

M.Ed. DEGREE PROGRAMME**SEMESTER I****CORE COURSE****Course Code: 904.6 ADVANCED METHODOLOGY OF
MATHEMATICS EDUCATION****COURSE OUTLINE**

Contact Hours : 108

Maximum Weight : 32

Duration of Exam : 3 hrs

No. of Credits : 4

Course Objectives

- ❖ To help the teacher educands to understand the development of mathematics as a logical system.
- ❖ To enable the teacher educands to understand the objectives of teaching mathematics
- ❖ To acquaint the teacher educands with the logical assumptions behind curricular planning in mathematics.
- ❖ To acquaint the teacher educands with the informal approaches in mathematics teaching.
- ❖ To develop the ability and skills for evaluating range of outcomes in mathematics education.
- ❖ To enhance and facilitate professional competency of teacher educands of mathematics education.
- ❖ To acquaint the teacher educands with modrn trends in evaluation.

Course content**Unit I : Nature, Development and significance of mathematics (18 hours)**

- Modern mathematics
- Abstractness of mathematics
- Distinction between mathematics and science
- Distinct roles of pure and applied mathematics

- Aesthetic aspect of mathematics
- Historical development of mathematical concepts with some of the famous anecdotes such as Gauss, Ramanujan etc.
- Mathematical modeling

Unit 2 : Objective of Mathematics Education (20 hrs)

- Aims of Mathematics Education – NCF (2005) & KCF (2007)
- Taxonomy of Educational Objectives – Bloom, Wilson, Yager
- Competency based approach
- Constructivism –Issue based Approach, Holistic Approach

Unit 3 : Mathematics Curriculum (30 hrs)

- Curriculum Development – Approaches and Patterns – Criteria for selection and organization of contents
- New trends in the development and transaction of mathematics curriculum
- Differential curricula – Horizontal and Vertical Acceleration – Enrichment Programmes – individualized instruction

Unit 4 : Informal Approach in Mathematics Teaching (10 hrs)

- Mathematics exhibition, club, field trip, mathematics library and laboratory
- Recreational mathematics – puzzles, games, amusements

Unit 5 : Mathematics Teacher (10 hrs)

- Professional Competencies and Challenges of Mathematics Teachers
- Components of class room management
- Professional Development Programmes for Mathematics Teachers
- Extension Activities for Mathematics Teachers

Unit 6 : Evaluation in Mathematics (20 hrs)

- Concept of Evaluation in Teaching – Learning Programme
- Role of CCE (Continuous & Comprehensive Evaluation)
- Competency based Evaluation

Practicum (Any two items)

1. Prepare a lesson design based on any one modern instructional strategy.
2. Critically analyse the curriculum of Mathematics at higher secondary level and prepare a lesson module.
3. Construct and standardize an achievement test in mathematics at secondary /higher secondary level.

References

1. Beryl. A. Geber (ed.) (1977). *Piaget and Knowing studies in Genetic Epistemology*. London: Routledge, Kegan Paul Ltd.
2. Bloom, B.S. (ed.) (1956). *Taxonomy of Educational objectives: The classification of Educational goals, handbook I : Cognitive Domain*.
3. Bloom, B.S, Hastings, J.T and Madaus, G.K. (1971). *Handbook on Formative and Summative Evaluation of student learning*. New York: Mc Graw Hill and Company.
4. Burton, L. (1999). *Learning Mathematics from Hierarchies to Networks*. New York: Falmer Press.
5. Gronlund, N.E. (1982). *Constructing Achievement Tests* (3rd Ed.), New Jersey: Prentice-Hall Inc Engle wood Cliffs.
6. Kim, E.C. and Kellough, R.C. (1978). *A Resource guide for secondary school Teaching*. New York: Mac Millan Inc.
7. Michelle Selinger (1994). *Teaching mathematics* London: Routledge.
8. Santhanam S. (1985). *Teachers and Learners*. New Delhi: Shanta Publishers.
9. Young, J.W.A. *The Teaching of Mathematics in the Elementary and Secondary Schools*. New York: American Teachers Series.
10. Butler, C.H. and Wren, F.L. (1965). *The teaching of secondary Mathematics*. New York : Mc Graw Hill.

Mahatma Gandhi University
M.Ed. Degree (CBCSS) First Semester Examination
Course Code 904.6 : Advanced Methodology of Mathematics Education

Time : Three hours

Maximum Weight : 32

PART - A

Answer any two questions. Each question carries a weight of 4.

1. What are the principles of constructing a Mathematics curriculum? Evaluate the present day higher secondary school mathematics curriculum.
2. Explain the modern trends and techniques of teaching mathematics.
3. Describe concept of evaluation in teaching mathematics and explain linear programming.
4. What are the different aims and objectives of teaching mathematics at secondary level.

(2×4 = 8 weight)

PART - B

Answer any six questions in two pages. Each question carries a weight of 2.

5. Distinguish between mathematics and science.
6. What is the importance of history of mathematics?
7. Explain different objectives under affective domain.
8. Define horizontal and vertical acceleration of mathematics curriculum. Explain its importance in secondary level.
9. What are the different advantages of library and laboratory?
10. Explain the role of continuous and comprehensive evaluation.
11. From your point of view write the challenges of mathematics teacher at elementary level.
12. Explain different components of classroom management.

(6×2 = 12 weight)

PART - C

Answer any six questions. Each question carries a weight of 1.

13. Write the different objectives under Wilson's classification.
14. Define Issue Based Approach.
15. Explain principle of curriculum organization.
16. Define supervised study.
17. How will you form a mathematics club?
18. Write five recreational activities in mathematics.
19. How do the mathematical puzzles help the students to develop interest in mathematics?
20. What are the extension activities for mathematics teachers?

(6×1 = 6 weight)

PART - D

Answer all questions. Each question carries ½ weight

21. Give one example for New math.
22. Give an example for a mathematic game.
23. What is teacher's diary?
24. Mention two characteristics of mathematics teacher.
25. What do you mean by evaluation?
26. Suggest two techniques for individualizing instruction.
27. Who is the exponent of branched programming?
28. Write two uses of mathematics Department Library.
29. Give two merits of Spiral Curriculum.
30. Suggest two measures to develop interest in mathematics learning.
31. Define competency based evaluation.
32. Bring out two advantages of mathematics exhibition.

(12× ½ = 6 weight)