



**List of Courses which focuses on Professional Ethics, Gender, Human Values, Environment & Sustainability and other value framework**

**Department : Zoology**

**Programme Name : Ph.D.**

**Academic Year : 2022-23**

**Courses which focuses on Professional Ethics, Gender, Human Values, Environment & Sustainability and other value framework:**

Sr. No.	Course Code	Name of the Course
01.	LS/ZOO/PPCW 101	Research Methodology and Ethics in Research

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Guru Ghasidas Vishwavidyalaya, Bilaspur



## Scheme and Syllabus

Session: 2019-2020

### SYLLABUS FOR PRE-Ph. D. COURSE WORK (ZOOLOGY)

Department of Zoology  
Guru Ghasidas Vishwavidyalaya, Bilaspur, CG

#### Scheme

SNo	Type of Course	Course code / Title of the Course	No. of credits	Total Marks
1	Compulsory Paper	LS/ ZOO/ PPCW 101 Research Methodology and Ethics in Research	4	100
2	Compulsory Paper	LS/ ZOO/ PPCW 102 Analytical and Instrumentation Training	4	100
3	Elective Paper	LS/ ZOO/ PPCW 103 (A) Aquaculture and Fisheries	4	100
		LS/ ZOO/ PPCW 103 (B) Biochemistry and Molecular Biology	4	100
		LS/ ZOO/ PPCW 103 (C) Endocrinology	4	100
		LS/ ZOO/ PPCW 103 (D) Molecular and Genetic Epidemiology	4	100
		LS/ ZOO/ PPCW 103 (E) Neuroscience	4	100
4	Compulsory Paper	LS/ ZOO/ PPCW 103 (F) Toxicology	4	100
		LS/ ZOO/ PPCW 104 * Seminar/ Presentation	-	100

Note: Seminar presentation.....

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**LS/ZOO/PPCW 101: RESEARCH METHODOLOGY AND ETHICS IN RESEARCH**

**Unit 1: Introduction to research**

Meaning of research, objectives of research, research process, criteria of good research, defining the research problem, basic principles of research design, developing a research plan, sample design, characteristics of good sampling procedure, types of data.

**Unit 2: Basics of scientific communication**

Types of scientific communication, importance of publishing research papers, review, choosing journals, constituents of research paper: title, running title, authorships, abstracts, keywords, introduction, materials and methods, results, discussion, acknowledgements, referees, figures, table components, communication with the editors, handling referees comments, galley proofs, Writing review articles, preparing and delivering of oral and poster presentations; Intellectual Property Rights.

**Unit 3: Statistical analysis**

Methods of data collection; Graphical representation of data; Measurement of central tendency: Definition, characteristics, types, merits and demerits; Measurement of dispersion: Range, Mean deviation, Standard deviation, Standard error; Variance, Correlation and Regression and their coefficients; Test of significance: Student's t test, Chi-square test and ANOVA.

**Unit 4: Computer application**

Basics of computers: MS Word: typing the script, inserting tables, figures and graphs to prepare thesis and research papers; MS Excel: designing and application of formulae use of statistical tools, preparation of graphs, histograms and charts; MS power point: insertion of figures, graphs, charts in presentation; Preparation of posters for scientific presentations.

**Unit 5: Research ethics involving human participants or laboratory animals**

Ethics and biomedical research: General principles on ethical considerations involving human subjects, ethical review procedures, Institutional ethics committee: its organization and functions, general ethical issues. Ethical guidelines for experimental animals; Sources of experimental animals, Laboratory animal husbandry and management, anesthesia and euthanasia, laboratory animal ethics, animal ethics committee, its organization and functions, ethical guidelines for use of animals for scientific research, CPCSEA guidelines.

**Unit 6: Responsible conduct of research and publication ethics**

Values of research, Research misconduct and handling misconduct, Responsible authorship and publication, Peer review, Reviewing and reporting research. International Committee for Medical Journal Editors guidelines. Scientific misconduct; Plagiarism, self-plagiarism, Plagiarism detection- Computer-assisted plagiarism detection- Citation based plagiarism detection, avoiding plagiarism.

**Suggested readings**

1. National Ethical Guidelines for Biomedical and Health Research involving human participants ICMR, New Delhi 2017.
2. Guidelines for care and use of animals in scientific research. Indian National Science Academy, New Delhi.
3. Research Methodology, methods and techniques by C.R. Kothari (2009).
4. Biostatistics: A foundation for analysis in health sciences, 9<sup>th</sup> Ed. Wayne W Daniel (2008).
5. Computer fundamentals, Pradip K Singha and Priti Singha (BPP Publication).

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18/08/2020