


School of Studies in Microbiology
Vikram University, Ujjain (M.P.)
Ph.D. Course work 2018-19

Syllabus and Scheme of Examination (Ordinance 11)

S.No.	Course Code	Paper and Title	Credits	Marks
1	MB I	Paper I Research Methodology	4	100 (60 + 40 CCE)
2	MB II	Paper II Review of Published Research in the relevant field	3	100 (60 written report + oral presentation)
3	MB III	Paper III Computer Applications	3	100 (60 + 40 CCE)
4	MB IV	Paper IV Microbiology	3	100 (60 + 40 CCE)
5	MB V	Paper V Comprehensive viva-voce	3	100
Total			16	500

Notes:

1. The candidate has to obtain a minimum of 55% of marks or its equivalent grade points in aggregate in the course work in order to be eligible to continue in Ph.D. programme.
2. If a candidate obtains F or Ab grade in the course/subject, he/she will be treated to have failed in that course. He/she has to reappear in the next semester.
3. If candidates further fails in course, he/she shall not be given another chance and shall be out of Ph.D. programme.


Vikram University
Ujjain
2018

Ph.D. Course work- Microbiology
PAPER - I RESEARCH METHODOLOGY

Unit 1

Introduction to Research Methodology and Research design: Meaning of Research, Objective of research, Research Problem, Need for Research Design, Different Research Designs, Developing a Research Plan.

Unit 2

Sample and Sampling: Sample, sampling unit, Purpose of sampling, process of sampling and different methods of sampling.

Unit 3

Data Collection: Collection of Primary Data, Observation Method, Interview method, Collection of Data through questionnaire and Schedules, Other methods. Collection of Secondary Data, Selection of appropriate method of data collection.

Unit 4

Processing and Analysis of Data: Measures of Central Tendency, Dispersion, t-Test, Chi- square test, Analysis of Variance and Co-variance, Probability-Definition, types of probability.

Unit 5

Interpretation and Report Writing: Meaning of Interpretation, Technique of Interpretation, Significance of Report Writing, Different Steps in Writing Report, Layout of the Research Report, Types of Reports, Mechanics of Writing a Research Report, Ethics in research.

Reference Books:

1. Garg B. L., Karadia R., Agarwal, F. and Agarwal U. K., 2002. An introduction to Research Methodology. RBSA Publishers.
2. Kothari C. R., 1990. Research Methodology: Methods and Techniques, New Age International, 418p.
3. Sinha S. C. and Dhiman A. K., 2002. Research Methodology, Ess Publications, 2 volumes.

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4. Trochim W. M. K., 2005. Research Methods: the concise knowledge base, Atomic Dog Publishing, 270p.
5. Suedecor G. W. and Cochran W.G., 1968). 'Statistical methods', Oxford & IBH, Delhi.
6. Prasad S., 2014. Elements of Biostatistics, Rastogi Publications.

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Ph.D. Course work- Microbiology
PAPER - III COMPUTER APPLICATION

Unit 1

Computer Fundamentals- Computer Basics, Computer Generations, Classification of computers, Computer organization and architecture.

Unit 2

Memory, Storage system and Input and Output devices- RAM, ROM, Storage systems, Input devices and Output devices.

Unit 3

Computer codes and operating systems-Decimal system, Binary system, Function and Types of operating systems, popular operating systems.

Unit 4

Computer software - Types of computer software, MS -DOS, MS word, MS excel, MS power point.

Unit 5

Internet and its applications.- History of Internet, Applications of Internet, Web Browsers, Email service.

Reference Books:

1. Rajaraman , Fundamentals of Computers, Prentice Hall India Pvt. Limited.
2. Gary B. Shelly, Thomas J. Cashman, Misty E. Vermaat, 2007. Microsoft Office Word: Complete Concepts and Techniques. Cengage Learning Inc.
3. Guy Hart-Davis, How to Do Everything with Microsoft Office Excel. Mc Graw Hill.
4. Catherine Skintik, 2007. Learning Microsoft Power Point, Pearson Education.
5. Rashidi H. H. and Buehler L. K., 2002. Bioinformatics Basics: Applications in Biological Science and Medicine, CRC Press, London.

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6. Balagurusamy E., Fundamentals of Computers 2014. McGraw Hill Education (India).

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Ph.D. Course work- Microbiology

Paper **IV** Microbiology

Unit 1

History of microbiology: Discovery of microbial world; Landmark discoveries relevant to the field of microbiology; Berge's manual, Classification of microbes, Five kingdom classification, Three domains system, Molecular approaches to microbial taxonomy.

Unit 2

Microbiological techniques and Instrumentation: Sterilization, aseptic culture techniques, Isolation and purification of microbes, Microscopy, Light-phase contrast and electron microscopy.

Unit 3

Microbial growth -Definition of growth; Growth curve; Mathematical expression of exponential growth phase; Measurement of growth; Synchronous growth; Continuous culture; Factors affecting microbial growth, physical and chemical factors for controlling growth of microorganisms.

Unit 4

Microbial interactions: Carbon, sulphur and nitrogen cycles; Different types of microbial interactions, Plant microbial interactions.

Unit 5

Application of microbes: Fermentation and its applications, application of microbes in industries, agriculture, medicine and in recombinant DNA technology.

Reference Books

1. Harley and Klein, Microbiology by Prescott, The Mc Graw Hill companies Inc., New York
2. Medigan M. T., Martinko J., M. and Parker J., Brock Biology of Microorganisms, Pearson Education Inc., New York
3. Nelson D. L., Cox, M. M., 2000. Lehninger- Principles of Biochemistry, III Ed. McMillan

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4. Klug W. S. and Cummings M. K. 2000. Concept of genetics, VII Ed., Pearson Education, New Delhi.
5. Chaapra H. L., Text Book of Medical Microbiology.

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