**UNIVERSITY OF SARGODHA**

**DEPARTMENT OF EDUCATION**

COURSE OUTLINE (BS – honor) Semester V Fall 2020

Course Title: Teaching Mathematics

Course Code: EDU-511

Credit Hours: 4(4-0)

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DESCRIPTION AND OBJECTIVES

This course will equip prospective teachers with knowledge and skills to teach Mathematics to grades I through VIII. They will become familiar with the Mathematics curriculum and expected student learning outcomes. Prospective teachers will learn to use a variety of instructional methods that promote active learning of math, including making and using teaching and learning materials. They will plan Mathematics lessons and activities and practice teaching Mathematics with peers.

INTENDED LEARNING OUTCOMES

At the end of the course, the prospective teachers will be able to:

* Describe the nature, history and development of Mathematics at elementary level in Pakistan
* Acquire the skills and competencies required for the teaching of Mathematics at elementary level
* Apply effectively the various methods of teaching Mathematics
* Know and use techniques and strategies of teaching Mathematics at elementary level
* Make and use teaching aids effectively

COURSE CONTENTS

1. **Methods of Teaching Mathematics:** 
   1. Inductive Method
   2. Deductive Method
   3. Analytic method
   4. Synthetic Method
   5. Heuristic Method
   6. Project Method
   7. Problem Solving Method
2. **Techniques of Teaching Mathematics** 
   1. Oral work, written work, assigned work, project work
   2. Discussions/ Group work
   3. Drill and practice: Forms of classrooms organization (whole class, large group, small group, individual work)
3. **Teaching Aids and Mathematics Laboratory** 
   1. Importance of teaching aids in Mathematics teaching
   2. Some important modern teaching aids for Mathematics including computer
   3. How to set up a Mathematics laboratory in elementary school
   4. How to use teaching aids and Mathematics laboratory
   5. Use of low cost /no cost materials (from classrooms and surrounding for teaching of Mathematics
   6. Child centred activities in Mathematics (educational trips, preparation of materials)
4. **Measuring Achievements in Mathematics** 
   1. Preparation of different types of test in Mathematics
   2. Using tests for diagnostic purpose
   3. Interpreting test results
5. **Planning Mathematics Learning** 
   1. Importance of planning in teaching of Mathematics
   2. Planning for the full course
   3. Scheme of work
   4. Lesson planning
   5. Qualities of good lesson plan
   6. Development of model lesson plans
6. **Content** 
   1. Numeration Systems
   2. Concept of Addition and Subtraction
   3. Concept of Multiplication and divisions
   4. Numbers Theory & Integers
   5. Fractions
   6. Set & Functions
   7. Elementary Statistical Concepts and Information Handling
   8. Percentage, Ratio and Proportion
   9. Algebraic Expressions
   10. Geometry and Trigonometry

COURSE SCHEDULE

|  |  |  |
| --- | --- | --- |
| **Week** | **Topics and Readings** | **Books with Page No.** |
| 1 | **1. Methods of Teaching Mathematics:**  1.1 Inductive Method  1.2 Deductive Method  1.3 Analytic method  1.4 Synthetic Method |  |
| 2 | **1. Methods of Teaching Mathematics:**  1.5 Heuristic Method  1.6 Project Method  1.7 Problem Solving Method |  |
| 3 | **2. Techniques of Teaching Mathematics**  2.1 Oral work, written work, assigned work, project work  2.2 Discussions/ Group work |  |
| 4 | **2. Techniques of Teaching Mathematics**  2.3 Drill and practice: Forms of classrooms organization (whole class, large group, small group, individual work) |  |
| 5 | **3. Teaching Aids and Mathematics Laboratory**  3.1 Importance of teaching aids in Mathematics teaching  3.2 Some important modern teaching aids for Mathematics including computer  3.3 How to set up a Mathematics laboratory in elementary school |  |
| 6 | **3. Teaching Aids and Mathematics Laboratory**  3.4 How to use teaching aids and Mathematics laboratory  3.5 Use of low cost /no cost materials (from classrooms and surrounding for teaching of Mathematics  3.6 Child centred activities in Mathematics (educational trips, preparation of materials) |  |
| 7 | **4. Measuring Achievements in Mathematics**  4.1 Preparation of different types of test in Mathematics |  |
| **8** | **Mid Term Exam** |  |
| 9 | **4. Measuring Achievements in Mathematics**  4.2 Using tests for diagnostic purpose  4.3 Interpreting test results |  |
| 10 | **5. Planning Mathematics Learning**  5.1 Importance of planning in teaching of Mathematics  5.2 Planning for the full course  5.3 Scheme of work |  |
| 11 | **5. Planning Mathematics Learning**  5.4 Lesson planning  5.5 Qualities of good lesson plan  5.6 Development of model lesson plans |  |
| 12 | **6. Content**  6.1 Numeration Systems  6.2 Concept of Addition and Subtraction  6.3 Concept of Multiplication and divisions  6.4 Numbers Theory & Integers |  |
| 13 | **6. Content**  6.5 Fractions  6.6 Set & Functions  6.7 Elementary Statistical Concepts and Information Handling |  |
| 14 | **6. Content**  6.8 Percentage, Ratio and Proportion  6.9 Algebraic Expressions  6.10 Geometry and Trigonometry |  |
| 15 | **Mini Research Project** (practical work by the student teachers) |  |
| **16** | **Final Term Exam** |  |

RESEARCH PROJECT /PRACTICALS /LABS /ASSIGNMENTS

Practical work by the student teachers

Preparing a Research Proposal and Research Report

ASSESSMENT CRITERIA

MidTerm Exam 30%

Sessional Marks 20%

MidTerm Exam 50%

READINGS

Recommended Books

Fauvel, John & Jeremy Gray (1990). The History of Mathematics: A Reader: London: Macmillan Press Ltd.

Greer, Brian and Gerry Mulhern, (1989). New Directions in Mathematics Education. New York: Routledge.

Lacombe, Antony. (1985) Mathematical Learning Difficulties in the Secondary School: Pupils‟ needs and Teacher’s Role. England: Milton Keynes,

Leon, Burton & Jaworski, Barbara (Editors) (1995). Technology in Mathematics Teaching, Chartwell. Orton, Anthony Wain Geoffrey (Editors) (1994), Issues in Teaching of Maths, London: Cassell Villiers House.

Bennett–Jr., A.B. and Nelson. L.T. (2004). Mathematics for elementary teachers: A conceptual approach. (6th ed.). Boston: McGrew-Hill, Inc.

Lodhi, S. M. Sipea, G. S. et al (2003). Mathematics -9. Lahore: Punjab Text Board

Rabbani, M.I. (2003). New millennium: Introduction to Pakistan studies Lahore: Carvan Book House.

Saleemi, F. (2003). Mathematics. (from class 1 to 8). Lahore: P T B.

Thong, H.S. and Hong, K. N. (2003). New additional Mathematics (for O’ level). Karachi: paramount publishing Enterprise.

~~Suggested Books~~

~~Langan, J. (2016).~~ *~~College writing skills.~~* ~~McGraw-Hill Higher Education.~~

~~Laurie G.Kirszner and Stephen R. (2018).~~ *~~Patterns of college writing~~* ~~(4~~~~th~~ ~~Ed.). Mandell: St. Martins Press.~~