Syllabus
Fourth Semester Course in **Zoology**
2024 – 2025

Contents:

- Syllabus for Skill Enhancement Course (SE):

  USZOO5001SE1 – PHILOSOPHY OF SCIENCE

PRINCIPAL
ST. XAVIER'S COLLEGE
AUTONOMOUS
MUMBAI - 400 001.

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APPROVED SYLLABUS

20 JAN 2024

S.Y.B.Sc. ZOOLOGY Course Code: USZOO5001SE1

PHILOSOPHY OF SCIENCE

Credits: **Theory 2 (Total 30 hrs)**

Prerequisite: **None**

Course Objectives:

- To introduce the idea of philosophy and its relevance in science
- Introduce them to key concepts in philosophy that shape the scientific method and thus inquiry and inculcate critical thinking.

Course Outcomes:

On completion of the course the learner should be able to:

CO	Course Outcomes	Bloom's Taxonomy Level
1	Know the historical development of scientific thought	Remembering
2	Understand logic and what is a valid and sound logical construction	Understanding
3	Be able to critically analyse data being presented and be able to pick out logical fallacies if any	Analysing
4	Be well versed with concepts like empiricism, epistemology and falsifiability	Understanding
5	Be able to contextualize philosophical issues in the study of organisms	Application

UNIT 1 (15 lectures)

- **Introduction to Philosophy of Science**
  - What does it mean?
  - Historical perspectives on Philosophy - Eastern and Western (Ancient, Medieval, Modern and Postmodern thought)
- **Logic**
  - What is Logic?
  - Constructing a logical argument - Structure of logical premises
  - Validity and Soundness in logical arguments
  - Deductive, Inductive and Abductive reasoning
- **Logical fallacies**
  - What is a fallacy?
  - Common logical fallacies - Strawman argument, non sequitur, correlation to causation inference, argument from personal incredulity and a few others
- **The Scientific Method**
  - Overview and critique.
  - Hypothesis testing and falsification principle.
  - Do scientific principles give us the true picture of reality?

UNIT 2 **(15 hours)**

- **Some Philosophical thoughts**
  - David Hume - Problem of induction
  - Carl Popper - The concept of falsifiability of scientific hypothesis
  - Thomas Kuhn - Structure of Scientific revolutions: why does science always keep changing?
  - Nancy Cartwright - Scientific explanations and causal reasoning
- **Philosophy of Biology**
  - Reductionism vs Holism
  - Teleology in Biology - Pros and cons
  - Scientific Epistemology
  - Intelligent design vs Evolution

- Science, Technology, and Ethics: Examining the ethical implications of scientific advancements.
- Case Studies: Applying philosophical concepts to real-world scientific controversies - Mind Body problem, Anti vax movement.

List Of Recommended Reference Books:

1. Philosophy of Science: A Very Short Introduction. Samir Osaka
2. Indian Philosophy and Philosophy of Science. John N Crossley. University of Hawaii press
3. Stanford Encyclopedia of Philosophy. https://plato.stanford.edu
4. Theory and Reality: An Introduction to the Philosophy of Science. Peter Godfrey-Smith
5. Science and Social Knowledge. Helen Longino
6. Philosophy of Science Association. https://www.philsci.org/

Evaluation (Theory): Total marks per course - 50

I. Formative Assessment 'for' Learning (continuous internal assessment - CIA to improve learning).

- The course will have 2 assignments to be handed in by the students for 20 Marks.

II. Summative Assessment 'of' Learning

- A group discussion/debate on topics pertaining to philosophical issues in a specific scientific discipline worth 15 Marks.
- Final discussion and Viva with the Course instructor on philosophical concepts taught (mainly focusing on the assignments submitted) worth 15 marks.

Template for End Semester examination in Semester IV for the Skill Enhancement course in Philosophy of Science.

UNITS	REMEMBERING	UNDERSTANDING	APPLICATION and ANALYSES	TOTAL MARKS Per unit
1	12	7	6	25
2	10	6	9	25
TOTAL	22	13	15	50
% WEIGHTAGE	44	26	30	100

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