

TRENDS & CONTEMPORARY ISSUES IN BIOLOGY EDUCATION

Course Code: EDBESc353

Credit Hours: 3

Course Description

The broad purpose of this course is to develop students' knowledge, skills, and abilities as Biology 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 Biology 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 Biology 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 a range of topic areas.
4. will learn about the institutions, systems, and practices found in academic as well as research process in Biology Education

Contents

1 Biology as a Discipline of Science

- 1.1 Scientific method of study in Biology.
- 1.2 Research approaches in field of Biology.
- 1.3 Biology in different periods and societies

2 Modern careers in Biology

- 2.1 Careers related to Zoology
- 2.2 Careers related to Botany
- 2.3 Integrated careers of Biology and other Science disciplines

3 Trends in research practices in Biology Education

- 3.1 Researches in classroom practices & Pedagogy
- 3.2 Curriculum interventions in school Biology
- 3.3 Assessment interventions in school Biology

4 Gender Disparity in Biology

- 4.1 Gender disparity in attitudes towards school Biology
- 4.2 Gender disparity in attitudes towards Biology related careers
- 4.3 Steps towards reducing gender disparity
- 4.4 Global statistics about trends towards Biology related fields
- 4.5 Regional statistics about trends towards Biology related fields

5 Population Education:

- 5.1 Concept of Population Education.
- 5.2 Factors affecting Population Education
- 5.3 Impact of Population Growth on National Development.
- 5.4 Roles and responsibilities of family, school, mosque and community in population education.
- 5.5 Steps towards population planning and welfare.

6 Environmental Awareness through Biology

- 6.1 Types of pollution
- 6.2 Causes of pollution
- 6.3 Environmental education
- 6.4 Role of Biology in reducing pollution

7 Curriculum innovations in Biology

- 7.1 BSCS Biological Sciences Curriculum Study
- 7.2 NSF Nuffield Science Foundation Curriculum
- 7.3 Challenges of quality curriculum in Biology
- 7.4 National Curriculum of Biology for Pakistan: Strengths and Limitations

8 ICT in Biology Education

- 8.1 New concept of information explosion
- 8.2 Expanding learning resources in Biology Classroom
- 8.3 Role of Information and communication technology (ICT) in Biology
- 8.4 Virtual Learning in Biology
- 8.5 Learning through simulations in Biology

Having studied these contents, the students will reflect over following trends and issues in specific context of Biology education

Issues in Biology Education

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

Trends in Biology Education

13. Scientific literacy: goal of Biology education in 21st century
14. Trend in international Math and Scientific Studies (TIMSS): Introduction & Major findings in Biology domain
15. Program for International Students Assessment (PISA): Introduction & Major findings in Biology domain
16. Constructivism in Biology Education: Theoretical background
17. Constructivism in Biology Education: Practices in classroom and challenges
18. Constructivism in Biology Education: Assessment practices and challenges
19. Use of concept mapping technique in teaching Biology
20. Scientific Inquiry
21. Nature of Biology

22. The role of Biology education in environmental literacy
23. Biology, Technology , Society (STS) connections
24. Curricular reforms in Biology Education
25. ICT in Biology Education
26. Biology teacher recruitment standards: A comparative approach
27. Modern Assessment practices in Biology disciplines
28. Introduction to major research journals in Biology Education
29. Role of argumentation in Biology Education
30. Standards for 21st century Biology laboratory
31. Career opportunities with Biology Education
32. Biology education at higher education level: an introduction to degree programs offered in Biology Education round the world
33. Use of low cost no cost material in Biology Education
- 34. Teaching-learning Strategies**
35. 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

- AIOU (2006). *Population Education Course MA EPM 584*, Islamabad: AIOU.
- Aubusson, P., & Watson, K. (2002). Packaging constructivist science teaching in a curriculum resource. *Asia Pacific Forum on Science Learning & Teaching* 3(2).
- Biological Sciences Curriculum Study (BSCS). (2006). *BSCS Biology: A molecular approach*. Columbus, Ohio: Glencoe/McGraw-Hill.
- Biological Sciences Curriculum Study (BSCS). (2008). *Scientists in Science Education: BSCS 1958 – 2008 Innovations, Reforms, Vision*. BSCS, Colorado Springs, CO.
- Haltak, J. (1990). *Investing in the future, setting educational priorities in the developing world*, paris. UNESCO. McGraw-Hill Kogakusha.
- Johnson, M.A., & Lawson, A.E. (1998). What are the relative effects of reasoning ability

and prior knowledge on biology achievement in expository and inquiry classes?

Journal of Research in Science Teaching, 35(1), 89-103.

Ministry of Education, Curriculum Wing (2010), *13 Modules on Various Core Themes of Population Education*, Islamabad.

Government of Pakistan. (2003). *Education for All*, Ministry of Education Curriculum Wing Islamabad: Author.

Rao, V. K. (2004). *Population education*. New Delhi: Efficient Printers.

UNESCO, Pakistan (2004). *Quality of education in Pakistan*, UNESCO Office, Islamabad.