B.Ed. OPTIONAL COURSE

PHYSICAL SCIENCE-PAPER-I

OBJECTIVES

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

- understand the nature and scope of Physical Science
- know the aims and objectives
- understand the principles of curriculum construction and organization of subject matter
- understand the skills in the teaching of Physical Science and to develop the skills in them through classroom teaching
- in acquiring skills relating to planning their lessons and presenting them effectively
- an understanding of the technology of teaching Physical Science and give them practice in the use of audio visual aids
- understand the techniques of evaluating Science teaching and to construct achievement test to evaluate the progress of pupils
- develop a theoretical and practical understanding of the various methods and techniques of teaching Physical Science and the importance of self-learning devices

- estimate the facilities required for the organization and maintenance of Science laboratory
- understand the criteria in selecting a good textbook and to evaluate a Science textbook.
- organize different co-curricular activities in Science
- understand the special qualities of a good Science teacher, acquire those qualities and to evaluate himself or herself

UNIT-I: Nature and Scope of Science

Nature and Scope of Science-Science as a product and a process–a body of knowledge (Empirical knowledge, Theoretical knowledge-facts, concepts, hypotheses, theory, principle, law)-a way of investigation-a way of thinking-Inter disciplinary approach-New developments-Implications

UNIT-II: Aims and Objectives of Teaching Physical Science

Aims and Objectives of teaching Physical Science-General and Specific Objectives of teaching Physical Sciences-Bloom's Taxonomy of Educational Objectives (Cognitive, Affective and Psychomotor)-Aims and Objectives of teaching Physical Science at different levels-Primary, Secondary, Higher Secondary.

UNIT-III: Micro Teaching

Microteaching and its scope-microteaching cycle-Relevant skills in Micro teaching-Skill of Introduction, Skill of Explaining, Skill of Stimulus Variation, Skill of Reinforcement, Skill of Questioning, Skill of using Blackboard, Skill of Demonstration, Skill of Achieving Closure-Need for link lessons in Microteaching.

UNIT-IV: Unit Planning and Lesson Planning

Content analysis-developing Unit Plan-steps in Unit Planning-characteristics of a good Unit Plan-Lesson Planning-Essential features of Lesson Planning and their importance-Steps in Lesson Planning (Herbartian steps)-Preparing Lesson Plans-Distinguishing Lesson Plan and Unit Plan

UNIT-V: Methods of Teaching Physical Science

Criteria for selecting a method of teaching Physical Science: Level of the class, size of the class, time availability and subject matter-Methods of Teaching Physical Science-General Methods: Heuristic Approach, Historical and Biographical Approaches, Lecture method, Lecture cum Demonstration Method, Individual Practical Method, Analytic and Synthetic Method, Scientific Method, Project Method.

UNIT-VI: Co-Curricular Activities

Co-curricular Activities: Organization of Science Club, Science Exhibitions and Fairs, Fieldtrips and Excursions.

UNIT-VII: Educational Technology

Classification of Audio Visual Aids (Projected and Non-projected)-their importance-Principles and use of Hardware: Film strip cum Slide Projector, Overhead Projector, Motion Picture Projector, Radio, TV, CCTV, Tape Recorder, principles and use of Software: Objects, specimens, slides, transparencies, CD, Audio and Video Tapes-Educational Broadcasts: Radio and T.V. lessons-Programmed Learning-Power Point-use of Internet in teaching Physical Science-e-learning.

UNIT-VIII: Evaluation

Tests and its types-Achievement tests–Qualities of a good test- Evaluating outcome of Science teaching-Principles of test construction-Blue Print and Question Paper-Item Analysis-Standardizing a test-Diagnostic testing and Remedial teaching.

Elementary Statistics-Measures of Central Tendency: Mean, Median and Mode–Measures of Variability-Mean, Standard and Quartile Deviation, Correlation co-efficient, Rank Order and Product Moment Correlation-Graphical representation of Data: Bar and Pie Diagrams, Histogram, Frequency Polygon-Cumulative Frequency Curve, Ogive, Percentile Ranks, Normal Probability Curve, Kurtosis, Skewness.

UNIT-IX: Science Laboratory

Physical Science Laboratory-Structure and Design-Organization and Maintenance of Science Laboratory-maintenance of Registers-Storage of Chemicals-Organization of Practical Work-Accidents and First Aids-Improvisation of Apparatus.

UNIT-X: Science Teacher

Science Teacher - Academic and Professional qualification-Special qualities-In-service training-Classroom Climate: Autocratic, Democratic and Laisez faire pattern, Flander's Classroom Interaction analysis.

PRACTICAL WORK

1. Construction and use of achievement test, analysis and interpretation of test scores.

2. Making 10 charts and 3 improvised apparatus.

3. Practicing 3 micro lessons with 3 different skills.

4. Preparation of laboratory instructional cards.

5. Conducting an investigatory project on any Science topic and presenting the report.

6. Participating in at least two seminars (in B.Ed. topics) and presenting two papers.

7. Presenting one demonstration to the peers.

8. Making 3 slides and one filmstrip.

9. Preparation of a programme of 20 frames on any topic in Physics or Chemistry.

10. Preparing a Science album with internet materials of scientific issues and website reports.

11. Preparation of work sheets.

12. Practice of minimum of 5 experiments in school syllabus.

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