Pedagogy of Mathematics: Part – II

Course Code: BED604 **Credit: 02 (L-2, T-0, P-0)**
Contact Hours: 30 **MM: 50**
Course Objectives:

On completion of the course the student teacher will be able to:

- To appreciate mathematics as a tool to engage the mind of students
- To understand the role of mathematics in day-to-day life
- To develop competencies for teaching-learning mathematics through various measures
- To appreciate importance of mathematics laboratory in learning mathematics
- To develop ability to use concepts for life skills.
- To understand the nature, importance and strategies of problem-solving and generalization.

Course Outline:

Unit I: Planning for Teaching and Teaching of Generalization.

- Selecting the content for instruction; Identifying concepts to be transacted at various level with special emphasis on content (Algebra, Geometry, etc.); Organization of concepts for teaching-learning of mathematics.
- Stating instructional objectives, identifying learning experiences, appropriate strategies, teaching aids
- Approaches of lesson planning, writing lesson plans for mathematics lessons. Planning a unit of instruction in mathematics. ICT applications.
- Teaching Generalization by exposition, moves in teaching a generalization; introduction and types. planning of expository strategies of teaching generalizations.
- Teaching Generalization by guided discovery: Nature and purpose of learning by discovery, Inductive deductive, synthetic analytical method, laboratory method; guided discovery strategies, Maxims for planning and conducting discovery strategies; planning of strategies involving either induction or deduction or both.

Unit II: Teaching of Proof and Problem Solving:

- Teaching of Proof - Developing an intuition about the nature of proof - to make the transition from concrete thinking to more formal reasoning and abstract thinking as they progress from class to class.
- Kinds of proof - proof by mathematical induction, proof by contradiction, proof by cases, the contrapositive, conjectures, disproof by counter example.
- Teaching of Problem Solving - Definition of a problem, problem solving and teaching problem solving: importance of teaching problem solving posing a problem,
- Discovering or exploring various options for solving the problem i.e. developing heuristics, carrying out the plan and generating and extending a good problem.

Unit III: Learning Resources in Mathematics:

- Textbooks and audio-visual multimedia - selection and designing;

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- Using community resources for mathematics learning, pooling of learning resources in school complex/block/district level, handling hurdles in utilizing resources.
- Identifying learner's strengths and weaknesses; Activities enriching mathematics learning, supplementary text material, summer programmes, correspondence course, mathematics club, contests and fairs.
- designing mathematics laboratory and its effective use, recreational activities - games, puzzles and riddles in mathematics, cooperative learning ensuring equal partnership of learners with special needs, stimulating creativity and effectiveness in mathematics.

Course Outcome:

After completing the course, students will be able to:

To understand the role of mathematics in day-to-day life
To develop competencies for teaching-learning mathematics through various measures.
To appreciate importance of mathematics laboratory in learning mathematics.
To appreciate mathematics as a tool to engage the mind.
To develop ability to use concepts for life skills.
To understand the nature, importance and strategies of problem-solving and generalization.

Suggested Reading:

1. Butler and Wren. The Teaching of Secondary Mathematics, London McGraw Hill Book Company.
2. Cooney, T.J. and Others. Dynamics of Teaching Secondary School Mathematics, Boston: Houghton Mifflin.

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