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

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# 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

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# 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 (Dunnett 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.

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# 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

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# 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

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