

Course Type	Course Code	Name of Course	L	T	P	Credit
OE	HSO301	Ethical Issues in Science	3	0	0	9

Course Objective

The objective of the course is to introduce undergraduate students to the ethical issues in science and scientific research. This course will provide a foundation for thinking and recognizing the ethical dimensions of a variety of issues in science. Students will think broadly about the role of scientists in society as well as learn how to critically assess the ethical consequences of science for humankind.

Learning Outcomes

Upon successful completion of this course, students will:

- Learn the key philosophical concepts related to responsible conduct of research.
- Acquire skills to describe and explain the rationale behind philosophical and ethical positions.
- Know about real-world ethical issues/challenges in scientific research.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Basic Concepts in Ethics Ethics, Philosophy and Science Science as a Profession Ethical Theories and Principles	9	This unit will make students understand the basic concepts in Ethics and its relationship with Philosophy and Science. The section will also explain the major ethical theories and principles.
2	Need of Responsible Conduct in Research Does the Scientist have an Ethical Obligation to Be Reliable? Philosophical Principles of the Scientific Method The Role of Trust in Knowledge The Scientist in the Public Forum Research as a Moral Enterprise	6	This part will help students to know that research is a moral enterprise. The scientific research has to be good and scientists should be responsible and socially conscious for what they do.
3	Conducting Research and Reporting Results Issues in Experimental Design Data Ownership, and Management Publication Issues, Credit, Plagiarism Intellectual Property Issues Academia and Industry Collaborations Peer Review and Funding Issues	7	This unit will explain how to conduct research and reporting its result ethically. Number of related issues like, Data management, Publication Issues, Credit, Plagiarism, Intellectual Property Issues,

			Academia and Industry Collaborations, Funding Issues will be discussed here.
4	Authorship Credit and Responsibility Who should be an author? Transparency	3	This will make students aware of the importance of authorship in scientific publication.
5	Conflict of Interest What is a Conflict of Interest? What should you do when there is conflict of interest?	3	The unit will help in understanding the conflict of Interests in the application as well as in the conduct of science..
6	Protection of Human Subject in Research Historical Perspective, Eugenics and Euthanasia, Consequentialistic approaches toward Human Research Subjects, Nazi Death Camp Experiments, the Nuremberg Code and the Declaration of Helsinki Historical Cases in Human Subjects' Violations Recent Cases in Human Subjects' Violations Informed Consent	6	This will help student to know all about research on human subject and related areas. Historical cases of human subject research and Informed Consent will be discussed here.
7	Ethical Issues in Animal Research The fundamental questions related to Animal experimentation Assessing requirement of Animals as research subjects Pain experiments Promote responsible use of animal subjects Protection of animals from all unnecessary suffering or pain.	3	This unit will explain the different issues in research on animals, their protection, pain experiments, etc.
8	Scientific Misconduct Defining Misconduct A Brief History of Scientific Misconduct Reporting Scientific Misconduct Dealing with Misconduct Preventing Misconduct	5	This will help in understanding, what is scientific misconduct, its history and its prevention methods.
	TOTAL LECTURE HOURS	42	

Text Books:

1. Resnik, D., *The Ethics of Science*. New York: Routledge, 1998.
2. Shrader-Frechette, K., *Ethics of Scientific Research*. Boston: Rowman and Littlefield, 1994.

Reference Books:

1. Penslar, R., *Research Ethics: Cases and Materials*. Bloomington: Indiana University Press, 1995.
2. Haack, S., *Defending Science within Reason*. New York: Prometheus Books, 2003.
3. Carson, R., *Silent Spring*. Boston: Houghton Mifflin, 1961.
4. Bronowski, J., *Science and Human Values*. New York: Harper and Row, 1956.