

# Syllabus for Ph.D. Course work

Department of Bio-Medical Laboratory Science and Management



Vidyasagar University

**2016**

**Course Structure**

Course	Subject	Full Marks	Unit	Distribution of Marks	Credit
Course I	Research Methodology	50	I	Written: 40 (Exam Hours: 2)	16
			II	Assignment writing on anyone (Practical): 10 Marks	
Course II	Computer and Bio-statistics	50	I	Written: 20	16
			II	Written: 20 (I+II, Exam Hours: 2)	
			III	Assignment writing on anyone (Practical):10 marks	
Course III	Research Techniques & Bio-safety	50		Written (Exam Hours: 2)	20
Course IV	Review Paper	50		Assignment to be Submitted* [*A Literature Review or data generated on the related research topic be submitted by each scholar duly signed and recommended by the Supervisor]	

**Course I**  
**Paper 101: Research Methodology**

**Credit Hours:**

**Marks: 50**

**[Written: 40 (Exam Hours: 2) +  
One Assignment: 10]**

**Unit I [Marks 40]**

1. Research and its general concept
2. Research Hypothesis Definition, Concept, Types
3. Research Problems, Criteria of a good Research Problem, Impact of good Research Problem on Project formulation
4. Classification of research: Basic Research, Applied Research, Action Research, Experimental Research, Historical research, Quantitative and Qualitative Research, Quasi Research

**Unit II: Assignment writing on any one (Practical) – 10 marks**

- Review of articles
- Research proposal
- Sample design
- Data analysis

**Course II**  
**Paper 102: Computer and Bio-Statistics**  
**Credit Hours: 16**  
**Marks: 50 [Written: 40 (Exam Hours: 2) +**  
**One Assignment: 10]**

**Unit: I [Marks: 20]**

- **Data Presentation:** Numerical and graphical presentation of data
- **Descriptive Statistics:** Measures of central tendency and measures of dispersion
- **Inferential Statistics:**
  - Testing of significance of hypothesis by student's t-test, paired t-test, and Fisher's t-test
  - Determination of correlation coefficient between two variables
  - Regression analysis: simple, multiple, and stepwise
  - Analysis of variance (ANOVA) and post-hoc tests (Dunnnett and Tukey)
- **Statistical Modelling:** Basics of statistical modelling

**Unit: II [Marks: 20]**

- **Basics of Computer:** Basics of software and hardware, RAM and ROM
- **Productivity Software:** Office management (MS-Word, MS-Excel, MS-PowerPoint)
- **Research Software:**
  - Image analysis: ImageJ, Image Lab Software
  - Bioinformatics: FASATA, BLAST
  - Statistical Software: SPSS, origin
- **Miscellaneous:** Adobe software (e.g., Photoshop, Illustrator), graphical presentation, PDF editing, publication proof correction

**Unit III: Assignment writing on any one (Practical) – 10 marks**

- Powerpoint presentation on a research topic.
- Analysis of data using MS Excel.
- Analysis of data on given statistical methods.

**Course III**  
**Paper 102: Research Techniques & Bio-safety**  
**Credit Hours: 20**  
**Marks: 50 [Written (Exam Hours: 2)]**

**Research Techniques**

1. Immunohistochemistry
2. PCR and RT PCR
3. Gene sequencing study
4. In-situ study
5. TUNEL Study
6. Amino acid serum study
7. Receptor assay technique
8. Signal transduction by mobile model and fix model receptor assay
9. Immuno-suppressing technique.
10. Gene mutation and its evaluation

**Biosafety**

1. National Health Policy
2. National safety for healthcare
3. Laboratory management/ Personal/ Quality

# **Course IV**

## **Paper 104: Review Paper**

**Marks: 50**

### **Assignment to be submitted**

1. Review writing (soft and hard copy) preference would be given to the P.h.D. work

Introduction, Aims of Objectives, Review & Literature, Discussion, Summary and Conclusion, References.

2. Power slide submission on any topic soft and hard copy