

TRENDS & CONTEMPORARY ISSUES IN PHYSICS EDUCATION

Course Code: EDBESc368

Credit Hours: 3

Course Description

The broad purpose of this course is to develop students' knowledge, skills, and abilities as physics educationist. In particular, this course aims to develop at high level of understanding and a critical analytic perspective across a diverse range of trends and issues in Physics Education by focusing on conceptual, theoretical and substantive research findings found in the academic research literature in the field.

Learning Outcomes Upon completion of this course, the students:

1. Will develop knowledge and skills that enable the student to evaluate, critique, and ultimately contribute to the scholarly literature in Physics Education.
2. Should have improved their written and verbal communication and analytical skills and feel comfortable discussing theoretical and methodological issues in a scholarly manner.
3. Will gain an appreciation of the development of knowledge in range of topic areas.
4. Will learn about the institutions, systems, and practices found in academic as well as research process in Physics Education.

Contents

Issues in Physics Education

1. Physics contents and religious conflicts
2. Globalization of physics education
3. Practical assessment in physics education
4. Comparative analysis of various methodologies in teaching physics
5. Problems of physics teaching in Pakistan
6. Physics teacher education in Pakistan
7. Students attitude towards Physics Education
8. Gender disparity in Physics Education
9. Regional disparity in Physics Education
10. Should physics curriculum be diversified?
11. Medium of Instruction for Physics Education. An exploratory approach
12. Demands of 21st century and our physics curriculum. An analytical approach
13. Our physics textbooks: source of knowledge or source of misconceptions

Trends in Physics Education

1. Goal of Physics education in 21st century
2. Trend in international Math and Scientific Studies (TIMSS): Introduction & Major findings in Physics domain
3. Program for International Students Assessment (PISA): Introduction & Major findings in Physics domain
4. Constructivism in Physics Education: Theoretical background
5. Constructivism in Physics Education: Practices in classroom and challenges
6. Use of concept mapping technique in teaching Physics
7. Scientific Inquiry in Physics Education
8. Nature of Physics

9. The role of physics education in environmental literacy
10. Curricular reforms in Physics Education
11. ICT in Physics Education
12. Physics teacher recruitment standards: A comparative approach
13. Modern Assessment practices in physics disciplines
14. Introduction to major research journals in Physics Education
15. Role of argumentation in physics Education
16. Standards for 21st century physics laboratory
17. Career opportunities with Physics Education
18. Physics education at higher education level: an introduction to degree programs offered in Physics Education round the world
19. Use of low cost no cost material in Physics Education

20. Teaching-learning Strategies

21. The instructional strategies will focus on constructionist learning approach.

These strategies will be diverse in line with the course contents. Therefore, these strategies will include but not limited to demonstration, cooperative learning, collaborative learning, teacher and student-led discussion, individual and group presentations, reflective practices and classroom activities.

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
- Martm, 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.