	3	0	0	3	0	25	-	25	50	-
6.	MA-ELE6	Department Elective VI	DEC	3	3	0	0	3	0	25	-	25	50	-
		Total		17	15	0	0							
Spring														
1.	MAN-600	Dissertation	DCC	12	-	-	-	-	-	-	-	30	70	-
2.	MA-ELE7	Department Elective VII	DEC	3	3	0	0	3	0	25	-	25	50	-
3.	MSC-4	Minor Specialization Course	MSC	3/4	3	-	-	3	0	-	-	-	-	-
4.	MSC-5	Minor Specialization Course	MSC	3/4	3	-	0	3	0	25	-	25	50	-
		Total		15-23	9	-	-							

List of the Department Elective Courses

Program Code: **312 Integrated M. Sc. (Applied Mathematics)**

Department Code: **MA MATHEMATICS**

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
Department Elective Courses (MA Elective-I and MA Elective-II) to be chosen in Third Year														
1.	MAN-321	Biomathematics	DEC	3	3	0	0	3	0	25	-	25	50	-
2.	MAN-322	Combinatorial Mathematics	DEC	3	3	0	0	3	0	25	-	25	50	-
3.	MAN-323	Computer Graphics	DEC	3	3	0	0	3	0	25	-	25	50	-
4.	MAN-324	Fuzzy Sets and Fuzzy Logics	DEC	3	3	0	0	3	0	25	-	25	50	-
5.	MAN-325	Mathematical Imaging Techniques	DEC	3	3	0	0	3	0	25	-	25	50	-
6.	MAN-326	Numerical Optimization	DEC	3	3	0	0	3	0	25	-	25	50	-
Department Elective Courses (MA Elective-III and MA Elective-IV) to be chosen in Fourth Year														
1.	MAN-521	Advanced Graph Theory	DEC	3	3	0	0	3	0	25	-	25	50	-
2.	MAN-522	Computer Vision	DEC	3	3	0	0	3	0	25	-	25	50	-
3.	MAN-523	Control Theory	DEC	3	3	0	0	3	0	25	-	25	50	-
4.	MAN-524	Integral Equations and Calculus of Variations	DEC	3	3	0	0	3	0	25	-	25	50	-
5.	MAN-525	Robotics and Control	DEC	3	3	0	0	3	0	25	-	25	50	-
6.	MAN-526	Soft Computing	DEC	3	3	0	0	3	0	25	-	25	50	-
7.	MAN-527	Stochastic Process	DEC	3	3	0	0	3	0	25	-	25	50	-
Department Elective Courses (MA Elective-V, MA Elective-VI and MA Elective-VII) to be chosen in Fifth Year														
1.	MAN-621	Abstract Harmonic Analysis	DEC	3	3	0	0	3	0	25	-	25	50	-
2.	MAN-622	Algebraic Number Theory	DEC	3	3	0	0	3	0	25	-	25	50	-
3.	MAN-623	Algebraic Topology	DEC	3	3	0	0	3	0	25	-	25	50	-
4.	MAN-624	Approximation Theory	DEC	3	3	0	0	3	0	25	-	25	50	-
5.	MAN-625	Coding Theory	DEC	3	3	0	0	3	0	25	-	25	50	-
6.	MAN-626	Commutative Algebra	DEC	3	3	0	0	3	0	25	-	25	50	-
7.	MAN-627	Dynamical Systems	DEC	3	3	0	0	3	0	25	-	25	50	-
8.	MAN-628	Evolutionary Algorithms	DEC	3	3	0	0	3	0	25	-	25	50	-
9.	MAN-629	Financial Mathematics	DEC	3	3	0	0	3	0	25	-	25	50	-
10.	MAN-630	Finite Element Methods	DEC	3	3	0	0	3	0	25	-	25	50	-

11.	MAN-631	Multivariate Techniques	DEC	3	3	0	0	3	0	25	-	25	50	-
12.	MAN-632	Optimal Control Theory	DEC	3	3	0	0	3	0	25	-	25	50	-
13.	MAN-633	Orthogonal Polynomials and Special Functions	DEC	3	3	0	0	3	0	25	-	25	50	-
14.	MAN-634	Parallel Computing	DEC	3	3	0	0	3	0	25	-	25	50	-
25.	MAN-635	Wavelet Theory	DEC	3	3	0	0	3	0	25	-	25	50	-