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. 2019-20

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

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

(*Approved by the BPGS in Mathematics held on 16 May 2019*)

FIRST SEMESTER

MATH: 601: RESEARCH METHODOLOGY

Maximum marks   **:** 100 (Terminal–60, Sessional–20, Project–20)
Term end   **:** 60
Terminal Examination duration   **:** 2 and ½ hours

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.*

Unit	Contains	Marks
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.*	**20**
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.*	**20**
III	***Numerical Analysis:*** *Interpolations, Differentiations and Integrations. Solving differential equations by Euler and Euler modified methods, Finite Difference Methods.*	**20**

UNIT-IV : PROJECT WORK

Contact Hours Per Week   : 2 hours
Examination Duration   : 1 hour
Maximum Marks   **: 20** (Record-10,Presentation-5, Viva-5)

Research Project Proposal and Resource Generation:

1. *Write a Research Project Proposal;*

2. *Getting funds from different funding agencies.*

Internal Assessment: Seminar Presentation.   ***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).*

FIRST SEMESTER

MATH: 602: COMPUTER APPLICATIONS

Maximum marks   **:** 100 (Terminal–50, Sessional–20, Practical–30)
Term end   **:** 50
Terminal Examination duration   **:** 2 hours
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.*

Unit	Contains	Marks
	Plane Geometry	
I	*Fundamental of Computing, Windows and UNIX (Linux) operating systems, MS- Office, Problem Solving Techniques, Networking.*	**20**
II	*Programming in C, MATLAB and MATHEMATICA, Complete idea on LaTeX and LyX.*	**30**

UNIT-III : PRACTICAL

Contact Hours Per Week   : 2 hours
Examination Duration   : 2 hours
Maximum Marks   **: 30** (Expt-20, Viva-5, Record-5)

Experiments

1. *Summation of series through MATHEMATICA / MATLAB / C – Programming.*

2. *Plotting the graphs of the polynomial of degree 2 to 5 through MATHEMATICA / MATLAB / C – Programming.*

3. *Solution of quadratic equations MATHEMATICA / MATLAB / C – Programming.*

4. *Obtaining adjoint and inverse of a matrix through MATHEMATICA / MATLAB / C – Programming.*

5. *Find the sum of Gregory's series by MATLAB.*

6. *Matrix operation (addition, multiplication, inverse, transpose) by MATHEMATICA / MATLAB.*

7. *Display Mathematical statements/Mathematical equations etc. by LaTeX.*

8. *Solution of ODE & PDE by MATHEMATICA / MATLAB.*

9. *Evaluation of Standard Deviation, Correlation, Regression etc by MATHEMATICA / MATLAB.*

10. *Solution of system of linear equations by Gauss Elimination method through MATHEMATICA / MATLAB / C – Programming.*

Internal Assessment: Seminar Presentation   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 MATAB v.7, 2e,   2 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, Addison Wesley, 2004.*