

DEPARTMENT OF MICROBIOLOGY

VALUE ADDED COURSE

Semester	Course Code	Course Title	Hours
III	22UMBVAC1	HUMAN MICROBIAL DISEASES AND MANAGEMENT	30

Course outcomes

At the end of the course, students will be able to:

- CO1. Understand the importance of human health and diseases.
- CO2. Introspect the knowledge on human microflora and its pathogenesis mechanism.
- CO3. Examine the characterization of microbial diseases and its diagnosis approaches.
- CO4. Determine the mechanisms and treatment of therapeutic agents.
- CO5. Acquire the knowledge on disease prevention methods.

UNIT I

6 hrs

Introduction to human diseases: Definition, concept and importance public health microbiology, disease, Infection and Pathogen. Human diseases types: Infectious and non- infectious diseases, microbial and non-microbial diseases, occupational diseases, Incubation period, mortality rate and# nosocomial infections#.

UNIT II

6 hrs

Human microflora and pathogenesis mechanism: Normal flora of major human body systems (respiratory tract, gastrointestinal tract, genitourinary system and skin). Mechanisms of Pathogenesis: entry into the human body; adhesion, colonization & invasion; pathogenic actions of bacteria (tissue destruction, toxins, immunopathogenesis); # mechanisms for escaping host defences #.

UNIT III

6 hrs

Diagnosis of uman microbial diseases:Causative agents and symptoms of Respiratory microbial diseases, gastrointestinal microbial diseases, urinary tract diseases, sexually transmitted diseases and# mosquito borne disease#. Molecular Diagnosis: Detection by diagnostic kits based on ELISA, Immunofluorescence, Agglutination tests and PCR.

UNIT IV

6 hrs

Therapeutics of microbial diseases:Treatment using antibiotics: Mechanism of action of antibiotics belonging to different classes: beta lactam antibiotics (penicillin, cephalosporins), quinolones, # polypeptides and aminoglycosides#. Importance of completing antibiotic regimen, emergence of antibiotic resistance, current issues of MDR/XDR microbial strains.

UNIT V

6 hrs

Prevention of microbial Diseases: General preventive measures, Importance of personal hygiene, environmental sanitation and methods to prevent the spread of infectious agents transmitted by direct contact, food, water and insect vectors. Vaccines: Importance, types, vaccines available against microbial diseases, #vaccination schedule (compulsory and preventive) in the Indian context#.

#Self-study portion

Text Books:

T.B-1 D. Greenwood, R. Slack and J. Peutherer, Medical Microbiology, 15th edition, ChurchHill Living stone Publication, 2012.

T.B-2 R. Anathanarayanan and C.K. Jayaram Paniker, Text book of Microbiology, 8th edition, University Press, Hyderabad, 2009.

T.B-3 S. Rajan, Medical Microbiology, MJP Publishers, 2017.

Semester	Course Code	Course Title	Hours
V	22UMBVAC2	MILK MICROBIOLOGY	30

Course Outcomes

At the end of the course, students will be able to

- CO1.Understand the milk,contamination,spoilage and milk borne diseases.
- CO2.Acquire the knowledge on morphology and classification of milk bacteria.
- CO3.Introspect the knowledge on microorganism in milk.
- CO4.Analyse the milk quality by various milk tests.
- CO5.Inspect the knowledge on milk hygiene management.

UNIT I

6 hrs

Introduction to MilkMicrobiology: Introduction- Definition of milk- milk hygiene-significance of microbes in milk-spreading of diseases through milk- sources of contamination preservation, spoilage of milk.#milk borne disease#.

UNIT II

6 hrs

Morphology and Classification of Milk Bacteria: Introduction- classification based on# shape, size and arrangement of cells#- classification based on temperature- classification based on oxygen- requirement and physiological grouping-characteristics of milk associated bacteria and fungi.

UNIT III

6 hrs

Microorganisms in Milk: Microorganisms associated with raw milk and their significance- #Role of psychrotrophs in milk# - Effect of processing on microorganisms in milk-Effect of cooling on milk, bacto-fugation, thermization and destruction of microbes by heat. Antimicrobial substances in milk.

UNIT IV

6 hrs

Milk Testing:Qualitative and quantitative methods of milk testing- Dye reduction tests,Resazurin Reduction Test, Direct microscopic count- Standard plate count- Coliform counts in milk- Methods of enumeration of other groups of bacteria- #Enumeration of yeast and moulds in milk.#

UNIT V

6 hrs

Hygienic Milk Production: Introduction- Principles of clean milk production- Animal management- Animal housing management- Feeding management-#Personal hygiene#-Milking management- Management during collection- Hygiene of milking utensils- Hygiene of milking environment-cooling and transportation of milk.

#Selfstudyportion.

Textbooks:

T.B-1 W.C. Frazier and D.C. Westhoff, Food microbiology, TATA McGraw Hill Publishing Company Ltd. New Delhi, 2004.

T.B-2 M.R. Adams and M.O. Moss, Food Microbiology, The Royal Society of Chemistry, Cambridge,2007.

T.B-3G.J. Banwart, Basic food microbiology, Chapman & amp; Hall, New York., 2014.

Semester	Course Code	Course Title	Hours
III	22PMBVAC1	MICROBIAL PRODUCTS AND ENTREPRENEURSHIP DEVELOPMENT	30

Course Outcomes

At the end of the course, students will be able to

- CO1.Understand the importance of microorganism in industries.
- CO2.Introspect the knowledge on fermented products.
- CO3.Describe the benefits of composting and production of biofertilizers.
- CO4.Examine the quality of the industrial products.
- CO5.Acquire knowledge on principles and government policies related to entrepreneurship.

UNIT I

6 hrs

Microbial Products: Commercial products obtained from microorganisms - *Spirullina*, *Streptomyces*, *Dunaliella* and yeast- food, feed and Baker's yeast, vitamin B₁₂, # β – carotene# and mushroom production.

UNIT II

6 hrs

Enzyme and Dairy products: Enzymes as products- bacterial and fungal amylases, proteolytic enzymes. Dairy products- buttermilk, cream, yoghurt, # kefir #, koumiss, acidophilus milk and cheese and their nutritional values.

UNIT III

6 hrs

Composting and Biofertilizers: Composting- definition, preparation, filling tray beds, spawning, maintaining optimal temperature, casing, water harvesting and storage. Biofertilizer production- *Rhizobium* sp., *Azospirillum* sp., #*Azotobacter* sp.#. Chemical fertilizers versus biofertilizers.

UNIT IV

6 hrs

Quality control: Microbiological examinations of Industrial products, Control of microbes for quality products. Food control agencies and its regulations. Pest control systems in industries. #Key aspects of hygiene in industries#. Inspection methods for raw materials and its products. Indian standard organizations and its procedures.

UNIT V

6 hrs

Entrepreneurship Development: Definition, Institutes involved, Government contributions to entrepreneur and risk assessment. Essentials of Entrepreneurship - Concepts of market survey. # Sales and Marketing principles #. Understanding of Government policies: Ethical and Other Legal Issues in microbial products

Self study portion.

Textbooks:

T.B-1 Charantimath , PM. Entrepreneurship Development Pearson Education, 2006.

T.B-2 Adams, M.R, and Moss, M.O. Food Microbiology, 2nd Edition, Royal society of chemistry, 2000.

T.B-3 Cassida, L.E., J.R. Industrial Microbiology, New Age International (P) Ltd, New Delhi, 2005.

T.B-4 Dubey, R.C. A Textbook of Biotechnology (4th edition), S. Chand and Company Ltd, New Delhi, 2007.