

### Syllabus template

<b>Semester: II</b>				
<b>Course : MOLECULAR MEDICAL MICROBIOLOGY (PGD MMM)</b>				
<b>Paper Title:</b> Analytical and Research Methods in Medical Microbiology				
<b>Paper code:</b> DMMB5251			<b>Credits: 4</b>	
<b>Hours/week :</b> 6hrs/week( 3 classes in SXC+3 classes in TMCK)				
<b>Category:</b> Core/MDC/SEC/VAC :				
<b>Theory / Practical / Composite :</b> Practical				
<b>No of Modules :</b> 2 modules				
<b>Course Overview: Clinical Biochemistry and Enzymology</b>				
<p><b>Course Outcome: Module I:</b> Importance of cancer biomarkers (enzymes and metabolites-like Apolipoprotein 1)- Activity Based Proteomics, Tumour markers: Alpha Feto-Protein (AFP), CA-15-3; CA- 125, CA- 19-9, CEA (carcino embryonic antigen), HCG (human chorionic gonadotropin), prostate specific antigen, etc. (TMCK) Study and assay of prostatic acid phosphatase from serum (PAP) kit-based assay Study of serum Prostate Specific antigen (PSA) (SXC). Study and assay of serum alkaline phosphatase. Basic knowledge of enzyme (kinetics and assay) and market enzymes in cancer diagnosis and therapy. Assay and importance of Monoamine oxidase A (MAO-A) enzyme is involved in Reactive oxygen species regulation (SXC). Therapeutic Drug Level Monitoring (TDM) using mass spectroscopy. <b>Module II:</b> Research questions and hypothesis, Study design, Sample size estimation, Research ethics, Research logistics, Data management, Writing of research grants</p>				
<b>Course outcome:</b>				
Understand the cancer related Biomarker				
Evaluate the basic enzyme kinetics related to diagnosis of cancer and therapy				
Remember quick and efficient methods for the diagnosis of factors involved in cancers and other diseases				
Analyze the enzyme related to Oxidative stress				
Apply how to write for research grants				
Understand principles of GCP (Good Clinical Practice) training				
<b>Prerequisites: Basic knowledge about any prior course</b>				
<b>SYLLABUS</b>				
UNIT/Module	CONTENT	HOURS or NUMBER OF CLASSES	CO Mapping	COGNITIVE LEVEL
1	<b>Module I:</b> Importance of cancer biomarkers (enzymes and metabolites-like Apolipoprotein 1)- Activity Based Proteomics, Tumour markers:	12	CO1,CO2,CO3	K2,K5

	<p>Alpha Feto-Protein (AFP),CA-15-3; CA- 125, CA- 19-9, CEA (carcino embryonic antigen), HCG (human chorionic gonadotropin), prostate specific antigen, etc. (TMCK)Study and assay of prostatic acid phosphatase from serum (PAP) kit-based assay Study of serum Prostate Specific antigen (PSA) (SXC).Study and assay ofserum alkaline phosphatase. Basic knowledge of enzyme (kinetics and assay) and market enzymes in cancer diagnosis and therapy. Assay and importance of Monoamine oxidase A (MAO-A) enzyme is involved in Reactive oxygen species regulation (SXC). Therapeutic Drug Level Monitoring (TDM) using mass spectroscopy</p>			
2	<p>Research questions and hypothesis, Study design, Sample size estimation, Research ethics, Research logistics, Data management, Writing of research grants</p>	14	CO4	K1,K4
<b>Text Books</b>				
Biochemistry: Murphy, Srivastava				
Clinical Biochemistry by Dr Satarupa Thakurta				
Clinical Biochemistry, second edition, by Gaw et al, Published by Churchill and Livingstone.				
Clinical Biochemistry: Nanda Maheshwari 3rdEdition JAYPEE Clinical				
<b>Suggested readings</b>				
1. Good Clinical Practice. National Drug Abuse Treatment Clinical Trials Network. <a href="https://gcp.nidatraining.com/">https://gcp.nidatraining.com/</a>				
2.				
3.				
<b>Web Resources</b>				
1.				
2.				

<b>3.</b>
<b>4.</b>
<b>Evaluation</b> Theory CIA:30 Semester Exam:70;
<b>Paper Structure :</b> CIA: 80 MARKS 1) End Semester Viva Voce: 20 Marks

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

<b>COs</b>	<b>CO Description</b>	<b>Cognitive levels</b>
<b>CO1</b>	Understand the cancer related Biomarker	K2
<b>CO2</b>	Evaluate the basic enzyme kinetics related to diagnosis of cancer and therapy	K5
<b>CO3</b>	Remember quick and efficient methods for the diagnosis of factors involved in cancers and other diseases	K1
<b>CO4</b>	Analyze the enzyme related to Oxidative stress	K4
<b>CO5</b>	Apply how to write for research grants	K3
<b>CO6</b>	Understand principles of GCP (Good Clinical Practice) training	K4
<b>CO7</b>	Understand the cancer related Biomarker	K4