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Every Good Work*

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A Don Bosco Institution of Higher Education, Founded in 1951 * Affiliated to Thiruvalluvar University, Vellore * Autonomous since 1987

Accredited by NAAC (4th Cycle – under RAF) with CGPA of 3.31 / 4 at 'A+' Grade

B.Sc Microbiology

S No	Title of the Paper	Course Code	Course Objectives	Course Outcomes	Relevance
1	FUNDAMENTALS OF MICROBIOLOGY	MB103	<ul style="list-style-type: none"> To make students to understand the Fundamentals in Microbiology. To know the basic principles and types of Light microscope and Electron microscope. To familiarize with detailed structure of Prokaryotes. To acquire knowledge on various Sterilization techniques. To learn the Microbial cultivation techniques and methods for isolation of microorganisms. 	<ul style="list-style-type: none"> Develop an understanding of the Fundamentals of Microbiology. Define and understand the concept of Cell, Cell theory, Prokaryotes and Eukaryotes. Categorize the various types, principles and applications of Light microscope and Electron microscope. Broad knowledge on the structure and functions of organelles of Bacteria. Demonstrate a clear understanding of microbial control mechanisms through Sterilization techniques and Antibiotics. Evaluate the methods used for the cultivation and identification of bacteria. 	Local and global developmental needs
2	MICROBIAL DIVERSITY AND CLASSIFICATION	MB104	<ul style="list-style-type: none"> To learn the Taxonomy of microorganisms. To analyze the Ultrastructure of Fungi, Algae and Protozoa. To understand the Classification of microorganisms. 	<ul style="list-style-type: none"> Understand the knowledge of Classifications and Taxonomy of Microorganisms in detail. Acquire the basic knowledge on the Ultrastructure, Classification, Mode of nutrition and Reproduction of Fungi, Algae and Protozoa. 	National and global developmental needs

			<ul style="list-style-type: none"> To recognize the fundamentals on Economic importance of microorganisms. To impart knowledge on Molecular identification of microorganisms 	<ul style="list-style-type: none"> Discuss the Economic importance of Fungi, Algae and Protozoa. Examine and define the structure, properties and classification of Human, Plant and Animal viruses. Explore and recommend the Molecular techniques applied in identification of microorganisms. Compile the basic information on the diversity and classification of Fungi, Algae, Protozoa and Algae. 	
3	MICROBIAL PHYSIOLOGY AND METABOLISM	MB203	<ul style="list-style-type: none"> To analyze the Nutrient requirements and Nutrition types of microorganisms. To observe the Transport of Nutrients in Microorganisms. To study the Microbial growth and its measurement. To learn the Microbial metabolism and respiration. To understand the Photosynthesis reaction in microorganisms 	<ul style="list-style-type: none"> Help learners to define and understand the objectives of Microbial physiology, Microbial nutrition and Microbial metabolism. Analyze and understand the basic concepts of Nutrient requirements and Nutrition types of microorganisms. Provide students with learning experiences that help in still deep interests in learning Transport of nutrients in Microorganisms. Develop broad and balanced knowledge and understanding of Microbial growth, Growth measurement and Preservation of microorganisms. 	Global developmental needs

				<ul style="list-style-type: none"> Equip students with appropriate knowledge on Microbial metabolism which includes Catabolism and Anabolism. Recommend students to find the Photosynthetic reaction in microorganisms. 	
4	BIOINSTRUMENTATION	MB204	<ul style="list-style-type: none"> To provide knowledge about Safety measures in Microbiology laboratory and First aid methods. To understand the principles and applications of various instruments used in Life science. To learn the techniques for operating the Microbiological instruments. To explain the principles and applications of types of Chromatography techniques. To learn principles, types and applications of Calorimeter and Spectrophotometer. 	<ul style="list-style-type: none"> Determine the Safety measures in Microbiology laboratory and First aid methods. Define and explain the principles and applications of various instruments used in Life science. Explain the Working principles and Applications of Various Microbiology laboratory instruments. Analyzing the principles and applications of types of Chromatography techniques. Evaluate the Working principle and Applications of Electrophoresis techniques. Perform the detailed analysis on Calorimeter and Spectrophotometer. 	Local, national and global developmental needs

5	IMMUNOLOGY	MB301	<ul style="list-style-type: none"> To make the students to understand the Immune system. To strengthen the knowledge of students through a detailed study on Antigens, Antibodies and Immunoassays 	<ul style="list-style-type: none"> Introducing the Immunology to study various types of Cells and Organs in Immune systems and Mechanism of immune activation 	National and global developmental needs
6	BIOINOCULANT TECHNOLOGY	MB401	<ul style="list-style-type: none"> To study about the Production, Formulation, Method of application and Quality control of Bioinoculants. To understand the role of Nitrogen fixers, Phosphate solubilizers, AM fungi and Algal biofertilizers. To learn the ability of Biofertilizers and Biocontrol agents 	<ul style="list-style-type: none"> The course Bioinoculant Technology has been designed to provide the knowledge to the students about Natural organic farming. This paper also provides the details of Production, Formulation, Method of application and Quality control of Bioinoculants 	Local, National and Global developmental needs
7	MICROBIAL GENETICS	MB402	<ul style="list-style-type: none"> To make the students to understand the Genetics of microorganisms. To focus on the basic principles of Cloning vectors and Gene transfer mechanism. To study the recent advances in microbial genetic principles for strong foundation in Microbiology 	<ul style="list-style-type: none"> The application of Microbial Genetics has completely transformed the Microbiology field with new possibilities ranging from the treatment of human diseases to the development of new forms of crops. It also looks set to be the most promising and exciting science of the next few decades 	Global developmental needs

8	MOLECULAR BIOLOGY AND GENETIC ENGINEERING	MB501	<ul style="list-style-type: none"> • To make the students to understand the Molecular Biology and Genetic Engineering. • To focus on the basic principles of DNA Replication, Transcription, Translation, Mutation and DNA Repair mechanisms. • To under the basic concepts and applications of Genetic Engineering 	<ul style="list-style-type: none"> • Molecular Biology and Genetic Engineering dispense recent study and innovation of significant methods and techniques. This paper embraces information on DNA Replication, Transcription, Translation, Mutation, DNA Repair mechanisms and various applications of Genetic Engineering. 	Local and Global developmental needs
9	MEDICAL BACTERIOLOGY	MB502	<ul style="list-style-type: none"> • To make the students to understand the Medical Bacteriology. • To study the pathogenicity, clinical symptoms and treatment for disease causing bacteria. • To provide the ability to characterize, isolate and identify different Medically important bacteria. 	<ul style="list-style-type: none"> • To introduce the knowledge of the medically important bacteria, bacterial morphology with the main focuses being the pathogenicity, clinical symptoms, identification and treatment for different bacteria. 	Regional, and global developmental needs

10	VIROLOGY	MB503	<ul style="list-style-type: none"> • To make the students to understand the role of viruses in major diseases. • To study general aspects of Structure, Classification, Replication, Pathogenicity, Clinical Syndrome, Laboratory diagnosis, Treatment and Preventive measures for Viruses. • To understand the structure and replication of Bacteriophages 	<ul style="list-style-type: none"> • Virologist are highly demanded in the Medical research companies, Pharmaceutical companies, Governmental agencies, Laboratory testing companies or Cancer treatment or Research companies depending upon the specialization. This paper will provide the wide knowledge on Structure, Classification, Replication, Pathogenicity, Clinical Syndrome, Laboratory diagnosis, Treatment and Preventive measures for Viruses 	Regional, and global developmental needs
11	MEDICAL MYCOLOGY AND PARASITOLOGY	MB504	<ul style="list-style-type: none"> • To make the students to understand the role of Fungi, Protozoa and Helminths in Human diseases. • To study general aspects of Pathogenicity, Clinical Syndrome, Laboratory diagnosis, Treatment and Preventive measures for Fungal and Parasitic diseases. • To establish basic theoretical knowledge in the fields of Mycology and Parasitology 	<ul style="list-style-type: none"> • Students will be familiar with current developments and advances in the field of Mycology and Parasitology. They also will gain more knowledge on Pathogenicity, Clinical Syndrome, Laboratory diagnosis, Treatment and Preventive measures for Fungal and Parasitic diseases 	Regional, and global developmental needs

12	HEALTH CARE AND HYGIENIC PRACTICES	MB505A	<ul style="list-style-type: none"> To strengthen the knowledge of personal health care and hygienic to students. To provide a detailed study on vaccine and its schedule throughout the life time for all age group. To understand the various type of pollution and its preventive measures 	<ul style="list-style-type: none"> Introducing the basics about the Health care and Hygienic practices to study various types of Vaccines to control the life time infectious disease 	Regional, and global developmental needs
13	ELECTIVE - COMPUTATIONAL BIOLOGY	MB505B	<ul style="list-style-type: none"> To detail the importance of Computer in the field of Life sciences. To obtain good understanding about the interpretation of Biological database. To uptake knowledge in latest tools and technology 	<ul style="list-style-type: none"> The paper Computational Biology adds information about the search engines and various software tools involved in Bioinformatics and Chemoinformatics. 	Global developmental needs
14	ELECTIVE - PHARMACEUTICAL MICROBIOLOGY	MB505C	<ul style="list-style-type: none"> To explains the concept, principles on control and management of manufacturing and quality control testing of Biopharmaceutical products. To understand a view on regulatory issues involving the trends in biopharmaceutical industry and changing regulatory needs related to products 	<ul style="list-style-type: none"> The paper Pharmaceutical Microbiology provides an overview of the concepts of manufacture Biopharmaceutical products in today's regulatory environment 	Global developmental needs

15	SSP – 1: NUTRITION AND DIETICS	MB507SP1	<ul style="list-style-type: none"> To know about importance of food, nutrition and nutrients. To understand the nutrients associated health risks. To learn about the various diets used for various disease conditions 	<ul style="list-style-type: none"> Nutrition is the study of nutrients in food, how the body uses nutrients, and the relationship between diet, health and disease. In this Self-study paper Nutrition and Dietics, students will gain knowledge about the Importance of nutrients and various diets used for various disease conditions 	Local, National, and global developmental needs
16	Non – Major Elective I – APPLIED MICROBIOLOGY	NMB 501	<ul style="list-style-type: none"> To make students to understand the fundamentals of microbiology and its applications. To encode the importance of the role of microorganisms in food industries and agricultural sciences both in beneficial and harmful ways. To study about the water borne disease and microbial standards of water quality. 	<ul style="list-style-type: none"> Microbiology has played a central role in all aspects of Biological sciences. This course Applied Microbiology will familiarize the students from various Arts and Science Departments with fundamental knowledge on microbiology and its applications 	Global developmental needs
17	MICROBIAL BIOTECHNOLOGY	MB601	<ul style="list-style-type: none"> To learn the basic tools in Microbial Biotechnology. To understand the various concepts of Recombinant DNA Technology and Microbial products. To emphasize on IPR issues and need for knowledge in patents in Biotechnology 	<ul style="list-style-type: none"> The paper Microbial Biotechnology helps the student to study theoretical concepts of Biotechnology and their applications in Genetic engineering and Microbiology. It also creates awareness on the Intellectual property rights and patenting of Biotechnological processes. 	National and global developmental needs

18	ENVIRONMENTAL MICROBIOLOGY	MB602	<ul style="list-style-type: none"> • To creating the awareness about environmental problems among people. • To provides a comprehensive overview of biogeochemical processes relevant to environmental scientists and engineers mediated by microorganisms. • To study about the water borne pathogens, water borne disease, microbial standards of water quality, biogenic pollution, air borne microbes and waste water management 	<ul style="list-style-type: none"> • The paper Environmental Microbiology will create awareness about Microbes and environment, distribution, diversity and ecological importance, characteristics of microorganisms in different environment and its biogeochemical cycle. This paper will also provides a detailed knowledge on Waste water treatment technologies 	local and global developmental needs
19	VERMITECHNOLOGY	MB603	<ul style="list-style-type: none"> • To study about the properties of soil and microbial composting. • To understand the biology of Earthworms and its role in Vermicomposting. • To learn the ability of Earthworms in Organic farming and Solid waste reclamation 	<ul style="list-style-type: none"> • The course Vermitechnology has been designed to provide the knowledge to the students about Organic farming through Composting and Vermicomposting. This paper also provides the details of Earthworms and its role in Solid waste reclamation 	National and global developmental needs
20	FOOD MICROBIOLOGY	MB604	<ul style="list-style-type: none"> • To encode the importance of the role of microorganisms in food industries both in beneficial and harmful ways. • To obtain a good understanding of food microbiology and become qualified as 	<ul style="list-style-type: none"> • The Food Microbiology paper adds information about the role of microorganisms in many food, beverage and various industries both in production and spoilage processes 	Global developmental needs

			<p>microbiologist in food industries.</p> <ul style="list-style-type: none"> • To know the role of microbes in the spoilage of food products 		
21	INDUSTRIAL MICROBIOLOGY	MB605	<ul style="list-style-type: none"> • To encompass the use of industrially important microorganisms in the manufacture of food or industrial products. • To understand the Fermentation process and design of various Fermentors. • To study the use of microorganisms for the production of Antibiotics, Vaccines, Organic acids, Organic solvents, Amino acids, Vitamins and Industrial enzymes. 	<ul style="list-style-type: none"> • From the Industrial Microbiology paper, students acquire the knowledge in the large scale production of Industrial product and providing the trends to cater the needs of industry 	Regional, and global developmental needs
22	Non – Major Elective 2 – MICROBIAL DISEASES AND HEALTH CARE	NMB601	<ul style="list-style-type: none"> • To make the students to understand the various diseases caused by microorganisms. • To study the clinical conditions and preventive measures for microbial diseases. • To provide the knowledge about Antibiotics, Drugs, Vaccines and Vaccination 	<ul style="list-style-type: none"> • To introduce the knowledge of the medically important microorganisms which are responsible for causing diseases. The course Microbial disease and health care will provide the knowledge to the students about microbial diseases and its preventive measures, vaccines and vaccination 	Global developmental needs