

**(III) Area of Specialization Courses in Chemistry**  
**TEACHING OF CHEMISTRY**

**Course Code: EDBESc-356**

**Credit Hours: 3**

**Course Description**

This course is designed specifically to equip the prospective science teachers with the latest pedagogical knowledge required to teach the contents of Chemistry at secondary level. In addition, the course will also provide the prospective science teachers an acquaintance with the modern assessment techniques and use of laboratory and computers in the field of teaching of Chemistry.

**Learning Outcomes**

At the end of the course, Students will be able to:

1. Differentiate between method, technique and strategy in context of teaching.
2. Describe various methods for teaching of chemistry.
3. Identify most suitable method to teach diverse topics.
4. Extend their knowledge of teaching to implement various methodologies.
5. Recognize the importance of teaching of chemistry.
6. Demonstrate the use of low cost no cost materials for teaching of chemistry.
7. Apply the computer technology for teaching of chemistry.
8. Use the laboratory apparatus effectively for disseminating chemical knowledge.

**Contents**

**1. Teaching of chemistry**

- 1.1 Introduction
- 1.2 The Nature of science
- 1.3 Scientific literacy and its importance
- 1.4 Definition of sciences: Science as product and process
- 1.5 The products of science
- 1.6 Processes of science
- 1.7 Scientific attitudes
- 1.8 The nature of scientific laws, facts, concepts and theories
- 1.9 Physical sciences and limitations of science
- 1.10 Definition of chemistry
- 1.11 Importance of chemistry in everyday life
- 1.12 Why teach chemistry

**2. Aims and Learning Outcomes of teaching chemistry**

- 2.1 Aims of teaching chemistry
- 2.2 Criteria for selection of aims
- 2.3 Learning Outcomes of teaching chemistry
- 2.4 Writing Learning Outcomes
- 2.5 Difference between aims and Learning Outcomes

**3. Methods of teaching chemistry**

- 3.1 Various methods of teaching chemistry
- 3.2 Lecture method
- 3.3 Demonstration method
- 3.4 Heuristic method
- 3.5 Assignment method
- 3.6 Project method
- 3.7 Inductive method
- 3.8 Deductive method
- 3.9 Scientific method

- 3.10 Problem method
- 3.11 Choice of method
- 4. The Nature of Children and Science Teaching**
  - 4.1 Piagetian theory of cognitive development
  - 4.2 Stages of cognitive development
  - 4.3 Characteristics of individual in various stages of cognitive development
  - 4.4 Piaget's theory and science curriculum
  - 4.5 Implications of Piagetian theory in facilitating learning of science
  - 4.6 The process of learning according to Robert Gagne, David Ausubel and Bruner
- 5. Lesson Planning**
  - 5.1 Advantages of the Lesson Planning
  - 5.2 Feature of a lesson plan
  - 5.3 Steps in lesson plan
- 6. Teaching aids in chemistry**
  - 6.1 Importance of teaching aids
  - 6.2 Principles for selection of teaching aids
  - 6.3 Principles for effective use of teaching aids
  - 6.4 Different types of teaching aid material
- 7. Apparatus and Equipment**
  - 7.1 Introduction
  - 7.2 Locally produces low cost equipment
  - 7.3 Chemicals
  - 7.4 Charts, Diagrams, Pictures and Bulletin board
  - 7.5 Improvised Apparatus
  - 7.6 Text books
- 8. The Chemistry Teacher**
  - 8.1 Duties and Responsibilities of a Chemistry teacher
  - 8.2 Effective use of Chemistry Laboratory
  - 8.3 Making Chemistry teaching more Interesting
- 9. Evaluation in Chemistry**
  - 9.1 Introduction
  - 9.2 Designing of Test
  - 9.3 Evaluation of Functional skills
  - 9.4 The Assessment of Practical work
  - 9.5 Recent Trends in Teaching of Chemistry

#### **Assessment and Examinations**

The students will be assessed according to the following criteria.

<b>Examination</b>	<b>Marks Distribution</b>
Sessional work	25 %
Mid Semester	35%
Final Semester	40%

### Suggested Readings

- Barke, H., Hazari, A., & Yitbarek, S. (2010). *Misconceptions in chemistry: Addressing perceptions in chemical education*. Berlin: Springer.
- Eilks, I., & Hofstein, A. (2013). *Teaching chemistry-- a study book: A practical guide and textbook for student teachers, teacher trainees and teachers*. Rotterdam: Sense Publishers.
- Eilks, I., Byers, B., Royal Society of Chemistry (Great Britain), & European Chemistry Thematic Network. (2009). *Innovative methods of teaching and learning chemistry in higher education*. Cambridge, UK: RSC Publishing.
- Gallagher-Bolos, J. A., & Smithenry, D. W. (2004). *Teaching inquiry-based chemistry: creating student-led scientific communities*. Portsmouth, NH: Heinemann
- Niaz, M. (2008). *Teaching general chemistry*. New York: Nova Science Publishers.
- Pauling, L. (2014). *General chemistry*. Newburyport: Dover Publications.