

**B.Ed. OPTIONAL COURSE**  
**PHYSICAL SCIENCE-PAPER-II**

**OBJECTIVES**

At the end of the course, the student- teachers will be able to

- understand the place of Physics and Chemistry in the modern world and the contribution of mankind in the development of Science.
- understand the psychological basis of modern trends in teaching Science and new techniques of teaching Science.
- develop lesson plans with activity approach.
- understand the principles of construction and standardization of diagnostic and aptitude tests in Physical Science.
- evaluate Physics and Chemistry book of different types.
- be aware of the recent trends in Science education.
- understand the problems of Science teaching in urban and rural schools and to develop scientific perspective of the problems confronting the world and the role of Science in solving them.
- acquire knowledge of all basic concepts in Physics and Chemistry.

**UNIT-I: Globalization and Discoveries in Science**

The meaning of Science-different branches of Science-Globalization and Science-Science and Society-values of teaching Science and importance of studying Science in school curriculum-discoveries and advancements in Science-knowledge of basic concepts in Science up to standard XII.

**UNIT-II: Science Curriculum**

Curriculum-Principles of curriculum construction-Organization of content matter-Critical evaluation of Tamil Nadu higher secondary school Science Curriculum-Curriculum Improvement Projects in India-NCERT and Abroad-CHEM Study, PSSC, CBA, Nuffield-recent trends in Science curriculum.

### **UNIT-III: Models of Teaching Science**

Modern trends in teaching of Science, different taxonomies, Psychological basis of methods in Science teaching - Gagne, Bruner, Piaget - Models of teaching Physical Science with one illustration for each type of model.

### **UNIT-IV: Modern Methods of Teaching Physical Science**

Modern methods of Teaching Physical Science: Group Discussion, Panel Discussion, Workshop, Seminar, Symposium, Team Teaching, Supervised Study, Computer Aided Instruction- Justification for including Physics and Chemistry separately at the higher secondary level.

### **UNIT-V: Lesson Planning**

Developing Lesson Plans using principles of Piaget, Bruner and Gagne-Activity approach in preparing lesson plans.

### **UNIT-IV: Individualization of Instruction**

Catering to individual differences, Identification and care of the scientifically talented pupils, National Talent Examination, helping Slow and Gifted learners.

### **UNIT-VII: Evaluation**

Evaluation of Teaching-Criterion Referenced Tests and Norm Referenced Tests-construction of Diagnostic and Aptitude tests in Physical Science.

### **UNIT-VIII: Science Text Book**

Qualities of a good Science textbook-use of textbooks inside and outside the classroom-Criteria for evaluation of Science textbooks. Critical analysis of the existing Tamil Nadu Science Text Book at the higher secondary level.

### **UNIT-IX: Science Library**

Science Libraries-values of school Science Libraries-School library and Class library-Journals and Magazines in Science-Nationalization of books.

## **UNIT-X: Problems of Science Teaching**

Problems of Science teaching in urban and rural areas-Global problems-Pollution -Diseases-Global warming, over population, malnutrition, superstitious beliefs. How Science teaching can help in solving them. Developing scientific temper among the people in the society.

### **PRACTICAL WORK**

1. Construction and standardization of diagnostic test in a Physics or Chemistry unit of Standard XI or XII.
2. Practising (3 sessions each of ten minutes) classroom interaction analysis and presenting the report.
3. Preparation of 3 improvised apparatus that could be used for standard XI or XII
4. Preparation of a lesson plan for Power Point presentation.
5. Evaluating reports of 3 websites in Science.
6. Preparation of work sheets

### **REFERENCES**

- Sharma, P.C. (2006). *Modern Science Teaching*, Dhanpat Rai Publications, New Delhi.
- Nayak, (2003). *Teaching of Physics*, APH Publications, New Delhi.
- Pandey, (2003). *Major Issues in Science Teaching*, Sumit Publications, New Delhi.
- Yadav, M.S. (2003). *Teaching of Science*, Amol Publications.
- Jenkins, E.W. (2000). *Innovations in Science and Technology Education*, Vol. VII, UNESCO, Paris.
- UNESCO-ICASE, Delhi University, (2000). *STL for All Materials*, UNESCO, New Delhi.
- Williams, B., (1999). *Internet for Teachers*, John Wiley & Sons, U.S.A.
- Natrajan, C. (Ed.). (1997). *Activity Based Foundation Course on Science Technology and Society*, Homi Bhabha Centre for Science Education, Mumbai
- NCERT, (1997), *Fifth Survey of Research in Education*, NCERT, New Delhi.
- Falvery, P., Holbrook, J., Conian, D. (1994). *Assessing Students*, Longmans Publications, Hongkong.

- UNESCO, 1993, *Final Report : International Forum on STL for All*, UNESCO, Paris.
- Husen, T., Keeves, J.P., (Eds.), (1991). *Issues in Science Education*, Pergamon Press, Oxford.
- Chauhan, S.S. (1985). *Innovation in Teaching and Learning Process*, Vikas Publishing House.
- Sharma, R.C. (1985). *Modern Science Teaching*, Thanpat Rai and Sons.
- Harms, N., Yager, R. (1981). *What Research Says to the Science Teacher*, Vol. 3, National Science Teachers Association, Washington DC, USA.
- Khana, S.D., Sexena, V.R. Lamba, T.P. and Murthy, V. (1976). *Technology of Teaching*, Doaba House.
- Panneer Selvam, A. (1976). *Teaching of Physical Science (Tamil)*, Government of Tamil Nadu.
- Mee, A.J. (1967). *A Modern Chemistry for Schools*, J.M. Dent & Son Limited, Bedford Street, London.
- Saunders, H.N. (1967). *The Teaching of General Science in Tropical Secondary School*, Oxford University Press, London,
- Chemistry Text Book, (1964). *Lab Manual and Teacher's Guipe Book*, NCERT Publication.
- P.S.S.C., (1964). *Physics Teachers Resource Book and Guide*, NCERT Publication.
- Thurber, Walter, A., and Collettee, Alfred, T. (1964). *Teaching Science in Today's Secondary School*, Prentice Hall of India Pvt. Ltd.
- Hoiss, Obourn & Hoffman (1961). *Modern Science Teaching*, Macmillan & Co. Limited, New York.
- Brandwein Paul, F. (1955). *The Gifted as Future Scientist*, New York, Earcourt Dcace and World Inc.
- Passi, B.K., *Becoming a Better Teacher*, Micro Teaching Approach.
- Nuffield Chemistry, *Books of Data, Collection of Experiment*, Published for the Nuffield Foundation by Longmans, Penguin Books.
- Nuffield Physics, *Teacher's Guide, Questions Book*, Guide to Experiments, Published for the Nuffield Foundation by Longmans, Penguin Books.