Centre for the Environment

Time slot F (Monday, Tuesday 12-1 pm , Friday 11-12 pm) Room 4005

Course Number & Title: EV 702 Applied Environmental Microbiology
L-T-P-C: 2-0-2-6
Course Content/ Syllabus: Introduction, Laboratory safety and documentation, Principles of light and electron microscopy, Scanning Electron Microscope, Confocal Microscope, Transmission Electron Microscope, sterilization methods, microbial culture medium, Chemical and Biological Oxygen demand; Laboratory Components: Collection of environmental samples from field (industrial sites, dump yard, water bodies, soil); Bacterial strain isolation using plate streaking; Gram staining and environmental strain isolation; Bacterial growth curve determination by spectroscopic method; Extraction of bacterial genomic DNA and estimation; Polymerase Chain Reaction amplification of bacterial 16s rRNA; Gel electrophoresis, purification of 16s rRNA genes, Bioinformatics analysis of 16s rRNA sequencing data.
Books (In case UG compulsory courses, please give it as “Text books” and “Reference books”. Otherwise, give it as “References”.
Texts and REFERENCES : (Format: Authors, Book Title in Italics font, Volume/Series, Edition Number, Publisher, Year.)

1.	Joanne Willey and Kathleen Sandman and Dorothy Wood. Prescott's Microbiology 12th Edition McGraw-Hill. ISBN13: 9781264088393
2.	James G. Cappuccino, Chad T. Welsh, Microbiology: A Laboratory Manual, 11th Edition. Pearson
3	Gerard J. Tortora, Berdell R. Funke and Christine L. Case. Microbiology: An Introduction, 13th Edition. Pearson. ISBN-13: 978-0134605180, ISBN-10: 0134605187
4	Michael J. Leboffe, Burton E. Pierce. Microbiology: Laboratory Theory and Application 4th Edition. Morton Pub Co. ISBN-10: 0895826127 ISBN-13: 978-0895826121

Details of Groups of Experiments

GR.NO	NAME OF PRACTICALS	SITE	No. of Classes
1	Introduction, Laboratory safety and documentation,	Classroom Activity	2 Classes 1 week
2	Principles of light and electron microscopy, Scanning Electron Microscope, Confocal Microscope, Transmission Electron Microscope,	Classroom Activity Centre Lab + Visit to CIF	2 Classes 1 week
3	Chemical and Biological Oxygen demand,	Classroom Activity	2 Classes 1 week
4	Sterilization methods, microbial culture medium, Collection of environmental samples from polluted sites (industrial sites, dump yard, water bodies, soil);	Field Activity: Entire course include only 2 days visit on weekend to following site listed below (for example); i. Bharalu river and/or Dipar Beel, ii. Municipal Dump Site/ Boragaon /Brahmaputra Industrial Park or EPIP	Field Visit Expenditure will be borne by the Centre
5	Bacterial strain isolation using plate streaking; Gram staining and environmental strain isolation; Bacterial growth curve determination by spectroscopic method;	Classroom Activity	6 Classes 3 weeks
6	Extraction of bacterial genomic DNA and estimation; Polymerase Chain Reaction amplification of bacterial 16s rRNA; Gel electrophoresis, purification of 16s rRNA genes.	Classroom Activity	6 Classes 3 weeks
7	Bioinformatics analysis of 16s rRNA sequencing data.	Classroom Activity	2 Classes 1 week