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

VII SEMESTER **BIOTECHNOLOGY** TIME: 3 Hrs/ Week

BTH 7704 (3) **MICROBIAL CULTURING TECHNIQUES** Max. Marks: 100

**(Core course)**

W.e.f 20AH Batch

**OBJECTIVES:** To enable the students to –

- Create novel methods to isolate the microorganisms
- Know the tools and advanced methodologies in microbiology
- Get familiar preservation methods
- Study the nutrition and sustainability of microorganisms

**I. Learning outcomes:**

1. Will develop skill of isolation of microorganisms
2. Could equip with the knowledge on tools and techniques in microbiology
3. Should acquire expertise in culture preservation
4. Understand the nutritional requirements of microorganisms

**UNIT-I: Laboratory organization**

1. Requirements for establishment of microbial laboratory, Laminar air flow, autoclave, hot air oven, centrifuge- basic principle, functioning and applications.
2. Methods of sterilization: Physical methods – Dry heat, moist heat, radiation method, filtration methods, Chemical methods and their application.

**UNIT – II: Microbial Media**

1. Medium definition, Types of media (liquid media, solid media, semisolid media).
2. Bacterial and fungal media.
3. Composition of Simple, complex, differential and, enriched media.
4. Preparation of stock solutions. Disbursing and sterilization of media.

**UNIT – III: Isolation techniques**

1. Isolation of microorganisms from soil, water and air.
2. Serial dilution technique, Pour plate, streak plate, spread plate methods.
3. Concept of pure culture,Methods of pure culture isolation, Enrichment culturing techniques, single cell isolation, and pure culture development.

**UNIT – IV: Staining techniques**

1. Stains used in microbiology, acidic stains, basic stains, neutral stains.
2. Staining methods –Simple staining, Grams staining, negative staining, and differentialstaining.
3. Spore staining and flagella staining.

**UNIT V: Identification and preservation**

1. Morphological, biochemical and molecular methods used in bacterial identification.
2. Preservation of microbial cultures: sub culturing, overlaying cultures with mineral oils.
3. Lyophilisation and storage at low temperature.

**REFERENCES**


1. Microbiology: concepts and Applications. Michael J. Pelczar, Jr., E.C.S., Chan, Noel R. Krieg, 1993. Me. Graw Hill, Inc.
2. Introductory Microbiology. 1995, by Trevor Gross.
3. Fundamentals of Microbiology. 4ltled. 1994. I.E.AIcamo. Scientific Publication,
4. Microbiology, 1990. 4th Ed.B.D. Davis, R. Dulbeco, H.N. Eisen and H.S. Ginsberg and J.B. Lippincott Company.
5. Fundamental Principles of Bacteriology. 1994. A.J. Sake. Tata McGraw Hill.
   Laboratory Experiments in Microbiology.3rd ed. Brief Version.1992. T.R. Johnson and C.L. Case.Addision Wesley International Publications.PP 350.


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