Pt. Ravishankar Shukla University, Raipur

School of Studies in Life Science

Syllabus for Ph.D. Course Work in Bioscience (2025-26)			
Program Code-Ph.D. BS (0409)			
One Semester			
There are two papers: each with maximum marks 100. The candidate must independently obtain 50% or more marks in each paper to qualify in the course work. The answer papers will be assessed independently by two examiners.			
No.	**Name of paper**	**Lectures**	**Marks**
Paper I Couse code – Ph.D. BS (0409A)	**Research Methodology, Advanced Tools & Techniques, Quantitative Data Analyses and Computer Fundamentals**	--	100
A	**Research Methodology:**	**25**	
	Introduction and Scope Research problem: Identification, Selection, and Formulation of research objectives	3L	
	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 research findings, Copyright, Cyber laws	3L	
	Bibliometrics: Measurement of academic output- Citation Index: Science Citation Index (SCI), h-index, i-10-index. Journal Impact Factor (JIF); AI in research	5L	
	Style of Bibliography, Reference Management Tools, Project, Research Paper, and Review Writing Literature search technique using SCOPUS, Google Scholar, PUBMED, Web of Science	5L	
B	**Advanced Tools & Techniques:** Principle, protocol and application	**25**	
	Histological, Histochemical, Cytochemical, Immunohistological and Immunohistochemical techniques	5L	
	Chromatography – GLC & HPLC, Electrophoresis	7L	
	PCR, Real-time PCR, DNA Microarray, DNA Sequencing, Protein Sequencing	8L	
	Biosensors: DNA Biosensors, 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**	**10**	
	Introduction to MS Office software: MS Word (Track change)	2L	
	MS Excel, PowerPoint	4L	
	Features for Statistical data analysis using computers and software, Microsoft Excel Data Analysis ToolPak, SPSS	4L	

Paper II Course code – Ph.D. BS (0409 B)		Review of Literature & Seminar	--	100
	A	Review of Literature – Writing a review of literature in the area of the proposed Ph.D. work		50
	B	Seminar – Based on the review of the literature		50

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

Recommended Books:

Buranen L and 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