



Course Syllabus  
Gyanmanjari Science College  
Semester-3 (M.Sc.)

**Subject:** Practicals-MSCMB13518

**Type of course:** Major

**Prerequisite:** Basic Knowledge of recombinant DNA technology, Environmental Microbiology, Bioinformatics and Metabolism of Microbes.

**Rationale:** Practical in this area can help students to develop the skills they need to design and conduct experiments in areas of Agriculture Microbiology, Industrial Microbiology, Molecular Biology and Immunology to analyze data by using scientific instruments.

**Teaching and Examination Scheme:**

Teaching Scheme			Credits C	Examination Marks					Total Marks
CI	T	P		Theory Marks		Practical Marks		CA	
				ESE	MSE	V	P	ALA	
0	0	12	6	00	00	40	80	30	150

*Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.*

**List of Practical:**

Sr. No	Descriptions	Hrs
1	Isolation of pigment mutant of <i>Serratia marcescens</i> .	6
2	Isolation of fermentative mutant of <i>E.coli</i> .	6
3	Determination of minimum inhibitory concentration of Streptomycin.	6
4	Determination of minimum inhibitory concentration of Penicillin.	6



Sr. No	Descriptions	Hrs
5	To perform Restriction Digestion of given DNA sample	3
6	To perform Ligation of given DNA sample	3
7	To perform Transformation of given DNA sample.	6
8	To determine the standard growth curve of <i>E.coli</i> .	6
9	To determine the diauxic growth curve of <i>E.coli</i> .	6
10	To estimate microbial growth by measuring the increase in protein content.	6
11	To study assay of alkaline phosphatase activity of given culture to study the activity of various temperature on the activity of alkaline phosphatase.	6
12	To study assay of alkaline phosphatase activity of given culture to study the activity of various pH on the activity of alkaline phosphatase.	6
13	To study assay of alkaline phosphatase activity of given culture to study the activity of various Substrate Concentration on the activity of alkaline phosphatase.	6
14	To estimate the standard sugar concentration by DNS method.	6
15	To extract pigment of chlorophyll from given sample.	6
16	Estimation of total protein from Cynobacterial biomass using Folin Lowry's method.	3
17	To extract and purify Phycobilin pigment from cyanobacteria.	3
18	To study cell surface hydrophobicity of given culture by MATH assay.	6
19	Isolation of lignin degrading fungi.	6
20	Screening of lignin degrading fungi.	6
21	To isolate and screen lignin degrading fungi by production of LMEs.	6
22	Qualitative and quantitative analysis of siderophore production.	6



<b>Sr. No</b>	<b>Descriptions</b>	<b>Hrs</b>
23	Phosphate solubilizing activity.	6
24	Sulphate solubilizing activity.	6
25	Decolorization of textile dye effluent and measure its color deletion.	6
26	Chemical oxygen demand of textile dye effluent.	6
27	Measurement of Biological Oxygen Demand of water sample.	6
28	Measurement of Dissolved Oxygen of water sample.	3
29	To study various NCBI tools.	3
30	Study of Open Reading Frame (ORF) by suitable software.	3
31	Study of FAST-QC file in detail and predict the results.	3
32	Perform Phylogeny analysis of genetic sequence to understand the evolution.	3
33	Perform different type of BLAST of given samples.	3
34	Demonstration of DNA microarray.	3
35	Perform Western blotting of given protein sample.	6
36	Biological Database with reference to Expasy and NCBI	3
	<b>Total</b>	<b>180</b>



**Continuous Assessment:**

Sr. No	Active Learning Activities	Marks
1	<b>Journal</b> Unit wise Practical will be given by faculty and students will prepare Journal for the Practical and faculty will upload marks on GMIU web Portal.	30
<b>Total</b>		<b>30</b>

**Suggested Specification table with Marks (Theory):60**

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	20%	40%	30%	10%	-	-

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

**Instructional Method:**

The course delivery method will depend upon the requirement of content and the needs of students. The teacher, in addition to conventional teaching methods by black board, may also use any tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in the laboratory.

