

(III) Area of Specialization Courses in Physics
TEACHING OF PHYSICS

Course Code:EDBESc-366

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 Physics 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 Physics.

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 Physics.
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 Physics.
6. Demonstrate the use of low cost no cost materials for teaching of Physics.
7. Apply the computer technology for teaching of Physics.
8. Use the laboratory apparatus effectively for disseminating physical knowledge.

Contents

1. Teaching of Physics

- 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 Physics
- 1.11 Importance of Physics in everyday life
- 1.12 Why teach Physics

2. Aims and Learning Outcomes of teaching Physics

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

3. Methods of teaching Physics

- 3.1 Various methods of teaching Physics
 - 3.1.1 Lecture method
 - 3.1.2 Demonstration method
 - 3.1.3 Heuristic method
 - 3.1.4 Assignment method
 - 3.1.5 Project method
 - 3.1.6 Inductive method
 - 3.1.7 Deductive method
 - 3.1.8 Scientific method
 - 3.1.9 Problem Solving method

3.2 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 Physics

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

8. Apparatus and Equipment

8.1 Introduction

8.2 Locally produces low cost equipment

8.3 Chemicals

8.4 Charts, Diagrams, Pictures and Bulletin board

8.5 Improvised Apparatus

8.6 Text books

9. The Physics Teacher

9.1 Duties and Responsibilities of a Physics teacher

9.2 Effective use of Physics Laboratory

9.3 Making Physics teaching more interesting

10. Evaluation in Physics

10.1 Introduction

10.2 Designing of Test

10.3 Evaluation of Functional skills

10.4 The Assessment of Practical work

10.5 Recent Trends in Teaching of Physics

Assessment and Examinations

The students will be assessed according to the following criteria.

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

Suggested Readings

- Bishop, K., & Denley, P. (2007). *Learning science teaching*. Maidenhead, England: McGraw Hill/Open University Press
- Martin, R. E., Sexton, C. M., & Gerlovich, J. A. (2001). *Teaching science for all children*. Boston: Allyn and Bacon
- Nayak, A. K. (2008). *Teaching of physics*. New Delhi, India: A P H Publishing Corporation
- Nilson, L. B. (2016). *Teaching at its best: A research-based resource for college instructors*. John Wiley & Sons.
- Olugbenga, A. F. (2011). *Physics pedagogy: A study of methods for improving the teaching of physics to a group of slow learning students*. Saarbrücken: LAP Lambert.
- Toplis, R. (2015). *Learning to teach science in the secondary school: A companion to school experience* (4th ed.). NY: Routledge.
- Wellington, J. J., Ireson, G., & Wellington, J. J. (2008). *Science learning, science teaching*. London: Routledge.