


KIT-Kalaigarkarunanidhi Institute of Technology

(An Autonomous Institution)

Coimbatore – 641 402.

Department of Biomedical Engineering

Conceptual Frame work

(For Students admitted from the Academic Year 2023-2024 and onwards)

Semester	Level of Course	Hours / Week	No of Courses	Range of Credits/ Courses	Total Credits
PART I					
A - Foundation Courses					
I to II	Humanities and Social Sciences (HS)	1-4	5	1-3	10
I to IV	Basic Sciences (BS)	4-5	5	4	20
I to II	Engineering Sciences (ES)	3-6	6	2-4	18
B - Professional Core Courses					
II to VII	Professional Core (PC)	2-4	26	2-4	77
C - Elective Courses					
V to VIII	Professional Elective (PE)	3	6	3	18
V to VIII	Open Elective (OE)	3	4	3	12
D – Project Work					
VI, VII & VIII	Project Work (PW)	4 -16	3	2 - 8	12
E - Mandatory Courses Prescribed by AICTE/UGC (Not to be Included for CGPA)					
I, III & IV	Mandatory Course (MC)	2-3	3	NC	NC
PART II					
F- Career Enhancement Courses (CEC)					
IV	Professional Certificate Course	-	-	-	1
V	Summer Internship	-	-	-	1
Total Credit					169


Programme Coordinator


Approved by BoS Chairman



Curriculum and Scheme of Assessment

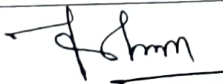
(For Students admitted from the Academic Year 2023-24 and onwards)


Semester - I

Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
B23IPT101	Induction Programme	HS	-	-	-	-	NC	-	-	-
Theory / Theory with Practical										
B23ENT101	Professional English	HS	2	2	0	0	2	40	60	100
B23MAT101	Matrices and Differential Calculus	BS	4	3	1	0	4	40	60	100
B23MET101	Engineering Graphics	ES	4	2	2	0	4	40	60	100
B23HST101	தமிழர்மரபு / Heritage of Tamils	HS	1	1	0	0	1	40	60	100
B23CHI101	Engineering Chemistry	BS	5	3	0	2	4	50	50	100
B23CSI101	C Programming	ES	5	3	0	2	4	50	50	100
Practical										
B23MEP101	Engineering Practices Laboratory	ES	4	0	0	4	2	60	40	100
Total credits to be earned							21			

Semester - II

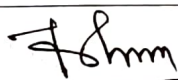
Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
Theory / Theory with Practical										
B23MAT201	Integral Calculus and Complex Analysis	BS	4	3	1	0	4	40	60	100
B23HST201	தமிழரும் தொழில்நுட்பமும்/ Tamils and Technology	HS	1	1	0	0	1	40	60	100
B23BMT201	Biosciences for Medical Engineering	PC	3	3	0	0	3	40	60	100
B23EET203	Introduction to Electrical Engineering	ES	4	3	1	0	4	40	60	100
B23ENI101	Professional Communication	HS	5	3	0	2	4	50	50	100
B23PHI101	Engineering Physics	BS	5	3	0	2	4	50	50	100
B23CEP201	Soft Skills	CEC	2	2	0	0	NC	100	-	100
Practical										
B23BMP201	Biosciences Laboratory	PC	4	0	0	4	2	60	40	100
Total credits to be earned							22			

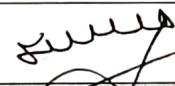

Programme Coordinator


Approved by BoS Chairman

Semester - III										
Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
Theory / Theory with Practical										
B23MAT302	Transforms and Probability	BS	4	3	1	0	4	40	60	100
B23BMT301	Sensors and Measurements	PC	3	3	0	0	3	40	60	100
B23CSI 304	Fundamentals of Data Structures in C	ES	5	3	0	2	4	50	50	100
B23BMT302	Electronic Devices and Circuits	PC	3	3	0	0	3	40	60	100
B23ECT301	Signals and Systems	PC	4	3	1	0	4	40	60	100
B23BMT303	Anatomy and Human Physiology	PC	3	3	0	0	3	40	60	100
Practical										
B23BMP301	Electronic Devices and Circuits Laboratory	PC	4	0	0	4	2	60	40	100
B23BMP302	Anatomy and Human Physiology Laboratory	PC	4	0	0	4	2	60	40	100
Total credits to be earned							25			

Semester - IV										
Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
Theory / Theory with Practical										
B23BMT401	Digital Circuits and Design	PC	3	3	0	0	3	40	60	100
B23BMT402	Bio Signal Processing	PC	4	3	1	0	4	40	60	100
B23BMT403	Bio Control Systems	PC	4	3	1	0	4	40	60	100
B23ECT403	Linear Integrated Circuits	PC	3	3	0	0	3	40	60	100
B23BMT404	Bio Materials	PC	3	3	0	0	3	40	60	100
B23BMT405	Bio Mechanics	PC	3	3	0	0	3	40	60	100
Practical										
B23BMP401	Bio Signal Processing Laboratory	PC	4	0	0	4	2	60	40	100
B23BMP402	Analog and Digital Integrated Circuits Laboratory	PC	4	0	0	4	2	60	40	100
B23CEP401	Professional Certificate Course	CEC	-	-	-	-	1	100	-	100
Total credits to be earned							25			
Summer Internship – THREE WEEKS (Review will be conducted in first week of Semester V and its credit will be included in Semester V)										



 Programme Coordinator


 Approved by BoS Chairman

Semester - V											
Course Code	Course Name	CT	Instructional Hours					Assessment			
			CP	L	T	P	C	CIA	ESE	Total	
Theory / Theory with Practical											
B23BMT501	Biomedical Instrumentation	PC	3	3	0	0	3	40	60	100	
B23BMT502	Rehabilitation Engineering	PC	3	3	0	0	3	40	60	100	
B23BMT503	Embedded Systems and IoMT	PC	4	3	1	0	4	40	60	100	
	Professional Elective - I	PE	3	3	0	0	3	40	60	100	
	Open Elective - I	OE	3	3	0	0	3	40	60	100	
B23MCT501	Environmental Sciences	MC	3	3	0	0	NC	100	-	100	
Practical											
B23BMP501	Embedded Systems and IoMT Laboratory	PC	4	0	0	4	2	60	40	100	
B23BMP502	Biomedical Instrumentation Laboratory	PC	4	0	0	4	2	60	40	100	
B23CEP501	Summer Internship	CEC	-	-	-	-	1	100	-	100	
Total credits to be earned							21				

Semester - VI											
Course Code	Course Name	CT	Instructional Hours					Assessment			
			CP	L	T	P	C	CIA	ESE	Total	
Theory / Theory with Practical											
B23BMT601	Diagnostic and Therapeutic Equipment	PC	3	3	0	0	3	40	60	100	
B23BMT602	Radiological Equipment	PC	3	3	0	0	3	40	60	100	
	Professional Elective - II	PE	3	3	0	0	3	40	60	100	
	Professional Elective - III	PE	3	3	0	0	3	40	60	100	
	Open Elective - II	OE	3	3	0	0	3	40	60	100	
B23MCT601	Indian Constitution	MC	3	3	0	0	NC	100	-	100	
Practical											
B23BMP601	Diagnostic and Therapeutic Equipment Laboratory	PC	4	0	0	4	2	60	40	100	
B23BMP602	Mini Project	PW	4	0	0	4	2	40	60	100	
Total credits to be earned							19				


Programme Coordinator


Approved by BoS Chairman

ESE
 Segment
 Total

R2023

KIT - Kalaignarkaranidhi Institute of Technology

Semester - VII										
Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
Theory / Theory with Practical										
B23MGT701	Universal Human Values	HS	3	3	0	0	2	40	60	100
B23BMT701	Medical Image Processing	PC	3	3	0	0	3	40	60	100
B23BMT702	Artificial Intelligence and Machine Learning	PC	4	3	1	0	4	40	60	100
	Professional Elective - IV	PE	3	3	0	0	3	40	60	100
	Professional Elective - V	PE	3	3	0	0	3	40	60	100
	Open Elective - III	OE	3	3	0	0	3	40	60	100
Practical										
B23BMP702	Medical Equipment Training	PC	4	0	0	4	2	60	40	100
B23MEP702	Project work Phase - I	PW	4	0	0	4	2	40	60	100
Total credits to be earned							22			

Semester - VIII										
Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
Theory / Theory with Practical										
	Professional Elective - VI	PE	3	3	0	0	3	40	60	100
	Open Elective - IV	OE	3	3	0	0	3	40	60	100
Practical										
B23MEP801	Project Work Phase - II	PW	16	0	0	16	8	40	60	100
Total credits to be earned							14			


Programme Coordinator


Approved by BoS Chairman

HUMANITIES AND SOCIAL SCIENCES (HS)

Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
B23IPT101	Induction Programme	HS	-	-	-	-	0	-	-	-
B23ENT101	Professional English	HS	2	2	0	0	2	40	60	100
B23HST101	தமிழர்மரபு / Heritage of Tamils	HS	1	1	0	0	1	40	60	100
B23HST201	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	HS	1	1	0	0	1	40	60	100
B23ENI201	Professional Communication	HS	5	3	0	2	4	50	50	100
B23MGT701	Universal Human Values	HS	3	3	0	0	2	40	60	100

BASIC SCIENCES (BS)

Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
B23MAT101	Matrices and Differential Calculus	BS	4	3	1	0	4	40	60	100
B23CHI101	Engineering Chemistry	BS	5	3	0	2	4	50	50	100
B23PHI101	Engineering Physics	BS	5	3	0	2	4	50	50	100
B23MAT201	Integral Calculus and Complex Analysis	BS	4	3	1	0	4	40	60	100
B23MAT301	Transforms and Probability	BS	4	3	1	0	4	40	60	100

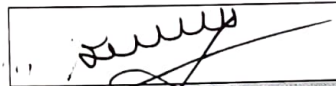
COIMBATORE

ENGINEERING SCIENCES (ES)

Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
B23MET101	Engineering Graphics	ES	4	2	2	0	4	40	60	100
B23CSI101	C Programming	ES	5	3	0	2	4	50	50	100
B23MEP101	Engineering Practices Laboratory	ES	4	0	0	4	2	60	40	100
B23EET203	Introduction to Electrical Engineering	ES	4	3	1	0	4	40	60	100
B23CSI304	Fundamentals of Data Structures in C	ES	5	3	0	2	4	50	50	100



Programme Coordinator

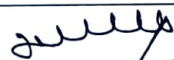


Approved by BoS Chairman

PROFESSIONAL CORE (PC)										
Course Code	Course Name	CT	Instructional Hours				Assessment			
			CP	L	T	P	C	CIA	ESE	Total
B23BMT201	Biosciences for Medical Engineering	PC	3	3	0	0	3	40	60	100
B23BMP201	Biosciences Laboratory	PC	4	0	0	4	2	60	40	100
B23BMT301	Sensors and Measurements	PC	3	3	0	0	3	40	60	100
B23BMT302	Electronic Devices and Circuits	PC	3	3	0	0	3	40	60	100
B23BMT303	Anatomy and Human Physiology	PC	3	3	0	0	3	60	40	100
B23ECT301	Signals and Systems	PC	4	3	1	0	4	40	60	100
B23BMP301	Electronic Devices and Circuits Laboratory	PC	4	0	0	4	2	60	40	100
B23BMP302	Anatomy and Human Physiology Laboratory	PC	4	0	0	4	2	60	40	100
B23BMT401	Bio Signal Processing	PC	4	3	1	0	4	40	60	100
B23BMT402	Bio Control Systems	PC	4	3	1	0	4	40	60	100
B23BMT401	Digital Circuits and Design	PC	3	3	0	0	3	40	60	100
B23ECT403	Linear Integrated Circuits	PC	3	3	0	0	3	40	60	100
B23BMT404	Bio Materials	PC	3	3	0	0	3	40	60	100
B23BMT405	Bio Mechanics	PC	3	3	0	0	3	40	60	100
B23BMP401	Bio Signal Processing Laboratory	PC	4	0	0	4	2	60	40	100
B23BMP402	Analog and Digital Integrated Circuits Laboratory	PC	4	0	0	4	2	60	40	100
B23BMT501	Biomedical Instrumentation	PC	3	3	0	0	3	40	60	100
B23BMT502	Rehabilitation Engineering	PC	3	3	0	0	3	40	60	100
B23BMT503	Embedded Systems and IoMT	PC	4	3	1	0	4	40	60	100
B23BMP501	Embedded Systems and IoMT Laboratory	PC	4	0	0	4	2	60	40	100
B23BMP502	Biomedical Instrumentation Laboratory	PC	4	0	0	4	2	60	40	100
B23BMT601	Diagnostic and Therapeutic Equipment	PC	3	3	0	0	3	40	60	100
B23BMT602	Radiological Equipment	PC	3	3	0	0	3	40	60	100
B23BMP601	Diagnostic and Therapeutic Equipment Laboratory	PC	4	0	0	4	2	60	40	100
B23BMT701	Medical Image Processing	PC	3	3	0	0	3	40	60	100
B23BMT702	Artificial Intelligence and Machine Learning	PC	4	3	1	0	4	40	60	100
B23BMP702	Medical Equipment Training	PC	4	0	0	4	2	60	40	100



Programme Coordinator



Approved by BoS Chairman

PROJECT WORK (PW)										
Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
B23BMP602	Mini Project	PW	4	0	0	4	2	40	60	100
B23MEP702	Project work Phase – I	PW	4	0	0	4	2	40	60	100
B23MEP801	Project Work Phase - II	PW	16	0	0	16	8	40	60	100

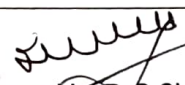
MANDATORY COURSE (MC)										
Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
B23MCT501	Environmental Sciences	MC	3	3	0	0	NC	100	-	100
B23MCT601	Indian Constitution	MC	3	3	0	0	NC	100	-	100

CAREER ENHANCEMENT COURSE (CEC)										
Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
B19CET201	Soft Skills	CEC	2	2	0	0	NC	100	-	100
B23CEP401	Professional Certificate Course	CEC	-	-	-	-	1	100	-	100
B23CEP501	Summer Internship	CEC	-	-	-	-	1	100	-	100

HS : Humanities and Social Sciences BS
 BS : Basic Sciences
 ES : Engineering Sciences
 PC : Professional Core
 PE : Professional Elective
 OE : Open Elective
 CEC : Career Enhancement Courses
 MC : Mandatory Courses

PW : Project Work
 L : Lecture
 T : Tutorial
 P : Practical
 C : Credit Point
 CP : Contact Period
 CIA : Continuous Internal Assessment
 ESE : End Semester Examination


 Programme Coordinator


 Approved by BeS Chairman

PROFESSIONAL ELECTIVE COURSES: VERTICALS**VERTICAL 1: COMMUNICATION**

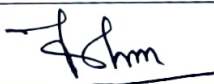
Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
	Wearable Devices	PE	3	3	0	0	3	40	60	100
	Body Area Network	PE	3	3	0	0	3	40	60	100
	Extended and Augmented Reality	PE	3	3	0	0	3	40	60	100
	Telehealth Technology and Cyber Security	PE	3	3	0	0	3	40	60	100
	Biometrics in Healthcare	PE	3	3	0	0	3	40	60	100
	Wireless Communication Systems	PE	3	3	0	0	3	40	60	100

VERTICAL 2 : ADVANCED HEALTHCARE DEVICES

Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
	Bio Mems	PE	3	3	0	0	3	40	60	100
	Clinical Care Equipment	PE	3	3	0	0	3	40	60	100
	Human Assist Devices	PE	3	3	0	0	3	40	60	100
	Advanced Healthcare Technology	PE	3	3	0	0	3	40	60	100
	Robotics in Medicine	PE	3	3	0	0	3	40	60	100
	Advanced Therapeutic Equipment's	PE	3	3	0	0	3	40	60	100

VERTICAL 3 : HEALTHCARE MANAGEMENT

Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
	Occupational Safety and HIPPA	PE	3	3	0	0	3	40	60	100
	Cell biology and Embryology	PE	3	3	0	0	3	40	60	100
	Medical Waste Management	PE	3	3	0	0	3	40	60	100
	Renewable Energy	PE	3	3	0	0	3	40	60	100
	Emergency Medical Services	PE	3	3	0	0	3	40	60	100
	Fundamentals of Health Care Analytics	PE	3	3	0	0	3	40	60	100



Programme Coordinator



Approved by BoS Chairman

VERTICAL 4 : BIO ENGINEERING

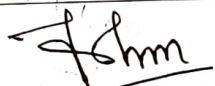
Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
	Nano Technology	PE	3	3	0	0	3	40	60	100
	Biomedical Optics and Photonics	PE	3	3	0	0	3	40	60	100
	Artificial Organs & Implants	PE	3	3	0	0	3	40	60	100
	Assistive Devices	PE	3	3	0	0	3	40	60	100
	Prosthetics and Haptics	PE	3	3	0	0	3	40	60	100
	Ergonomics in Healthcare	PE	3	3	0	0	3	40	60	100

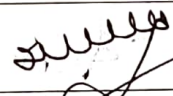
VERTICAL 5: MEDICAL DEVICE INNOVATION & DEVELOPMENT

Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
	Medical Device Design	PE	3	3	0	0	3	40	60	100
	Product Design and Development	PE	3	3	0	0	3	40	60	100
	Rapid prototyping	PE	3	3	0	0	3	40	60	100
	Medical Innovation and Entrepreneurship	PE	3	3	0	0	3	40	60	100
	Patient Safety Standards and Ethics	PE	3	3	0	0	3	40	60	100
	Medical Device Regulation	PE	3	3	0	0	3	40	60	100

VERTICAL 6: SIGNAL AND IMAGE PROCESSING

Course Code	Course Name	CT	Instructional Hours					Assessment		
			CP	L	T	P	C	CIA	ESE	Total
	Soft computing Applications and Techniques in Healthcare	PE	3	3	0	0	3	40	60	100
	Speech and audio Signal Processing	PE	3	3	0	0	3	40	60	100
	Computer Vision	PE	3	3	0	0	3	40	60	100
	Brain Computer Interface and Applications	PE	3	3	0	0	3	40	60	100
	Deep Learning in Health Care	PE	3	3	0	0	3	40	60	100
	Imaging and Radiology	PE	3	3	0	0	3	40	60	100


Programme Coordinator


Approved by BoS Chairman

R2023

B.E / B.Tech	B23BMT201 – BIOSCIENCES FOR MEDICAL ENGINEERING	L	T	P	C
		3	0	0	3

Course Objectives

1. To learn about the fundamental concepts of biochemistry.
2. To study structural and functional properties of carbohydrates, proteins, lipids and amino acids
3. To emphasize the role of cell degeneration, repair and neoplasia.
4. To Gain knowledge on the fluid and hemodynamic derangements.
5. To know the fundamentals of microbiology and immunopathology.

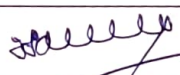
UNIT - I	FUNDAMENTALS TO BIOCHEMISTRY	9
Introduction to Biochemistry, water as a biological solvent, weak acid and bases, pH, buffers, Handerson Hasselbalch equation, physiological buffers in living systems, Energy in living organism. Properties of water and their applications in biological systems. Introduction to Biomolecules, Biological membrane, Clinical application of Electrolytes and radioisotopes.		

UNIT - II	CARBOHYDRATES, LIPIDS, PROTEINS	9
Classification of carbohydrates - mono, di, oligo and polysaccharides. Structure, physical and chemical properties of carbohydrates - Classification of lipids- simple, compound, and derived lipids. Nomenclature of fatty acid - Structure and properties of proteins, structural organization of proteins, classification and properties of amino acids. Nucleic acid: Structural aspects – Components of DNA and RNA, Nucleosides & Nucleotides (introduction, structure & bonding), Double helical structure of DNA (Watson-Crick model), various forms of DNA.		

UNIT - III	CELL DEGENERATION, REPAIR AND NEOPLASIA	9
Cell injury - Reversible cell injury and Irreversible cell injury and Necrosis, Apoptosis, Intracellular accumulations, Pathological calcification- Dystrophic and Metastatic. cellular adaptations of growth and differentiation, Inflammation and Repair including fracture healing, Neoplasia, Classification, Benign and Malignant tumours, carcinogenesis, spread of tumours Autopsy and biopsy.		

UNIT - IV	FLUID AND HEMODYNAMIC DERANGEMENTS	9
Edema, Hyperemia/Ischemia, normal hemostasis, thrombosis, disseminated intravascular coagulation, embolism, infarction, shock and Chronic venous congestion. Hematological disorders-Bleeding disorders, Leukaemias, Lymphomas Haemorrhage.		


Programme Coordinator


Approved by BoS Chairman



R2023

FUNDAMENTALS OF MICROBIOLOGY AND IMMUNOPATHOLOGY

9

UNIT - V

Structure of Bacteria and Virus - Morphological features and structural organization of bacteria and virus
 - List of common bacterial, fungal and viral diseases of human beings.- Basics of Microscopes : Light microscope, Electron microscope (TEM & SEM). - Natural and artificial immunity, types of Hypersensitivity, antibody and cell mediated tissue injury, Immunological techniques: immune diffusion, immuno electrophoresis, RIA and ELISA, monoclonal antibodies.

Total Instructional hours : 45

Course Outcomes: Students will be able to

- CO1 Explain the fundamentals of biochemistry.
- CO2 Analyze structural and functional aspects of living organisms.
- CO3 Identify the mechanism of disease and how events at the level of the cell affect the Patients as a whole.
- CO4 Summarize the fluid and hemodynamic derangements.
- CO5 Outline about the fundamentals of microbiology and immunopathology.


Text Books

1. RAFI MD "Text book of biochemistry for Medical Student" Fourth Edition, Universities Press, Orient Blackswan Private Limited - New Delhi 2021.
2. Ramzi S Cotran, Vinay Kumar & Stanley L Robbins, "Pathologic Basis of Diseases", 10th edition: South Asia Edition Elsevier India, 2020.
3. Ananthanarayanan & Panicker, "Microbiology" Orientblackswan, 2017, 10th edition.

Reference Books

1. David L.Nelson, Michael M.Cox, Lehninger "Principles of Biochemistry Macmillan", 7th Edition 2017.
2. Harper's Illustrated Biochemistry, Mc Graw Hill Publishers, 30th Edition, 2018.
3. Underwood JCE, "General and Systematic Pathology", Churchill Livingstone, 3rd, Ed.2000.
4. Prescott, Harley, Klein, "Microbiology", McGraw Hill, 9th Edition, 2013.


Programme Coordinator


Approved by BoS Chairman



B23BMP201 – BIOSCIENCES LABORATORY

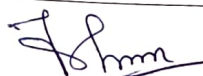
L	T	P	C
0	0	4	2

B. E / B.Tech

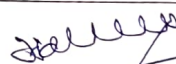
Course Objectives

1. To Estimate and quantify biomolecules.
2. To understand the separation techniques of the biomolecules
3. To study the features of compound microscope
4. To learn various staining process.
5. To study the chemical examinations, Histopathological examinations etc.

Expt. No.	Description of the Experiments
1.	Preparation of solutions: 1) percentage solutions, 2) molar solutions, 3) normal solutions
2.	Standardization of pH meter, preparation of buffers, emulsions.
3.	Spectroscopy: Determination of absorption maxima (λ_{max}) of a given solution
4.	General tests for carbohydrates, proteins and lipids.
5.	Identification of Blood Collection Tubes and Phlebotomy equipment
6.	Estimation of Hemoglobin and blood glucose
7.	Estimation of urea and uric acid
8.	Separation of proteins by SDS electrophoresis (Demo) and amino acids by thin layer Chromatography (Demo).
9.	Basic staining – Hematoxylin and eosin staining.
10.	Types of Staining: Simple stain, Gram stain
11.	Study of parts of compound microscope
12.	Study of Histopathological slides of benign and malignant tumours.
13.	Study of Hematology slides of anemia and leukemia.



Programme Coordinator



Approved by BOS Chairman



R2023


Course Outcomes : Students will be able to

CO1	Make use of the biochemistry laboratory functional components
CO2	Analyze the parameters with interpretation
CO3	Explain the basics knowledge of Biochemical parameter and their interpretation in Blood sample
CO4	Demonstrate practical experiments on staining Processes.
CO5	Explain with pathological slides of benign and malignant tumours.

Text Books

1. Ramnik Sood, Textbook of Medical Laboratory Technology, 6th Edition, Jaypee Brothers Medical Publishers, 2009


 Programme Coordinator


 Approved by BoS Chairman

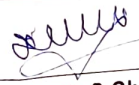


R2023

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS

Sl. No.	Description of Equipment	Quantity required
1.	Colorimeter	2
2.	Spectrophotometer	1
3.	pH meter	1
4.	Weighing balance	1
5.	Refrigerator	1
6.	SDS gel electrophoresis	1
7.	TLC, ready TLC plates	1
8.	Wintrobe's tube	2
9.	Centrifuge Normal	1
10.	Microslides	2 Packets
11.	Lancet	5 Boxes
12.	Microscope	1
13.	Neubaur's Chamber	2
14.	Heparinized Syringe	1Box
15.	Haemoglobinometer	1
16.	Capillary tubes	1 box
17.	Phlebotomy equipment	2 box
18.	Autoclave	1


 Programme Coordinator


 Approved by BoS Chairman