



PRINCE SHRI VENKATESHWARA ARTS AND SCIENCE COLLEGE

Gowrivakkam, Chennai-600073.

Affiliated to University of Madras, ISO 9001:2015 Certified Institution

Recognized by UGC under section 2(f) of UGC Act 1956

DEPARTMENT OF MICROBIOLOGY

2022-2023

COURSE OUTCOMES

M. Sc MICROBIOLOGY

YEAR/ SEM: I/ I – MQ21A – MICROBIAL DIVERSITY & TAXONOMY

NO.	COURSE OUTCOME
C101.1	To understand the basic concepts in Biodiversity.
C101.2	To learn the classification and applications of extremophiles including thermophiles, archaebacteria and methanogens.
C101.3	To understand the extremophiles including alkaliphiles, acidophiles, halophiles, and basophiles..
C101.4	To gain basic knowledge on microbial taxonomy and its classification.
C101.5	To learn the bacterial classification according to Bergey's manual.

YEAR/ SEM: I/ I – MQ21B – GENERAL MICROBIOLOGY AND LABORATORY ANIMAL SCIENCE

NO.	COURSE OUTCOME
C102.1	To understand the working principles of different microscope and their applications.
C102.2	To learn the bacterial anatomy, nutritional requirements and an overview of actinomycetes.
C102.3	To understand different staining procedures, pure culture techniques and sterilization methods.
C102.4	To gain knowledge about the life cycles and reproduction of algae.
C102.5	To know about the laboratory animals including handling and testing procedures with microorganisms

YEAR/ SEM: I/ I – MQ21C - IMMUNOLOGY

NO.	COURSE OUTCOME
C103.1	To acquire knowledge about the fundamental concepts of immunity, the role of the different organs and cells in immune responses
C103.2	To gain knowledge of antigens, antibodies, complement and their role in Immunology.



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C103.3	To understand the mechanisms of antigen and antibody reactions.
C103.4	To acquire knowledge on the concepts of transplantation and tumor immunology.
C103.5	To understand the unique properties of vaccines and types.

YEAR/ SEM: I/I – MQ41A – MICROBIAL METABOLIC PATHWAYS

NO.	COURSE OUTCOME
C104.1	To gain knowledge about enzymes, mechanism and regulation of enzymes
C104.2	To gain knowledge on the generation of energy source.
C104.3	To understand the concepts of carbohydrate metabolism.
C104.4	To understand the concepts of Lipid metabolism.
C104.5	To understand the biosynthetic pathways of peptidoglycan, aminoacids, purines and pyrimidines

YEAR/ SEM: I/I – MQ41B – PHARMACEUTICAL MICROBIOLOGY

NO.	COURSE OUTCOME
C105.1	To know the importance of monitoring the sterility control during the manufacturing process till the final products in pharma industries.
C105.2	To gain knowledge on new technology and production of some important pharmaceutical products
C105.3	To understand the basic concepts on pharmacological principles of drug metabolism and the need of developing new drugs.
C105.4	To understand the methodology of testing the antimicrobial properties of substances
C105.5	To assess the role of various regulatory guidelines, policies in manufacturing quality products

YEAR/ SEM: I/I – PSSEA – LANGUAGE AND COMMUNICATION ADVANCED LEVEL

NO.	COURSE OUTCOME
C106.1	Develop effective verbal communication skills to express ideas clearly and persuasively in various contexts.
C106.2	Enhance active listening and comprehension abilities to better understand and respond to others' messages.



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C106.3	Demonstrate proficiency in written communication by composing clear and coherent documents, such as emails, reports, and presentations.
C106.4	Cultivate intercultural communication competence to interact sensitively and respectfully with diverse individuals and groups.
C106.5	Acquire critical thinking and problem-solving skills to analyze and resolve communication challenges in professional and personal settings.

YEAR/ SEM: I/I – MQ211 – PRACTICAL I GENERAL MICROBIOLOGY AND IMMUNOLOGY

NO.	COURSE OUTCOME
C107.1	To Know how to perform sterilization techniques and handling of microscope for different microbiological work
C107.2	To apply technical skills on staining methods and different types of media preparation for identification of bacteria.
C107.3	To understand how to perform pure culture techniques and anaerobic culturing methods.
C107.4	To evaluate the serological techniques.
C107.5	To analyze the components of human sera by performing centrifugation, precipitation and chromatography techniques.

YEAR/ SEM: I/II – MQ221- PRACTICAL II – MEDICAL BACTERIOLOGY, MEDICAL MYCOLOGY AND PARASITOLOGY & VIROLOGY

NO.	COURSE OUTCOME
C108.1	To gain knowledge about the standard operating procedure to be followed in diagnosis of bacterial diseases.
C108.2	To understand how to isolate and identify the specific pathogen associated with the disease, standard methodology in determination of antimicrobial activity of the drugs against the bacterial pathogens for treatment purpose.
C108.3	To isolate and identify various medically important fungal agents associated with different forms of fungal diseases.
C108.4	To isolate and identify various medically important parasitic agents cause diseases in human and learn the role of arthropod vectors in disease transmission.
C108.5	To attain practical skill on the propagation, cell culture methods and characterization of virus types from different sources.

YEAR/ SEM: I/II – MQ22A - VIROLOGY

NO.	COURSE OUTCOME
C109.1	To know about the viral classification, taxonomy, properties and its cultivation



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C109.2	To gain knowledge of the different types of bacteriophages.
C109.3	To gain knowledge of viral diseases of economically important crop plants.
C109.4	To know about the various medically important viral diseases prevalent throughout the world
C109.5	To gain knowledge on the current trends and modern approaches in studying the epidemiology, diagnosis and treatment of viral diseases.

YEAR/ SEM: I/II – MQ22B – MEDICAL BACTERIOLOGY

NO.	COURSE OUTCOME
C110.1	To learn the interrelationship between normal flora and hosts
C110.2	To learn and familiarize with the terminologies and basic principles of specimen collections.
C110.3	To know about the various important zoonotic diseases and Nosocomial infections
C110.4	To learn the concept, etiology, differential diagnosis, epidemiology and prevention of various gram positive bacterial diseases.
C110.5	To learn the concept, etiology, differential diagnosis, epidemiology and prevention of various gram negative bacterial diseases.

YEAR/ SEM: I/II – MQ22C – MEDICAL MYCOLOGY AND PARASITOLOGY

NO.	COURSE OUTCOME
C111.1	To understand the basics of fungi.
C111.2	To gain knowledge on the etiological agents, its disease mechanism associated with various types of fungal infections in humans.
C111.3	To gain knowledge about the diagnosis of fungal infections and its treatment.
C111.4	To know about the medically important protozoans causing diseases in human.
C111.5	To gain knowledge about medically important helminth causing diseases in humans and immunocompromised individuals.

YEAR/ SEM: I/II – MQ42A – INDUSTRIAL AND FERMENTATION TECHNOLOGY

NO.	COURSE OUTCOME
C112.1	To gain knowledge about fermentation, types and its importance.



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C112.2	To know about design of bioreactor, factors affecting growth and production.
C112.3	To understand the rationale in medium formulation and design for microbial fermentation, sterilization of medium and air.
C112.4	To know about primary & secondary metabolites.
C112.5	To gain knowledge about recent advancements in fermentations.

YEAR/ SEM: I/II – MQ32A – BIostatISTICS, BIOINFORMATICS & BIOINSTRUMENTATION

NO.	COURSE OUTCOME
C113.1	To describe various applications of Biostatistics and to recognize the importance of data collection
C113.2	To recall the requisites of probability distribution and to interpret the measures of averages and dispersion. To evaluate practical problems arising in biostatistics
C113.3	To describes the contents and properties of the most important bioinformatics databases, perform text- and sequence-based searches.
C113.4	To gain knowledge about various concepts, advanced technical tools in docking, computational drug discovery and ADME responses.
C113.5	To know about the importance and applications of biological instrumentation for modern day research.

YEAR/ SEM: I/II – PSSEB – SPOKEN AND PRESENTATION SKILLS

NO.	COURSE OUTCOME
C114.1	Develop effective verbal communication techniques to deliver clear, engaging, and persuasive presentations in various settings.
C114.2	Enhance public speaking confidence and reduce speaking anxiety to deliver presentations with poise and self-assurance.
C114.3	Master the art of structuring presentations to ensure coherent and organized delivery of ideas and information.
C114.4	Acquire skills in using visual aids and technology to enhance the impact and effectiveness of presentations.
C114.5	Receive constructive feedback and self-assessment to continuously improve and refine spoken communication and presentation abilities.



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M. Sc APPLIED MICROBIOLOGY

YEAR/ SEM: II/III – MDT3A – MICROBIAL GENETICS

NO.	COURSE OUTCOME
C201.1	To outline the basics of nucleic acid and its properties.
C201.2	To highlight the organization of gene and chromosomes in prokaryotes.
C201.3	To understand the extrachromosomal genetic materials and their transfer mechanism.
C201.4	To analyze processes involved in gene mutation and transfer in microorganisms.
C201.5	To extend the knowledge of gene mapping and strain construction.

YEAR/ SEM: II/III – MDT3B – GENETIC ENGINEERING

NO.	COURSE OUTCOME
C202.1	To understand the principles, methods and enzymes in genetic engineering.
C202.2	To outline the vectors and artificial chromosomes.
C202.3	To categorize the cloning techniques and gene transfer mechanisms.
C202.4	To analyze the basic molecular biology techniques in gene manipulation.
C202.5	To articulate the different DNA finger printing and protein engineering techniques.

YEAR/ SEM: II/III – MDT3C – MOLECULAR BIOLOGY

NO.	COURSE OUTCOME
C203.1	To highlight the composition and functions of biomolecules.
C203.2	To understand the DNA replication, recombination and their repair mechanism.
C203.3	To articulate the processes involved in RNA synthesis.
C203.4	To extend the knowledge on the concepts of protein synthesis and post-translational modification of proteins.
C203.5	To analyze the different mechanisms of gene regulations in transcription and translation level



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YEAR/ SEM: II/III – MDTAD – SOIL AND AGRICULTURAL MICROBIOLOGY

NO.	COURSE OUTCOME
C204.1	To summarize the properties of soil and interaction of microbes with plants, insects and microbes.
C204.2	To extend knowledge on biogeochemical cycles, biofertilizers and biopesticides.
C204.3	To articulate the principles of plant infection and defense mechanism.
C204.4	To categorize the symptoms, etiology and epidemiology of various plant diseases.
C204.5	To outline the use of biotechnological approaches to plant disease management.

YEAR/ SEM: II/III – MDTBB – ENVIRONMENTAL BIOTECHNOLOGY

NO.	COURSE OUTCOME
C205.1	To extend knowledge on biofilm occurrence, effect and control measures.
C205.2	To categorize the various types of bioreactors and its usage in production of commercially important products.
C205.3	To outline the waste water treatment, drinking water treatment and denitrification processes.
C205.4	To summarize the various detoxification of hazardous chemical and biodegradation of environmental contaminants.
C205.5	To understand the bioremediation of various industrial effluents and biomass from waste.

YEAR/ SEM: II/III – PSSEC – LIFE AND MANAGERIAL SKILLS

NO.	COURSE OUTCOME
C206.1	To increase one's knowledge and awareness of emotional competency and emotional intelligence at place of study/work.
C206.2	To provide opportunity for realizing one's potential through practical experience
C206.3	To develop interpersonal skills and adopt good leadership behaviour for empowerment of self and others.
C206.4	To set appropriate goals, manage stress and time effectively
C206.5	To manage competency- mix at all levels for achieving excellence with ethics.



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YEAR/ SEM: II/III – PSSEQ - INTERNSHIP

NO.	COURSE OUTCOME
C207.1	To construct the company profile by compiling the brief history, management structure, products / services offered, key achievements and market performance for his / her organization of internship
C207.2	To assess its Strengths, Weaknesses, Opportunities and Threats (SWOT).
C207.3	To determine the challenges and future potential for his / her internship organization in particular and the sector in general.
C207.4	To test the theoretical learning in practical situations by accomplishing the tasks assigned during the internship period.
C207.5	To analyse the functioning of internship organization and recommend changes for improvement in processes

YEAR/ SEM: II/III – MDT31 – MICROBIAL GENETICS, MOLECULAR BIOLOGY AND GENETIC ENGINEERING

NO.	COURSE OUTCOME
C208.1	To experiment the techniques for isolation of plasmid and genomic DNA and their estimation methods.
C208.2	To execute the techniques for isolation of RNA from yeast and isolation of auxotrophic mutants.
C208.3	To illustrate the protein estimation, electrophoresis, isoelectric focusing and chromatography techniques.
C208.4	To display experimental knowledge on separation of proteins using chromatography, immobilization, western blotting techniques.
C208.5	To implement knowledge on the lab skills for competent cell preparation, transformation and restriction analysis.

YEAR/ SEM: II/IV – MDT41 – SOIL, AGRICULTURAL, FOOD AND ENVIRONMENTAL MICROBIOLOGY

NO.	COURSE OUTCOME
C209.1	To isolate and enumerate the soil microorganisms.
C209.2	To estimate the foliar infection by stoyer's method and cultivation of oyster mushroom.
C209.3	To evaluate the qualitative and quantitative analysis of milk sample.
C209.4	To enact the quantification of microorganisms in air.
C209.5	To experiment the techniques for the methods of physical, chemical and microbial assessment of water and potability test for water.



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YEAR/ SEM: II/IV – MDT4A – FOOD, DAIRY AND ENVIRONMENT MICROBIOLOGY

NO.	COURSE OUTCOME
C210.1	To understand the principles & methods of food preservation and food borne diseases.
C210.2	To outline the spoilage and preservation of milk & milk products and milk borne diseases.
C210.3	To evaluate the assessment of air quality and air borne diseases.
C210.4	To extend the knowledge of students on waste water treatment methods.
C210.5	To summarize the role of microflora in degradation of xenobiotic compounds.

YEAR/ SEM: II/IV – MDT4Q - PROJECT

NO.	COURSE OUTCOME
C211.1	To Gain knowledge of conducting an independent research work
C211.2	To understand how to do selection of a topic, design of protocol and collection of literature
C211.3	To acquire knowledge on organizing and conducting the experimental part of the project.
C211.4	To learn how to write a project thesis, its organization and ethical parts.
C211.5	To learn how to publish the research paper in journals and to present the papers in national or international conferences.

YEAR/ SEM: II/IV – MDTAE – RESEARCH METHODOLOGY

NO.	COURSE OUTCOME
C212.1	To understand the basics of research methodology and fundamentals of bioethics.
C212.2	To extend knowledge on writing the research report.
C212.3	To highlight the molecular biology techniques.
C212.4	To outline the histochemical and immuno techniques.
C212.5	To summarize the different radiolabeling techniques.



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YEAR/ SEM: II/IV – PSED – COMPUTING SKILL

NO.	COURSE OUTCOME
C213.1	To get basic knowledge in computer skills refer to the ability to use computers and related technology
C213.2	To make presentations, work with application software.
C213.3	To create visually beautiful slides, posters, marketing materials and presentations is one of the most desired skills.
C213.4	To gain knowledge on how to prepare charts, graphs and rank using functions.
C213.5	To learn basic understanding of computer hardware and software.