Pt. Ravishankar Shukla University, Raipur

Syllabus for Ph.D. Course Work in Zoology (2025-2026)				
Program code-Ph.D. ZO (0412)				
One Semester				
There are Two papers; each with 100 maximum marks. The candidate must obtain 50% or more marks in each paper independently to qualify in the course work. The answer papers will be assessed independently by two examiners.				
No.		**Name of paper**	**Lectures**	**Marks**
Paper-I Course code- Ph.D. BS (0412 A)		**Research Methodology, Advanced Tools & Techniques, Quantitative Data Analyses and Computer Fundamentals**	**-**	**100**
	A	**Research Methodology:**	**24**	
		Introduction and Scope Research problem: Identification, Selection, Formulation of research objectives	2L	
		Research design: Components, Importance, Types	3L	
		Types of data, Data collection - Methods and Tools	2L	
		Research ethics, Institutional ethics committee	2L	
		Plagiarism - Pitfall, Regulation [UGC, ICMR, ICAR, DBT]	2L	
		Patents and IPR: Patent laws, process of patenting a research finding, Copy right, Cyber laws	3L	
		Bibliometrics: Measurement of academic output- Citation Index: Science Citation Index (SCI), h-index, i-10-index. Journal Impact Factor (JIF); Style of Bibliography, reference management tools, Project, research paper and review writing Literature search technique using SCOPUS, Google Scholar, PUBMED, Web of Science	10L	
	B	**Advanced Tools & Techniques:** Principle, protocol and application	**28**	
		Histological, Histochemical, Cytochemical, Immunohistological and Immunohistochemical techniques	8L	
		Chromatography- GLC & HPLC, Electrophoresis	5L	
		DNA laddering, DNA methylation, Comet Assay	5L	
		PCR, Real time PCR, DNA microarray, DNA sequencing, Protein sequencing	5L	
		Biosensors: DNA Biosensor, Immunosensors, Biosensors techniques, Biosensor applications.	5L	
	C	**Quantitative Data Analyses**	**20**	
		Hypothesis testing	2L	
		Normal and Binomial distributions and their property	3L	
		Tests of significance: Student t-test, *F-test, Chi-square* test	5L	
		Correlation and Regression	4L	
		ANOVA- One-way and Two-way, Multiple-range test	6L	
	D	**Computer Fundamentals**	**08**	

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		Introduction to MS-Office software: MS-Word (Track change)	2L	
		MS-Excel, Power Point	3L	
		Features for Statistical data analysis using computers and software, Microsoft Excel Data Analysis ToolPak, SPSS	3L	

Paper-II Course code- Ph.D. BS (0412 B)		**Review of Literature & Seminar**	**-**	**100**
	A	Review of Literature- Writing review of literature in the area of the proposed Ph.D. work		50
	B	Seminar- Based on the review of literature		50

Note: Research and Publication Ethics (2 credit course)-As per guidelines of Pt. Ravishankar Shukla University, Raipur (C.G)

Recommended Books:

Al Vogel	Analytical chemistry
Buranen Land Roy AM	Perspectives on Plagiarism and Intellectual Property in a Post-Modern World
Campbell RC	Statistics for biologists
Cassel P *et al.*	Inside Microsoft Office Professional
Chatwal and Chatwal	Instrumentation
Coleman P and Dyson P	Mastering Internets
CR Kothari	Research Methodology: Methods & techniques, 2008
Gilmore B	Plagiarism: Why it happens, How to prevent it?
Gralla P	How the Internet Works
Habraken J	Microsoft® Office 2003 All in One, Microsoft® Office 2010 In Depth
Kumar Anupa P	Cyber Law
R Panneerselvam	Research Methodology
Shelly GB, Vermaat ME, Cashman TJ	Microsoft® 2007: Introductory Concepts and Techniques
Snedecor GW & Cochran WG	Statistical Methods
Sokal RR & Rohlf FJ	Introduction to Biostatistics
Sood V	Cyber Law Simplified
Sumner M	Computers: Concepts & Uses
Upadhyaya and Upadhyaya	Instrumentation
Wardlaw AC	Practical Statistics for Experimental Biologists
White R	How Computers Work
Zar JH	Biostatistical Analysis

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