

UZO-483 General Microbiology-I

Cr. (2)

Course Objectives:

The objectives of the course are:-

1. To enable the students to work with microorganisms
2. To understand the basic techniques of sterilization, culturing and isolation
3. To determine different characteristics of the microorganisms

Course Learning Outcomes:

Upon successful completion of the course, the student will be able to:

1. **ATTAIN** the fundamental knowledge regarding microorganisms
2. **COMPREHEND** the basic concepts of microbial diversity

3. **GRASP** the microbiological techniques and use them efficiently
4. **EXPLORE** the microbial diversity and role of microorganisms
5. **VALIDATE** practical skills in the design and execution of experiments
6. **APPLY** the scientific method of investigation and hypothesis testing

Course Contents:

History and Introduction of Microbiology: The beginnings of Microbiology; Discovery of the microbial world; Discovery of the role of microorganisms in transformation of organic matter, in the causation of diseases, development of pure culture methods. The scope of microbiology. **Characterization, Classification, and Identification of Microorganisms:** Microbial evolution, systematics and taxonomy; Characterization and identification of microorganisms. Nomenclature and Bergey's manual. **Morphology and fine structure of bacteria:** Size, shape and arrangement of bacterial cells, Flagella and motility, Pili, Capsules, sheaths, Prosthecae and stalks, structure and chemical composition of cell wall, cytoplasmic membrane, protoplasts, spheroplasts, the cytoplasm, nuclear material. **The Cultivation of Bacteria:** Nutritional requirements, nutritional types of bacteria, bacteriological media, physical conditions required for growth, choice of media, conditions of incubation. **Viruses:** Bacteriophages; Replication of bacteriophages. Viruses of animals and plants; History, structure and composition; classification and cultivation of animal viruses. Effects of virus infection on cells. Cancer and viruses.

Teaching-Learning Strategies

Teaching will be a combination of class lectures, class discussions, and group work. Short videos /films will be shown on occasion.

Assignments

The sessional work will be a combination of written assignments, class quizzes, presentation, and class participation/attendance.

Assessments and Examination

Sessional Work:	25 marks
Midterm Exam:	35 marks
Final term Exam:	40 marks

Books Recommended:

1. MICROBIAL APPLICATIONS (complete version) LABORATORY MANUAL IN GENERAL MICROBIOLOGY, 2002. Benson, H.J. WMC Brown Publishers, England.
2. Pelczar Jr., Chan, E.C.S. and Krieg, M.R. 2009. Microbiology, McGraw Hill, London.
3. Madigan, M.T., Martinko, J.M. and Parker. 2019. Brock's Biology of Microorganisms, J. Prentice-Hall, London.
4. Stainier, R.Y., Ingraham, J.L., Wheelis, M.L. and Painter. 1990. The Microbial World, R.R. Prentice Hall, London.

UZO-484 General Microbiology-I (Lab)

Cr. (1)

Course Objectives:

The objectives of the course are:-

1. To enable the students to work with microorganisms
2. To understand the basic techniques of sterilization, culturing and isolation
3. To determine different characteristics of the microorganisms

Course Learning Outcomes:

Upon successful completion of the course, the student will be able to:

1. **ATTAIN** the fundamental knowledge regarding microorganisms
2. **COMPREHEND** the basic concepts of microbial diversity

3. **GRASP** the microbiological techniques and use them efficiently
4. **EXPLORE** the microbial diversity and role of microorganisms
5. **VALIDATE** practical skills in the design and execution of experiments
6. **APPLY** the scientific method of investigation and hypothesis testing

Course Contents:

Study of bacteria, yeasts, molds and protozoa. Staining of microorganisms: Simple stains, positive staining; negative staining. Demonstration of special structures by stains: Spore stain, Flagella stain. Differential stains: Gram stain, Metachromatic granule stain, Acid fast stain.

Teaching-Learning Strategies

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Assignments

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Assessments and Examination

Sessional Work:	25 marks
Midterm Exam:	35 marks
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