



Pradesh-176215

Central University of Himachal Pradesh

(ESTABLISHED UNDER CENTRAL UNIVERSITIES ACT 2009)

Dharamshala, Himachal



NAAC Criterion-I

Key Indicator – 1.2.2

Structure of the program clearly indicating the courses, Credits/
Electives

1.2.2 Evidences



Srinivasa Ramanujan Department of Mathematics
Central University of Himachal Pradesh, Dharamshala,
Kangra

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Srinivasa Ramanujan Department of Mathematics

S. No.	DESCRIPTION	Agenda item	Page No.
1	Structure of the program clearly indicating the courses, Credits/ Electives as proved by the competent board dt 14/06/2016.	BOS 4/ 4.2	1-7

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Proposed structure of courses to be offered in the Department of Mathematics (M. Sc. students) as per new Choice Based Credit System (CBCS)

Annexure-1

CORE COMPULSORY COURSES
(40 Credits)

Sr. No.	Course Code	Course Name	Credits	Pre-requisite/Remarks
1	MTH 403	Linear Algebra	4	
2	MTH 404	Abstract Algebra	4	
3	MTH 406	Real Analysis	4	
4	IAM 401	Complex Analysis	4	
5	IAM 402	Ordinary and Partial differential Equations	4	
6	IAM 405	Fluid Dynamics	4	
7	IAM 407	Differential Geometry	4	
8	MTH 501	Topology	4	
9	MTH 405	Lebesgue Measure and Integration	4	MTH 406
10	MTH 510	Number Theory	4	MTH 406

CORE OPEN COURSES
(12 CREDITS)

Sr. No.	Course Code	Course Name	Credits	Pre-requisite/Remarks
1	IAM 406	Theory of Elasticity	4	
2	IAM 413	Introduction to Fourier Analysis	4	
3	MTH 410	Fundamentals of Statistics	4	
4	MTH 411	Introduction to Projective Geometry	4	
5	MTH 412	Introduction to Non-Euclidean Geometry	4	
6	MTH 413	Probability Theory	4	
7	MTH 503	Discrete Mathematics	4	
8	MTH 504	Mechanics	4	
9	IAM 503	Mathematical Analysis	4	
10	MTH 508	Graph Theory	4	
11	MTH 512	Introduction to Algebraic Topology	4	
12	IAM 506	Finite Element Methods	4	
13	IAM 516	Spectral Methods	4	
14	IAM 517	Mesh Free Methods	4	
15	IAM 410	General Relativity and Cosmology	4	
16	IAM 526	Integral Equations and Boundary Value Problems	4	
17	MTH 606	Principle of Mathematics and Techniques	4	
18	MTH 516	Introduction to Representation Theory	4	
19	MTH 609	Advanced Algebra	4	MTH 404
20	MTH 619	Mechanics of Fluids	4	
21	MTH 620	Group Analysis of Differential Equations	4	

**ELECTIVE SPECIALIZATION
(16 CREDITS)**

GROUP-I (Choose 12 Credits)				
Sr. No.	Course Code	Course Name	Credits	Pre-requisite/ Remarks
1	IAM 403	Numerical Analysis	4	
2	IAM 404	Mathematical Methods	4	
3	IAM 409	Applied Algebra	4	
4	IAM 501	Functional Analysis	4	
5	IAM 502	Applied Numerical Analysis	4	
6	MTH 407	Numerical Methods	4	
7	IAM 408	Mathematical Modelling	4	
8	IAM 507	Wavelet Theory	4	
9	IAM 508	Image Processing	4	
10	IAM 509	Robotics and Control	4	
11	IAM 510	Artificial Intelligence	4	
12	IAM 511	Computer Aided Design	4	
13	IAM 514	Data Base Management	4	
14	IAM 518	Optimization Techniques	4	
15	IAM 519	Data Structure Techniques	4	
16	MTH 502	Operational Research	4	
17	MTH 623	Introduction Algebraic Geometry	4	
18	MTH 519	Introduction to Commutative Algebra	4	
19	MTH 520	Field Theory and Galois Theory	4	
20	MTH 521	Introduction to Elliptic Curve	4	
21	MTH 522	Analytic Number Theory	4	
22	IAM 521	Advanced Fluid Dynamics	4	
23	MTH 590	M. Sc. Dissertation	12	
24	IAM 602	Computational Methods	4	
25	IAM 603	Applied Functional Analysis	4	
26	IAM 604	Advanced Mathematical Methods	4	
27	IAM 606	Fractional Differential Equations	4	
28	MTH 607	Coding Theory & Applications	4	
29	MTH 608	Advanced Complex Analysis	4	
30	MTH 610	Algebraic Number Theory	4	
31	MTH 611	Advanced Topics in Topology and Analysis	4	MTH 501
32	MTH 614	Differentiable Structures on Manifolds	4	
33	MTH 615	Algebraic Curves	4	
34	MTH 616	Projective Representations of the Symmetric Groups	4	
35	MTH 617	Banach Algebras	4	
36	MTH 618	Differentiable Manifolds and Lie groups	4	MTH 403, MTH 501
37	MTH 408	Partial Differential Equations and Integral Equations	4	
38	MTH 409 A	Complex Analysis	4	

GROUP-II (Choose 4 Credits)

Sr. No.	Course Code	Course Name	Credits	Pre-requisite/Remarks
1	MTH 507	Approximation Theory	4	
2	MTH 511	Numerical Mathematical Analysis	4	
3	MTH 550	M. Sc. Project	4	
4	IAM 505	Mathematical Modelling and Simulations	4	
5	IAM 550	Project and Seminar based on Practical Training with Industry	4	

ELECTIVE OPEN
(4 CREDITS)

Sr. No.	Course Code	Course Name	Credits	Pre-requisite/Remarks
1	MTH 401	Ordinary Differential Equations	4	
2	MTH 402	Partial Differential Equations	4	
3	MTH 613	Category Theory	4	
4	MTH 517	Stochastic Differential Equations	4	
5	MTH 505	Fuzzy Sets and Fuzzy Systems	4	
6	IAM 512	Queues and Reliability	4	
7	IAM 513	Computer Graphics	4	
8	IAM 515	Bio-Mathematics	4	
9	MTH 514	Global Differential Geometry	4	
10	MTH 515	Non-Commutative Rings	4	
11	MTH 624	Commutative Algebra	4	
12	MTH 625	Introduction to Homological Algebra	4	
13	MTH 626	Galois Theory	4	
14	MTH 621	Categories and Modules	4	

SKILL DEVELOPMENT
(4 CREDITS)

Sr. No.	Course Code	Course Name	Credits	Pre-requisite/Remarks
1	IAM 504	Computer Applications	4	
2	MTH 506	Software Lab	4	
3	IAM 524	Mathematical Packages	4	
4	IAM 523	Special Functions	4	
5	IAM 411	Mathematics for Social Sciences	2	
6	IAM 412	Vedic Mathematics	2	
7	IAM 414	Introduction to Geometry	2	
8	IAM 415	Elementary Number Theory	2	
9	IAM 416	Computational Number Theory	2	
10	IAM 525	Financial Mathematics	2	
11	MTH 527	Introduction to Mathematical Statistics	2	

HUMAN DEVELOPMENT

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(4 CREDITS)

Sr. No.	Course Code	Course Name	Credits	Pre-requisite/ Remarks
1	MTH 549	Community Lab	4	
2	IAM 520	Theory of Vibrations	4	
3	IAM 598	Project	4	
4	MTH 528	Introduction to Rigorous and Precise Thinking	2	
5	MTH 529	Basics of Propositional Logic	2	

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Credit requirement for M.Sc. Programme of Study (4 Semester)

Courses	Category	Percentage	Credits
Core	Compulsory	50%	40
	Open	15%	12
Elective	Specialization	20%	16
	Open	5%	4
Foundation	Skill Development	5%	4
	Human Making	5%	4
Total		100%	80

Semester wise Credit Distribution

Courses	Core		Elective		Foundation		Total
	Compulsory	Open	Specialization	Open	Skill Development	Human Making	
I	16	-----	-----	-----	2	2	20
II	8	4	4	-----	2	2	20
III	8	4	8	-----	-----	-----	20
IV	8	4	4	4	-----	-----	20
Total	40	12	16	4	4	4	80

Annexure-2(B)

Mid-Semester Examinations

2 Credit Course				4 Credit Course			
Section	No. of Questions	Marks of each Question	Total Marks	Section	No. of Questions	Marks of each Question	Total Marks
I	5	1 M	5 M	I	10/5	1 M/2 M	10 M
II	2(3)*	5 M	10 M	II	4(6)	5 M	20 M
III	1	10 M	10 M	III	2	10 M	20 M
Grand Total			25 M	Grand Total			50 M

End-Semester Examinations

2 Credit Course				4 Credit Course			
Section	No. of Questions	Marks of each Question	Total Marks	Section	No. of Questions	Marks of each Question	Total Marks
I	5/10	2M/1 M	10 M	I	10/20	2 M/1M	20 M
II	4(6)	5 M	20 M	II	8 (12)	5 M	40 M
III	2	10 M	20 M	III	4	10 M	40 M
Grand Total			50 M	Grand Total			100 M

Distribution of Marks

Component	2 Credit Course	4 Credit Course
Internal Assesment	25 Marks	50 Marks
Mid-Term Examination	25 Marks	50 Marks
End-Term Examination	50 Marks	100 Marks
Total	100 Marks	200 Marks

* 2(3) Indicates that 2 Questions out of 3 Questions

(100)

Approved in the First meeting of Board of Studies (BOS) held on 19th September, 2012

Courses for selecting 16 credits for Specialization in Industrial Mathematics

Course Code	Name of the Course	Credits	Level at which to be offered	Prerequisite	Co-requisite
MTH 407	Numerical Methods	4	4		
MTH 502	Operational Research	4	5		
IAM 403	Numerical Analysis	4	4		
IAM 404	Mathematical Methods	4	4		
IAM 408	Mathematical Modelling	4	4		
IAM 409	Applied Algebra	4	4		
IAM 501	Functional Analysis	4	5		
IAM 502	Applied Numerical Analysis	4	5		
IAM 507	Wavelet Theory	4	5		
IAM 508	Image Processing	4	5		
IAM 509	Robotics and Control	4	5		
IAM 510	Artificial Intelligence	4	5		
IAM 511	Computer Aided Design	4	5		
IAM 514	Data Base Management	4	5		
IAM 518	Optimization Techniques	4	5		
IAM 519	Data Structure Techniques	4	5		
IAM 550	Project and Seminar based on Practical Training with Industry	4	5		

* The above list is included in section Elective Specialization (Group I-Sr. No. 1-16, Group-II-Sr. No.-8) (see Annexure-1)