



Mahila Vikas Sanstha's
INDRAPRASTHA NEW ARTS
COMMERCE & SCIENCE
COLLEGE, AT POST NALWADI, DIST. WARDHA (M.S.)
Accredited 'B' by NAAC

Approved by government
of Maharashtra

Affiliated to Rashtrasant Tukadoji
Maharaj Nagpur University, Nagpur

Recognised by U.G.C New Delhi
under section 2 (f) & 12 (b) of
UGC act 1956

Department of Microbiology

Courses Offered :

Department of Microbiology offers following courses

S.No.	Name Of Course	Subject	Level
1	B.Sc.	Biotechnology, Microbiology, Chemistry	UG



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Course Outcomes (COs) :

Course Specific Outcomes : B.Sc Sem I

Paper I : Fundamentals Of Microbiology

Sr.no	Course outcome
1	Students will understand the contributions of different scientists in the fields of Microbial science.
2	Students will have knowledge about the established and emerging fields of science with respect to Microbiology.
3	Students will have knowledge about basic structure & nutritional requirement of bacteria.
4	Develop practical skills to handle microorganism aseptically.
5	Understand the use of apparatus and their use without fear.
6	Correlate their Microbiology theory concepts with practical outcomes.

Paper II : Basic Techniques In Microbiology

Sr.no	Course outcome
1	Students will be able to understand the needs and basics of techniques used in observing microbes.
2	Students will be aware of applications of basic techniques.
3	Students will learn sterilization and disinfection principles and procedures.
4	Students will learn cultivation & aseptically handling of microorganism.



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Course Outcomes (COs) :

Course Specific Outcomes : B.Sc Sem II

Pape I : MICROBIAL DIVERSITY

Sr.no	Course outcome
1	Acquire basics and importance of Microbiology
2	Learn about basic characteristics features of microorganisms
3	Describe the classification of Bactria
4	Gain insights into the important characters, classification & life cycle of viruses.

Pape II : Food Microbiology and Milk Microbiology

Sr.no	Course outcome
1	This course will help students learn various methods of isolation, detection and identification of spoilage microorganisms in milk.
2	Understand the application of principle of effect of temperature on spoilage of milk products.
3	Develop technician level human resource for dairy industry.
4	Develop young entrepreneurs for self-employment through dairy technology and associated activities.
5	Impart knowledge and technical proficiency in processing of milk, testing and quality control of milk and milk products



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Course Outcomes (COs) :

Course Specific Outcomes : B.Sc Sem III

Pape I : Chemistry Of Organic Components and Enzymology

Sr.no	Course outcome
1	Define and classify carbohydrates and understand the structure and function of different polysaccharides.
2	Understand and illustrate the structure of lipids and their function in biology.
3	Understand and describe the terminology and concepts related to enzymology.
4	Explain the phenomenon behind enzyme assay and derive the kinetic equations related to enzymes.

Pape II : Industrial Microbiology

Sr.no	Course outcome
1	Ability the principle of management and controls on the microbial processes in industrial settings.
2	Ability the principles of physiological understanding in improvement of industrial processes



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Course Outcomes (COs) :

Course Specific Outcomes: B.Sc SEM IV

Paper I : Metabolism

Sr.no	Course outcome
1	Comprehend the concept of bioenergetics, various terminologies related to it and the concept of high-energy molecules and bonds
2	Develop an understanding of various metabolisms in cell
3	They will know the formation and the breakdown of different biomolecules and the places where it took place
4	Various physiological and pathological aspects of byproducts of metabolic pathways and their regulations relate with various industrial processes.

Pape II : Environmental Microbiology

Sr.no	Course outcome
1	Understanding the significance of microorganisms in biogeochemical cycling of nutrients
2	Understanding the significance of sustainable development and bioremediation of pollutants for developing strategies of environmental conservation and remediation



Course Outcomes (COs) :

Course Specific Outcomes: B.Sc SEM V

Paper I : Medical Microbiology

Sr.no	Course outcome
1	Students will be able to correlate disease symptoms with causative agent, isolate and identify pathogens.
2	They will gain knowledge of mechanism of action of antimicrobial drugs and Prophylaxis.

Paper II : Molecular Biology And Instrumentation

Sr.no	Course outcome
1	Illustrate the concept of mutation and DNA repair
2	Students will gain knowledge of prokaryotic gene transfer mechanisms, mutations and recombination ,conjugation ,transduction and transformation
3	Understand and illustrate the principle and functioning behind spectrophotometry.
4	Understand and illustrate the principle and functioning behind Chromatography, centrifugation ,electrophoresis and Isotopic tracer technique.



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Course Outcomes (COs) :

Course Specific Outcomes: B.Sc SEM VI

Paper I: Immunology

Sr.no	Course outcome
1	Understand and explain immune system, properties of immune system, types of immunity, pathways of complement systems
2	the concept of antigen, antigenic determinants, haptens, and factors affecting Antigenicity in various diseases.
3	Know immunoglobulin, structure, types, and functions and can apply the concept of Hypersensitivity and vaccination while observing the different diseased situations
4	Perform various immunological techniques.

Paper II: Microbial Biotechnology and rDNA TECHNOLOGY

Sr.no	Course outcome
1	Students can give an introduction to rDNA technology, the basics of genetic engineering, various enzymes, the concept of different vectors and their applications and can apply them further.
2	Apply the concept of PCR, its applications, general features of expression vectors- advantages and problems, and various applications of r-DNA technology while performing experiments in r-DNA technology.
3	Understanding the concept of gene library, cloned genes, expression of prokaryotic gene.
4	Know the vectors and their types.



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PROGRAM OUTCOMES OF B. Sc. MICROBIOLOGY

PO1 : Students will be able to acquire, articulate, retain and apply specialized language and knowledge relevant to microbiology.

PO2 : Students will acquire and demonstrate competency in laboratory safety and in routine and specialized microbiological laboratory skills applicable to microbiological research or clinical methods, including accurately reporting observations and analysis.

PO3 : Students will communicate scientific concepts, experimental results and analytical arguments clearly and concisely, both verbally and in writing.

PO4 : Students will demonstrate engagement in the microbiology discipline through involvement in research or internship activities, the microbiology student association club (MSA) and outreach or mentoring activities specific to microbiology.

PO5 : Students study microscopic living systems and organisms. They can work across a spectrum of private industries or government agencies. Cell biologists focus on the uses, functions, development and lives of cells and their related systems and interaction

PO6 :This course presents the study of Micro organisms. On successful completion of the subject the student should have understood the Role of microorganisms in the diversity.

PO7 :A general course emphasizing distribution, morphology and physiology of microorganisms in addition to skills in aseptic procedures, isolation and identification.

PO8 :This course also includes sophomore level material covering immunology, virology, epidemiology and DNA technology.

PO9 :Recommended for all allied health students. Three hours lecture and four hours lab per week.

PO10 : With the individual Research projects, Research orientation will be improved which is reflected in the form of papers and conference presentations.

PO11 :Applied papers are advanced, making the students updated in the field. More number of practicals is there in the course making the students well worse with the subject.