B.Sc. Microbiology Honours

Semester One Course

Structure

SL No	Name of the course	Semester	Course code	Credit	Marks in the course	Course outcome
1.	**INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY**	**1**	**CC101-TH (THEORY)**	**3**	**75**	To understand What Is Microbiology? and Why Is It Important? The portion also describes the history and progress of the filed from last 150 years.
	History of Development of Microbiology					
B	Diversity of Microbial World					To understand the range of different kinds of unicellular organisms, bacteria, archaea, protists, algae and fungi. The module describes the structural features, classification and application of diverse microbial world.
C.	Overview of Scope of Microbiology					To have a basic overview of application of microbes in everyday

						use. Application of microbes in different areas of everyday use and research
2	**FOOD FERMENTATION TECHNIQUES AND PACKAGING**	**1**	**MCB-SEC101-TH**	**4**	**100**	
A.	Fermented Foods					The course is subjected to discuss Definition, types, advantages, and health benefits of fermented foods.
B.	Milk Based Fermented Foods					The course is subjected to discuss dairy starter cultures, Dahi, Yogurt, Buttermilk (Chach), acidophilus milk, kumiss, kefir, and cheese: Preparation of inoculums, types of microorganisms, and production process.

C.	Grain-Based Fermented Foods					The course is subjected to discuss Idli, Dosa, Bread, Soy sauce, tampeh: microorganisms involved and production process.
D.	Vegetable-Based Fermented Foods					The course is subjected to discuss Pickle, Saeurkraut: microorganisms involved and production process
E.	Fermented Meat and Fish					The course is subjected to discuss thr major microorganisms involved and production process
F.	Probiotics					The course is subjected to discuss Probiotics: Health benefits, types of microorganisms used, probiotic foods available in the market.
G.	Controlling the Microbiological Quality of Foods					The course is subjected to discuss quality Control using Microbiological Criteria, Control at Source (Training, Facilities and Operations, Equipment,

						Cleaning, and Disinfection), Codes of Good Manufacturing Practice (HACCP), Identification of Critical Control Points, Quality Systems: FSSAI, BSI and their importance
H.	Food Packaging Techniques					Basic principle of food packaging, importance, techniques in practice, merits and demerits of food packaging techniques are discussed in the unit.
3.	**INTRODUCTION AND SCOPE OF MICROBIOLOGY**	**1**	**MCB-IDC-TH**	**2**	**50**	
A.	History of Development of Microbiology					To understand What Is Microbiology? and Why Is It Important? The portion also describes the history and progress of the filed from last 150 years.
B.	Diversity of Microorganisms					To understand the range of different kinds of unicellular organisms,

						bacteria, archaea, protists, algae and fungi. The module describes the structural features, classification and application of diverse microbial world.
C.	Microscopy					To gain insight on different microscopic methods including Bright Field Microscope, Dark Field Microscope, Phase Contrast Microscope, Fluoresence Microscope, Transmission Electron Microscope, Scanning Electron Microscope
D.	Sterilization					Study the principle and applications of important instruments, Preparation of culture media for bacterial cultivation, Sterilization of medium using Autoclave and assessment for sterility, Sterilization of glassware using Hot Air

						Oven and assessment for sterility, Sterilization of heat sensitive material by membrane filtration and assessment for sterility.
E.	Microbes in Human Health & Environment					The module is directed towards understanding : List of important human diseases and their causative agents of various human systems. Definitions of immunity (active/passive), primary and secondary immune response, antigen, antibody and their types. Whereas the second module discusses Definitions and examples of important microbial interactions – mutualism, commensalism, parasitism, Definitions and microorganisms used as biopesticides, biofertilizers, in biodegradation,

						biodeterioration and bioremediation (e.g. hydrocarbons in oil spills)
F.	Industrial Microbiology					This module is subjected towards understanding the definition of fermentation, primary and secondary metabolites, types of fermentations and fermenters and microbes producing important industrial products through fermentation.
G.	Food and Dairy Microbiology					Finally, the last module is directed to discuss microorganisms as food (SCP), microorganisms in food fermentations (dairy and non dairy basedfermented food products) and probiotics.Microorganisms in food spoilage and food borne infections.