Pt. Ravishankar Shukla University, Raipur (C.G.)

					Lectures	Marks
	**Syllabus for Ph. D. Course Work in Biochemistry (2025-2027)**						

Syllabus for Ph. D. Course Work in Biochemistry (2025-2027)

Program code- Ph. D. BC (0410)

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 (0410A)			**Research Methodology, Techniques in Biochemistry, Quantitative Data Analyses and The art of Presentation**	--	100
	A		**Research Methodology:**	**24**	
			Introduction and Scope Research problem : Identification, Selection, Formulation of research objectives	2L	
			Defining the Research Problem - Identification of broad area of research; Review of literature using appropriate sources – reviews, patents, research papers, books; Utilization of tools for literature source – web and libraries; Defining a research problem	3L	
			Types of data, Data collection-Methods and Tools	2L	
			Ethics and Animal Ethics compliance and concerns; Genetically modified organisms;	2L	
			Guidelines for Ph.D. thesis. Patents and Intellectual property rights; Patent laws, process of patenting a research finding, Copy right, Cyber laws. Regulation [UGC, ICMR, ICAR, DBT]	5L	
			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		**Techniques in Biochemistry:** Principle, protocol and application	**28**	
			Enzyme assay, enzyme activity and specific activity determination. Cell disintegration and extraction techniques, separation of proteins by fractionation (ammonium sulphate, organic solvents).	8L	
			Chromatography–GLC & HPLC, Electrophoresis	5L	
			Spectroscopy and Spectrometry	2L	
			Concepts of vaccine development	3L	
			PCR, Real time PCR, DNA microarray, DNA sequencing, Protein sequencing	5L	
			Bioinformatics tools - Investigation of hypothesis through **in-silico** (software emulations) method.	5L	

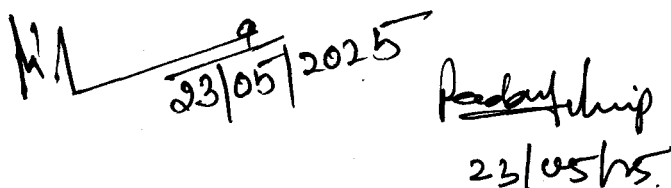23/05/ 2025   2)/05/25

		Dry Lab- testing and analyses is performed using data, coding and computer systems. Modeling and analysis of experiments using software.		
	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	**The art of Presentation**	08	
		Development of writing skills – Plan of research, Research project, Research report, Research article and review, Term paper; Bibliography, referencing and footnotes; Creation of reference libraries; Plagiarism check; Development of Oral presentation skills – Planning, Preparation, Practice, Oration; Use of visual aids and software like MS Word, MS PowerPoint, MS Excel, End Note.	5L	
		Analytical software SPSS and Prism.	3L	

Paper-II Course code- Ph.D.BS (0410B)		**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 (2creditcourse)-As per guidelines of Pt. Ravi Shankar Shukla University, Raipur (C.G)

Recommended Books:
1. AI Vogel Analytical chemistry
2. Buranen Land Roy AM   Perspectives on Plagiarism and Intellectual Property in a Post- Modern World
3. Campbell RC   Statistics for biologists
4. Casse l P *et al.* Inside Microsoft Office Professional
5. Chatwal and Chatwal   Instrumentation
6. C R Kothari   Research Methodology:Methods&techniques,2008
7. Gilmore B   Plagiarism: Why it happens, How to prevent it?
8. Gralla PHow the Internet Works
9. Kumar Anup a P   Cyber Law
10. R Panneer selvam   Research Methodology
11. Shelly G B, Verma at ME,   Microsoft 2007: Introductory Concepts and Techniques

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