

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

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



  
Department of Mathematics  
HEAD  
Department of Mathematics  
Rajiv Gandhi University  
Reno Hills, Doimukh (A.P.)

**Ph. D. (Course Work) Syllabus**  
**MATH: 701: RESEARCH METHODOLOGY:**

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

**Internal Assessment:** **Marks: 20**

**Text and Reference Books**

1. Nicholas J. Higham: Handbook of Writing for the 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).

## **MATH: 702: COMPUTER APPLICATIONS:**

**Full Marks: 100**

**Term end: 50**

**Practical: 30**

**Internal: 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:**     **Marks: 20**

### **Text and Reference Books**

1. V.Rajarman     : *Fundamentals of Computing, PHI.*
2. Jon Sticklen & M Taner Eskil     : *An Introduction to Technical Problem Solving with MATLAB v.7, 2e, 2006, Great lakes press.*
3. Michel Trott     : *The Mathematical Guide Book for Programming, 2004, Springer-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, 2<sup>nd</sup> Edition, Addison Wesley, 1994.*
8. F. Mittelbach     : *The LaTeX Companion, 2<sup>nd</sup> Edition, AddisonWesley, 2004.*