Veer Bahadur Singh Purvanchal University
Jaunpur

Pre- Ph.D. Course Work (Ordinance and Syllabus)

Biotechnology
(w.e.f. 2022-23)

(As per National Educational Policy-2020)

Syllabus Developed by:

S. No.	Name	Designation	Department	University
1	Dr. Pradeep Kumar	Convener, BOS, Biotechnology	Biotechnology	V B S Purvanchal University, Jaunpur-222003
2	Prof. Gyaneshwar Chaubey	External Expert, BOS, Biotechnology	Zoology	Banaras Hindu University, Varanasi-221005
3	Prof. Vandana Rai	Internal Expert, BOS, Biotechnology	Biotechnology	V B S Purvanchal University, Jaunpur-222003
4	Prof. Ram Naraian	Internal Expert, BOS, Biotechnology	Biotechnology	V B S Purvanchal University, Jaunpur-222003
5	Prof. Rajesh Sharma	Internal Expert, BOS, Biotechnology	Biotechnology	V B S Purvanchal University, Jaunpur-222003

V.B.S. PURVANCHAL UNIVERSITY, JAUNPUR
Pre- Ph.D. Course Work (Ordinance and Syllabus)
Biotechnology (w.e.f. 2022-23)

As per the university ordinance, the research scholars who are provisionally registered for the Ph. D. Programme will undergo a Pre- Ph.D. Course work.

Aim of the Course Work: The aim of Pre- Ph. D. course work is to develop and enhance the research skills like **investigation, evaluation, reasoning, comprehension, analysis, writing, editing and designing**

Course Work Structure:

The duration of Pre-Ph. D. course will be of one semester (six month). There will be three compulsory papers during the course. The minimum attendance required during the course work period is 75% of the total courses. This course work is mandatory. The following scheme is to be followed for successful completion of the course work.

Scheme of the Course (All papers are compulsory)

Paper Title:

Paper- I **Research Methodology** (Credits-6)

Paper- II **Computer Applications** (Credits-6)

Paper- III **Research Ethics** (Credits-4)

Note- 1. Minimum Passing Marks- 55% or equivalent Grades/ CGPA.

2. One research project* is mandatory for each research scholar.

Paper setting and Evaluation Pattern

(For Paper I, II and III)

Types of Question	Total Number of Questions	Questions to be Attempted	Marks	Time
Objective Type	10	10	10x2=20	
Short Type	8	5	5x8=40	3 Hours
Long type	4	2	2x20=40	
			Total Marks: 100	
			(Total Credits: 16)	

*Research project will be of 100 marks, its marks will not be included in CGPA

Note: 1. Language of the course would be either English of Hindi.
2. Teachers in service are allowed to attend either online or offline mode of Pre PhD Course Work class.

Department of Biotechnology
Faculty of Science
V.B.S. Purvanchal University, Jaunpur
Course work for Ph.D. Students

Course 1: Research Methodology

6 Credits

UNIT I
Objectives of Research, Research problem and techniques involved in defining a problem, steps of scientific study, formulation of hypothesis, defining sources, workable hypothesis, basic concept of research design

UNIT II
Survey, Case study (if required), experimental method, interdisciplinary approaches

UNIT III
Collection, Classification and tabulation of data, Measures of central tendency, Chi square test

UNIT IV
Analysis and interpretation of data, techniques of interpretation, steps of report/ review/ research paper writing, layout and preparation of report

UNIT V Studying various National R&D agencies (CSIR, ICMR, DST, DBT, UGC, ICAR, etc) to findout their priority areas and thrust areas.

Recommended readings:
1. Research methodology: Methods and techniques by Kothari, CR(2007); New age international Ptv. Ltd.
2. Research Methodology by pannecrselvam, R(2007); prentice Hall India (P) Ltd.
3. Quantitative Methods: ICFAI University press(2004).
4. Instrumental Methods of Analysis: by HH Willard, merrit, jr LL, Dean JA &Settle, jr, FA; CBS Publisher and distribution (1986).
5. Business Statistics by Bhardwaj, RS Excel Books. Statistical Methods by Shenoy, GV and Pant LM(1994); MacMillan India Ltd.

Course 2: Computer Applications

6 Credits

UNIT I Introduction to computer, types of computer and components of computer, role of computer in research
UNIT II Concept of languages, languages suitable in scientific research
UNIT III MS Office tools (access, excel, power point, word)
UNIT IV Introduction to internet, different parts of internet, application of internet
UNIT V Introduction to software Software commonly used in scientific research (sigma-plot, enzfitter, BLAST etc.)

Recommended readings:
1. Biostatistics, Computer Application and Bioinformatics (2015) V. Kumaresan, N. Arumugam, R Sundaralingam A Gopi , A Meena

2. Computer Applications for Life Sciences **Author:** Joan Harnett **ISBN:** 978-1-60797-418-5

Course 3: Research Ethics

4 Credits

UNIT I: Objectives in research ethics; management of risk, the application of fundamental ethical principles in scientific research.

UNIT II: Various aspects of academic scandal, including scientific misconducts (such as fraud, fabrication of data and plagiarism), Whistle blowing, etc.

UNIT III: The design and implementation of research involving human and animal experimentation; Animal Ethics Committees (AECs),

UNIT IV: Ethical Issues in Biological Research: the efficiency, equity, excellence and environmental consequences of resource and institutional management.

UNIT V: Regulations and guidelines relating to radiation or biological safety.

Recommended readings:
1. **Research in Medical and Biological Sciences**-From Planning and Preparation to Grant Application and Publication, 1st Edition **Editors:** Petter Laake Haakon Benestad Bjorn R. Olsen **Paperback** **ISBN:** 9780127999432**eBook ISBN:** 9780128001547 **Imprint:** Academic Press
2. **Textbook of Research Ethics** Theory and Practice**By:** Sana Loue ISBN: 9781475773170