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| Course Name**: Foundations of Science Education** |
| **Course Code:**  | EDUC-6501 | **Credit Hours:** | 3 |
| **Introduction:** |
| The goal of this course is to help prospective science teachers to gain a foundational perspective of science education. The present course explores religious philosophical, psychological and socio-economic perspectives of science education and their impact on science education. Moreover materials on comparative analysis of science education at global and national level have also been included. |
| **Learning outcomes:** |
| After completing this course learners with be able to:1. Explain Islamic perspective of science education and contributions of Muslims in flowing of exact sciences.
2. Describe views of various philosophers of science and their impact on science education.
3. Discuss the importance of socio-economic factors in shaping science education.
4. Analyze and evaluate the state of science education in the world with special reference to Pakistan.
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| **Prerequisite: N / A** |
|  **Course Outline**  |
| Unit 1 |  | **Islamic Foundations of Science Education-I** |
|  |  | Introduction |
|  |  | Objectives |
|  |  | The Quran and Science |
|  |  | Hadiths and Science |
|  |  | Fiqh and Science |
|  |  | The Quran, Hadiths and Modern Science |
| Unit 2 |  | **Islamic Foundations of Science Education-II** |
|  |  | Introduction |
|  |  | Objectives |
|  |  | The Golden Age of Muslim Science and Technology |
|  |  | Contributions of Muslims in Science |
|  |  | Decline of Science and Technology in the Muslim World |
|  |  | Rebirth of Science and Technology in the Muslim World |
| Unit 3  |  | **Philosophical Foundations of Science-I** |
|  |  | Introduction |
|  |  | Objectives |
|  |  | Introduction Philosophy of Science |
|  |  | Similarities and Differences Between Science and Technology |
|  |  | Inductive VS Deductive approaches |
|  |  | Empiricism |
|  |  | Constructivist Empiricism and Science Education |
| Unit 4 |  | **Philosophical** **Foundations of Science-II** |  |
|  |  | Introduction |
|  |  | Objectives |
|  |  | Flasification |
|  |  | Rationalism |
|  |  | Relativism |
|  |  | Realism |
|  |  | Instrumentalism |
|  |  | Logical Positivism |
| Unit 5 |  | **Psychological Foundations of Science Education-I** |
|  |  | Introduction |
|  |  | Objectives |
|  |  | S & R Theories and Science Teaching |
|  |  | Skinner’s Theory and Science Teaching |
|  |  | Gagne’s Learning Hierarchies |
|  |  | Gestalt theories and Science Education |
|  |  | Burner’s Theory of Discovery learning and Teaching of Science |
|  |  | Ausubel’s Theory of Learning and Science Education |
|  |  | Mastery Learning Theory of Bajman S. Bloom |
| Unit 6 |  | **Psychological Foundations of Science Education-II** |
|  |  | Introduction |
|  |  | Objectives |
|  |  | Constructivism as a Referent in Teaching Science |
|  |  | Types of Constructivism |
|  |  | Piaget’s theory of Cognitive Development and Leading |
|  |  | Information Processing Theory |
|  |  | Social Learning Theories. |
| Unit 7 |  | **Socio-Economic Foundations of Science Education-I** |
|  | 1. | Introduction |
|  | 2. | Objectives |
|  | 3. | Relationship Between Science and Society |
|  | 4. | Cultural Study of Science and Science Education |
|  | 5. | Science for Social Reconstruction |
|  | 6. | Science and Social Development |
|  | 7. | Science for Leadership |
| Unit 8 |  | **Socio-Economic Foundations of Science Education-II** |
|  | 1. | Introduction |
|  | 2. | Objectives |
|  | 3. | Science and Progress |
|  | 4. | A critical Appraisal of Science for Economic Development |
|  | 5. | Social Constrains in Implementation of Science Development |
|  | 6. | Science Education and Underdevelopment |
|  | 7. | Globalization of Science Education for Development |
| Unit 9 |  | **Science Education in Global Perspective** |
|  | 1. | Introduction |
|  | 2. | Objectives |
|  | 3. | Science Education in the Developed Countries |
|  | 4. | Science Education in the Developing Countries |
|  | 5. | Science Education in Pakistan |
|  | 6. | Future Trends in Science Education |
| **Course Assignment**  |
| A variety of assessments will be used to assess student learning. It is recommended that students will actively work in class on different projects and present their work. The 5 seminars and two or more assignments on assigned topics will be arranged during this period.  |
| **Assessment Criteria and Time Distribution of Course** |
| Theory and classroom activities | 12 weeks  | 64% |  |
| Discussion session  | 1 weeks  | 16 % |  |
| Presentations | 3 weeks  | 20% |  |
| **Reading Material:**Dash, N. R. (2015). *Philosophical Foundation of Education*. Directorate of Distance & Continuing Education, Utkal University, Bhubaneswar.  |
| **Recommended Readings:** Belarmino, J. J. (2017). *Exploring The Nature of Models in Science, Philosophy of Science, and Science Education*. Ph. D. Thesis University of Illinois at Urbana-Champaign. Rosenberg, A. (2005). *Philosophy of Science* (2nd Ed.). Routledge.  |