

TRENDS & CONTEMPORARY ISSUES IN MATHEMATICS EDUCATION

Course Code: EDBESc363

Credit Hours: 3

Course Description

Mathematics education has undergone many shifts and in recent century its importance has been enormously recognized. The rapidly changing environment, globalization, environmental changes and developments in the relevant fields demands rigorous changes in theory and practices of mathematics education and efforts to equip individuals with mathematics knowledge and mathematics skills to meet the challenges of twenty first century. This course gives an overview of the contemporary issues and trends in mathematics education: Mathematics curriculum, teaching and learning, assessment, use of technology, research, experiences, and reforms in mathematics education. This course will help to manage mathematics education according to Pakistani context, while keeping in view global trends.

Learning Outcomes of the Course:

On successful completion of this course, you should be able to:

1. Explain conditions creating a demand for change in mathematics education at elementary and secondary level
2. Analyze current status of elementary and secondary mathematics education of Pakistan
3. Debate on contemporary issues in mathematics education related to goals, curricular frameworks, content, instruction, assessment and experiences for mathematics education.
4. Make recommendations for possible solutions of current issues of mathematics education
5. Explain the new trends in mathematics curricula, pedagogy of mathematics, ways of mathematics learning and development & use of instructional materials towards mathematics education both at national & international level
6. Discuss Research related to learning, curriculum, instructional materials and instruction in mathematics education
7. Discuss current activities and reforms to bring changes in curriculum development & implementation, instructional materials and instruction for elementary and secondary mathematics education
8. Make judgments and recommendations for improvement of mathematics education in Pakistani context

CONTENTS

PART I: Conditions creating a demand for change

1. Environmental, social/cultural, technological and economic demands for change in mathematics education
2. Changing world and mathematics education

PART II: Current status of mathematics education in elementary and secondary schools

1. Achievements
2. Curriculum
3. Instructional materials and instruction
4. Assessments

PART III: Contemporary issues in mathematics education: goals, curricular frameworks, content, instruction, assessment and experiences form a thematics education at elementary and secondary level at both National & International level

1. Elementary and secondary school mathematics education frameworks
2. Educational Policies, commissions and associations and its implications for mathematics education in Pakistan
3. Issues related to curriculum development in Pakistan
4. Issues of content in mathematics education
5. Instructional issues in mathematics education
6. Assessment issues in mathematics education
7. Relationship of among mathematics, science, and technology
8. Gender, cultural and social issues in mathematics education
9. Cultural and language issues and their effect on mathematics education
10. Effect of gender, globalization and learners' attitudes on mathematics education
11. Current problems in mathematics education

PART IV: Research related to learning, curriculum, instructional materials and instruction in mathematics education

Research on:

1. Learning of mathematics
2. Mathematics curriculum
3. Instructional materials, instruction and mathematics classroom environment
4. Assessment and evaluation in mathematics
5. Mathematics teachers characteristics, behaviors and preparation

PART V: Contemporary trends in mathematics curriculum, instructional materials and instruction for elementary and secondary mathematics education

1. Curricular reforms in mathematics Education
2. Curriculum matters: looking back, looking forward
3. The current state of the school mathematics curriculum
4. Technology and the mathematics curriculum
5. Curriculum as a change agent
6. Mathematics for all: problems and implications
7. Goal of mathematics education in 21st century
8. Trend in international Math and Scientific Studies (TIMSS): Introduction & Major findings in mathematics domain
9. Program for International Students Assessment (PISA): Introduction & Major findings in mathematics domain
10. Constructivism in mathematics Education: Theoretical background
11. Constructivism in mathematics Education: Practices in classroom and challenges
12. Use of concept mapping technique in teaching mathematics

13. Scientific Inquiry in mathematics Education
14. Nature of mathematics
15. ICT in mathematics Education
16. Mathematics teacher recruitment standards: A comparative approach
17. Modern Assessment practices in mathematics disciplines
18. Career opportunities with mathematics Education
19. Mathematics education at higher education level: An introduction to degree programs offered in Mathematics Education round the world
20. Use of low cost no cost material in Mathematics Education

21. Teaching-learning Strategies

22. The instructional strategies will focus on constructionist learning approach. These strategies will be diverse in line with the course contents. Therefore, these strategies will include but not limited to demonstration, cooperative learning, collaborative learning, teacher and student-led discussion, individual and group presentations, reflective practices and classroom activities.

Assessment and Examinations

Students will be assessed according to the following criteria.

Examination	Marks Distribution
Sessional work	25 %
Mid Semester	35%
Final Semester	40%

Suggested Readings

- Borwein, J. M., Bailey, D. H., & Girgensohn, R. (2004). *Experimentation in mathematics: Computational paths to discovery*. New York: CRC Press.
- Ransaw, T. S., & Majors, R. (2017). *Emerging issues and trends in education*. Michigan: Michigan State University Press.
- Reys, B. J., Reys, R. E., & Rubenstein, R. (2010). *Mathematics curriculum: Issues, trends, and future directions*. Reston, VA: National Council of Teachers of Mathematics.
- Sylvester, C. (1994). *Feminist theory and international relation, in post-modern era*. NY: Cambridge University Press.
- UNESCO, Pakistan (2004). *Quality of education in Pakistan*. UNESCO Office, Islamabad.