Central University of Himachal Pradesh
(ESTABLISHED UNDER CENTRAL UNIVERSITIES ACT 2009)
Dharamshala, Himachal Pradesh-176215

NAAC Criterion-I

Key Indicator – 1.2.1

Approved Minutes of relevant BOS meeting highlighting the name of new courses introduced

1.2.1 Evidences

Srinivasa Ramanujan Department of Mathematics

Central University of Himachal Pradesh, Dharamshala, Kangra

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Srinivasa Ramanujan Department of Mathematics

Central University of Himachal Pradesh

[Established under Central Universities Act 2009]
PO Box: 21, Dharamshala, District Kangra-176215, Himachal Pradesh

Department of Mathematics

Minutes of the Fifth meeting of Board of Studies (BOS) held on 16th May, 2018 at 4:00 P.M.

The Fifth meeting of BOS of the Department of Mathematics was held on 16th of May, 2018 at Temporary Academic Block (TAB), Shahpur at 04:00 P.M.

The following were present:

1. Prof. I.V. Malhan, Chairman & Convenor
2. Dr. Jyoti Prakash Sharma, External Expert, HPU
3. Prof. Roshan Lal Sharma, Dean School of Humanities & Languages,CUHP
4. Dr. Ravinder Singh, Member, Department of Mathematics, CUHP

The decisions taken on various items of Agenda and record of discussions held are as under

Item-BOS-5.1: To confirm the minutes of the Fourth Meetings of BOS of the Department of Mathematics held on 15th June 2016.

Decision: The minutes of the Fourth Meeting of the BOS of the Department of Mathematics were approved.

Item-BOS-5.2: To ratify the revised course of study taken by the Department to introduce the new pattern of courses as per UGC guidelines (Annexure-1).

Decision: The BOS approved the Item **BOS-5.2.**

Item-BOS-5.3: To approve the Synopsis of the following students (Annexure-3 & 4):

S. No.	Name of Student with Roll No.	Name of Supervisor	Area of Research	Date of Joining of student for Ph.D.
1.	Ms. Kanika Sood CUHP15RDMATH01	Dr. Sachin Kumar Srivastava	Differential Geometry	2nd Dec. 2015
2.	Mr. Ravinder Kumar, CUHP15RDMATH02	Dr. Rakesh Kumar	Fluid Mechanics	4th Nov. 2015
3.	Ms. ReenaKoundal, CUHP15RDMATH03	Dr. Rakesh Kumar	Fractional Differential Equations	2nd Dec. 2015

Decision: The BOS members unanimously approved the synopsis of Kanika Sood, Ravinder Kumar and Reena Koundal. Professor Jyoti Prakash exhorted that the work done till date and published could also appended to the synopsis.

Item-BOS-4.5: To approve the faculty members to supervise the Ph.D. work of the following scholars:

S. No.	Name of Student with Roll No.	Name of Supervisor	Area of Research	Date of Joining of student for Ph.D.
1.	Mr. Anuj Kumar CUHP17RDMATH01	Dr. Sachin Kumar Srivastava	Differential Geometry	13th Nov. 2017
2.	Ms. Mayrika Dhiman CUHP17RDMATH02	Dr. Sachin Kumar Srivastava	Differential Geometry	13th Nov. 2017
3.	Mr. Manoj Kumar CUHP17RDMATH03	Dr. Ravinder Singh	Algebra	10th Nov. 2017

Decision: The BOS members unanimously approved the respective faculty members to supervise the Ph.D. work of Anuj Kuamr, Mayrika Dhiman and Manoj Kumar.

Item-BOS-5.5: Moving the course MTH 606 Principles of Mathematics and Techniques (Credits 04) from the category Core Open Courses to the category Skill Development and change its code and credits to MTH414 (Credits 02) respectively.

Decision: The BOS members approved the moving of the course MTH 606 Principles of Mathematics and Techniques (Credits 04) from the category Core Open Courses to the category Skill Development but suggested that its code and credits should not be altered.

Items-BOS-5.6-BOS-5.10 Changing the name of the courses as listed in the agenda as items BOS-5.6-BOS-5.10.

Decision: The BOS members suggested that name of the courses as listed in the agenda as items BOS-5.6-BOS-5.10. should not be altered.

Items-BOS-5.11-BOS-5.13: Removing the courses as listed in the agenda as items BOS-5.11-BOS-5.13.

Decision: The BOS members suggested that instead of dropping the courses mentioned in the items BOS-5.11-BOS-5.13 these courses can be relegated to the Comprehensive Courses list of the department.

Items BOS-5.14-BOS-5.22: Introducing new courses as listed in the agenda as items items BOS-5.14-BOS-5.22.

Decision: The BOS approved the items BOS-5.14 to BOS-5.22

Item-BOS-5.11 Removing the course **MTH 619 Mechanics of Fluids (Credits 04)** from the Category **CORE OPEN COURSES**as suggested by **Prof. S.K. Tomar(subject expert, School Board)** due to duplication with the Courses **IAM 405 Fluid Dynamics** and **IAM 521 Advanced Fluid Dynamics**. Also removing the course **Theory of Elasticity (IAM 406, Credits 4) from** the category **CORE OPEN COURSES.**

Item-BOS-5.12 Removing the course IAM 602 **Computational Methods (Credits 04)** from the Category **ELECTIVE SPECIALIZATION** as suggested by **Prof. S.K. Tomar(subject expert, School Board)** due to duplication with the course **Applied Numerical Mathods.**

Item-BOS-5.13 Removing the course from the **IAM 520 Theory of Vibrations (Credits 04)** from the Category **Human Development** as suggested by **Prof. S.K. Tomar (subject expert, School Board)**

Item-BOS-5.14 To Introduce a new course **MTH 415 Abstract Algebra II (Credits 04)** in the Category **CORE OPEN COURSES.**

Item-BOS-5.15 To Introduce a new course **MTH 416 Analysis II (Credits 04)** in the Category **CORE OPEN COURSES.**

Item-BOS-5.16 To introduce a new course **MTH 417 Linear Algebra II (Credits 04)** in the Category **ELECTIVE SPECIALIZATION.**

Item-BOS-5.17 To Introduce a new course **MTH 418 Topology II(Credits 04)** in the Category **ELECTIVE OPEN.**

Item-BOS-5.18 To Introduce a new course **MTH 421 Set Theory (Credits 04)** in the Category **ELECTIVE SPECIALIZATION.**

Item-BOS-5.19 To Introduce a new course **MTH 530 Introduction to Module Theory (Credits 04)** in the Category **CORE OPEN COURSES.**

Item-BOS-5.20 To Introduce a new course **MTH 525 Curves and Surfaces (Credits 04)** in the Category **CORE OPEN COURSES.**

Item-BOS-5.21 To Introduce a new course **MTH 531 Introduction to Mathematical Logic (Credits 04)** in the Category **ELECTIVE SPECIALIZATION.**

Item-BOS-5.22 To Introduce a new course **MTH 532 Introduction to Riemann Surfaces (Credits 04)** in the Category **ELECTIVE SPECIALIZATION.**

Item-BOS-5.23: To approve the list of external paper setters for various courses of study. (Annexure-5)

Item-BOS-5.24: To approve the list of experts for teaching courses in the **workshop mode** (Annexure-6)

Item-BOS-5.25 To adopt UGC(Credit Framework for Online Learning Course through SWAYAM) regulation, 2016 for course registration preferably selecting if required, the need based courses that may augment the requisite skills of learners.

Item-BOS-5.26: Any Other item with the permission of the chair.

(Prof. I.V. Malhan)

Annexure-1

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

CORE COMPULSORY COURSES
(40 Credits)

Sr. No.	Course Code	Course Name	Credits	Pre-requisite/ Remarks
1.	IAM 401	Complex Analysis	4	
2.	MTH 401	Ordinary Differential Equations	4	
3.	MTH 402	Partial Differential Equations	4	
4.	MTH 403	Linear Algebra I	4	
5.	MTH 404	Abstract Algebra I	4	
6.	MTH 406	Analysis I	4	

Central University of Himachal Pradesh
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SRINIVASA RAMANUJAN DEPARTMENT OF MATHEMATICS

Minutes of the SIXTH meeting of Board of Studies (BOS) held on 28th October, 2020 at 11:00 AM

The SIXTH meeting of BOS of the Srinivasa Ramanujan Department of Mathematics was held on 28th October, 2020 in online mode at Temporary Academic Block, Shahpur at 11:00AM.

The following were present:

1. Prof. Rakesh Kumar, Chairman & Convenor
2. Dr. Pawan Kumar Sharma, External Expert, NIT Hamirpur
3. Prof. Jyoti Prakash, External Expert, HPU Shimla
4. Prof. Hum Chand, Head, Department of Physics & Astronomical Science, CUHP
5. Dr. Rajender Kumar, Head, Department of Chemistry & Chemical Science, CUHP
6. Dr. Sachin Kumar Srinivasa, Member, Srinivasa Ramanujan Department of Mathematics, CUHP
7. Dr. Pankaj Kumar, Dean's Nominee, Srinivasa Ramanujan Department of Mathematics, CUHP

The decisions taken on various items of Agenda and record of discussions held are as under:

Item-BOS 6.1: To confirm the minutes of the 5th Meetings of BOS of the Department of Mathematics held on 16th May 2018 (Annexure I).

Decision: The minutes of the Fifth Meeting of the BOS of Srinivasa Ramanujan Department of Mathematics were approved.

Item-BOS 6.2: To approve the Research Methodology course (Course Code MTH 601) for the scholars of Srinivasa Ramanujan Department of Mathematics (Annexure-II).

Decision: The BOS approved the Item **BOS-6.2.**

Item-BOS 6.3: To approve the course "Research and Publication Ethics (RPE)" for PhD students (Annexure-IIIA). As per D.O. No. F.1-1/2018(Journal/CARE), December 2019, UGC approved two Credit Course for awareness about publication ethics and publication misconducts entitled "Research and Publication Ethics (RPE)" to be made compulsory for all PhD students for coursework (Annexure-IIIB).

Decision: The BOS approved the Item **BOS-6.3.**

Item-BOS-6.4: To approve the Synopsis of the following students (Annexure-IV & V):

S. No.	Name of Student with Roll No.	Name of Supervisor	Area of Research	Date of Joining of student for Ph.D.
1	Anuj Kumar CUHP17RDMATH01	Dr. Sachin Kumar Srivastava	Differential Geometry	13.11.2017
2	Mayrika Dhiman CUHP17RDMATH02	Dr. Sachin Kumar Srivastava	Differential Geometry	13.11.2017

Annexure-II

Course Code: MTH 601

Course Name: Research Methodology

Credits Equivalent: 04 Credits (One credit is equivalent to 10 hours of lectures / organised classroom activity /contact hours; 5 hours of laboratory work / practical / field work / Tutorial / teacher-led activity and 15 hours of other workload such as independent individual/ group work; obligatory/ optional work placement; literature survey/ library work; data collection/ field work; writing of papers/ projects/dissertation/thesis; seminars, etc.)

Course Objective: The purpose of this course is to develop a research orientation among the PhD Students of Mathematics and to acquaint them with the Fundamentals of Research methods, scientific writings and Research Tools.

Attendance Requirements:
Students are expected to attend all lectures in order to be able to fully benefit from the course. A minimum of 75% attendance is a must failing which a student may not be permitted to appear in examination.

Evaluation Criteria:
1. Mid Term Examination: 25%
2. End Term Examination: 50%
3. Counselling, Activities and Tutorials (CAT): 25%

Assignment	15%
Class participation	5%
Class tests	5%

Course Contents:

Unit I: Fundamentals of Research:
Objectives, Motivation, General Characteristics, Criterion of good research and Literature Review. **(15 Hours)**

Unit II: Mathematics and its History, Identification and Evaluation of Research Problems. **(15 Hours)**

Unit III: Scientific Writing: Writing a survey article, research paper, survey article and thesis writing. **(15 Hours)**

Unit IV: Research Tools: LaTeX, Beamer, Reference Manager like Zotero & Mendeley, Plagiarism detection software. **(15 Hours)**

References:

1. C.R. Kothari, **Research Methodology** Methods & Techniques, Second Edition, New Age International publisher, 2004.
2. J. Stillwell, **Mathematics and its History**, 3rd Edition, Springer, 2010.
3. N. E. Steenrod, P. R. Halmos, M. M. Schiffer & J. A. Dieudonné,
How to Write Mathematics, American Mathematical Society, 1973.
4. N. J. Higham, **Handbook of Writing for the Mathematical Sciences**, 2nd edition, Society for Industrial and Applied Mathematics, 1998.
5. D. E. Knuth, T. Larrabee & P. M. Roberts, **Mathematical Writing**,
Mathematical Association of America, 1989.
6. L. Lamport, LaTeX, **a Document Preparation System**, Pearson, 2008.
7. M. Goossens, F. Mittelbach, S. Rahtz, D. Roegel & H. Voss, **The LaTeX Graphics Companion**, Addison-Wesley, 2008.
8. F. Mittelbach, M. Goossens, J. Braams, D. Carlisle & C.
Rowley, **The LaTeX Companion** (Tools and Techniques for Computer Typesetting) 2nd Edition, Addison-Wesley Professional, 2004.
9. T. Tantau, **The BEAMER class**: User Guide for version 3.49, 12th Media Services, 2016.
10. N. R. Glassman, **Citation Management Tools: A Practical Guide for Librarians**, Rowman & Littlefield, 2018.

Annexure-IIIB

Course Code: MTH 622

Course Name: Research and Publication Ethics (RPE)

Credits Equivalent: 02 Credits (One credit is equivalent to 10 hours of lectures / organised classroom activity /contact hours; 5 hours of laboratory work / practical / field work / Tutorial / teacher-led activity and 15 hours of other workload such as independent individual/ group work; obligatory/ optional work placement; literature survey/ library work; data collection/ field work; writing of papers/ projects/dissertation/thesis; seminars, etc.)

Attendance Requirements:
Students are expected to attend all lectures in order to be able to fully benefit from the course. A minimum of 75% attendance is a must failing which a student may not be permitted to appear in examination.

Evaluation Criteria:
1. Mid Term Examination: 25%
2. End Term Examination: 50%
3. Counselling, Activities and Tutorials (CAT): 25%

Assignment	15%
Class participation	5%
Class tests	5%

Course Contents:

Unit I: Philosophy and Ethics: Introduction to philosophy: definition, nature and scope, concept, branches Ethics: definition, moral philosophy, nature of moral judgements and reactions;

Scientific Conduct: Ethics with respect to science and research, Intellectual honesty and research integrity, Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP), Redundant publications: duplicate and overlapping publications, salami slicing, Selective reporting and misrepresentation of data;

Publication Ethics: Publication ethics: definition, introduction and importance, Best practices / standards setting initiatives and guidelines: COPE, WAME, etc., Conflicts of interest, Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types, Violation of publication ethics, authorship and contributor ship, Identification of publication misconduct, complaints and appeals, Predatory publishers and journals.

(15 Hours)

Unit II: Open Access Publishing: Open access publications and initiatives, SHERPA/RoME0 online resource to check publisher copyright & self-archiving policies, Software tool to identify predatory publications developed by SPPU, Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.;

Publication Misconduct:

A. Group Discussions: Subject specific ethical issues, FFP, authorship, Conflicts of interest, Complaints and appeals: examples and fraud from India and abroad
B. Software tools: Use of plagiarism software like Turnitin, Urkund and other open source software tools.

Databases and Research Metrics:

A. Databases: Indexing databases, Citation databases: Web of Science, Scopus, etc.
B. Research Metrics: Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g index, I10 index, altmetrics. **(15 Hours)**

References:

Refer UGC Website: https://www.ugc.ac.in/pdfnews/9836633_Research-and-Publication-Ethics.pdf

Central University of Himachal Pradesh

Srinivasa Ramanujan Department of Mathematics

School of Mathematics, Computers and Information Science

AGENDA

8th BOARD OF STUDIES MEETING

TO BE HELD ON **27th September, 2021**

Venue: through Online Mode on Google Meet

meet.google.com/msn-aaqh-uvi

हिमाचल प्रदेश केंद्रीय विश्वविद्यालय
Central University of Himachal Pradesh
(Established under Central Universities Act 2009)
शाहपुर परिसर, शाहपुर, ज़िला काँगड़ा (हि.प्र.) - 176206
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आज़ादी का अमृत महोत्सव

AGENDA-INDEX

Agenda Item No.	PARTICULARS	Information
SRDM-BOS-8/21-1	Confirmation and Approval of the Minutes of the 7th Board of Studies meeting held on 15th June, 2021.	**Annexure –I**
SRDM-BOS-8/21-2	Approval of revised structure (including list of revised courses and list of new courses) of the M.Sc. Mathematics program in light of the National Education Policy-2020. All the revisions made from time to time in the syllabus of different courses of the M.Sc. Mathematics program as per the NEP-2020 guidelines will be reported to the upcoming BOS meetings	**Annexure – II, III & IV**
SRDM-BOS-8/21-3	To approve the adoption of Blended mode of learning in M.Sc. Mathematics program in the light of National Education Policy-2020.	
SRDM-BOS-8/21-4	To approve the adoption of Multiple Entry-Exit system in M.Sc. Mathematics programme in the light of National Education Policy-2020.	
SRDM-BOS-8/21-5	To approve the list of new courses to be included in the course work of Ph.D. Mathematics in the light of National Education Policy-2020	**Annexure - V**
SRDM-BOS-8/21-6	Deliberation and Approval of the Ph.D. Synopsis of Mr. Manoj Kumar, CUHP17RDMATH03.	**Annexure - VI**
SRDM-BOS-8/21-7	Any item with the permission of the Chair	

Prof. Rakesh Kumar
Head,
Srinivasa Ramanujan Department of Mathematics

Annexure-II

Suggested Course Scheme for Master Degree Programme of Two Years duration (Four Semeters) w.e.f. Academic Session 2021-23[$]

2 YEARS MASTER'S DEGREE PROGRAMME
Total Credits: 80
Credit per Semester: 20
Eligibility: 3 Year Bachelor's Degree Programme

Semester	Disciplinary/ Interdisciplinary : Major Course	Disciplinary/ Interdisciplinary : Minor Course	Vocational / Skill	IKS	Review of Literature, Research Proposal	Dissertation & Viva-Voce	Total
1st	10	04	04	02[+]	0	0	20
2nd	12	04	02	02[#]	0	0	20
3rd	04 Elective Specialization (*Course basket is to be offered)*	04[*] (Research Methodology)	04[*] Software based Data Analysis (Available in the concerned subject / field)	0	08[*]	00	20
4th	04 Elective Specialization (*Course basket is to be offered)*	02 **Theory** (Academic Writings) 02 **Practical** (Paper Publications / Seminar - Conference Presentation at National Level)	04[*] Subject based Data Analysis and Interpretation	0	0	08 50% Dissertation 50% Presentation & Viva-Voce	20
Total	**30**	**16**	**14**	**04**	**08**	**08**	**80**

[+] *02 Credits Course Developed by University Level Committee and uniform for all the programmes.*
[#] *02 Credits Course Developed by the Department concerned.*
* *50% Theory and 50% Practical.*

[$]University has issued the guidelines for the implementation of NEP 2020 which are subject to the approval from Academic Council and Executive Council, CUHP.

Proposed Course Basket for Master Degree Programme (MSc Mathematics) of Two Years duration (Four Semeters) in Srinivasa Ramanujan Department of Mathematics w.e.f. Academic Session 2021-23 as Per NEP 2020 Guidelines of CUHP[$]

Name of Programme: M.Sc. Mathematics
Duration: Two Years (Four Semester)
Total Credits: 80
Credit per Semester: 20

Major Courses (30 credits)

S. No.	Course Code	Course Name	Credit	Pre-requisite/ Remarks
1.	MTH 401	Ordinary Differential Equations	02	
2.	MTH 402	Partial Differential Equations	02	
3.	MTH 403	Linear Algebra	04	
4.	MTH 404	Abstract Algebra	04	
5.	MTH 406	Real Analysis	04	
6.	IAM 401	Complex Analysis	04	
7.	IAM 403	Numerical Analysis	02	
Elective Specialization				
1.	MTH 405	Lebesgue Measure and Integration	02	MTH 406
2.	MTH 408	Partial Differential Equation and Integral Equations	02	
3.	MTH 413	Probability Theory	02	
4.	MTH 504	Mechanics	02	
5.	MTH 505	Fuzzy Sets and Fuzzy Systems	04	
6.	MTH 508	Graph Theory	02	
7.	MTH 510	Number Theory	04	
8.	MTH 512	Introduction to Algebraic Topology	04	
9.	MTH 514	Global Differential Geometry	04	
10.	MTH 515	Non-Commutative Rings	04	
11.	MTH 516	Introduction to Representation Theory	04	
12.	MTH 517	Stochastic Differential Equations	04	
13.	MTH 519	Introduction to Commutative Algebra	04	
14.	MTH 520	Field Theory and Galois Theory	04	
15.	MTH 521	Introduction to Elliptic Curve	02	
16.	MTH 607	Coding Theory & Applications	04	

[$]University has issued the guidelines for the implementation of NEP 2020 which are subject to the approval from Academic Council and Executive Council, CUHP.

17.	MTH 608	Advanced Complex Analysis	04	
18.	MTH 609	Advanced Algebra	04	MTH 404
19.	MTH 610	Algebraic Number Theory	04	
20.	MTH 611	Advanced Topics in Topology and Analysis	04	MTH 501
21.	MTH 613	Category Theory	04	
22.	MTH 614	Differentiable Structures on Manifolds	04	
23.	MTH 615	Algebraic Curves	04	
24.	MTH 616	Projective Representations of the Symmetric Groups	04	
25.	MTH 617	Banach Algebras	04	
26.	MTH 618	Differentiable Manifolds and Lie groups	04	MTH 403, MTH 501
27.	MTH 619	Mechanics of Fluids	04	
28.	MTH 620	Group Analysis of Differential Equations	04	
29.	MTH 621	Categories and Modules	04	
30.	MTH 623	Introduction to Algebraic Geometry	04	
31.	MTH 624	Commutative Algebra	04	
32.	MTH 625	Introduction to Homological Algebra	04	
33.	IAM 406	Theory of Elasticity	02	
34.	IAM 410	General Relativity and Cosmology	02	
35.	IAM 413	Introduction to Fourier Analysis	02	
36.	IAM 501	Functional Analysis	02	
37.	IAM 502	Advanced Numerical Analysis	04	
38.	IAM 503	Mathematical Analysis	02	
39.	IAM 506	Finite Element Methods	04	
40.	IAM 512	Queues and Reliability	04	
41.	IAM 513	Computer Graphics	04	
42.	IAM 516	Spectral Methods	04	
43.	IAM 517	Mesh Free Methods	04	
44.	IAM 520	Theory of Vibrations	04	
45.	IAM 521	Advanced Fluid Dynamics	04	
46.	IAM 602	Computational Methods	04	
47.	IAM 603	Applied Functional Analysis	04	
48.	IAM 604	Advanced Mathematical Methods	04	
49.	IAM 606	Fractional Differential Equations	04	

Minor Courses (16 credits)

S. No.	Course Code	Course Name	Credit	Pre-requisite/ Remarks
1.	MTH 501	Topology	02	MTH 406
2.	IAM 404	Mathematical Methods	04	
3.	IAM 407	Differential Geometry	02	

[$]University has issued the guidelines for the implementation of NEP 2020 which are subject to the approval from Academic Council and Executive Council, CUHP.

4.	MTH 550	M.Sc. Project	04	
5.	MTH 551	Research Methodology	04	
6.	MTH 552	The basics of Scientific Writing	02	
7.	MTH 553	Term Paper	02	
8.	IAM 550	Project and Seminar Based on Practical Training with Industry	04	

Vocational/ Skill Courses (14 credits)

S. No.	Course Code	Course Name	Credit	Pre-requisite/ Remarks
1.	MTH 410	Fundamentals of Statistics	04	
2.	MTH 411	Introduction to Projective Geometry	02	
3.	MTH 412	Introduction to Non-Euclidean Geometry	02	
4.	MTH 420	Basics of Python Programming	02	
5.	MTH 421	Programming in C	02	
6.	MTH 422	Programming in C++	02	
7.	MTH 423	Android Programming	02	
8.	MTH 424	Cyber Security	02	
9.	MTH 425	Internet of Things	02	
10.	MTH 430	Cyber Laws	02	
11.	MTH 502	Operational Research	02	
12.	MTH 503	Discrete Mathematics	02	
13.	MTH 506	Software Lab	02	
14.	MTH 507	Approximation Theory	02	
15.	MTH 511	Numerical Mathematical Analysis	02	
16.	MTH 522	Analytic Number Theory	02	
17.	MTH 527	Introduction to Mathematical Statistics	02	
18.	MTH 529	Basics of Propositional Logic	02	
19.	MTH 545	Introduction to Latex Programming	02	
20.	MTH 548	Cryptography	02	
21.	MTH 549	Community Lab	02	
22.	MTH 606	Principle of Mathematics and Techniques	04	
23.	MTH 626	Galois Theory	02	
24.	IAM 402	Ordinary and Partial differential Equations	02	
25.	IAM 405	Fluid Dynamics	04	
26.	IAM 408	Mathematical Modelling	02	
27.	IAM 409	Applied Algebra	04	
28.	IAM 414	Introduction to Geometry	02	
29.	IAM 416	Computational Number Theory	02	
30.	IAM 504	Computer Applications	02	
31.	IAM 505	Mathematical Modelling and Simulations	04	
32.	IAM 507	Wavelet Theory	04	

[$]University has issued the guidelines for the implementation of NEP 2020 which are subject to the approval from Academic Council and Executive Council, CUHP.

33.	IAM 508	Image Processing	02	
34.	IAM 509	Robotics and Control	02	
35.	IAM 510	Artificial Intelligence	02	
36.	IAM 511	Computer Aided Design	02	
37.	IAM 514	Data Base Management	02	
38.	IAM 515	Bio-Mathematics	02	
39.	IAM 518	Optimization Techniques	02	
40.	IAM 519	Data Structure Techniques	02	
41.	IAM 523	Special Functions	02	
42.	IAM 524	Mathematical Packages	02	
43.	IAM 525	Financial Mathematics	02	
44.	IAM 526	Integral Equations and Boundary Value Problems	02	

Indian Knowledge System Courses (Credit 04)

Courses at Department Level (Credit 02)				
S. No.	**Course**	**Course Name**	**Credit**	**Pre-requisite/Remarks**
1.	MTH 426	Mathematics in Ancient India	02	
2.	MTH 427	Mathematics in Medieval India	02	
3.	MTH 428	Contributions of Bhaskaracharya	02	
4.	MTH 429	Geometry in Ancient India	02	
5.	MTH 528	Introduction to Rigorous and Precise Thinking	02	
6.	IAM 411	Mathematics for Social Sciences	02	
7.	IAM 412	Vedic Mathematics	02	
8.	IAM 415	Elementary Number Theory	02	
Courses at University Level (Credit 02)				
S. No.	**Course**	**Course Name**	**Credit**	**Pre-requisite/Remarks**
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Review of Literature, Research Proposal (Credit 08)

S. No.	Course Code	Course Name	Credit	Pre-requisite/Remarks
1.	MTH 555	Review of Literature	04	
2.	MTH 556	Research Proposal	04	

Dissertation and Viva-Voce (Credit 08)

S. No.	Course	Course Name	Credit	Pre-requisite/Remarks
1.	MTH 590	Dissertation & Viva-Voce	08	

[$]University has issued the guidelines for the implementation of NEP 2020 which are subject to the approval from Academic Council and Executive Council, CUHP.

[$]University has issued the guidelines for the implementation of NEP 2020 which are subject to the approval from Academic Council and Executive Council, CUHP.

Annexure III

Proposed List of revised Courses for M.Sc. Mathematics in Srinivasa Ramanujan Department of Mathematics w.e.f. Academic Session 2021-23 in the Light of NEP 2020*

The following list is prepared after reducing the Credits of each course from 04 credit to 02 credit (except the Dissertation & Viva-Voce Course (Previous Course Name: M.Sc. Dissertation) where credits are reduced by 04 credits) in the previously existing course structure:

S. No.	Course Code	Course Name	Credit
1.	MTH 401	Ordinary Differential Equations	02
2.	MTH 402	Partial Differential Equations	02
3.	MTH 405	Lebesgue Measure and Integration	02
4.	MTH 408	Partial Differential Equation and Integral Equations	02
5.	MTH 411	Introduction to Projective Geometry	02
6.	MTH 412	Introduction to Non-Euclidean Geometry	02
7.	MTH413	Probability Theory	02
8.	MTH 501	Topology	02
9.	MTH 502	Operational Research	02
10.	MTH503	Discrete Mathematics	02
11.	MTH504	Mechanics	02
12.	MTH 506	Software Lab	02
13.	MTH 507	Approximation Theory	02
14.	MTH 508	Graph Theory	02
15.	MTH 511	Numerical Mathematical Analysis	02
16.	MTH 521	Introduction to Elliptic Curve	02
17.	MTH 522	Analytic Number Theory	02
18.	MTH 549	Community Lab	02
19.	MTH 590	Dissertation & Viva-Voce	08
20.	MTH 626	Galois Theory	02
21.	IAM 402	Ordinary and Partial differential Equations	02
22.	IAM 403	Numerical Analysis	02
23.	IAM 406	Theory of Elasticity	02
24.	IAM 407	Differential Geometry	02
25.	IAM 408	Mathematical Modelling	02
26.	IAM 410	General Relativity and Cosmology	02
27.	IAM 413	Introduction to Fourier Analysis	02
28.	IAM 501	Functional Analysis	02
29.	IAM 503	Mathematical Analysis	02
30.	IAM 504	Computer Applications	02
31.	IAM 508	Image Processing	02
32.	IAM 509	Robotics and Control	02
33.	IAM 510	Artificial Intelligence	02
34.	IAM 511	Computer Aided Design	02

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35.	IAM 514	Data Base Management	02
36.	IAM 515	Bio-Mathematics	02
37.	IAM 518	Optimization Techniques	02
38.	IAM 519	Data Structure Techniques	02
39.	IAM 523	Special Functions	02
40.	IAM 524	Mathematical Packages	02
41.	IAM 526	Integral Equations and Boundary Value Problems	02

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Annexure-IV

Proposed List of New Courses for the Master Degree Programme (MSc Mathematics) of Two Years duration in Srinivasa Ramanujan Department of Mathematics in the Light of NEP 2020 Guidelines*

Sr. No.	Course Code	Course Name	Credits	Course Type
1.	MTH 420	Basics of Python Programming	02	Vocational/ Skill
2.	MTH 421	Programming in C	02	Vocational/ Skill
3.	MTH 422	Programming in C++	02	Vocational/ Skill
4.	MTH 423	Android Programming	02	Vocational/ Skill
5.	MTH 424	Cyber Security	02	Vocational/ Skill
6.	MTH 425	Internet of Things	02	Vocational/ Skill
7.	MTH 426	Mathematics in Ancient India	02	Indian Knowledge System
8.	MTH 427	Mathematics in Medieval India	02	Indian Knowledge System
9.	MTH 428	Contributions of Bhaskaracharya	02	Indian Knowledge System
10.	MTH 429	Geometry in Ancient India	02	Indian Knowledge System
11.	MTH 430	Cyber Laws	02	Vocational/ Skill
12.	MTH 545	Introduction to Latex Programming	02	Vocational/ Skill
13.	MTH 548	Cryptography	02	Vocational/ Skill
14.	MTH 551	Research Methodology	04	Minor
15.	MTH 552	The basics of Scientific Writing	02	Minor
16.	MTH 553	Term Paper	02	Minor
17.	MTH 555	Review of Literature	04	Review of Literature, Research Proposal
18.	MTH 556	Research Proposal	04	Review of Literature, Research Proposal

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Annexure-V

Proposed List of New Courses for the Course work in PhD Mathematics in Srinivasa Ramanujan Department of Mathematics in the Light of NEP 2020*

S. No.	Course Code	Course Name	Credit
1.	MTH 641	Cloud Computing	04
2.	MTH 642	Advances in Internet of Things (IoT)	04
3.	MTH 643	Cryptography and Network Security	04
4.	MTH 651	Indian Traditional Knowledge and Practices	02
5.	MTH 652	Pedagogy of Teaching and Learning Process	02

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