UZO-485 General Microbiology-II Cr. (2)

Course Objectives:

The objectives of the course are:-

1. Toenable the students to work with microorganisms
2. Tounderstand the basic techniques of sterilization, culturing and isolation
3. Todetermine 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 regardingmicroorganisms
2. **COMPREHEND** the basic concepts of microbial diversity
3. **GRASP**the microbiological techniques and use them efficiently
4. **EXPLORE**the microbial diversity androle 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:

Reproduction and growthof bacteria: Modes of cell division, New cell formation, Normal growth cycle of bacteria, synchronous growth, continuous culture, quantitative measurement of bacterial growth; Direct microscopic count, Electronic enumeration of cell numbers, the plate count method, Membrane-filter count, Turbidimetric method, Determination of nitrogen content, Determination of the dry weight of cells, The selection of a procedure to measure growth, Importance of measurement of growth. **Pure cultures and cultural characteristics:** Natural microbial populations, selective methods; Chemical methods, Physical methods, Biological methods, Selection in nature, Pure cultures; Methods of isolating pure cultures, Maintenance and preservation of pure cultures, Culture collections, Cultural characteristics; Colony characteristics, Characteristics of broth cultures. **Prokaryotic diversity Bacteria:** Purple and green bacteria; cyanobacteria, prochlorophytes, chemolithotrophs, methanotrophs and methylotrophs, sulfate and sulfer-reducing bacteria,

homoacetogenic bacteria, Budding and appandaged bacteria, spirilla, spirochetes, Gliding bacteria, Sheathed bacteria, Pseudomonads, Free living aerobic nitrogen fixing bacteria, Acetic acid bacteria, Zymomonas and chromobacterium, Vibrio, Facultatively aerobic Gram-negative rods, Neisseria and other Gram-negative cocci, Rickettsias, Chlamydias, Gram-positive cocci, Lactic acid bacteria, Endospore forming Gram-positive rods and cocci, Mycoplasmas, High GC Gram-positive bacteria; Actinomycetes, Coryneform bacteria, propionic acid bacteria, Mycobacterium, Filamentous Actinomycetes.

Eukaryotic Microorganisms: Algae: Biological and economic importance of algae; Characteristics of algae; Lichens. Fungi: Importance of fungi; Morphology; Physiology and reproduction, Cultivation of fungi. Protozoa: Ecology and importance of protozoa. Classification of protozoa.

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, 1994. Benson, H.J. WMC Brown Publishers, England.
2. Pelczar Jr., Chan, E.C.S. and Krieg, M.R. 1986. Microbiology, McGraw Hill, London.
3. Madigan, M.T., Martinko, J.M. and Parker. 1997. Brock's Biology of Microorganisms, J. Prentice-Hall, London.
4. Stainier, R.Y., Ingraham, J.L., Wheelis, M.L. and Painter. 1986. The Microbial World, R.R. Prentice Hall, London.

UZO-486 General Microbiology-II(Lab.) Cr. (1)

Course Objectives:

The objectives of the course are:-

1. Toenable the students to work with microorganisms
2. Tounderstand the basic techniques of sterilization, culturing and isolation
3. Todetermine 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 regardingmicroorganisms
2. **COMPREHEND** the basic concepts of microbial diversity
3. **GRASP**the microbiological techniques and use them efficiently
4. **EXPLORE**the microbial diversity androle 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:

The culture of microorganisms: Preparation and sterilization of culture media, agar slope, agar slab, streak plate and pour plate methods. Isolation and pure culturing of bacteria. Quantitative plating methods.The turbidimetric estimation of microbial growth.Study of bacterial viruses.