



Bachelor of Science (Dialysis Technology)

Program code: SAH0130

(2020 - 2023)

Program and Course Structure

School of Allied Health Sciences

SU/SAHS/BDT

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1.1 Vision, Mission and Core Values of the University

Vision of the University

To serve the society by being a global University of higher learning in pursuit of academic excellence, innovation and nurturing entrepreneurship.

Mission of the University

1. Transformative educational experience
2. Enrichment by educational initiatives that encourage global outlook
3. Develop research, support disruptive innovations and accelerate entrepreneurship
4. Seeking beyond boundaries

Core Values

- Integrity
- Leadership
- Diversity
- Community



1.2 Vision and Mission of the School

Vision of the School

To steer the School of Allied Health Sciences towards excellence in academics, innovation and entrepreneurship by constant endeavors.

Mission of the School

1. To create the state of the art facility for quality teaching learning, research & innovation
2. To incorporate the contemporary standards in teaching & learning
3. To inculcate in the students values of integrity and compassion towards the care of patients and society.

Core Values

- Critical Thinking and Observation
- Analytical Skills
- Creativity
- Skilled professional
- Multidimensional
- Compassion
- Management

1.3 BDT Program Educational Objectives (PEO)

A under graduate student having qualified the BSc Dialysis Technology examination should be able to:

- PEO1: Acquire comprehensive knowledge of structure and functions of human body, physiological and biochemical mechanisms involved in normal and abnormal health condition, knowledge of light microscopic and ultrastructure of human specimen. Knowledge of structure and functional correlation of blood constituents with disease process and be able to communicate the same clearly and with precision.
- PEO2: Be aware of contemporary advances and developments in the field of dialysis technology.
- PEO3: Acquire knowledge of modern research techniques and be familiar with the recent advances in dialysis technology.
- PEO4: Inculcate habit of scientific enquiry and be able to identify lacunae in the existing knowledge in a given area.
- PEO5: Have acquired skills in interpreting the results to medical and paramedical professionals as Unit manager/ supervisor or health care administrator.
- PEO6: Have acquired skills in effectively communicating with the students and colleagues from various medical and paramedical fields as educational consultant or laboratory coordinator etc.
- PEO7: Have acquired skills of integrating tests with other disciplines of medical sciences as and when needed.



1.3.2 BDTMap PEOs with Mission Statements:

PEO Statements	School Mission 1	School Mission 2	School Mission 3
PEO1:	3	3	3
PEO2:	3	2	3
PEO3:	3	3	3
PEO4:	2	3	2
PEO5:	3	2	3
PEO6:	2	3	3
PEO7:	3	2	3

Enter correlation levels 1, 2, or 3 as defined below:

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

4. No correlation (--)

1.3.3 BDT Program Outcomes (PO's)

Program Specific Outcomes: The graduate attributes of BSc Dialysis Technology of SAHS are as follows:

PO1 : Knowledge of laboratory tests: Posses theoretical and practical knowledge of the laboratory test associated with diagnosis of diseases including biochemical, pathological and microbiological test in the laboratory.

PO2 : Thinking abilities: Utilize the principles of scientific test, thinking analytically, clearly and critically, while solving laboratory problems and making patient reports after sample processing in daily practice.

PO3 : Planning abilities: Demonstrate effective planning abilities including laboratory tests timing management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.

PO4 : Professional identity: Understand, analyse and communicate the value of their professional roles in society (e.g. health care professionals, laboratory supervisors and managers) through consideration of social, economic and health issues.

PO5: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the laboratory practice.

PO6: Lifelong learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of dialysis technology.

1.3.4 Mapping of Program Outcome Vs Program Educational Objectives

	PEO1	PEO2	PEO3	PEO4	PEO5	PEO6	PEO7
PO1	3	3	3	3	3	3	3
PO2	3	3	2	3	3	3	3
PO3	3	3	3	3	3	3	3
PO4	3	3	3	3	3	3	3
PO5	3	3	3	3	2	3	3
PO6	3	3	2	3	3	3	2

1. Slight (Low)

2. Moderate (Medium)

3. Substantial (High)

1.3.5 BDT Program Outcome Vs Courses Mapping Table:

Program Outcome Courses	Course code	Course Name		PO1	PO2	PO3	PO4	PO5	PO6
Semester-1									
Theory									
Course 1.1	BDT 106	BIOCHEMISTRY- I		3	3	3	3	3	3
			CO1						
			CO2	3	2	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 1.2	BDT 107	PATHOLOGY- I		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	2	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 1.3	BDT 108	MICROBIOLOGY-I		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	2	3	3	2	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 1.4	BDT 109	HUMAN ANATOMY-I		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 1.5	BDT 110	HUMAN PHYSIOLOGY-I		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 1.6	BDT011	ENGLISH-I		3					
			CO1		3	3	3	3	3
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Practical									
Course 1.7	BDT 156	BIOCHEMISTRY- I (LAB)		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3

			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 1.8	BDT 157	PATHOLOGY- I (LAB)		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 1.9	BDT 158	MICROBIOLOGY-I (LAB)		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 1.10	BDT 159	HUMAN ANATOMY-I (LAB)		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 1.11	BDT 150	HUMAN PHYSIOLOGY-I (LAB)		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Semester 2									
Theory									
Course 2.1	BDT111	BIOCHEMISTRY- II		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 2.2	BDT112	PATHOLOGY- II		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	2	3	3	3
			CO5	3	3	3	3	2	3
Course 2.3	BDT113	MICROBIOLOGY-II		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3

			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 2.4	BDT114	HUMAN ANATOMY-II		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 2.5	BDT115	HUMAN PHYSIOLOGY-II		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Practical									
Course 2.6	BDT 151	BIOCHEMISTRY- II (LAB)		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 2.7	BDT 152	PATHOLOGY- II (LAB)		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 2.8	BDT 153	MICROBIOLOGY-II (LAB)		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 2.9	BDT 154	HUMAN ANATOMY-II (LAB)		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3
Course 2.10	BDT 155	HUMAN PHYSIOLOGY-II (LAB)		3	3	3	3	3	3
			CO1						
			CO2	3	3	2	3	3	3
			CO3	3	3	3	3	3	3
			CO4	3	3	3	3	3	3
			CO5	3	3	3	3	2	3

SHARDA UNIVERSITY
School of Allied Health Sciences
Program: B.Sc Dialysis Technology

Semester/Term.: 1

Session: 2020-21

S. No.	Paper ID	Subject Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course: CC AECC SEC DSE
				L	T	P			
THEORY									
1.		BDT 106	BIOCHEMISTRY- I	2	1	-	3	Core	CC
2.		BDT 107	PATHOLOGY- I	2	1	-	3	Core	CC
3.		BDT 108	MICROBIOLOGY-I	2	1	-	3	Core	CC
4.		BDT 109	HUMAN ANATOMY-I	2	1	-	3	Core	CC,AECC
5.		BDT 110	HUMAN PHYSIOLOGY-I	2	1	-	3	Core	CC,AECC
6.		BDT011	English-I	2	-	-	2	Pre-requisite	SEC
Practical									
1.		BDT 156	BIOCHEMISTRY- I (LAB)	-	-	2	1	Core	CC,SEC
2.		BDT 157	PATHOLOGY- I (LAB)	-	-	2	1	Core	CC,SEC
3.		BDT 158	MICROBIOLOGY-I (LAB)	-	-	2	1	Core	CC,SEC
4.		BDT 159	HUMAN ANATOMY-I (LAB)	-	-	2	1	Core	CC,SEC
5.		BDT 150	HUMAN PHYSIOLOGY-I (LAB)	-	-	2	1	Core	CC,SEC
TOTAL CREDITS							22		

SHARDA UNIVERSITY
School of Allied Health Sciences
Program: B.Sc Dialysis Technology

Semester/Term.: 2

Session: 2020-21

S. No.	Paper ID	Subject Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course: CC AECC SEC DSE
				L	T	P			
THEORY									
1		BDT111	BIOCHEMISTRY- II	2	1	-	3	Core	CC
2		BDT112	PATHOLOGY- II	2	1	-	3	Core	CC
3		BDT113	MICROBIOLOGY-II	2	1	-	3	Core	CC
4		BDT114	HUMAN ANATOMY-II	2	1	-	3	Core	CC,AECC
5		BDT115	HUMAN PHYSIOLOGY-II	2	1	-	3	Core	CC,AECC
		OPE	Open Elective course	2	-	-	2	Elective	AECC, SEC
Practical									
6.		BDT151	BIOCHEMISTRY- II(LAB)	-	-	2	1	Core	CC,SEC
7.		BDT152	PATHOLOGY- II(LAB)	-	-	2	1	Core	CC,SEC
8.		BDT153	MICROBIOLOGY-II(LAB)	-	-	2	1	Core	CC,SEC
9.		BDT154	HUMAN ANATOMY-II(LAB)	-	-	2	1	Core	CC,SEC
10.		BDT155	HUMAN PHYSIOLOGY-II(LAB)	-	-	2	1	Core	CC,SEC
TOTAL CREDITS							22		

Table 1: Evaluation scheme of B.Sc. Dialysis Technology 1st semester University examination:

S.No.	Paper ID	Subject Code	Subject Name	EVALUATION SCHEME (Distribution of Marks)			Total Marks
				Continuous Assessment	Mid Term Examination	End Term Examination	
THEORY SUBJECTS							
1		BDT 106	BIOCHEMISTRY- 1	30	20	50	100
2		BDT 107	PATHOLOGY- 1	30	20	50	100
3		BDT 108	MICROBIOLOGY-1	30	20	50	100
4		BDT 109	HUMAN ANATOMY-1	30	20	50	100
5		BDT 110	HUMAN PHYSIOLOGY-1	30	20	50	100
6		BDT011	English-1	50			
PRACTICAL SUBJECTS							
1		BDT 156	BIOCHEMISTRY- I (LAB)	60	-	40	100
2		BDT 157	PATHOLOGY- I (LAB)	60	-	40	100
3		BDT 158	MICROBIOLOGY-I (LAB)	60	-	40	100
4		BDT 159	HUMAN ANATOMY-I (LAB)	60	-	40	100
5		BDT 150	HUMAN PHYSIOLOGY-I (LAB)	60	-	40	100
Grand Total [5 (Th) +5(Pr)]							1000

Note: English-I will be the subsidiary subject and marks will convert into grade.

Table 2. Evaluation scheme of B.Sc. Dialysis Technology 2nd semester University examination:

S.No	Paper ID	Subject Code	Subject Name	EVALUATION SCHEME (Distribution of Marks)			Total Marks
				Continuous Assessment	Mid Term Examination	End Term Examination	
THEORY SUBJECTS							
1		BDT111	BIOCHEMISTRY- II	30	20	50	100
2		BDT112	PATHOLOGY- II	30	20	50	100
3		BDT113	MICROBIOLOGY-II	30	20	50	100
4		BDT114	HUMAN ANATOMY-II	30	20	50	100
5		BDT115	HUMAN PHYSIOLOGY-II	30	20	50	100
6		OPE	Open Elective course	-	-	-	-
PRACTICAL SUBJECTS							
1		BDT151	BIOCHEMISTRY- II(LAB)	60	-	40	100
2		BDT152	PATHOLOGY- II(LAB)	60	-	40	100
3		BDT153	MICROBIOLOGY-II(LAB)	60	-	40	100
4		BDT154	HUMAN ANATOMY- II(LAB)	60	-	40	100
5		BDT155	HUMAN PHYSIOLOGY- II(LAB)	60	-	40	100
Grand Total [5 (Th) +5(Pr)]							1000

Note: Open elective course will be in audit mode and student will have to pass it.

- Value added courses are mandatory for each student of odd semester (List of VAC is enclosed as Annexure 1) and it is non-graded.
- Open elective course is mandatory for each student of even semester (List of approved open elective courses offered by the University are enclosed as Annexure 2 and it will be in audit mode and mandatory to pass it.
- In each academic session, project work will be provided to the students.

Course Structure

Of

Bachelor of Science(Dialysis Technology)

BDT 106: BIOCHEMISTRY- I&BDT 106: BIOCHEMISTRY- I (Lab)

School: SAHS		Batch : 2020-23	
Program: BDT		Current Academic Year: 2020-21	
Branch: Dialysis Technology		Semester: 1	
1	Course Code	BDT 106	
2	Course Title	BIOCHEMISTRY -I	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Status	Compulsory	
5	Course Objective	<ul style="list-style-type: none"> • To train the students in the management of laboratory along with handling a variety of laboratory chemicals and instruments including electronic and advanced equipment's used in modern dialysis technology. • To make the students able to do routine laboratory testing under stipulated conditions. • To prepare specimens and operate machines that automatically analyse samples. • To provide the conceptual basis for understanding biochemical and particularly address the fundamental mechanisms of the biomolecules to facilitate the life. 	

		<ul style="list-style-type: none"> To develop diagnostic skills in clinical biochemistry and to provide an advanced understanding of the core principles and topics of Biochemistry and their experimental basis. 	
6	Course Outcomes	CO1: To understand the importance of sampling techniques CO2: To understand the importance of different types of glassware's CO3: To understand the importance of different types of equipment's CO4: To understand the importance of acid, base and buffer CO5: To understand the importance of chemistry of carbohydrates and lipids	
7	Course Description	<ul style="list-style-type: none"> Introduction of Glasswares Introduction of Laboratory Equipments Safety of measurements in Laboratory, Sampling technique and its preservation Preparation of Solutions Acid, Base and Indicators Nutrition Carbohydrate Chemistry Lipid Chemistry 	
8	Outline syllabus		CO mapping
	Theory		
	Unit 1	Introduction of Glasswares and laboratory equipments	CO1, CO2
		a. Pipettes, Burettes, Beakers, Petri dishes, depression plates; Flasks - different types ; Volumetric, round bottomed, Erlenmeyer conical etc. b. Water bath: Use, care and maintenance. Oven & Incubators. c. Refrigerators, cold box, deep freezers. Colorimeter and spectrophotometer.	
	Unit 2	Safety of measurements in Laboratory, Sampling technique and its preservation	CO1, CO2
		a. Different types of samples such as urine, blood, stool, tissue etc. and various techniques to	

		<p>preserve the samples.</p> <p>b. Preparation of percentage and normal solution.</p> <p>c. Preparation of molar and molal solution.</p>	
	Unit 3	Acid, Base, Indicators and Nutrition	CO1, CO3
		<p>a. Acid- base indicators: Definition, concept, mechanism of action.</p> <p>b. Importance of nutrition: Calorific values, Respiratory quotient, Energy requirement of a person - Basal metabolic rate.</p> <p>c. Balanced diet, recommended dietary allowances, Role of carbohydrates, lipid and protein in diet.</p>	
	Unit 4	Carbohydrate Chemistry	CO1, CO4
		<p>1. Definition, general classification with examples.</p> <p>2. Glycosidic bond, Structures, composition, sources, properties and functions of Monosaccharide's and Disaccharides.</p> <p>3. Structures, composition, sources, properties and functions of Oligosaccharides and Polysaccharides.</p>	
	Unit 5	Lipid Chemistry	CO1, CO5
		<p>a. Definition, classification, properties and functions of Fatty acids.</p> <p>b. Triacylglycerol and Phospholipids.</p> <p>c. Cholesterol, Essential fatty acids and their importance, Lipoprotein.</p>	
1	Course Code	BDT 156	
2	Course Title	BIOCHEMISTRY –I(LAB)	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
5	Course Outcomes	<p>CO1: To understand the importance of sampling techniques</p> <p>CO2: To understand the importance of different types of glass wares</p> <p>CO3: To understand the importance of different types of equipment's</p> <p>CO4: To understand the importance of acid and base</p> <p>CO5: To understand the importance of buffers</p>	

6	Course Description	<ul style="list-style-type: none"> • Introduction of Glassware's • Introduction of Laboratory Equipment's • Safety of measurements in Laboratory, • Preparation of Solutions • Determination of strength of acids and bases 			
	Practical's				CO mapping
	Unit 1	a. Introduction to Laboratory apparatus -1 b. Introduction to Laboratory apparatus -2 c. Maintenance of Laboratory apparatus-3			CO1, CO2
	Unit 2	<ul style="list-style-type: none"> • Introduction to Laboratory glassware's -1 • Introduction to Laboratory glassware's -2 • Maintenance of Laboratory glassware's 			CO1, CO2
	Unit 3	a. Safety measurements in Biochemistry lab b. General laboratory protocols c. Awareness in a lab			CO1, CO3
	Unit 4	a. Preparation of acids of different concentration b. Preparation of bases of different concentration c. Preparation of solutions of different concentration			CO1, CO4
	Unit 5	a. Determination of the strength of NaOH solution b. Determination of the strength of HCl solution c. Determination of the strength of NH ₄ OH solution			CO1, CO5
	Mode of examination	Theory and Practical			
	Weightage Distribution for Theory	CA	MTE	ETE	
		30%	20%	50%	
	Weightage Distribution for Practical's	CA	MTE	ETE	
		60%	0%	40%	

	Text book/s*	<ol style="list-style-type: none">1) A text book of Medical Biochemistry by Chatterjee &Shinde2) Text book of biochemistry for Medical students by Vasudevan and Sreekumari3) Biochemistry by Lehninger4) Clinical chemistry by Varley5) Harpers Illustrated Biochemistryby Robert K.M.	
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BDT 107: PATHOLOGY- I&BDT 157: PATHOLOGY- I (Lab)

School: SAHS		Batch : 2020-23	
Program: BDT		Current Academic Year: 2020-21	
Branch: Dialysis Technology		Semester: 1	
1	Course Code	BDT 107	
2	Course Title	PATHOLOGY-I	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Status	Compulsory	
5	Course Objective	<ul style="list-style-type: none"> • To introduce basic principles and application relevance of clinical disease for students who are in preparation for laboratory technologists. • The content of rigorous course provides knowledge of the structure and function of the major organ systems, including the molecular, biochemical and cellular mechanisms for maintaining homeostasis. • It also provides knowledge of the pathogenesis of diseases, interventions for effective treatment, and mechanisms of health maintenance to prevent disease. • The student will be able to properly order and interpret hematologic and coagulation tests, including CBC's, PT's, INR's, and APTT's, for the proper diagnosis and effective treatment of patients with hematologic, bleeding, and thrombotic disorders. 	
6	Course Outcomes	CO1: To understand the importance of Haematology CO2: To understand the importance of Laboratory safety guidelines CO3: To understand the importance of Hb, PCV	

		estimation CO4: To understand the importance of Section cutting and Biomedical waste management CO5: To understand the importance of Blood Bank	
7	Course Description	<ul style="list-style-type: none"> • Introduction to Haematology • Laboratory safety guidelines • Estimation of Bleeding time, Clotting time, Prothrombin time • Biomedical waste management • Blood bank 	
8	Outline syllabus Theory		CO mapping
	Unit 1	<ul style="list-style-type: none"> • Introduction to Haematology: Normal collection of blood, their structure and function. • Various anticoagulants used in Haematology • Various instruments and glassware used in Haematology 	CO1, CO2
	Unit 2	<ul style="list-style-type: none"> • Preparation and use of glassware's. • Laboratory safety guidelines • SI units and conventional units in hospital laboratory 	CO1, CO2
	Unit 3	<ul style="list-style-type: none"> • Hb, PCV, ESR & Normal haemostasis • Bleeding time, Clotting time, Prothrombin time • Activated partial thromboplastin time 	CO1, CO3
	Unit 4	<ul style="list-style-type: none"> • Section cutting and Tissue processing for routine paraffin sections • Decalcification of tissues & Staining of tissues – H& E staining • Biomedical waste management 	CO1, CO4
	Unit 5		

		<ul style="list-style-type: none"> • Introduction of Blood bank • Blood grouping and Rh types • Cross matching 	CO1, CO5
	Course Code	BDT 157	
	Course Title	PATHOLOGY –I(LAB)	
	Credits	1	
	Contact Hours (L-T-P)	0-0-2	
	Course Outcomes	CO1: To understand the importance of Haematology CO2: To understand the importance of Laboratory safety guidelines CO3: To understand the importance of Hb, PCV estimation CO4: To understand the importance of Bleeding time CO5: To understand the importance of Clotting time	
	Course Description	<ul style="list-style-type: none"> • Introduction to Haematology • Laboratory safety guidelines • Estimation of Bleeding time • Estimation of Clotting time • Estimation of Hb and Prothrombin time 	
	Practicals		CO mapping
	Unit 1	<ul style="list-style-type: none"> • Blood grouping and Rh typing in normal sample • Blood grouping and Rh typing in patient sample • Blood grouping and Rh typing in unknown sample 	CO1, CO2
	Unit 2	<ul style="list-style-type: none"> • Packed cell volume and Hb estimation in normal sample • Packed cell volume and Hb estimation in patient sample • Packed cell volume and Hb estimation in patient in unknown sample 	CO1, CO2
	Unit 3	<ul style="list-style-type: none"> • Erythrocyte sedimentation rate in normal sample • Erythrocyte sedimentation rate in patient 	CO1, CO3

		sample <ul style="list-style-type: none"> Erythrocyte sedimentation rate in unknown sample 		
	Unit 4	<ul style="list-style-type: none"> Bleeding time estimation in normal sample Bleeding time estimation in abnormal sample Bleeding time estimation in unknown sample 	CO1, CO4	
	Unit 5	<ul style="list-style-type: none"> Clotting estimation in normal sample Clotting time estimation in abnormal sample Clotting time estimation in unknown sample 	CO1, CO5	
	Mode of examination	Theory and Practical		
	Weightage Distribution for Theory	CA	MTE	ETE
		30%	20%	50%
	Weightage Distribution for Practical's	CA	MTE	ETE
		60%	0%	40%
	Text book/s*	<ol style="list-style-type: none"> Histopathology Techniques by Culling Cytology by Koss Clinical diagnosis by Laboratory method by Todd and Sanford Laboratory Technology by RamnicSood Practical Haematology by Dacie and Lewis Text book of Pathology by Krishna 		

BDT108 -MICROBIOLOGY-I &BDT158 - MICROBIOLOGY-I (Lab)

School: SAHS		Batch : 2020-23	
Program: BDT		Current Academic Year: 2020-21	
Branch:Dialysis Technology		Semester: 1	
1	Course Code	BDT 108	
2	Course Title	MICROBIOLOGY-I	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
Course Status		Compulsory	
5	Course Objective	<ul style="list-style-type: none"> • To introduce basic principles and application relevance of clinical disease for students who are in preparation for lab technologists. • To know many etiological agents responsible for global infectious diseases caused by bacteria, viruses and other pathogens related with infectious diseases in humans. • To provide the conceptual basis for understanding pathogenic microorganisms and particularly address the fundamental mechanisms of their pathogenicity. • To provide opportunities for a student to develop diagnostic skills in microbiology, including the practical application and interpretation of laboratory tests for the diagnosis of infectious diseases 	
6	Course Outcomes	CO1: To know about Microbiology and its importance CO2:to know the importance of immunology and immune system CO3:To know the mechanism of Hypersensitivity and vaccines formation CO4:To know the importance of General bacteriology	

		CO5:To know the importance of Systemic bacteriology	
7	Course Description	<ul style="list-style-type: none"> • Introduction of microbiology • Introduction to immunology and immune system • Hypersensitivity and vaccines • General bacteriology • Systemic bacteriology 	
8	Outline syllabus Theory		
	Unit 1	Introduction of microbiology	
		<ul style="list-style-type: none"> • 1) Medical Microbiological terminologies • 2) Importance and applications of medical Microbiology • 3) History • 	
	Unit 2		
		<ul style="list-style-type: none"> • Sterilization, antiseptic and disinfection • Microscopy • Organ and cells involved in immune response • Antigen and characteristics • Classification and nature of Immunity: Innate and acquired immunity 	
	Unit 3		
		<ul style="list-style-type: none"> • Innate and acquired immunity • Hypersensitivity • Immunity (vaccines) 	
	Unit 4		
		<ul style="list-style-type: none"> • Bacterial taxonomy, General properties: morphology and anatomy • Physiology: nutrient & microbial growth • Culture media and identification 	
	Unit 5		
		<ul style="list-style-type: none"> • Introduction, classification, general features, 	

		<p>pathogenicity, diagnosis, treatment and prevention of Mycobacterium tuberculosis, Mycobacterium leprae, Enterobacteriaceae: coliform, proteus, Staphylococcus aureus, Steptococcus pneumoniae.</p> <ul style="list-style-type: none"> • Diarrhoea: salmonella, shigella, vibrio • Food poisoning: clostridium 	
	Course Code	BDT 158	
	Course Title	MICROBIOLOGY –I(LAB)	
	Credits	1	
	Contact Hours (L-T-P)	0-0-2	
	Course Outcomes	<p>CO1: To know about Microbiology and its importance</p> <p>CO2: to know the importance of sterilization</p> <p>CO3: To know the different types of glassware's</p> <p>CO4: To know the importance of equipment's</p> <p>CO5: To know the importance of Gram staining</p>	
	Course Description	<ul style="list-style-type: none"> • Introduction of microbiology • Identification of glassware's • Identification of equipment's • Staining methods • Sample collection and its processing 	
	Practical's		
	Unit 1	<ul style="list-style-type: none"> • Safety rules in a microbiology laboratory • Demonstration of glassware's, plastic wares used in microbiology lab • Sterilization 	
	Unit 2	<ul style="list-style-type: none"> • Demonstration of equipment's used in microbiology lab (microscope, hot air oven, autoclave, water bath, electronic weighing balance etc.). • Sample accountability, 	

		<ul style="list-style-type: none"> • Calibration of clinical laboratory instruments. 	
	Unit 3	<ul style="list-style-type: none"> • Result interpretation and reporting's. • Quality management system and • Ethics in dialysis technology practice. 	
	Unit 4	<ul style="list-style-type: none"> • Collection of clinical specimens, • Transportation of sample • Sample processing 	
	Unit 5	<ul style="list-style-type: none"> • Staining: methods of smear preparation and fixation, • Staining of spores and capsules examination • Gram staining and Zn staining 	
	Mode of examination	Theory and Practical	
	Weightage Distribution for Theory	CA 30%	MTE 20%
	Weightage Distribution for Practical's	CA 60%	MTE 0%
	Text book/s*	<ol style="list-style-type: none"> 1) Medical Microbiology by Anathanarayana and Panikar 2) Medical Microbiology –The practice of medical Microbiology by RobertyCruckshank 3) Parasitology – Interpretation to Clinical Medicine by Chatterjee 4) Medical Mycology by Rippon 5) Medical Parasitology by AjitDamle 	

BDT109 – HUMAN ANATOMY-I&BDT159 – HUMAN ANATOMY-I (Lab)

School: SAHS		Batch : 2020-23	
Program: BDT		Current Academic Year: 2020-21	
Branch: Dialysis Technology		Semester: 1	
1	Course Code	BDT 109	
2	Course Title	HUMAN ANATOMY-I	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
Course Status		Compulsory	
Course Objective		<ol style="list-style-type: none"> 1) To provide an opportunity for lab technologists who distinguish themselves in Human Anatomy - dissection consistency, theoretical knowledge and knowledge application, to undertake research based training in Anatomy. 2) To capture distinguished medical students and offer them such training as would enable them to sub-specialize in anatomy at an early stage of their career. 3) To develop as research scientists and research based teachers for schools of allied health sciences both locally and externally. 4) It also strengthens the research foundation of the students with broad vision of leading in research based teaching of anatomy and stimulates the research attitudes and aptitudes of students. 	

6	Course Outcomes	CO1: To understand the importance of Anatomy of human body CO2: To understand the importance of different types of bones involved in locomotion CO3: To understand the importance of Cardiovascular system CO4: To understand the importance of Gastro-intestinal system CO5: To understand the importance of Respiratory system	
7	Course Description	<ul style="list-style-type: none"> • Cells and its organelles • Locomotion and support • Cardiovascular system • Gastro-intestinal system • Respiratory system 	
8	Outline syllabus		CO mapping
	Theory		
	Unit 1	Introduction of Anatomy <ol style="list-style-type: none"> 1. Introduction to Anatomy (division, planes, terminology for direction & movements) 2. Cell and its organelles 3. Tissue: Connective & Epithelium- definition, classification, example and function 4. Glands- classification, describe serous and mucus glands with example. 5. Basic tissue classification with examples. 	CO1, CO2
	Unit 2	Locomotion and support <ol style="list-style-type: none"> 1. Cartilage – types and histology 2. Bones – classification, development, histology. 3. Joints – classification with examples. 4. Muscles – classification and histology (name of muscles of the body) 5. Details of synovial joint 	CO1, CO2
	Unit 3	Cardiovascular system <ol style="list-style-type: none"> 1. Heart- size, location, chambers, exterior and interior. 2. Blood supply of heart (Branches of aorta and all major artery, Major veins of body) 3. Systemic and pulmonary circulation 	CO1, CO3

		4. Lymphatic system (Histology of lymphatic organs)	
	Unit 4	Gastro intestinal system	CO1, CO4
		<ol style="list-style-type: none"> 1. Parts of GIT, oral cavity (lips, tongue, salivary gland with histology), tonsil, dentition, pharynx, salivary gland, waldeyer's ring. 2. Oesophagus. Stomach. Intestine. 3. Radiographs of abdomen. 4. Accessory digestive organs (liver, pancreas, gallbladder) 	
	Unit 5	Respiratory system	CO1, CO5
		<ol style="list-style-type: none"> 1. Part of respiratory system 2. Nose, nasal cavity, larynx, trachea 3. Lungs and Broncho pulmonary segment 4. Histology of lungs 5. Names of paranasal sinuses. 	
1	Course Code	BDT 159	
2	Course Title	HUMAN ANATOMY –I (LAB)	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
5	Course Outcomes	CO1: To know about Anatomy and its importance CO2: To know the importance of epithelium, cartilage and bones CO3: To know the importance of skeletal (TS & LS), smooth and cardiac muscle CO4: To know the importance of artery, vein, lymph node, spleen, tonsil and thymus CO5: To know the importance of respiratory system	
6	Course Description	<ul style="list-style-type: none"> • Histology of types of epithelium, serous, mucus and mixed salivary gland • Histology of cartilages, bones • Histology of skeletal (TS & LS), smooth and cardiac muscle • Histology of artery, vein, lymph node, spleen, 	

		tonsil and thymus <ul style="list-style-type: none"> Demonstration of parts of respiratory system and histology of lung and trachea 		
	Practical's		CO mapping	
	Unit 1	a. Histology of epithelium and salivary gland, b. Histology of cartilage, compact and cancellous bone. c. Histology of muscle tissue.	CO1, CO2	
	Unit 2	a. Demonstration of all bone. b. Radiograph of bones & joints. c. Demonstration of all body muscles.	CO1, CO2	
	Unit 3	a. Histology of vessels. b. Histology of lymph node, c. Histology of spleen.	CO1, CO3	
	Unit 4	a. Histology of tonsil and thymus b. Demonstration of heart and related structure c. Radiograph related to heart	CO1, CO4	
	Unit 5	a. Demonstration of lung b. Demonstration of lung related structure. c. Radiograph related to lungs.	CO1, CO5	
	Mode of examination	Theory and Practical		
	Weightage Distribution for Theory	CA	MTE	ETE
		30%	20%	50%
	Weightage Distribution for Practical's	CA	MTE	ETE
		60%	0%	40%
	Text book/s*	1) Understanding Human Anatomy and Physiology by William Davis 2) A text book of Anatomy by BD Chaurasia 3) A text book of human Anatomy by T.S. Ranganathan		

BDT110 – HUMAN PHYSIOLOGY-I&BDT150 – HUMAN PHYSIOLOGY-I (Lab)

School: SAHS		Batch : 2020-23	
Program: BDT		Current Academic Year: 2020-21	
Branch: Dialysis Technology		Semester: 1	
1	Course Code	BDT 110	
2	Course Title	Human Physiology-I	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Status	Compulsory	
5	Course Objective	<ul style="list-style-type: none"> • To learn and understand the fundamental scientific concepts relating to a broad range of topics in human physiology. • To make the students familiar with the basic factual information concerning the mechanisms and functioning of humans body system. • To develop investigative skills and to become familiar with standard techniques of measurement. • To help the students to gain practice and confidence in applying this knowledge, in a quantitative manner where appropriate, to actual experiments. 	
6	Course Outcomes	CO1: To know the importance of general and nerve	

		muscle physiology CO2: To understand the importance, function and function of Blood along with clinical importance CO3: To get the information about Cardiovascular system CO4: To understand the respiratory system and its function CO5: To know about Digestive system of the body	
7	Course Description	<ul style="list-style-type: none"> • General & nerve muscle physiology • Blood • Cardiovascular system • The respiratory system • Digestive system 	
8	Outline syllabus		CO mapping
	Theory		
	Unit 1	1. Cell and cell organelle Structure & function, transport across cell membrane, homeostasis, membrane potential. 2. Structure & functions of nerve tissues, physiological properties of nerve fibres, nerve fibre types & functions. 3. Neuromuscular junction, Difference between skeletal muscle, smooth muscle & cardiac muscle.	CO1, CO2
	Unit 2	1. Composition & functions of blood, plasma	CO1, CO2

		proteins & haemoglobin. 2. Erythrocytes, jaundice, leucocytes & platelets. 3. Blood coagulation, blood groups & immunity	
	Unit 3		
		1. Cardiac Muscle, physiological anatomy of the heart & blood vessels, cardiac cycle. 2. Conducting system of heart, Heart sounds & ECG. 3. Heart Rate, Cardiac Output, Blood Pressure & Pulse.	CO1, CO3
	Unit 4		
		1. Physiological anatomy & functions of respiratory system, airways, dead space, graph of lung volume & capacities. 2. Transport of Gases. 3. Regulation of respiration & Hypoxia.	CO1, CO4
	Unit 5		
		1. Physiological anatomy of GIT, Saliva, Mouth & Oesophagus. 2. Stomach, Pancreas, Liver & Gall Bladder. 3. Small Intestine, Large Intestine, Digestion and Absorption in GIT.	CO1, CO5

1	Course Code	BDT 150	
2	Course Title	HUMAN PHYSIOLOGY –I(LAB)	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
5	Course Outcomes	CO1: To know about Physiology and its importance CO2: To know the importance of Compound microscope CO3: To know the importance of haemoglobin estimation and blood group detection CO4: To know the importance of Total Red Blood Cell Count and total Leucocyte Count CO5: To know the importance of ESR and PCV	
6	Course Description	<ul style="list-style-type: none"> • Study of Compound Microscope • Estimation of Haemoglobin Concentration • Total Red Blood Cell Count. • Total Leucocyte Count. • BT,CT,Blood Group Estimation and Demonstration of ESR & PCV. 	
	Practical's		CO mapping
	Unit 1	Study of Compound Microscope	CO1, CO2
		a. Briefing b. Demonstration c. Practical	
	Unit 2	Estimation of Haemoglobin Concentration	CO1, CO2
		a. Briefing b. Demonstration	

		c. Practical			
Unit 3	Total Red Blood Cell Count and			CO1, CO3	
	a. Briefing b. Demonstration c. Practical				
Unit 4	Total Leucocyte Count			CO1, CO4	
	a. Briefing b. Demonstration c. Practical				
Unit 5	Bleeding Time, Clotting Time, Blood Group Estimation and Demonstration of ESR & PCV.			CO1, CO5	
	a. BT & CT b. Blood Groups c. Demonstration of ESR & PCV				
Mode of examination	Theory and Practical's				
Weightage Distribution for Theory	CA	MTE	ETE		
	30%	20%	50%		
Weightage Distribution for Practical's	CA	MTE	ETE		
	60%	0%	40%		
Text book/s*	1) Text book of Physiology by Guyton 2) Human Physiology by Chatterjee 3) Concise Medical Physiology by sujith K Choudhary 4) Review of Medical Physiology by Ganong 5) A text book of Physiology by A.K.Jain				

BDT011: ENGLISH-I

School: SAHS		Batch : 2020-23	
Program: BDT		Current Academic Year: 2020-21	
Branch: Dialysis Technology		Semester: 1	
1	Course Code	BDT 011	
2	Course Title	ENGLISH-I	
3	Credits	2	
4	Contact Hours (L-T-P)	2-0-0	
	Course Status	Pre requisite	
5	Course Objective	To develop better understanding in English language To develop better communication skill To know the importance of English language To develop the potential of an independent learner in students	
6	Course Outcomes	CO1: To know the use of parts of speech CO2: To know the importance of Articles CO3: To know the use of tenses CO4: To know the implication of vocabulary enhancement CO5: To understand the pattern of reading comprehension	
7	Course Description	1) Basic elements of grammar 2) Vocabulary enhancement 3) Reading comprehension	
8	Outline syllabus Theory		
	Unit 1	1.Parts of speech, 2.Articles: A, An , The 3.Tenses	CO mapping CO1, CO2

	Unit 2				
		1. Antonyms & Synonyms, 2. Homophones, 3. Homonyms			CO1, CO2
	Unit 3				
		1. Reading comprehension 2. Reading comprehension passage, 3. Discussions Based on the text			CO1, CO3
	Mode of examination	Jury/Viva			
	Weightage Distribution for Theory	CA	Viva	ETE	
		50%	50%	0%	
	Text book/s*	1) First flight: Text book in English 2) Pearson: Text book in English			

BDT 111: BIOCHEMISTRY- II & BDT 151: BIOCHEMISTRY- II (Lab)

School: SAHS		Batch : 2020-23	
Program: BDT		Current Academic Year: 2020-21	
Branch: Dialysis Technology		Semester: 2	
1	Course Code	BDT 111	
2	Course Title	BIOCHEMISTRY -II	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Status	Compulsory	
5	Course Objective	<ul style="list-style-type: none"> • To train the students in the management of dialysis technology along with handling a variety of laboratory chemicals and instruments including electronic and advanced equipment's used in modern dialysis technology. • To make the students able to do routine laboratory testing under stipulated conditions. • To prepare specimens and operate machines that automatically analyse samples. • To provide the conceptual basis for understanding biochemical and particularly address the fundamental mechanisms of the biomolecules to facilitate the life. • To develop diagnostic skills in clinical biochemistry and to provide an advanced understanding of the core principles and topics of Biochemistry and their experimental basis. 	
6	Course Outcomes	CO1: To understand the importance of amino acid chemistry CO2: To understand the importance of Enzymes CO3: To understand the importance of Minerals CO4: To understand the importance of vitamins CO5: To understand the importance of cell biology and chemistry of nucleic acid	

7	Course Description	<ul style="list-style-type: none"> • Amino-acid Chemistry • Enzymes • Mineral metabolism • Vitamins • Cell Biology, Nucleotide and Nucleic acid Chemistry 	
8	Outline syllabus		CO mapping
	Theory		
	Unit 1	Amino-acid Chemistry	CO1, CO2
		<ol style="list-style-type: none"> 1. Amino acid chemistry: Definition, Classification, Peptide bonds. Peptides: Definition, Biologically important peptides. 2. Protein chemistry: Definition, Classification, Functions of proteins, 3. Primary, Secondary, tertiary and quaternary structure of proteins 	
	Unit 2	Enzymes	CO1, CO2
		<ol style="list-style-type: none"> 1. Definition, Active site, Cofactor (Coenzyme, Activator), Proenzyme. Classification with examples, Factors effecting enzyme activity. 2. Enzyme inhibition and significance, 3. Isoenzymes, Diagnostic enzymology (clinical significance of enzymes) 	
	Unit 3	Mineral metabolism	CO1, CO3
		<ol style="list-style-type: none"> 1. Definition, Sources, RDA, absorption, transport, and excretion of various minerals. 2. Functions of various minerals 3. Disorder of various minerals (Sodium, Potassium, Calcium, Phosphate, Sulphur, Iron, Magnesium, Fluoride, Selenium, Zinc and Copper) 	
	Unit 4	Vitamins	CO1, CO4
		<ol style="list-style-type: none"> 1. Definition, classification according to solubility, Sources and Coenzyme forms of different vitamins 2. Functions, RDA, digestion, absorption and 	

		transport of various vitamins. 3. Deficiency and toxicity of various vitamins	
	Unit 5	Cell Biology, Nucleotide and Nucleic acid Chemistry	CO1, CO5
		<ol style="list-style-type: none"> 1. Cell structure, Cell membrane structure and function, various types of absorption. Intracellular organelles and their functions, briefly on cytoskeleton. 2. Nucleotide chemistry: Nucleotide composition, functions of free nucleotides in body. 3. Nucleic acid (DNA and RNA) chemistry: Difference between DNA and RNA, Structure of DNA (Watson and Crick model), Functions of DNA. Structure and functions of tRNA, rRNA, mRNA. 	
1	Course Code	BDT 151	
2	Course Title	BIOCHEMISTRY –II(LAB)	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
5	Course Outcomes	CO1: To understand the importance of different types of acids CO2: To understand the importance of different types of bases CO3: To understand the importance of different types of solutions CO4: To understand the importance of carbohydrates CO5: To understand the importance of proteins	
6	Course Description	<ul style="list-style-type: none"> • Preparation of acids of different concentration: • Preparation of bases of different concentration: • Preparation of solutions of different concentration: • Qualitative analysis of Carbohydrates • Qualitative analysis of Proteins 	

Practical's		CO mapping		
Unit 1	a. Preparation of acids of different concentration-1 b. Preparation of acids of different concentration-2 c. Preparation of acids of different concentration-3	CO1, CO2		
Unit 2	a) Preparation of bases of different concentration-1 b) Preparation of bases of different concentration-2 c) Preparation of bases of different concentration-3	CO1, CO2		
Unit 3	a. Preparation of solutions of different concentration-1 b. Preparation of solutions of different concentration-2 c. Preparation of solutions of different concentration-3	CO1, CO3		
Unit 4	a) Qualitative analysis of Carbohydrates-1 b) Qualitative analysis of Carbohydrates-2 c) Qualitative analysis of Carbohydrates-3	CO1, CO4		
Unit 5	a) Qualitative analysis of Proteins-1 b) Qualitative analysis of Proteins-2 c) Qualitative analysis of Proteins-3	CO1, CO5		
Mode of examination	Theory and Practical			
Weightage Distribution for Theory	CA	MTE	ETE	
	30%	20%	50%	
Weightage Distribution for Practical's	CA	MTE	ETE	
	60%	0%	40%	
Text book/s*	1. A text book of Medical Biochemistry by Chatterjee & Shinde 2. Text book of biochemistry for Medical students by Vasudevan and Sreekumari 3. Biochemistry by Lehninger 4. Clinical chemistry by Varley 5. Harpers Illustrated Biochemistry by Robert K.M.			

BDT 112: PATHOLOGY- II & BDT 152: PATHOLOGY- II (Lab)

School: SAHS		Batch : 2020-23	
Program: BDT		Current Academic Year: 2020-21	
Branch: Dialysis Technology		Semester: 2	
1	Course Code	BDT 112	
2	Course Title	PATHOLOGY-II	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Status	Compulsory	
5	Course Objective	<ul style="list-style-type: none"> • To introduce basic principles and application relevance of clinical disease for students who are in preparation for laboratory technologists. • The content of rigorous course provides knowledge of the structure and function of the major organ systems, including the molecular, biochemical and cellular mechanisms for maintaining homeostasis. • It also provide knowledge of the pathogenesis of diseases, interventions for effective treatment, and mechanisms of health maintenance to prevent disease. • The student will be able to properly order and interpret hematologic and coagulation tests, including CBC's, PT's, INR's, and APTT's, for the proper diagnosis and effective treatment of 	

		patients with hematologic, bleeding, and thrombotic disorders.	
6	Course Outcomes	CO1: To understand the importance of Histopathology CO2: To understand the importance of Grossing and mounting techniques CO3: To understand the importance of Clinical pathology CO4: To understand the importance of Urine examination CO5: To understand the importance of examination of body fluids	
7	Course Description	<ul style="list-style-type: none"> • Introduction to Histopathology • Grossing and mounting techniques • Clinical pathology • Urine collection and examination • Examination of body fluid 	
8	Outline syllabus		CO mapping
	Theory		
	Unit 1		
		<ul style="list-style-type: none"> • Introduction to histopathology • Receiving of specimen in the laboratory • Grossing techniques 	CO1, CO2
	Unit 2		
		<ul style="list-style-type: none"> • Mounting techniques • Maintenance of records and filing of the slides. • Use and care of microscopes 	CO1, CO2
	Unit 3		
		<ul style="list-style-type: none"> • Various fixatives, Mode of action, preparation and indication. • Introduction to clinical pathology • Collection, transport, preservation and 	CO1, CO3

		processing of various clinical specimens.	
	Unit 4		
		<ul style="list-style-type: none"> • Urine examination: Collection and preservation of urine. • Physical and chemical examination. • Microscopic examination of urine. 	CO1, CO4
	Unit 5		
		<ul style="list-style-type: none"> • Examination of cerebrospinal fluid (CSF) • Sputum examination • Examination of faeces. 	CO1, CO5
	Course Code	BDT 152	
	Course Title	PATHOLOGY –II (LAB)	
	Credits	1	
	Contact Hours (L-T-P)	0-0-2	
	Course Outcomes	CO1: To understand the importance of Urine examination CO2: To understand the importance of abnormal constituents of urine CO3: To understand the importance of section cutting CO4: To understand the importance of Tissue processing CO5: To understand the importance of tissue staining	
	Course Description	<ul style="list-style-type: none"> • Urine examination • Physical, chemical and microscopic examination. • Section cutting • Tissue processing for routine paraffin sections • Staining of tissues-H & E staining 	

Practical's					CO mapping
Unit 1	<ul style="list-style-type: none"> Physical examination of Urine Chemical examination of Urine Normal constituent of urine 				CO1, CO2
Unit 2	<ul style="list-style-type: none"> Abnormal constituent of urine Microscopic examination of Normal Urine sample Microscopic examination of abnormal Urine sample 				CO1, CO2
Unit 3	<ul style="list-style-type: none"> Importance of section cutting Methods of section cutting Precautionary measures in section cutting 				CO1, CO3
Unit 4	<ul style="list-style-type: none"> Importance of Tissue processing for routine paraffin sections Methods of Tissue processing for routine paraffin sections Precautionary measures in Tissue processing for routine paraffin sections 				CO1, CO4
Unit 5	<ul style="list-style-type: none"> Importance of staining of tissues Methods of staining of tissues (H & E staining) Precautionary measures in staining of tissues 				CO1, CO5
Mode of examination	Theory and Practical				
Weightage Distribution for Theory	CA	MTE	ETE		
	30%	20%	50%		
Weightage Distribution for Practical's	CA	MTE	ETE		
	60%	0%	40%		

	Text book/s*	<ol style="list-style-type: none">1. Histopathology Techniques by Culling2. Cytology by Koss3. Clinical diagnosis by Laboratory method by Todd and Sanford4. Laboratory Technology by RamnicSood5. Practical Haematology by Dacie and Lewis6. Text book of Pathology by Krishna	
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BDT113 - MICROBIOLOGY-II & BDT153 - MICROBIOLOGY-II (LAB)

School: SAHS		Batch : 2020-23	
Program: BDT		Current Academic Year: 2020-21	
Branch: Dialysis Technology		Semester: 2	
1	Course Code	BDT 113	
2	Course Title	MICROBIOLOGY-II	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
Course Status		Compulsory	
5	Course Objective	<ul style="list-style-type: none"> • To introduce basic principles and application relevance of clinical disease for students who are in preparation for lab technologists. • To know many etiological agents responsible for global infectious diseases caused by bacteria, viruses and other pathogens related with infectious diseases in humans. • To provide the conceptual basis for understanding pathogenic microorganisms and particularly address the fundamental mechanisms of their pathogenicity. • To provide opportunities for a student to develop diagnostic skills in microbiology, including the practical application and interpretation of laboratory tests for the diagnosis of infectious diseases 	
6	Course Outcomes	CO1: To know the importance of Parasitology	

		CO2: To know the importance of Virology CO3: To know the importance of Mycology CO4: To know the mechanism of hospital acquired infection CO5: To know the importance of Biomedical waste management	
7	Course Description	<ul style="list-style-type: none"> • Introduction of Parasitology • Introduction of Virology • Introduction of Mycology • Pathogenesis, diagnosis and treatment of parasites, viral and fungal diseases • Biomedical waste management 	
8	Outline syllabus Theory		CO mapping
	Unit 1	a. Parasitology: Introduction and classification. b. General features of parasites c. Pathogenicity, diagnosis, treatment and prevention of parasites, Plasmodium, Amoebiasis, Roundworm, Hookworm, Giardiasis	CO1, CO2
	Unit 2	a. Virology: Introduction, classification, general features, pathogenicity, diagnosis, treatment and prevention. b. Taxonomy and general features of viruses c. Cultivation of virus, Orthomyxovirus, Paramyxovirus, Hepatitis, Herpesvirus, HIV	CO1, CO2
	Unit 3	a. Mycology: Introduction and classification b. General features of fungus c. Pathogenicity, diagnosis, treatment and prevention of fungal diseases.	CO1, CO3
	Unit 4		

		a. Taxonomy and general features of fungus b. Lab Diagnosis of fungal disease c. Subcutaneous Mycoses	CO1, CO4
	Unit 5		
		a. Systemic Mycoses b. Hospital acquired infection c. Biomedical waste management	CO1, CO5
	Course Code	BDT 153	
	Course Title	MICROBIOLOGY –II (LAB)	
	Credits	1	
	Contact Hours (L-T-P)	0-0-2	
	Course Outcomes	CO1: To know about importance of permanent slides CO2: To know the importance of culture media and its preparation CO3: To know the different types of culture conformation tests CO4: To know the importance of biochemical tests CO5: To know the importance of Enzyme production tests	
	Course Description	<ul style="list-style-type: none"> • Demonstration of permanent slides • Bacterial culture media and culture methods • Preparation of culture media • Bacterial growth on culture media and Isolation of pure cultures • Culture conformation tests • Biochemical tests • Enzyme production tests 	
	Practicals		CO mapping
	Unit 1	a. Demonstration of permanent slide of Ascaris b. Demonstration of permanent slide of Hookworm	CO1, CO2

		c. Bacterial culture media and culture method			
Unit 2		a. Preparation of culture media (nutrient broth and nutrient agar) b. Preparation of culture media (blood agar and chocolate agar) c. Preparation of culture media (MacConkey medium, LJ medium and Robertson Cooked meat media)			CO1, CO2
Unit 3		a. Bacterial growth on culture media b. Isolation of pure cultures c. Culture conformation (colony morphology and microscopy)			CO1, CO3
Unit 4		a. Culture conformation (biochemical test) b. Culture conformation (Antibiotic Sensitivity Test) c. Biochemical tests - Carbohydrate Utilization test.			CO1, CO4
Unit 5		a. Enzyme production tests (catalase and urease) b. Enzyme production tests (oxidase and coagulase) c. Other tests (indole, citrate, nitrate, triple sugar, iron)			CO1, CO5
Mode of examination		Theory and Practical			
Weightage Distribution for Theory	CA	MTE	ETE		
	30%	20%	50%		
Weightage Distribution for Practical's	CA	MTE	ETE		
	60%	0%	40%		
Text book/s*		1. Medical Microbiology by Anathanarayana and Panikar 2. Medical Microbiology –The practice of medical Microbiology by RobertyCruckshank 3. Parasitology – Interpretation to Clinical Medicine by Chatterjee 4. Medical Mycology by Rippon			

BDT114 – HUMAN ANATOMY-II & BDT154 – HUMAN ANATOMY-II (LAB)

School: SAHS		Batch : 2020-23	
Program: BDT		Current Academic Year: 2020-21	
Branch: Dialysis Technology		Semester: 2	
1	Course Code	BDT 114	
2	Course Title	HUMAN ANATOMY-II	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Status	Compulsory	
5	Course Objective	<p>5) To provide an opportunity for lab technologists who distinguish themselves in Human Anatomy - dissection consistency, theoretical knowledge and knowledge application, to undertake research based training in Anatomy.</p> <p>6) To capture distinguished medical students and offer them such training as would enable them to sub-specialize in anatomy at an early stage of their career.</p> <p>7) To develop as research scientists and research based teachers for schools of allied health sciences both locally and externally.</p> <p>8) It also strengthens the research foundation of the students with broad vision of leading in research based teaching of anatomy and stimulates the research attitudes and aptitudes of students.</p>	

6	Course Outcomes	CO1: To understand the anatomy of Urinary system CO2: To understand the importance of Reproductive system CO3: To understand the position and function of Endocrine glands CO4: To understand the importance of parts of Nervous system CO5: To understand the importance and location of sensory organs	
7	Course Description	<ul style="list-style-type: none"> • Urinary system • Reproductive system • Endocrine glands • Nervous system • Sensory organs 	
8	Outline syllabus		CO mapping
	Theory		
	Unit 1	Urinary system	CO1, CO2
		<ol style="list-style-type: none"> 1. Description in brief Urinary system 2. Kidney, ureter, urinary bladder, male and female urethra 3. Histology of kidney, ureter and urinary bladder 	
	Unit 2	Reproductive system	CO1, CO2
		<ol style="list-style-type: none"> 1. Parts of male reproductive system, testis, vasdeferens and epididymis (gross and histology) 2. Parts of female reproductive system, ovary (gross and histology), fallopian tube, uterus and mammary gland gross. 3. Embryology: gametogenesis, ovulation, fertilization. 4. Prostate gland, Mammary gland, Fetal circulation, Placenta. 	
	Unit 3	Endocrine glands	CO1, CO3
		<ol style="list-style-type: none"> 1. Name of all endocrine glands in detail 2. Pituitary gland and thyroid gland in detail 3. Parathyroid gland, suprarenal gland (gross and histology) 	

	Unit 4	Nervous system	CO1, CO4
		<ol style="list-style-type: none"> 1. Neuron, Classification of Nervous system, Cerebrum, cerebellum, midbrain, pons, medulla oblongata. 2. Spinal cord with spinal nerve, Meninges, Ventricles and cerebrospinal fluid 3. Names of basal nuclei, Blood supply of brain, Cranial nerves, Sympathetic trunk and parasympathetic ganglia 	
	Unit 5	Sensory organ	CO1, CO5
		<ol style="list-style-type: none"> 1. Skin: Skin histology, Appendages of skin 2. Eye: parts of eye, extra ocular muscle and blood supply 3. Ear: parts of external, middle and internal ear with contents. 	
1	Course Code	BDT 154	
2	Course Title	HUMAN ANATOMY –II (LAB)	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
5	Course Outcomes	CO1: To know about the importance of urinary system CO2: To know the location and importance of glands CO3: To know the importance and role of different types of nerves CO4: To know the importance and parts of Brain CO5: To know the importance and location of Sensory organs	
6	Course Description	<ul style="list-style-type: none"> • Reflections and urinary system • Different types of endocrine glands • Different types of nerves • Brain and its part along with function • Sensory organs such as skin and eye 	
	Practical's		CO mapping

Unit 1	a. Demonstration of parts of urinary system b. Histology of kidney, ureter and urinary bladder c. Radiograph related to urinary system			CO1, CO2
Unit 2	a. Demonstration of reproductive organ b. Radiograph related to reproductive system			CO1, CO2
Unit 3	a. Demonstration of eyeball b. Histology of eyeball			CO1, CO3
Unit 4	a. Demonstration of glands b. Histology of pituitary gland and thyroid gland. c. Histology of parathyroid and suprarenal gland.			CO1, CO4
Unit 5	a. Histology of thick skin b. Histology of thin skin c. Demonstration of brain and spinal cord			CO1, CO5
Mode of examination	Theory and Practical			
Weightage Distribution for Theory	CA	MTE	ETE	
	30%	20%	50%	
Weightage Distribution for Practical's	CA	MTE	ETE	
	60%	0%	40%	
Text book/s*	1. Understanding Human Anatomy and Physiology by William Davis 2. A text book of Anatomy by BD Chaurasia 3. Human anatomy by Fattana 4. Physiology and Anatomy with practical considerations by Ester. M.Grishcimer			

BDT115 – HUMAN PHYSIOLOGY-II & BDT155 – HUMAN PHYSIOLOGY-II (LAB)

School: SAHS		Batch : 2020-23	
Program: BDT		Current Academic Year: 2020-21	
Branch: Dialysis Technology		Semester: 2	
1	Course Code	BDT 115	
2	Course Title	HUMAN PHYSIOLOGY-II	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Status	Compulsory	
5	Course Objective	<ul style="list-style-type: none"> • To learn and understand the fundamental scientific concepts relating to a broad range of topics in human physiology. • To make the students familiar with the basic factual information concerning the mechanisms and functioning of humans body system. • To develop investigative skills and to become familiar with standard techniques of measurement. • To help the students to gain practice and confidence in applying this knowledge, in a quantitative manner where appropriate, to actual experiments. 	
6	Course Outcomes	CO1: To understand the importance, function and function of Excretory system of body	

		CO2: To get the information about Endocrine system CO3: To understand the Nervous system and its function CO4: To understand the reproductive system and its function CO5: To know about special senses of the body	
7	Course Description	<ul style="list-style-type: none"> • Physiology of Excretion system • Endocrine system • Nervous system • Reproductive system • Special Senses 	
8	Outline syllabus		CO mapping
	Theory		
	Unit 1	Excretory system	CO1, CO2
		1. Physiological anatomy of kidney, structure and functions of excretory system, structure of nephron. 2. Mechanism of formation of Urine. & mechanism of concentration and dilution of urine. 3. The Counter Current System: Physiology of micturition and Regulation of Body Temperature in Humans.	
	Unit 2	Endocrine system	CO1, CO2
		1. General principles of endocrinology, The pituitary Gland.	

		2. The Thyroid Gland, The parathyroid, Calcitonin and Vitamin D. 3. The Adrenal Cortex & Pancreas.	
Unit 3	Reproductive system		CO1, CO3
		1. Changes during Puberty, Classification of Male sex hormones and their functions, Spermatogenesis & semen. 2. Changes during Puberty, Classification and Functions of female sex hormones, menstruation, ovulation and contraception. 3. Physiological changes during pregnancy, functions of placenta and physiology of lactation.	
Unit 4	Nervous system		CO1, CO4
		1. Organisation of Nervous system, The Synapse , Physiology of receptor organs for special and general sensation, physiology of reflex action, classification and properties of reflexes. 2. Intro to Sensory and motor system. Functions of hypothalamus, thalamus, basal ganglia, cerebrum & cerebellum. 3. Autonomic nervous system, Cerebrospinal Fluid and Blood Brain Barrier.	

	Unit 5	Special Senses	CO1, CO5
		<ol style="list-style-type: none"> 1. Taste and Olfaction. 2. Vision—structure and function of eye, errors of refraction & their correction. Colour blindness. 3. Hearing—structure and function of ear, general outline of mechanism of hearing and perception of sound. 	
1	Course Code	BDT 155	
2	Course Title	HUMAN PHYSIOLOGY –II (LAB)	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
5	Course Outcomes	CO1: To know about importance of DLC estimation CO2: To know the importance of TLC estimation CO3: To know the importance of arterial blood pressure measurement CO4: To know the importance of Radial pulse measurement CO5: To know the importance of Blood indices measurement	
6	Course Description	<ul style="list-style-type: none"> • Differential Leucocyte Count. • Arterial Blood Pressure • Radial pulse. • Blood indices • Effect of posture on blood pressure 	
	Practical's		CO mapping
	Unit 1	Differential Leucocyte Count -1	CO1, CO2
		<ol style="list-style-type: none"> a. Briefing b. Demonstration 	

		c. Practical –Preparation of Blood Smear			
Unit 2	Differential Leucocyte Count -2				CO1, CO2
		a. Staining of smear b. Fixation of smear c. Identification of cells			
Unit 3	Arterial Blood Pressure measurement				CO1, CO3
		a. Briefing b. Demonstration c. Practical			
Unit 4	Radial Pulse measurement				CO1, CO4
		a. Briefing b. Demonstration c. Practical			
Unit 5	Effect of posture on Blood pressure				CO1, CO5
		a. Briefing b. Demonstration c. Practical			
Mode of examination	Theory and Practical's				
Weightage Distribution for Theory	CA	MTE	ETE		
	30%	20%	50%		
Weightage Distribution for Practical's	CA	MTE	ETE		
	60%	0%	40%		
Text book/s*	1. Text book of Physiology by Guyton 2. Human Physiology by Chatterjee 3. Concise Medical Physiology by sujith K Choudhary 4. Review of Medical Physiology by Ganong 5. A text book of Physiology by A.K.Jain				

Clinical Training and internship: Every student who has passed in all the theory and practical examinations of all the six semesters will have to undergo 06 month clinical training in at-least 250 bedded hospital as internship as per schedule finalized by the School of Allied Health Sciences authorities. Duration of internship can be extended up to 01 year, for National & International students also (on the request of student) in order to increase the employment opportunity and their higher study even at International level. No candidate shall be permitted to proceed to the internship of the course of study i.e. clinical training in hospital, unless he/she has passed in all the written theory and practical examinations conducted during the preceding three years of the course of study. Every student should attend his/her training in the associated training hospital as per the timings of those centers. The candidate shall maintain a **log book** for all the events of the respective posting. Logbook completed by the student in that training Centre will have to be countersigned by the Faculty or In-charge of that center. The Regular participation of students in seminars / case presentations is mandatory and aimed to encourage them in learning research and development programs in dialysis technology. On completion of the training, the log book submitted by each candidate will be evaluated by authorities and declared to be 'Satisfactory' or 'Not Satisfactory'.



Annexure 1

S.No	Course code	Value added course (VAC)	Syllabus Status	Program offered by the Department
1	SAH001	Molecular Biology and its application	Done	Biochemistry
2	SAH002	Nutrition and Health	Done	Nutrition and Dietetics
3	SAH003	Basic Psychology and Mental Health	Done	Psychology
4	SAH004	Gender issues, Human values, professional ethics and environmental sustainability	Done	Physiology
5	SAH005	Medical terminology and its clinical importance	Done	Pharmacology
6	SAH006	Basics of Forensic sciences and Crime scene investigation	Done	Forensic Sciences
7	SAH007	Research methodology	Done	Clinical Research
8	SAH008	Occupational optometry	Done	Optometry
9	SAH009	Radiation and imaging	Pending	Radiology Imaging
10	SAH010	Ethics in Public health	Pending	Clinical Medical Practice

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Annexure 2
Open Elective courses offered by the University

Course Code (will be generated later)	Mode (Theory/Jury)	Name Of Course	Program offered by the Department
OPE101	Theory	Nano Science and Technology	Physics
OPE103	Theory	Environment and Society	Environmental Sciences
OPE 106	Theory	Indoor ornamental plants for interiorscaping, aesthetics and business	Agriculture Sciences
OPE 108	Theory	Fundamentals of organisational Behaviour	Human Resource Management
OPE147	Practical	Understanding Cross Cultural Diversity	Human Resource Management
OPE167	Practical	Finance for Non-Finance	Finance
OPE109	Theory	Digital Marketing	Marketing
OPE133	Practical	Brand Management	Marketing
OPE172	Practical	Health and wellness	General Management
OPE154	Practical	Health, lifestyle and Environment	General Management
OPE173	Practical	Advanced Excel	IT and BA
OPE 152	Theory	Renewable energy	OM and SCM
OPE234	Practical	Community Outreach	
OPE 166	Practical	Unnat Bharat Abhiyan	
OPE111	Jury	Basic sketching	Design
OPE 110	Jury	Audio Visual Production	Mass

			Communication
OPE171	Theory	Communication for Employment	Humanities / Social Sciences
OPE177	Theory	Psychology for Health and Well-Being	Education
OPE220	Theory	Basic Oral Health Care	School of Dental Sciences
OPE 118	Theory	Indian Constitution	Law
OPE 150	Jury	Community Outreach	
OPE224	Theory	Environmental Planning	Civil Engineering
OPE230	Theory	Alternate Fuels and Energy System	Mechanical Engineering
OPE125	Theory	Non Conventional Energy	
OPE122	Theory	Green Energy	EEE
OPE123	Theory	Solid Waste Management	Biotechnology
OPE228	Theory	Basics of Cyber Security	Computer Science & Engineering
OPE148	Practical	Innovate & Create	ECE
OPE231	Practical	TRADITIONAL MEDICINE	Pharmacy
OPE 160	Theory	Prevention of life style diseases	Allied Health
OPE178	Theory	Audio visual aids	Nursing Sciences
OPE131	Online	Biomedical waste management	Online

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