

## Syllabus template

<b>Semester: VI</b>				
<b>Course : Microbiology</b>				
<b>Paper Title:</b> Medical microbiology, Recombinant DNA technology, Enzymology Practical				
<b>Paper code: C3MB230641P</b>		<b>Credits:4</b>		
<b>Hours/week : 4 hours/week</b>				
<b>Category: Core/MDC/SEC/VAC : Core (Major)</b>				
<b>Theory / Practical / Composite : Practical (Non-composite)</b>				
<b>No of Modules : NO MODULES</b>				
<b>Course Overview:</b> This practical course focuses on the development of hand-on skills related to certain experimental techniques in the fields of Medical Microbiology, Enzymology and Spectroscopy				
<b>Course Outcome:</b>				
1. To learn about the biochemical tests for identification of clinically important bacteria				
2. To study the effect of antibiotics on clinically important bacteria and its quantification by MIC				
3. To learn about the usages of UV-Vis Spectrophotometry and quantify concentration of proteins				
4. To learn enzymological techniques				
<b>Prerequisites: Basic knowledge about any prior course</b>				
<b>SYLLABUS</b>				
<b>UNIT/Module</b>	<b>CONTENT</b>	<b>HOURS or NUMBER OF CLASSES</b>	<b>CO Mapping</b>	<b>COGNITIVE LEVEL</b>
1.	Identification of few of the bacteria ( <i>E.coli/Salmonella spp/Pseudomonas spp./Staphylococcus spp./Bacillus spp.</i> ) using laboratory strains on the basis of cultural, morphological and biochemical characteristics: Catalase, oxidase, nitrate reduction test, IMViC test, urease production, carbohydrate fermentation, and TSI	3	CO1	K1,K2,K3,K4,K5
2.	Study of the bacterial flora of the human skin by swab method	3	CO1	K1,K2,K4,K5
3.	Antibacterial sensitivity by Kirby-Bauer method	3	CO2	K1,K2,K3,K4,K5
4.	Determination of minimal inhibitory concentration (MIC) of an antibiotic.	3	CO2	K1,K2,K3,K4,K5
5.	To determine an unknown protein concentration by plotting	3	CO3	K1,K2,K3,K5

	a standard graph of BSA. Using UV-Vis Spectrophotometer and validating the Beer-Lambert's Law.			
6.	Purification of an enzyme using some of the following techniques: a) Salt precipitation b) Dialysis of extract c) Affinity Chromatography d) Gel Filtration e) Assessing purity of samples from each step of purification by SDS-PAGE Gel Electrophoresis	3	CO4	K1,K2,K3,K4,K5
7.	Absorption Spectroscopy for native and Denatured DNA.	3	CO3	K1,K2,K3,K5
8.	Immunofluorescence chromatography	3	CO1	K1,K2,K3,K4,K5
9.	Determination of pH optima and temperature optima of an enzyme	3	CO4	K1,K2,K3,K4,K5
10.	Determination of kinetic parameters (Km and Vmax) of enzymes.	3	CO4	K1,K2,K3,K4,K5
11.	Assay of Amylase, Alkaline Phosphatase and Trypsin	3	CO4	K1,K2,K3,K5
12.	Numericals on Bioenergetics, Reaction Kinetics (Integrated Rate Law and Arrhenius equation) and Enzyme Kinetics.	3	CO4	K1,K2,K3,K4,K5,K6
<b>Text Books</b>				
1. Cappucino J and Sherman N. (2010). Microbiology				
2. A Laboratory Manual. 9th edition. Pearson Education Limited 10. Practical manual of Microbiology Mitra & Sarkar.				
Suggested readings: Same as above				
Web Resources: NA				
Evaluation: CA: 80 Semester Exam: 15+ 5 (attendance)				
Paper Structure for Theory Semester Exam Module : NA				

#### Course outcomes (COs) and Cognitive Level Mapping

COs	CO Description	Cognitive levels
CO1	To learn about the biochemical tests for identification of clinically important bacteria	K1,K2,K3,K4,K5
CO2	To study the effect of antibiotics on clinically important bacteria and its quantification by MIC	K1,K2,K3,K4,K5
CO3	To learn about the usages of UV-Vis Spectrophotometry and quantify concentration of proteins	K1,K2,K3,K5

<b>CO4</b>	<b>To learn enzymological techniques</b>	<b>K1,K2,K3,K4,K5,K6</b>
------------	--	--------------------------