

Bachelor of Education (B.Ed.)

Title of the Course: Pedagogy IA: P.I.2A: Science
(Semester: I)

Credits 2
MM: 50 (External: 35 Internal: 15)
Contact Week: 15

Introduction of the Course

This course would enable the pupil teachers to understand Science as a discipline through its philosophical and epistemological perspectives. The insights into the nature of science and how children construct knowledge of science would help in developing a critical understanding about science and how it unfolds through the transactional processes at the various levels of school education. This course also aims to develop an understanding about Indian Contributions to science from ancient to modern times and to develop insights about the evolution of scientific knowledge and methods of science. In this course, we will also explore the various factors that influence a science classroom as to develop a profound understanding of the pedagogical underpinnings in the domain of science education.

Learning Outcomes:


After completion of the course, student will be able to

1. Develop understanding about the nature of science and establish its meaningful linkages with science as a discipline.
2. Critically study science within historical and philosophical contexts.
3. Apply principles of Science-Technology-Society-Environment (STSE) interface to real-world issues.
4. Critically analyze the Indian Contributions from ancient to modern times and their relevance in contemporary pedagogical practices.
5. Develop an understanding of a science classroom.
6. Foster scientific thinking among learners.

Number of Units 3

Weeks 15 = 30 hours

Unit I: Nature of Science and Science Education (7 weeks = 14 hours)


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- The nature of science- science as a process and science as a body of knowledge, as a social enterprise;
- The development of science as a discipline; awareness of the contributions like Popper and Kuhn.
- Development of scientific temper and public understanding of science, ethics of science; Science-Technology-Society-Environment (STSE) Interface, Science for Sustainable Development

Unit II: Science in Indian context (4 weeks = 8 hours)

- Understanding the evolution of scientific knowledge and methods of science through Indigenous Knowledge Systems.
- Conceptualizing the development of scientific temper, critical thinking, and enquiry-based learning through the Indian Contributions from ancient to modern times in areas like medicine, agriculture, health and well-being, physics, chemistry, and other forms (Like Baudhayan Sulbha-Sutra, Aryabhat and Aryabhatika, Varahmihira, Sir J. C. Bose, Ramanujan, P.C. Ray, APJ Abdul Kalam, Anadibai Joshi etc.) *


*The list is suggestive and can be expanded both for areas as well as contributors to science and technology, as per the context. For assessment purposes names are to be considered just examples.

Unit III: Understanding the Science Classroom (4 weeks = 8 hours)

- Understanding children's fear of science addressing their inability to correlate the observed phenomena with micro level processes and with their symbolic/mathematical representations.
- Role and limitation of language: its contribution towards expression, articulation and understanding of science
- Addressing Learner-diversity: gender issues, socio-cultural diversity, special need-learners, contextual factors.

Practicum/ Suggested Projects / Assignments (Any Two)

1. Reflect upon the tentative and revisionary nature of science
2. Research and develop a community-based project related to a specific environmental issue. In what ways will this project contribute meaningfully towards understanding the STSE principles?

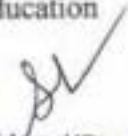

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3. Document and analyze contributions of any one of the Indian thinkers/scientists in any area. Reflect upon the role of systematic enquiry and evidence-based research that is fundamental for contributions in science

Note: On the basis of the above, the teacher may design his/her own relevant projects/assignments.

Essential/ Recommended Readings

- Aikenhead, W. W. (1998). Cultural aspects of learning science. Part one, pp 39-52. (B. F. Tobin, Ed.) Netherlands: Kluwer academic Publisher.
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Teaching Learning Resources (Digital):

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- National Council of Educational Research and Training. (n.d.). NISHTHA. <https://diksha.gov.in/nistha>
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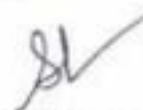
Teaching Learning Process:

The course will be taught through interactive pedagogic methods such as classroom discussions, debates, collaborative learning tasks and laboratory methods with the appropriate use of digital processes, so as to enhance reflective practices and critical analytical thought processes among learners. Self-learning, self-exploration, creative expression and comprehension & application of concepts will be encouraged.

Assessment Method:

The assessment will be formative in nature both in theory and practicum and will focus on rigorous student participation. Individual and group tasks will aim at developing scientific temper, social skills, and values among learners. Assessment will also be based on development of creative expressions, critical understanding, reflections, and ethics in science.

Key words: Nature of Science, Pedagogy of Science, Science in Indian Context



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