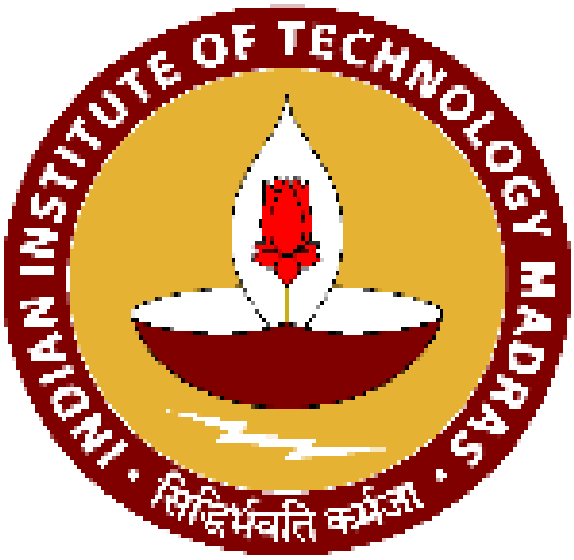

INDIAN INSTITUTE OF TECHNOLOGY MADRAS
CHENNAI 600 036

Curriculum for
M.Sc. Degree Programme
2015 Batch

INDIAN INSTITUTE OF TECHNOLOGY MADRAS

Curriculum for M.Sc. Degree Programme

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M.Sc. Degree Programme
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MINIMUM CREDIT REQUIREMENTS

Sl.No.	Details	Credit
1	Chemistry	211
2	Mathematics	208
3	Physics	227

Branch Code: CY

M.Sc. Chemistry

2015 Batch

Semester 1

S.No	Course No	Course Name	L	T	E	P	O	C
1	CY5011	Transition Metal and Organometallic Chemistry	4	0	0	0	8	12
2	CY5013	Conceptual Organic Chemistry and Introductory Biochemistry	4	0	0	0	8	12
3	CY5015	Equilibrium and Statistical Thermodynamics	4	0	0	0	8	12
4	CY5017	Principles of Quantum Mechanics	4	0	0	0	8	12
5	CY5019	Organic Chemistry lab	0	0	0	5	2	7
6	CY5021	Computational Chy & Exp.Magnetic Resonance Lab	0	0	0	5	2	7
		Total Credits :						**62**

Semester 2

S.No	Course No	Course Name	L	T	E	P	O	C
1	CY5012	Main Group and Bio - Inorganic Chemistry	4	0	0	0	8	12
2	CY5014	Reactive Intermediates and Concerted Reactions	4	0	0	0	8	12
3	CY5016	Chemical Kinetics	3	0	0	0	6	9
4	CY5018	Quantum Chemistry and Group Theory	3	0	0	0	6	9
5	CY5022	Inorganic Chemistry Laboratory	0	0	0	5	2	7
6	CY5024	Physical Chemistry Laboratory	0	0	0	5	2	7
		Total Credits :						**56**

Semester 3

S.No	Course No	Course Name	L	T	E	P	O	C
1	CY6011	Solid State Chemistry	3	0	0	0	6	9
2	CY6013	Modern Synthetic Methodology in Organic Chemistry	4	0	0	0	8	12
3	CY6015	Surface, Interfaces Dispersed Systems and Macro molecules	3	0	0	0	6	9
4	CY6017	Principles of Molecular and Magnetic Resonance Spectroscopy	3	0	0	0	6	9
5	CY6019	Spectroscopy – Applications in Organic and Inorganic Chemistry	3	0	0	0	6	9
6	CY6021*	Project – I	0	0	0	9	0	9
		Total Credits :						**57**

roject (CY6021*) grade will be awarded at the end of 4th semester.

Semester 4

S.No	Course No	Course Name	L	T	E	P	O	C
1	DPE1	Department Elective 1	3	0	0	0	6	9
2	DPE2	Department Elective 2	3	0	0	0	6	9
3	DPE3	Department Elective 3 #	3	0	0	0	6	9
4	DPE4	Department Elective 4 #	3	0	0	0	6	9
5	DPE5	Department Elective 5 #	3	0	0	0	6	9
6	CY6023	Project – II $	0	0	0	18	0	18
		Total Credits :						**36**

Semester	I	II	III	IV	Total
Credits	62	56	57	36	211

$ Students opting for project will take any two electives in Semester **(IV).**

Non Project students will take any five electives in semester **(IV)**

Branch Code: MA

M.Sc. Mathematics
2015 Batch

Semester 1

S.No	Course No	Course Name	L	T	E	P	O	C
1	MA5310	Linear Algebra	3	0	0	0	6	9
2	MA5330	Real Analysis	4	0	0	0	8	12
3	MA5350	Fundamentals of Discrete Mathematics	3	0	0	0	6	9
4	MA5370	Multivariable Calculus	4	0	0	0	8	12
5	MA5390	Ordinary Differential Equations	4	0	0	0	8	12
		Total Credits :						**54**

Semester 2

S.No	Course No	Course Name	L	T	E	P	O	C
1	MA5320	Algebra – Groups and Rings	4	0	0	0	8	12
2	MA5340	Measure and Integration	3	0	0	0	6	9
3	MA5360	Complex Analysis	4	0	0	0	8	12
4	MA5380	Topology	4	0	0	0	8	12
5	MA5920	Partial Differential Equations	4	0	0	0	8	12
		Total Credits :						**57**

Semester 3

S.No	Course No	Course Name	L	T	E	P	O	C
1	MA5260	Seminar	0	0	0	0	2	2
2	MA5400	Probability Theory	3	0	0	0	6	9
3	MA5450	Functional Analysis	4	0	0	0	8	12
4	MA5470	Numerical Analysis	3	0	0	0	6	9
5	DPE1	Department Elective 1*	3	0	0	0	6	9
6	DPE2	Department Elective 2	3	0	0	0	6	9
		Total Credits :						**50**

*** Department Elective 1 is to be chosen as one from the following courses**

1. MA5430 Algebra II Algebra II Ring Theory & Field Theory
2. MA5490 Fluid Mechanics
3. MA6080 Fourier Analysis
4. MA6190 Mathematical Logic

Semester 4

S.No	Course No	Course Name	L	T	E	P	O	C
1	DPE3	Department Elective 3	3	0	0	0	6	9
2	DPE4	Department Elective 4	3	0	0	0	6	9
3	DPE5	Department Elective 5	3	0	0	0	6	9
4	DPE6	Department Elective 6	3	0	0	0	6	9
5	DPE7	Department Elective 7**	3	0	0	0	6	9
6	MA6651	Viva Voce	0	0	0	0	2	2
7	MA6650	Project **	0	0	0	0	9	9
		Total Credits :						**47**

**** Students have the option to take either project MA6650 or Department Elective 7**

Semester	I	II	III	IV	Total
Credits	54	57	50	47	208

LIST OF ELECTIVES FOR M.SC. MATHEMATICS

S.No	Course No	Course Name	L	T	E	P	O	C
1	MA5013	Applied Regression Analysis	3	0	0	0	6	9
2	MA5014	Applied Stochastic Processes	3	0	0	0	6	9
3	MA5016	Ergodic Theory	3	0	0	0	6	9
4	MA5017	Representation Theory	3	0	0	0	6	9
5	MA5140	Introduction to Algebraic Topology	3	0	0	0	6	9
6	MA5220	Continuum Mechanics	3	0	0	0	6	9
7	MA5312	Stochastic Differential Equations	3	0	0	0	6	9
8	MA5313	Introduction to Mathematical Statistics	3	0	0	0	6	9
9	MA5440	Combinatorics and Number Theory	3	0	0	0	6	9
10	MA5430	Algebra-II Ring Theory & Field Theory	3	0	0	0	6	9
11	MA5460	Transform Techniques	3	0	0	0	6	9
12	MA5490	Fluid Dynamics	3	0	0	0	6	9
13	MA5540	Probability and Statistics	3	0	0	0	6	9
14	MA5710	Mathematical Modelling in Industry	2	0	0	2	6	10
15	MA5741	Object Oriented Programming	1	0	0	2	4	7
16	MA5750	Applied Statistics	3	0	0	0	6	9
17	MA5770	Modelling Workshop II	0	0	0	3	3	6
18	MA5790	Computer Modelling and Simulation	2	0	0	2	6	10
19	MA5850	Operations Research	4	0	0	0	8	12
20	MA5890	Numerical Linear Algebra	3	0	0	0	6	9
21	MA5950	Mathematical Finance	3	0	0	0	6	9
22	MA6001	Introduction to Coding Theory	3	0	0	0	6	9
23	MA6002	Approximation Theory	3	0	0	0	6	9
24	MA6003	Theory of Wavelets	3	0	0	0	6	9
25	MA6004	Mathematics of Fractals	3	0	0	0	6	9
26	MA6005	Applied Linear Algebra	3	0	0	0	6	9
27	MA6006	Applied Integral Equations	3	0	0	0	6	9
28	MA6007	Non-linear Partial Differential Equations	3	0	0	0	6	9
29	MA6050	Dynamical Systems	3	0	0	0	6	9
30	MA6060	Nonlinear Conservation Laws	3	0	0	0	6	9
31	MA6080	Fourier Analysis	3	0	0	0	6	9
32	MA6090	Sobolev Spaces and PDE	3	0	0	0	6	9
33	MA6120	Advanced Complex Analysis	3	0	0	0	6	9
34	MA6140	Fixed Point Theory and Applications	3	0	0	0	6	9
35	MA6150	Basic Operator Theory	3	0	0	0	6	9
36	MA6180	Introduction to Algebraic Geometry	3	0	0	0	6	9
37	MA6190	Mathematical Logic	3	0	0	0	6	9
38	MA6200	Theory of Computation	3	0	0	0	6	9
39	MA6230	Graph Theory	3	0	0	0	6	9
40	MA6312	Mathematical Theory of Games	3	0	0	0	6	9
41	MA6360	Optimization Techniques	3	0	0	0	6	9
42	MA6380	Stochastic Methods in Industry	3	0	0	0	6	9
43	MA6420	Algebraic Theory of Codes and Automata	3	0	0	0	6	9
44	MA6460	Computational Fluid Dynamics	3	0	0	0	6	9
45	MA6470	Commutative Algebra	3	0	0	0	6	9
46	MA6480	Galois Theory	3	0	0	0	6	9
47	MA7011	Advanced Topics in Commutative Algebra	3	0	0	0	6	9
48	MA7012	Abstract Harmonic Analysis	3	0	0	0	6	9
49	MA7014	Riemann Surfaces and Algebraic Curves	3	0	0	0	6	9
50	MA7015	Introduction to Cryptology	3	0	0	0	6	9
51	MA7870	Game Dynamics	3	0	0	0	6	9
52	MA5311	Linear Systems Theory	3	0	0	0	6	9
53	MA5720	Numerical Analysis of Differential Equations	3	0	0	0	6	9
54	MA5910	Data Structures and Algorithms	3	0	0	0	6	9
55	MA6110	Topics in Advanced Analysis	3	0	0	0	6	9
56	MA6210	Combinatorial Optimization	3	0	0	0	6	9
57	MA6270	Numerical Solutions of Partial Differential Equations	3	0	0	0	6	9
58	MA7013	Fourier Analysis on Euclidean Spaces	3	0	0	0	6	9

Branch Code: PH

M.Sc. Physics
2015 Batch

Semester 1

S.No	Course No	Course Name	L	T	E	P	O	C
1	PH5010	Mathematical Physics I	3	1	0	0	6	10
2	PH5030	Classical Mechanics	3	1	0	0	6	10
3	PH5100	Quantum Mechanics I	3	1	0	0	6	10
4	PH5040	Electronics	3	0	0	0	6	9
5	PH5060	Physics Lab. I (PG)	0	0	0	9	3	12
		Total Credits :						**51**

Semester 2

S.No	Course No	Course Name	L	T	E	P	O	C
1	PH5020	Electromagnetic Theory	3	1	0	0	6	10
2	PH5080	Statistical Physics	3	0	0	0	6	9
3	PH5170	Quantum Mechanics II	3	0	0	0	6	9
4	PH5160	Condensed Matter Physics I	3	1	0	0	6	10
5	PH5250/ PH5720	Advanced Electronics & Lab/ Numerical Methods and Programming Lab	3	0	0	3	6+0	12
6	PH5120	Physics Lab. II (PG)	0	0	0	9	3	12
		Total Credits :						**62**

Semester 3

S.No	Course No	Course Name	L	T	E	P	O	C
1	PH 5410	Atomic and Molecular Physics	3	1	0	0	6	10
2	PH5110/ PH5050	Optics and Photonics/ Mathematical Physics II	3	0	0	0	6	9
3	PH5210 / PH5211	Condensed Matter Physics II / High Energy Physics	3	0	0	0	6	9
4	DPE1	Elective – I [Self Study / Free Elective – I]	3	0	0	0	6	9
5	PH5270	Physics Lab. III (PG)	1	0	0	6	2+2	11
6	PH5290	Project I	0	0	0	0	9	9
		Total Credits :						**57**

* Project (PH5290*) Grades will be awarded at the end of 4th semester

Semester 4

S.No	Course No	Course Name	L	T	E	P	O	C
1	DPE2	Elective – II [Self Study / Free Elective – II]	3	0	0	0	6	9
2	DPE3	Elective –III	3	0	0	0	6	9
3	DPE4	Elective- IV	3	0	0	0	6	9
4	PH5230	Seminar	0	0	0	0	3	3
5	PH5240	Viva voce	0	0	0	0	6	6
6	PH5300	Project II	0	0	0	0	21	21
7		**Total Credits :**						**57**

Semester	I	II	III	IV	Total
Credits	51	62	57	57	227