ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM

IV SEMESTER **BIOTECHNOLGY** 4 Hrs/Week

BTH 4701 (3) **MICROBIOLOGY** Max. Marks:100

w.e.f. 2016-2019(16 AD Batch **SYLLABUS**

OBJECTIVES: To enable the students to

1. Comprehend the diversity of microorganisms.
2. Know the technique of culturing and studying Microorganisms.
3. Understand the applications of microbiology.
4. Understand the organization, replication and economic importance of viruses.

COURSE:

UNIT I: DIVERSITY OF MICRO ORGANISMS

1. Introduction, History and development of Microbiology .
2. Microbial nutrition and Nutritional classification of bacteria.
3. Gene recombination in bacteria.
4. Ultra structure of Archea, Archeal cell membrane, other cell structures.
5. Classification of bacteria – Bergey's Mannual.

UNIT II: METHODS IN MICROBIOLOGY – I

1. Sterilization methods – Terminology of sterilization, disinfection, Antiseptics, Sanitization, Germicide, Microbiostasis, Preservative and antimicrobial agents.
2. Physical control: Temperature (Moist heat – Autoclave, Dry heat – Hot air oven and Incinerators) Desiccation, Surface tension, Osmotic pressure, Radiation, UV light, Filtration – LAF.
3. Chemical Control: Antiseptics and Disinfectants (Halogens, Alcohols, Gaseous sterilization).

UNIT III: METHODS IN MICROBIOLOGY – II

1. Culturing of Microorganisms
    a. Culture media – Composition and types.
    b. Culturing Methods
    c. Isolation of pure culture
2. Staining Methods
    a. Simple Staining
    b. Differential staining by (1) Gram Staining, (2) Acid fast Staining, (3) Endospore Staining.
    c. Hanging Drop Method

UNIT IV: MICROBIAL GROWTH AND MEASURMENT

1. Microbial growth
    a) Growth rate and generation time, details of growth curve & its various phases.
    b) Concept of synchronous cultures, continuous and batch cultures (Chemostat and Turbidostat).
    c) Measurement of growth
2. Pure cultures and culture characteristics. Maintenance and preservation of pure culture.

UNIT V: VIROLOGY

1. General charcterstics of viruses, structure, different shapes and symmetris with one example of each type.
2. Classification of viruses on the basis of Nucleic acids, phages and animal cell viruses, Examples of each and their importance.
3. Replication of Viruses
4. Bacteriophage Viruses: Lytic and Lysogenic cycles.
5. Structure – TMV, HIV & Heptitis.

REFERENCES :

1. A Text book of Microbiology – By R.C.Dubey, D.K.Maheshwari public. S.Chand 2005
2. Text of Microbiology – By Ananthanarayan and panikes
3. General Microbiology – By R.P.Singh Publi. Kalyan Publication 2005.
4. Microbiology – By cappuceino
5. Practical Microbiology – by Arya
6. Elements of Microbiology Vy Pelezar and Chan public. MCGREW-Hill International, New Delhi.

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ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) , VISAKHAPATNAM

IV SEMESTER **BIOTECHNOLGY** 2 Hrs/Week

BTH 4751 (2) **MICROBIOLOGY** Max. Marks:50

w.e.f. 2016-2019(V Batch) **PRACTICALS – II B**

OBJECTIVES : To enable the students acquire skills necessary to –

1. handle equipment needed for study of microorganisms
2. Culture microbial study.
3. Identify the staining techniques.

COURSE

UNIT I: Microbiological Examination of Organisms

1. Bacteria – E.coli, Streptococcus
2. Algae – Chalmydomonus
3. Fungi – yeast, Penicillium, Aspergillus

UNIT II: Sterilization – Equipment for sterilization-Hot Air Oven, Autoclave, Laminar air flow chamber.

UNIT III: Preparation of Culture media:

1. Nutrient Broth 2. Nutrient Agar
3. Maccanokey Agar 4. Potato Dextrose Agar

UNIT IV: Microbial Culture – Methods

1. Innoculation Methods :

a. Streak method - i. Streaking on Plates

ii. Streaking on Slants

b. Serial Dilution

c. Pour Plate Method

d. Stab Method

UNIT V: Staining Methods:

1. Simple Staining
2. Differential Straining
   i. Gram Staining
   ii. Acid fast staining

UNIT VI: Microbiological Examination of Water

UNIT VII: Microbiological Examination of Milk

UNIT VIII: Bacterial Growth Curve .

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