

YASHWANTRAO CHAVAN COLLEGE OF SCIENCE KARAD

DEPARTMENT OF MICROBIOLOGY

PG

PROGRAMME OUTCOMES

PROGRAMME SPECIFIC OUTCOMES

COURSE OUTCOMES

Yashwantrao Chavan College of Science Karad

Department of Microbiology (PG)

Programme Outcomes (PO)

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PO 1	It helps in developing competent Microbiologists who can progress to diverse fields of microbiological interests in various fields of industries, research, teaching, medical science and entrepreneurship.
PO 2	The course is aimed at adding to the knowledge base of Microbiology graduates through significant inputs of latest information on the subject
PO 3	It also envisages that the students read original research publications and develop the ability of critical evaluation of the study.
PO 4	Development of communication skills as well as laboratory work and team work, creativity, planning and execution are also a major objective of this program
PO 5	In the core courses, the students study the basics of Microbiology along with the basics of subjects allied to and useful in Microbiology (Techniques, Biostatistics, Computer handling and Bioinformatics, Biosafety, Scientific writing and Agricultural and Clinical Microbiology).
PO 6	The specializations include topics on various fields of Industrial Microbiology, Fermentation Technology, Quality assurance, Recombinant DNA Technology and Pharmaceutical Microbiology
PO 7	During this program students undertake a On job training, Research Project, field projects which the student is expected to study research methodology through experimental work, literature survey and report writing.
PO 8	In On job training, the student is to take training in the Industry for a period of at least two weeks which will help student to study Microbiological aspects in the Industry.
PO 9	Educational tour to various institutes and or industries provides actual microbiological applications in various fields of Microbiology.



Yashwantrao Chavan College of Science Karad

Department of Microbiology (PG)

Programme Specific Outcomes (PSO)

After successful completion of PG syllabus of Microbiology student should be able to

	Programme Outcomes (PSO)
PSO 1	Identify and classify microorganisms using appropriate laboratory techniques and tools.
PSO 2	Comprehend the ecological roles of microorganisms in various environments, including soil, water, and the human body.
PSO 3	Explore principles of microbial genetics, including gene transfer mechanisms and the role of genetic variation in microbial evolution.
PSO 4	Utilize bioinformatics tools for the analysis of microbial genomes
PSO 5	Write and publish microbiological research effectively through scientific written reports, oral presentations, and scientific documentation etc.
PSO 6	Adhere to safety protocols in microbiological laboratories
PSO 7	Understand and apply microbiological techniques in biotechnological applications, including r DNA technology, drug discovery and design, the production of biomolecules etc.
PSO 8	Apply microbiological principles to real-world scenarios, such as food safety, environmental monitoring, and industrial processes.
PSO 9	Describe the diversity of microorganisms, including bacteria, viruses, fungi, and protozoa, and their roles in various ecosystems.
PSO 10	Use different analytical techniques like chromatography, spectroscopy etc in the estimation of biomolecules.



Yashwantrao Chavan College of Science Karad

Department of Microbiology (PG)

Course Outcomes (CO)

MMT-101: Microbial Systematics	
After completion of this course, students will be able to,	
CO 1	To gain knowledge of systematics of bacteria
CO 2	To understand new trends in systematics of bacteria
CO 3	To learn different approaches bacterial systematics

MMT 102: Immunology	
After completion of this course, students will be able to,	
CO 1	Understand classes of immunoglobulin, organization and expression of immunoglobulin genes.
CO 2	Know details of major histocompatibility complex and disease susceptibility.
CO 3	Understand cytokines, hypersensitivity and their medical significance.
CO 4	Know immunodeficiencies and auto immunity.

MET 103 A: BIOCHEMISTRY	
After completion of this course, students will be able to,	
CO 1	Understand basic concepts in biochemistry.
CO 2	Understand structural features and chemistry of macromolecules..
CO 3	Know membrane transport mechanism in bacteria.

MET-103 B MICROBIAL METABOLISM	
After completion of this course, students will be able to,	
CO 1	Understand basic concepts of metabolism.
CO 2	Understand bioenergetics, aerobic respiration and anaerobic respiration.
CO 3	Know metabolism of carbohydrates, lipids and nucleic acids.

MET 103-C : ENVIRONMENTAL MICROBIOLOGY	
After completion of this course, students will be able to,	
CO 1	Understand concept of aeromicrobiology, biosafety and waste water management.
CO 2	Understand bioremediation and biodegradation processes.
CO 3	Know environmental laws.



RM-106 Research Methodology	
After completion of this course, students will be able to,	
CO 1	Understand basics of research methodology
CO 2	Apply knowledge in project or research work
CO 3	Analyse the data qualitatively and quantitatively
CO 4	Be aware about research ethics and misconduct
CO 5	Know the process of publishing research work

MMPR- 104 PRACTICAL COURSE-I	
After completion of this course, students will be able to,	
CO 1	Operate high end laboratory instruments
CO 2	Know basic practical skills in Biochemistry
CO 3	Know basic practical skills in Immunology

MEPR- 105 PRACTICAL COURSE-II	
After completion of this course, students will be able to,	
CO 1	Use basic softwares for bacterial systematics
CO 2	Cultivate extremophiles.
CO 3	Conduct experiment for detection of pollution strength

MMT 201 GENETICS AND MOLECULAR BIOLOGY	
After completion of this course, students will be able to,	
CO 1	Understand the basic concepts of microbial genetics
CO 2	Understand the process of inheritance
CO 3	Know the role of genes in cancer biology
CO 4	Know the molecular process of protein synthesis and recombination

MMT 202 FERMENTATION TECHNOLOGY	
After completion of this course, students will be able to,	
CO 1	Understand the basic concepts of fermentation
CO 2	Know about different types of fermentors & fermentation processes and problems
CO 3	Understand specific fermentations of industrially important products
CO 4	Know about role of computer in fermentation technology

MET 203-A TECHNIQUES IN MICROBIOLOGY	
After completion of this course, students will be able to,	
CO 1	Understand the basic concepts of techniques used in microbiology
CO 2	Know, how to preserve industrially important microorganisms.
CO 3	Understand good microbiological laboratory practices
CO 4	Know about general principles and working of analytical techniques



MET 203-B QUALITY ASSURANCE AND VALIDATION IN PHARMACEUTICAL SECTOR	
After completion of this course, students will be able to,	
CO 1	Understand the role of microbiologist pharmaceutical sector
CO 2	Know the basics of drug designing and development
CO 3	Understood microbial synthesis and standard operating processes in pharma industry
CO 4	Understand the role of regulatory affairs in pharma

MET 203-C Microbial Ecology	
After completion of this course, students will be able to,	
CO 1	Understand the basics of microbial ecology
CO 2	Study different microbial interactions and their significance
CO 3	Know emerging techniques used in microbial ecology
CO 4	Explore the applications of microbial ecology

MMPR 204- Practical Course I	
After completion of this course, students will be able to,	
CO 1	Perform common molecular biology methods
CO 2	Understand practical aspects of fermentation processes
CO 3	Understand microbial ecology of different environments
CO 4	Calibrate colorimeter

MEPR 205- Practical Course II	
After completion of this course, students will be able to,	
CO 1	Perform different separation techniques
CO 2	Know about methods used to preserve microbial culture
CO 3	Perform environmental monitoring and microbial limit test

CC-301: Biostatistics, Bioinformatics and Scientific Writing	
After completion of this course, students will be able to,	
CO 1	Understand applications of different statistical parameters
CO 2	Understand role of different statistical test for validation of experimental data
CO 3	Understand the use of computer softwares for analysis of biological data
CO4	Learn the ethics of scientific writing and publishing a research

CCS-302- Enzymology and Enzyme Technology	
After completion of this course, students will be able to,	
CO 1	Learn basic concept of enzymology
CO 2	Understand kinetics of enzyme catalyzed reaction
CO 3	Know about industrial applications of enzyme

CCS-303- Fermentation Technology	
After completion of this course, students will be able to,	
CO 1	Understand the basic concepts of fermentation
CO 2	Know about different types of fermentors & fermentation processes and problems
CO 3	Understand specific fermentations of industrially important products
CO 4	Know about role of computer in fermentation technology



DSE-304- Quality Control Microbiology-I	
After completion of this course, students will be able to,	
CO 1	Learn biosafety levels microbiology laboratory
CO 2	Understand safe handling of biological materials in laboratory
CO 3	Learn basics of sterilization and sterility assurance
CO 4	Learn about safety cabinets and protective equipments

CCPR-305- Laboratory course	
After completion of this course, students will be able to,	
CO 1	Use statistical methods in data analysis
CO 2	Learn basic practical skills in Bioinformatics & Scientific writing
CO 3	Understand the effect of different factors on enzyme kinetics
CO 4	Know about calibration and validation of laboratory instruments

CC-401- Food and Dairy Microbiology	
After completion of this course, students will be able to,	
CO 1	Understand different methods of food preservation
CO 2	Learn different food borne diseases
CO 3	Acquire knowledge about probiotic and different food safety and standards
CO 4	Commercial values of fermented foods

CCS-402- Industrial waste management	
After completion of this course, students will be able to,	
CO 1	Characterize industrial effluents and their adverse effects on environment
CO 2	Learn the role of microorganisms in treatment of industrial waste
CO 3	Know about the rules and regulations of waste disposal

CCS-403- Recombinant DNA Technology	
After completion of this course, students will be able to,	
CO 1	Understand Modern tools and techniques in molecular biology.
CO 2	Understand methods of cloning and its significance.
CO 3	Learn the role of Recombinant DNA technology in industries

DSE-404- Quality Control Microbiology-II	
After completion of this course, students will be able to,	
CO 1	Learn the role of various regulatory agencies in pharmaceutical sector
CO 2	Understand how to maintain the clean rooms and monitoring the environment
CO 3	Learn the data keeping and auditing process

CCPR-405- A-Laboratory Course	
After completion of this course, students will be able to,	
CO 1	Analyze microbiological quality of the milk and milk products
CO 2	Learn about characterization and treatment of industrial effluents
CO 3	Understand the basics of plant tissue culture


HEAD

DEPARTMENT OF MICROBIOLOGY

