Ph.D. in Mathematics

Program Outcomes:

1. Develop critical and analytical thinking in recognizing and analyzing the mathematical problems with sufficient knowledge, theoretical skills, questioning and plausible explanations.
2. Prepare sound base for interpreting, synthesis and evaluation of research techniques.
3. Identifying current unsolved research problems in a specific area.
4. Developing innovative ideas and strategies for addressing a research problem.
5. Undertake original research on a particular concurrent and relevant topic in the field of mathematics
6. Effectively communicating research to the mathematical community through publications in journals and presentations in conferences.
7. Integrating the knowledge and skills that they have acquired throughout to become pro-active professionals in research and personal life.
8. The skill to identify and apply scientific research in new emerging areas of mathematics for resolution of economic, environmental and societal problems.
9. Evolving as excellent professionals in the educational institutions/ research laboratories and contribute towards the general and scientific growth of the country.

Program Specific Outcomes:

1. Acquiring deep knowledge and expertise in chosen area of research in pure or applied mathematics.
2. Facilitating interaction and exchange with national and international researchers and developing collaborations.
3. Imbibing highest standard of ethics in research publications
4. Skill in publishing quality research papers in reputed mathematical journals.
5. Developing pedagogical and research skills
6. Capability in communicating the basic and advanced mathematical topics to undergraduate and graduate students

Course Structure of Ph.D. Course work (Mathematics)	
Paper I- Research Methodology	**Paper II- Pre Ph.D. Mathematics**

Paper: **Research Methodology**

Course outcomes:

The aim of the course is to provide students with an introduction to research methods, report writing, manuscript writing, thesis writing and programme writing of some mathematical software   like MATLAB. Upon successful completion of the course students are expected to:

1. Develop understanding on various kinds of research methods, objectives of doing research, research process, research designs and sampling.
2. Have basic knowledge on qualitative research techniques, have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis
3. Have basic awareness of data analysis-and hypothesis testing procedures
4. Have adequate knowledge of some mathematical software like MATLAB and Latex

Course specific outcomes:

The specific outcome of this course is to

1. Develop knowledge about the importance of research methodology in research
2. Acquaintance with the concurrent review of literature through previous research manuscripts, published research papers, on-line resources etc.
3. Ability to identify and select the appropriate research problem and formulate methodology for pursuing the research on the chosen identified relevant topic ,
4. Review published articles and books in the field of research work undertaken and understand terms like citation index, impact factor etc. and meaning and scope of term indexing
5. Competency in grant writing, research proposal and competency in soft wares: Latex Beamer. Mat Lab etc.
6. Develop and enhance writing skills for presentation in scientific seminars; oral/poster presentation, research paper/ PhD thesis, dissertation presentation. etc.

Paper II**: Pre Ph.D. Mathematics**

Course outcomes:

The course is designed in such a way that after completing the course the student will be able to have a vast knowledge of mathematical concepts so that they can easily opt any of the prescribed area of research.

Course specific outcomes:

1. Understand and be able to identify various properties of Univalent functions, entire functions in Complex Analysis and in the development of the theory of Special functions.
2. Achieve conceptual understanding of several concepts such as the concept of spectral theory in the field of Algebra.
3. Assimilate knowledge of Differential Geometry of Manifolds and Approximation Theory and identify and interpret their application
4. Acquire the knowledge in applied mathematics especially in the areas of Fluid Mechanics, Discrete Mathematics, Operation Research and Astrophysics & Astrobiology.