

Course outcomes

Program Outcomes:

The graduates of the M.Sc (Mathematics Education) program will be able:

- professionally inclined Mathematics educators who have sound knowledge of subject matter and specialized in constructivist & alternate pedagogy.
- to use ICT in Mathematics teaching in multiple ways
- develop need based Mathematics teaching-learning resources
- contribute as trained work force to provide teaching-learning support to schools
- contribute as researchers in play making, curriculum design and in evaluation reforms to raise the standard of Mathematics Education

Course Outcomes:

I.2 Perspectives in Mathematics Education

Upon Completion of this course the students will be able to:

- understand mathematics education as an academic and research field.
- discuss the nature of mathematics with reference to pure and applied mathematics
- analyse nature of mathematics from cognitive to social perspective
- define specific components of mathematics (axioms, postulates, paradoxes, mathematical statements, theorem and proof)
- develop an understanding of philosophical, cultural, social, historical and psychological facets of mathematics education
- discuss and analyse the history of mathematics with respect numbers, measurement, algebra, set theory, calculus, infinity and continuity
- apply the history and development of field of mathematics in the present school mathematics curriculum
- critically analyse the present school mathematics curriculum

II.2 Curriculum and Evaluation in Mathematics

Upon Completion of this course the students will be able to:

- understand need and scope of curriculum
- differentiate between formal and informal curriculum
- outline the process of designing curriculum
- analysis the 'Objective Model' and 'Process Model' of curriculum formation
- differentiate between 'National Curriculum Framework' and 'National Curriculum'
- analysis the aims and objectives of Mathematics curriculum as mentioned in the National Curriculum Framework-2005

II.3 ICT in Mathematics Education

Upon Completion of this course the students will be able to:

- define information and communication technology
- define the purpose and scope of ICT in education

Course outcomes

- list out potential use of ICT in education
- outline the framework for ICT based pedagogy

II.4 Learning ways of Mathematical Writing

Upon Completion of this course the students will be able to:

- define characteristics of a language
- describe features of mathematics as a language
- list out symbols and notations used in mathematical writing
- understand the rules of writing mathematics
- identify errors in mathematical writing
- write small content module using rules of mathematical writing
- write mathematical content in Latex (or appropriate software)

III.2 Art of Teaching Mathematics

Upon Completion of this course the students will be able to:

- define constructivists paradigm of learning
- discuss the theories of learning given by Piaget, Dewey, Bruner, Vygotsky, Dienes
- apply constructivists theories of learning in classroom practices
- prepare lesson plans to address the pedagogical concerns in Numbers, Algebra, Geometry, Probability and Statistics, Calculus, limits and Continuity
- develop interdisciplinary Mathematics projects based on school curriculum
- use project method based teaching in Mathematics classroom
- develop comprehensive assessment plan for Mathematics classroom
- develop and use concept and age appropriate Mathematical models to be used as 'hands-on' approach for teaching Mathematics

III.3 Digital Technologies in Mathematics Education

Upon completion of this course the students will be able to:

- apply basic ICT skills in planning and teaching mathematics at school level
- create web-based learning environment using blogs, virtual classrooms and web based educational applications
- use mathematics specific software, such as Geogebra, Graphic Calculator and others
- use design software such as Captivate, Photoshop and others to create need based e-learning resources for students
- teach Mathematics by organizing virtual classrooms

III.4 Research Methodology in Education

Upon completion of this course the students will be able to:

- understand need and scope of research
- outline the process of conducting research
- identify potential research areas in Education
- write null hypothesis/alternate hypothesis for any research problem
- differentiate among various research designs, such as experimental research, descriptive research, quasi-experimental research and others
- write synopsis for a chosen area of research

Course outcomes

- choose and apply basic statistical techniques for various kinds of data collected under educational research

IV.2 Research Investigations in Mathematics Education

Upon completion of this course the students will be able to:

- develop critical understanding on issues and investigations in Mathematics curriculum, pedagogy and assessment
- differentiate between significant research trends in Mathematics Education
- understand ethical issues in Mathematics Education research
- appreciate need and scope of interdisciplinary research in Mathematics Education
- conduct small scale research in a potential research area of their choice
- use appropriate statistical techniques to analyze the research data
- make meaningful inferences based on the analysis of research data
- compile and write based dissertation based on their experiences as a researcher