



PRINCE SHRI VENKATESHWARA ARTS AND SCIENCE COLLEGE

Gowrivaikkam, Chennai-600073.

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

DEPARTMENT OF MICROBIOLOGY

2019-2020

COURSE OUTCOMES

M. Sc APPLIED MICROBIOLOGY

YEAR/ SEM: I/ I – MDT1A – MICROBIAL TAXONOMY

| NO. | COURSE OUTCOME |
|---------------|---|
| C101.1 | To identify the taxonomy and classification of microorganism. |
| C101.2 | To categorize microorganism on the concepts of Bergey's manual systematic bacteriology. |
| C101.3 | To understand the significance and characteristics of fungi. |
| C101.4 | To outline the characteristics and classification of protozoa. |
| C101.5 | To extend knowledge on the systematic classification of algae. |

YEAR/ SEM: I/ I – MDT1B – GENERAL MICROBIOLOGY AND LABORATORY ANIMAL SCIENCE

| NO. | COURSE OUTCOME |
|---------------|--|
| C102.1 | To understand the principles of microscopy, centrifugation and staining techniques. |
| C102.2 | To summarize the anatomy, growth and nutrition of microorganism. |
| C102.3 | To compare and categorize the life cycle of various species of algae. |
| C102.4 | To extend knowledge on the management, breeding and handling of different of laboratory animals. |
| C102.5 | To outline the maintenance and uses of gnotobiotic and transgenic animals. |

YEAR/ SEM: I/ I – MDT1C - IMMUNOLOGY

| NO. | COURSE OUTCOME |
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| C103.1 | To extend knowledge on the structure and functions of immune system. |



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| C103.2 | To outline the structure and functions of antibody and antigen. |
| C103.3 | To understand the basic principles and methods of immunological techniques. |
| C103.4 | To explain the various mechanisms of immune function. |
| C103.5 | To summarize the principles and types of vaccines. |

YEAR/ SEM: I/I – MDTAA – METABOLIC PATHWAYS

| NO. | COURSE OUTCOME |
|---------------|---|
| C104.1 | To understand the basics of enzymes and mechanism of enzyme reaction. |
| C104.2 | To highlight the principles of bioenergetics and electron transport chain. |
| C104.3 | To categorize the metabolism of various biomolecules. |
| C104.4 | To extend knowledge on the lipid metabolism and oxidation of inorganic molecules. |
| C104.5 | To summarize the biosynthesis and interconversions of amino acids. |

YEAR/ SEM: I/I – MDTAB – MICROBIAL DIVERSITY

| NO. | COURSE OUTCOME |
|---------------|---|
| C105.1 | To understand the basics of microbial diversity. |
| C105.2 | To outline the classification, habitats and applications of thermophiles and methanogens. |
| C105.3 | To extend knowledge on the classification and applications of halophiles, barophiles, acidophiles and alkalophiles. |
| C105.4 | To summarize the objectives of space microbiology. |
| C105.5 | To highlight the Martian environment and monitoring of astronauts microbial flora. |

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

| NO. | COURSE OUTCOME |
|---------------|----------------------------|
| C106.1 | To revise language skills. |



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| C106.2 | To build fluency |
| C106.3 | To learn the principles of LSRW |
| C106.4 | To know to take notes and be aware of one's body languages while communicating |
| C106.5 | To develop and Expand Writing Skills through Controlled and Guided activities |

YEAR/ SEM: I/II – MDT11 – PRACTICAL I GENERAL MICROBIOLOGY, PHYSIOLOGY AND IMMUNOLOGY

| NO. | COURSE OUTCOME |
|---------------|--|
| C107.1 | To implement knowledge on the sterilization techniques and handling of microscope for different microbiological applications. |
| C107.2 | To display experimental knowledge on staining methods and different types of media preparation for identification of bacteria. |
| C107.3 | To execute the 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 – MDT21 - PRACTICAL II – SYSTEMETIC BACTERIOLOGY, MYCOLOGY, PARASITOLOGY & VIROLOGY

| NO. | COURSE OUTCOME |
|---------------|--|
| C108.1 | To apply skills to identify medically important bacteria from the clinical samples |
| C108.2 | To analyze the processing of clinical sample. |
| C108.3 | To evaluate medically important fungi using microscope. |
| C108.4 | To the feces and blood sample for the detection of pathogenic parasites. |
| C108.5 | To isolate phage from natural sources. |



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YEAR/ SEM: I/II – MDT2A - VIROLOGY

| NO. | COURSE OUTCOME |
|--------|---|
| C109.1 | To understand the classes of viruses and general features & diseases caused by viruses. |
| C109.2 | To outline the properties of bacteriophages and its application in bacterial genetics. |
| C109.3 | To highlight the general characteristics of plant viruses and common viral diseases of crop plants. |
| C109.4 | To extend knowledge on the DNA and RNA viruses. |
| C109.5 | To identify the treatment of viral diseases and antiviral agents. |

YEAR/ SEM: I/II – MDT2B – SYSTEMATIC MEDICAL BACTERIOLOGY

| NO. | COURSE OUTCOME |
|--------|--|
| C110.1 | To extend knowledge on the clinical conditions of various bacterial syndromes. |
| C110.2 | To outline the collection and transport of clinical specimens for microbiological diagnosis. |
| C110.3 | To understand the morphology, cultural characteristics and laboratory diagnostics of Gram positive & Gram negative bacteria. |
| C110.4 | To identify the anaerobic Gram negative bacteria and leptospirosis. |
| C110.5 | To highlight the zoonotic diseases and their control. |

YEAR/ SEM: I/II – MDT2C – MYCOLOGY AND PARASITOLOGY

| NO. | COURSE OUTCOME |
|--------|--|
| C111.1 | To understand the morphology and Classification of fungi. |
| C111.2 | To analyze the superficial and systemic fungal infection. |
| C111.3 | To evaluate the collection and isolation of medically important fungi. |
| C111.4 | To outline the medically important protozoa. |
| C111.5 | To highlight the medically important helminths. |



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YEAR/ SEM: I/II – MDTAC – INDUSTRIAL AND PHARMACEUTICAL MICROBIOLOGY

| NO. | COURSE OUTCOME |
|---------------|---|
| C112.1 | To understand the types of fermentation and the raw materials used for the production of desired product. |
| C112.2 | To outline the design & types of bioreactors and production of recombinant proteins. |
| C112.3 | To highlight the biology and applications of various industrial microorganism. |
| C112.4 | To extend knowledge on the production of primary metabolites. |
| C112.5 | To extend knowledge on the production of secondary metabolites. |

YEAR/ SEM: I/II – MDTBA – BIOSTATISTICS AND BIOINFORMATICS

| 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 understand the major steps in pairwise and multiple sequence alignment by dynamic programming and predict the secondary and tertiary structures of protein and DNA sequences. |
| C113.5 | To familiarize with various tools in identifying sequences for enhancing the advancements in system medicines. |

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

| NO. | COURSE OUTCOME |
|---------------|--|
| C114.1 | To inbuilt the basic attributes about presentation. |
| C114.2 | To help the students to get acquaint with presenting a paper. |
| C114.3 | To excel in advance presentation skill |
| C114.4 | To help the student understand the difference between verbal and non-verbal communication. |



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| C114.5 | To make the student enhance the various aspects and techniques in presenting a topic related to their major stream. |
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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. |



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| 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. |



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| 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. |

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 |
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| C209.1 | To isolate and enumerate the soil microorganisms. |



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| 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. |

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. |



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| 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. |

YEAR/ SEM: II/IV – PSSSED – 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. |