RAJIV GANDHI UNIVERSITY

(A Central University)

RONO HILLS:: DOIMUKH



DEPARTMENT OF MATHEMATICS

One Semester Course Structure

Ph. D. (Course Work)

Mathematics & Computing

w.e.f. 2017-18

STRUCTURE OF THE SYLLABUS FOR Ph. D. PROGRAMME

Ph. D. Programme			
Semester	Paper Code	Title	Marks Distribution
I-Semester (Two Papers) Compulsory	MATH -701	Research Methodology	Theory-60, Internal- 20, Practical-20
	MATH -702	Computer Applications	Theory-50, Internal- 20, Practical-30



Department of Mathematics

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MATH: 701: RESEARCH METHODOLOGY

Course Outcome: The paper equips students with the basics of the research. It equips students with concept of Formulating research aim and objectives in an appropriate manner are one of the most important aspects and give the overall direction of the research.

Full Marks: 100 Term end: 60 Practical: 20 Internal: 20

Unit-I: An overview of Research Methodology: Research concept, characteristics of Research, the choice and statement of research problem, justification and hypothesis. Literature collection-textual and digital.

Elementary Scientific Method: Authority in science observation and

Elementary Scientific Method: Authority in science, observation and descriptions, analysis and synthesis, Hypothesis, Deduction, Models and Mathematics, Testing of Hypothesis, Preparation of research synopsis, Significance of Research Work. **Marks: 20**

- UNIT-II: Scientific writing skills and Technical writing skills: Form of scientific and technical writing: Planning and Producing documents, Documents types, elements of technical documents, Graph and figure, Paragraphs, Mechanism of, citing sources and listing Reference, Reference Writings, Different types of Article and Theses writing styles. Marks: 20
- UNIT-III: Numerical Analysis: Interpolations, Differentiations and Integrations.
 Solving differential equations by Euler and Euler modified methods, Finite
 Difference Methods, Curve Fitting, Predictor-Corrector method for accuracy
 and stability, Statistical Inference.

 Marks: 20
- **UNIT-***IV*: Research Project Proposal Resource Generation:

Marks-20

Marks: 20

- 1. Write a Research Project Proposal;
- **2.** Getting funds from different funding agencies.

Internal Assessment:

Text and Reference Books

- 1. Nicholas J. Higham: Handbook of Writing for te Mathematical Sciences, Second Edition, SIAM Publisher (1998).
- 2. Robert K, Yin: Case Study Research: Design and Methods, Sage Publications Ltd., London (2008).
- 3. Leslie C.Prerelman: The Mayfield Technical Scientific Writing, Tata James parade & McGraw Hills (2001).
- 4. H. C. Saxena: Finite Difference and Numerical Analysis, S. Chand & Co. (2005).

Course Outcome: The students are expected to be well equipped with fundamentals knowledge of computer programming and mathematical software's for their computational aspects of their research.

Full Marks: 100 Term end: 50 Practical: 30 Internal: 20

Marks: 20

- UNIT-I Fundamental of computing, Windows and UNIX (Linux) operating systems,MS- Office, Problem solving techniques, networking.Marks: 20
- UNIT –II Programming in C, MATLAB and MATHEMATICA Complete idea on LaTeX and LyX.

 Mark: 30
- UNIT-III Practical Materials covered in Unit-I and Unit-II. Marks: 30

Internal Assessment:

Text and Reference Books

1. V.Rajarman : Fundamentals of Computing, PHI.

2. Jon Sticklen & M : An Introduction to Technical Problem Solving with MATAB v.7, 2e, 2

Taner Eskil 2006, Great lakes press.

3. Michel Trott : The Mathematical Guide Book for Programming, 2004, Spinger-

Verlag.

4. P.Dey and M. Ghosh : Computer Fundamentals and Programming in C, 2007, Oxford

University Press

5. Shubhi Lall : Computer Fundamentals and Introduction to IBM. PC, 2005,

University Book House

6. E.Balagurusamy : Programming in ANSIC, Tata McGraw Hill, 2001.

7. Laslie Lamport : LaTeX: a document preparation system, User's guide and reference

Manual, 2nd Edition, Addison Wesley, 1994.

8. F. Mittelbach : The LaTeX Companion, 2nd Edition, AddisonWesley, 2004.