**A.S.D.GOVT.DEGREE COLLEGEFOR WOMEN (A) KAKINADA**

**DEPARTMENT OF MICROBIOLOGY**

**PROGRAMME OUT COMES:**

The programme BSc Microbiology introduces students to the vast array of microbes *VIZ* bacteria, archaea, viruses, fungi and protozoa around us, their diversity and structure. This course focuses on the general principles of microbiology and includes the following topics: bacterial cell structure and function; genetic systems of bacteria, bacteriophages and plasmids; microbial growth and metabolism; control of microorganisms; introduction to viruses; food and industrial microbiology. The programme has a strong practical emphasis, providing students with the basic laboratory skills required for a career in either applied or research microbiology.

**PROGRAMME SPECIFIC OUT COMES:**

* **Develop knowledge and skills on microbiological laboratory safety- General rules and Regulations.**

**COURSE OUT COMES:**

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| **APPORVED SYLLABUS THROUGH BOS 2017-18 DT:29-06-17)** |
| **(For Admitted Batch2017-2018)**  **B.Sc MICROBIOLOGY (CBCS) SYLLABUS** |
| **FIRST YEAR – SEMESTER- I** |
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| **MBT- 101 INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY** |
| **TOTAL HOURS: 48**  **CREDITS: 4** |
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| **UNIT-I**  **No. of hours: 12** |
| History and mile stones in microbiology.  Contributions of Anton von Leeuwenhoek, Edward Jenner, Louis Pasteur, Robert Koch, Ivanowsky and Winogradsky.  Importance and applications of microbiology.  Classification of microorganisms – Haeckel’s three Kingdom concept, Whittaker’s five kingdom concept, three domain concept of Carl Woese.  Outline classification of bacteria as per the second edition of Bergey’s Manual of Systematic Bacteriology. |
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| **UNIT – II**  **No. of hours: 10** |
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| General characteristics of Bacteria, Archaea, Mycoplasmas and Cyanobacteria.  Ultra structure of Prokaryotic cell- Variant components and invariant components.  General characteristics of viruses.  Morphology, Structure and replication of TMV and HIV. |
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| **UNIT-III**  **No. of hours: 10** |
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| General characteristics and outline classification of Fungi, Algae and Protozoa.  Principles of microscopy - Bright field and Electron microscopy (SEM and TEM). |
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| **UNIT-IV**  **No. of hours: 8** |
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| Staining Techniques –Simple and Differential (Gram Staining and Spore Staining).  Sterilization and disinfection techniques - Physical methods – autoclave, hot- air oven, pressure cooker, laminar air flow, filter sterilization, Radiation methods – UV rays, Gamma rays and ultra sonic methods.  Chemical methods – alcohols, aldehydes, fumigants, phenols, halogens, heavy metals, quaternary ammonium compounds and hypochlorites. |
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| **UNIT –V No. of hours: 8** |
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| Isolation of Microorganisms from natural habitats.  Pure culture techiques – dilution-plating, Streak-plate, Spread-plate, Pour-Plate and micromanipulator. Enrichment culturing.  Preservation of microbial cultures – subculturing, overlaying cultures with mineral oils, lyophilization, sand cultures, storage at low temperature. |

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| **MBP- 101 INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY** |
| **TOTAL HOURS: 48**  **CREDITS: 2** |
| 1. Microbiology Good Laboratory Practices and Biosafety. |
| 2. Preparation of culture media for cultivation of bacteria |
| 3. Preparation of culture media for cultivation of fungi |
| 4. Sterilization of medium using Autoclave |
| 5. Sterilization of glassware using Hot Air Oven |
| 6. Light compound microscope and its handling |
| 7. Microscopic observation of bacteria (Gram +ve bacilli and cocci, Gram -ve  bacilli), Cyanobacteria, Algae and Fungi. |
| 8. Simple staining |
| 9. Gram’s staining |
| 10. Hanging-drop method. |
| 11. Isolation of pure cultures of bacteria by streaking method. |
| 12. Preservation of bacterial cultures by various techniques. |
| 13. Diagramatic or Electron photomicrographic observation of TMV, HIV, T4 phage and  Adenovirus |

**Additional Inputs:**

**Isolation of Microbes from natural habitat air/soil (Hospital environment/ different crops)**

**Learning Out comes:**

**Up on completion of this course students should able to :**

1. **Explain relationship and apply appropriate terminology relating to the structure, Genetics, metabolism and ecology of prokaryotic microorganisms, Algae, viruses and Fungi.**
2. **Demonstrate appropriate laboratory skill and techniques related to isolation, staining, identification and control of microorganisms.**