

ELECTIVE COURSE 2 (EC 2)
PEDAGOGY OF SCHOOL SUBJECT: MATHEMATICS

Total Credits: 6

Total Marks: 100

Objectives

1. To understand the basic concepts associated with academic disciplines
2. To understand place of different disciplines in the school curriculum understand nature, scope & importance of Mathematics at secondary level.
3. To acquaint and formulate aims and instructional objectives in teaching mathematics in Secondary school level as per revised taxonomy.
4. To apply different approaches and methods of teaching mathematics in classroom situations.
5. To set up mathematics club in the school and organize its activities.
6. To use a mathematics laboratory to develop in students an interest in mathematics.
7. To understand the professional competencies, commitments and expectations of mathematics teacher.
8. To develop knowledge of various values of teaching Mathematics
9. To appreciate the role of mathematics in day-to-day life
10. To understand that mathematics is more than formulas and mechanical procedures
11. To channelize, evaluate, explain and reconstruct students' thinking
12. To appreciate the importance of mathematics laboratory in learning mathematics

MODULE 1: FUNDAMENTALS OF MATHEMATICS EDUCATION (2 Credits)

Unit 1: Basics of Academic Disciplines

- a) Meaning of academic disciplines, Relationship between academic disciplines and Mathematics
- b) Classification of academic disciplines: Becher -Biglan typology (pure-hard, pure soft, applied-hard, applied-soft types) with emphasis on nature of knowledge in each type.,
- c) Place of Mathematics in the present school curriculum

Unit 2: Introduction to the Teaching of Mathematics

- a) Meaning , Nature & scope of Mathematics
- b) Aims and Objectives of teaching Mathematics at Secondary and Higher Secondary Levels (NCF 2009)
- c) Values of teaching Mathematics

Unit 3: Essentials of Teaching Mathematics and Curriculum Transaction

- a) Maxims of teaching
 - From Known to Unknown
 - From Simple to Complex
 - From Particular to General
 - From Concrete to Abstract
 - From Whole to Part
- b) Approaches of curriculum construction-Concentric and Topical
- c) Pedagogical Analysis ,Unit Planning &Lesson planning

MODULE 2: TRANSACTING MATHEMATICS CURRICULUM**(2 Credits)****Unit 4: Methods and Techniques of Teaching Mathematics**

- Learner Centered methods ---Inductive Deductive (Teaching Generalizations), Analytical Synthetic (Teaching Proofs)
- Activity centered methods—Problem solving, Lecture cum Demonstration
- Techniques of teaching Mathematics ---Drill and Review, Assignment in Mathematics

Unit 5: Learning Resources

- Mathematic Laboratory & Mathematic club (objectives, significance)
- Textbook – Characteristics and Critical analysis
- Digital Resources for Teaching Mathematics- Geogebra & Virtual Manipulative (Meaning, Application, Advantages and Limitations)

Unit 6: Professional Development of Teacher

- Competencies of Mathematics teacher
- Need and Avenues of Continuous Professional Development
- Contribution of mathematicians- Aryabhata, Ramaujan, Euclid, Pythagoras

MODULE 3: INTERNAL ASSESSMENT**(2 Credits)**

Sr.No	Particulars	Marks
1	Task/Assignment/ Activity for each module held in the semester (2X10)	20
2	One periodical class test held in the given semester	15
3	One Essay held in the given semester	05
	Total	40

Any two of the following tasks:

- Plan and implement lessons in mathematics using appropriate methods/approaches to teach :
 - Generalizations
 - Theorems/ Proofs
 - Problem Solving
 - Lecture cum DemonstrationTake up a problem in mathematics (from any area like number system, geometry etc.). Make a group of 3 or 4 students to discuss about the probable ways of solving
- Conduct one lesson in the math using manipulative- Physical/ virtual.
- Assignment: For any one selected topic, prepare Pedagogical Analysis Plan
- Critically appreciate any one textbook of mathematics.
- Conduct one lesson in the math using manipulative- Physical/ virtual.
- Prepare a diagnostic test in mathematics.
- Critically appreciate any one textbook of mathematics.
- Collect the names of Mathematicians and Prepare a report about their contribution to Mathematics)

References:

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