



Course Structure of M.Sc. in Applied Mathematics (PG)

COURSE STRUCTURE
OF
M.Sc. in APPLIED MATHEMATICS
DEPARTMENT OF MATHEMATICS
SCHOOL OF SCIENCE

SESSION: 2017-19

A. Mathematics - Core (THEORY)

Discipline/ Name (Theory)	Paper Code	Total Credits	L-T-P	Contact Hours/paper
1. Abstract Algebra	SMA51101	4	3-1-0	(4x15)
2. Advanced Linear Algebra	SMA51103	4	3-1-0	(4x15)
3. Probability & Statistics	SMA51105	3	2-1-0	(3x15)
4. Advanced Real Analysis	SMA51102	4	3-1-0	(4x15)
5. Topology	SMA51104	4	3-1-0	(4x15)
6. Discrete Mathematics	SMA51106	4	3-1-0	(4x15)
7. Statistical Inference	SMA51108	3	3-0-0	(3x15)
8. Functional Analysis	SMA52101	3	3-0-0	(3x15)
9. Stochastic Processes	SMA52103	3	3-0-0	(3x15)
10. Calculus of variation and Integral Equation	SMA52105	4	3-1-0	(4x15)
11. Operation Research	SMA52107	4	3-1-0	(4x15)
12. Functions of Complex variables	SMA52109	4	3-1-0	(4x15)
13. Wavelet transform with Applications	SMA52102	4	3-1-0	(4x15)
Total		48	38-10-0	

B. Computer - Core (THEORY)

Discipline/ Name (Theory)	Paper Code	Total Credits	L-T-P	Contact Hours/paper
1. Fundamentals of Computer Algorithms		3	3-0-0	(3x15)
2. Computer Programming		3	3-0-0	(3x15)
3. Data Structures		4	3-1-0	(4x15)
4. Design and Analysis of Algorithms		3	3-0-0	(3x15)
5. Object Oriented Programming		3	3-0-0	(3x15)
Total		16	15-1-0	

C. Foundation Papers (Knowledge Enhancement Course)

Discipline/ Name (Theory)	Paper Code	Total Credits	L-T-P	Contact Hours/paper
Environmental Science and Energy Resources		2	3-0-0	
		02	12-0-0	

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D. Optional Paper

Discipline/ Name (Theory)	Paper Code	Total Credits	L-T-P	Contact Hours/paper
Optional-I		04	3-1-0	3
Optional-II		04	3-1-0	3
Optional-III		04	3-1-0	3
Total		12	9-3-0	

E. Core Lab

Discipline/ Name (Practical)	Paper Code	Total Credits	L-T-P	Contact Hours/paper
Computer Programming Lab	ECS51201	02	0-0-3	3
Data Structures Lab	ECS51203	02	0-0-3	3
Design and Analysis of Algorithms Lab	ECS51202	02	0-0-3	3
Object Oriented Programming Lab	ECS51204	02	0-0-3	3
Total		08	0-0-12	

F. Project/Dissertation/Seminar on Project

Discipline/ Name (Theory)	Paper Code	Total Credits	L-T-P	Contact Hours/paper
Minor Project		02	0-0-4	04
Project/ Dissertation		06	0-0-12	12
Seminar on Project		04	0-0-0	---
Total		12	0-0-16	

G. Summer Internship

Discipline/ Name (Theory)	Paper Code	Total Credits	L-T-P	Contact Hours/paper
Summer Internship /Summer Training (In between 2 nd and 3 rd Semester)		02		4 weeks
Total		02		

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SEMESTER - I								
Type of the Paper	Paper Code	Theory / Practical	Brief Contents	Contact Hour Per Week	L	T	P	Credit
CORE	SMA51101	Abstract Algebra	Sylow theorem, Ring theory, PID.	4	3	1	0	4
CORE	SMA51103	Advanced Linear Algebra	Rank -nullity theorem, Minimal Polynomial, Inner product space.	4	3	1	0	4
CORE	SMA51105	Probability and Statistics	Bayes' theorem, Probability distribution(discrete, continuous), Correlation and Regression, time series analysis and forecasting methods	3	2	1	0	3
CORE	ECS51101	Computer Programming	Basics of C programming, Functions and Pointers, Array, String, Structure.	3	3	0	0	3
CORE	ECS51105	Fundamentals of Computer Algorithms	Searching, Sorting Algorithm Stacks and Queues, Linked list, Graph.	3	3	0	0	3
CORE	ECS51107	Data Structures	Time and Space complexity, Sparse matrices, Huffman Algorithm, Spanning Tree.	4	3	1	0	4
CORE	ECS51201	Computer Programming Lab		4	0	0	4	2
CORE	ECS51203	Data Structures Lab		4	0	0	4	2
FOUNDATION		Environmental Science and Energy Resources		2	2	0	0	2
Total				31	19	4	8	27

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SEMESTER - II								
Type of the Paper	Paper Code	Theory / Practical	Brief Contents	Contact Hour Per Week	L	T	P	Credit
CORE	SMA51102	Advanced Real Analysis	Archimedean property, Riemann-Stieltjes integral, Sequence and Series of functions.	4	3	1	0	4
CORE	SMA51104	Topology	Product topology, Connected spaces, Compactness, Uryshon's lemma.	4	3	1	0	4
CORE	SMA51106	Discrete Mathematics	Partial order relation, Principles of mathematical induction, Pigeon-Hole Principle, Recurrence relation.	4	3	1	0	4
CORE	SMA51108	Statistical Inference	Confidence Estimation, Hypothesis testing, Neyman Pearson lemma.	3	2	1	0	3
CORE	ECS51102	Design and Analysis of Algorithms	Asymptotic analysis of complexity, Huffman Code and data compression problems, Shortest Path Algorithms.	3	3	0	0	3
	ECS51104	Object Oriented Programming	Inheritance, polymorphism, GUI programming, Applets.	3	3	0	0	3
CORE	ECS51202	Design and Analysis of Algorithms Lab		3	0	0	3	2
	ECS51204	Object Oriented Programming Lab		3	0	0	3	2
Total				27	17	4	6	25

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SEMESTER - III								
Type of the Paper	Paper Code	Theory / Practical	Brief Contents	Contact Hour Per Week	L	T	P	Credit
CORE	SMA52101	Functional Analysis	Banach spaces, Riesz-Fischer theorem, Reflexive Normed spaces.	3	2	1	0	3
CORE	SMA52103	Stochastic Processes	Markov, Chebyshev's and Jensen's inequalities, Markov Chains and process.	3	2	1	0	3
CORE	SMA52105	Calculus of Variation and Integral Equations	Rayleigh-Ritz method, Resolvent kernel.	4	3	1	0	4
CORE	SMA52107	Operations Research	LPP problems, Transportation problem, Assignment model, Game theory, Queuing theory.	4	3	1	0	4
CORE	SMA52109	Functions of Complex Variables	Analytic functions, C-R equation, Bilinear transformation.	4	3	1	0	4
CORE		Optional- I		4	3	1	0	4
CORE		Minor Project		4	0	0	4	2
		Summer Internship						2
Total				25	15	6	4	26

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SEMESTER - IV								
Type of the Paper	Paper Code	Theory / Practical	Brief Contents	Contact Hour Per week	L	T	P	Credit
CORE	SMA52102	Wavelet Transforms with Applications	The Gabor transforms Haar wavelet.	4	3	1	0	4
CORE		Optional II		4	3	1	0	4
CORE		Optional III		4	3	1	0	4
CORE		Project/ Dissertation		12	0	0	12	6
CORE		Seminar on Project and Viva-Voce			0	0	0	4
Total				24	9	3	12	22

List of Optional papers		
Optional I	Optional II	Optional III
Numerical Solution of Partial Differential Equations [SMA52111]	Operator Theory [SMA52104]	Image Processing [ECS52110]
Formal Language Automata Theory [ECS52101]	Industrial Statistics [SMA52106]	Graph Theory [SMA52110]
Fractional Differential Equations and its Applications [SMA52113]	Fuzzy Mathematics and Fuzzy Logic [SMA52108]	Cryptography and Cyber Security [ECS53102]
Mathematical Modeling [SMA52115]	Fixed point theory & its Applications [SMA52110]	Fluid Dynamics [SMA52112]

***Offering of subjects will vary from year to year subject as per choice of Students.**