Level B. Ed (ICT)/ Semester VII **Full Marks : 60**

Course Title: Teaching Mathematics **Pass Marks : 30**

Nature of the Course: Theory **Credit Hours : 3**

1.Course Description

This course is designed for B.ED. (ICT) to fulfill the gap between pedagogical knowledge and ICT tools which can be effectively used in the classroom situation. The main purpose of this course is to enhance teaching competency in prospective teachers using ICT tools and methods in teaching mathematics. This course provides an understanding of different learning theories, instructional strategies, evaluation techniques, and an skill of planning lessons in order to achieve the aim of preparing professionally competent teacher.

2. General objectives

The general objectives of this course are as follows:

- To develop an understanding on difference between mathematics and mathematics education.
- To impart knowledge to the students on learning theories and related instructional strategies
- To make the students able in classifying and preparing learning objectives of different domains of Bloom's taxonomy
- To provide the ability of discovering learning difficulties and preparing strategies to facilitate learning of a particular content.
- To develop skills in analyzing different instructional strategies and to use them in the classroom instruction.
- To develop the knowledge and skills for the development of a professionally sound teacher.
- To enable the students in developing evaluation techniques and use them in the respective purpose.
- To develop appropriate teaching skills for a particular content from school mathematics.

3. Specific Objective and Contents

Specific Objectives	Contents
• Explain the meaning and definition of mathematics and mathematics education. • To describe the nature of mathematics and mathematics education.	**Unit I: Math and Math Education (3)** 1.1 Mathematics and mathematics education 1.2 Nature of mathematics and mathematics education 1.3 Difference between mathematics and mathematics education

• Differentiate between mathematics and mathematics education.	
• Explain Piaget stages theory • Describe Bruner's process theory • Explain Gagne's information processing theory • Explain the implications of different learning theories	**Unit II: Different Learning Theories (5)** 2.1 Cognitive theories of learning mathematics: • Piaget's learning theory • Bruner's learning theory • Gagne's learning theory 2.2 Implications of different learning theories.
• Differentiate between general and specific objectives • Classify specific objectives according to Bloom`s taxonomy • Write specific objectives of different domains	**Unit III: Formulation of Instructional Objectives (8)** 3.1.Introduction to goals and objectives 3.2Instructional objectives and their classification based on Bloom`s taxonomy 3.3Writing instructional objectives
• To enable the students describe the importance of different level of planning at school. • To identify the types of planning • To enable the students to describe the importance of planning • To enable the students to prepare different types of plans.	**Unit IV: Instructional Planning (8)** 4.1 Introduction 4.2Types of planning 4.3 Importance of planning 4.4 Preparing different types of plans • Annual Plan • Unit Plan • Lesson Plan
• Explain the problems of mathematics instruction	**Unit V: Instructional Strategies (10)** 5.1Problems of instruction in mathematics

• Describe different methods of teaching mathematics • Explain different teaching strategies in mathematics classroom.	• Understanding, • Assimilation, • Permanence • Tansfer 5.2 Different teaching methods used under different instructional strategies in mathematics classroom • Lecture • Laboratory • Inductive • Deductive • Analytic • Deductive • Problem solving • Guided discovery • Project method
• Apply traditional and alternative assessment techniques in evaluating student`s achievement. • Describe the challenges for the use of formative assessment • Differentiate between measurement and evaluation • Describe different types of tests	**Unit VI: Evaluation (6)** 6.1Traditional vs alternative assessment • Formative assessment • Challenges of formative assessment • Suggestions for improvement of formative assessment. • Summative assessment and its use 6.2 Measurement and evaluation • Meaning • Types • Comparison 6.3Different types of tests • Achievement test • Diagnostic test
• To develop appropriate teaching skills using ICT soft wares for a particular content	**Unit VII: Teaching Selected topics of different branches of mathematics (8)** • Arithmetic • Algebra

from school mathematics in the area of : • Arithmetic • Algebra • Geometry	• Geometry

4. Instructional Techniques

4.1 General Instructional Techniques: Although ,the lecture method dominates the teaching – learning program,the following methods can be used appropriately **:**

- Lecture
- Discussion
- Presentation
- Project work

4.2 **Specific Instructional Techniques** : Based on the nature of the content , the following specific techniques can be performed using Goe-gebra ,Photomat ,Malmath :

- Project work

- Assessment
- Discussion
- Report writing and presentation

5. Evaluation

5.1 Internal Evaluation 40%

Internal evaluation will be conducted by subject teacher based on the following aspects:

Attendance	5 marks
Participation in learning activities	5 marks
First assignment	10 marks
Second assignment	10 marks
Third assignment/Assessment	10 marks
Total	40 marks

5.2 External Evaluation (60%)

The Examination Division of Dean Office, Faculty of education will conduct the final examination at the end of semester . The number of questions and marks allocated to different types of questions will be as follows :

Types of questions	Total questions	Marks allocated	Total marks
Multiple choice items	10	10 x 1 mark	10
Short questions	6	6 x 5 marks	30
Long questions	2	2 x 10 marks	20

6. Recommended and Reference Books

6.1 Recommended books:

Maharjan, H.B. Upadhyaya. H.N. & Poudel, L.N.(2063). *Teaching mathematics in secondary schools.* Kathmandu: Bhundi Puran Prakashan.

Pandit, R.P.(2009*). Teaching mathematics, Kathmandu*: Indira Pandit .

Rahman, M.H. (2007). *Teaching mathematics* (3rd edition). Kathmandu:Subdharatha Prakashan.

Upadhyay. H. P.; et.al. (2070). *Exploratory teaching mathematics* (1st edition). Kathmandu: Sukunda Pustak Bhawan.

6.2Reference Books:

Acharya, B. R.(2017). *Diversity in mathematics education*. Kathmandu:Pinnacle publication.

Acharya, B. R. (2017). *Foundation of mathematics education*. Kathmandu: Dikshant Prakashant Prakashan.

Bell, H.F. (1978). *Teaching and learning mathematics*. WMC Brown Company.

Cangelosi,(2003). *Teaching mathematics in secondary and middle schools*: An interactive approach (3rd edition). Ohics Merill Prentice Hall.

Cangelosi, J.S.(1990). *Designing tests for evaluating students achievement*. New York: Addision Wesly Publishing Co.Inc.

Posamentier, Alfred S., Stepelman J.(2002). *Teaching of secondary mathematics techniques andeEnrichment* Units. USA: Merill Prentice Hall

Posamentier, A.S. & Stepelmn, J.(1990). *Teaching secondary school mathematic*s(3rd edition. New York: Mcmilan Publishing Company. .