Programme Structure

Sharda School of Allied Health Sciences

B.Sc. Cardio Vascular Technology (BCVT)

Programme Code: SAH0108

Batch: 2023 - 2027

SHARDA UNIVERSITY

Sharda School of Allied Health Sciences

Programme: B. Sc. Cardio Vascular Technology (BCVT)

Semester: I

Batch: 2023-2027

S. No.	Paper ID	Course Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course[1]: 1. CC 2. AECC 3. SEC 4. DSE
				L	T	P			
THEORY									
1.		HAN 101	Human Anatomy – I	3	1	-	4	Core	CC
2.		HPY 101	Human Physiology – I	4	0	-	4	Core	CC
3.		BCY 101	Biochemistry – I	2	1	-	3	Core	CC
4.		PAT 101	Pathology – I	4	0	-	4	Core	CC
5.		MIB 101	Microbiology – I	4	0	-	4	Core	CC
6.	35741	BCVT116	Basics of Hospital and data management – I	2	0	-	2	Core	CC
Practical									
1.		HAN 151	Human Anatomy – I (Lab)	-	-	2	1	Core	CC, AECC
2.		HPY 151	Human Physiology – I (Lab)	-	-	2	1	Core	CC, AECC
3.		BCY 151	Biochemistry – I (Lab)	-	-	2	1	Core	CC, AECC
4.		PAT 151	Pathology – I (Lab)	-	-	2	1	Core	CC, AECC
5.		MIB 151	Microbiology – I (Lab)	-	-	2	1	Core	CC, AECC
TOTAL HOURS							**26**		

[1] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

SHARDA UNIVERSITY

Sharda School of Allied Health Sciences

Programme: B. Sc. Cardio Vascular Technology (BCVT)

Semester: 2

Batch: 2023-2027

S. No.	Paper ID	Course Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course[2]: 5. CC 6. AECC 7. SEC 8. DSE
				L	T	P			
THEORY									
7.		HAN 201	Human Anatomy – II	3	1	-	4	Core	CC
8.		HPY 201	Human Physiology – II	4	0	-	4	Core	CC
9.		BCY 201	Biochemistry – II	2	1	-	3	Core	CC
10.		PAT 201	Pathology – II	4	0	-	4	Core	CC
11.		MIB 201	Microbiology – II	4	0	-	4	Core	CC
12.	35831	BCVT216	Basics of Hospital and data management – II	2	0	-	2	Core	CC
13.		OPE	Open Elective course	2	-	-	2	Elective	AECC, SEC
Practical									
6.		HAN 251	Human Anatomy – II (Lab)	-	-	2	1	Core	CC, AECC
7.		HPY 251	Human Physiology – II (Lab)	-	-	2	1	Core	CC, AECC
8.		BCY 251	Biochemistry – II (Lab)	-	-	2	1	Core	CC, AECC
9.		PAT 251	Pathology – II (Lab)	-	-	2	1	Core	CC, AECC
10.		MIB 251	Microbiology – II (Lab)	-	-	2	1	Core	CC, AECC
TOTAL HOURS							**28**		

[2] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

SHARDA UNIVERSITY

Sharda School of Allied Health Sciences

Programme: B. Sc. Cardio Vascular Technology (BCVT)

Semester: 3

Batch: 2023-2027

S. No.	Paper ID	Course Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course[3]: 9. CC 10. AECC 11. SEC 12. DSE
				L	T	P			
THEORY									
1	35888	BCVT311	Medicine relevant to cardiac care technology –I	2	1	-	3	Core	CC
2	35889	BCVT312	Applied Pathology –I	2	1	-	3	Core	CC
3	35890	BCVT313	Applied Microbiology – I	2	1	-	3	Core	CC
4	35891	BCVT314	Applied Pharmacology – I	2	1	-	3	Core	CC
5	35892	BCVT315	Introduction to Cardiac Care Technology – I	2	1	-	3	Core	CC
Practical									
1	35893	BCVT321	Applied Pathology –I (Lab)	-	-	2	1	Core	AECC
2	35894	BCVT322	Applied Microbiology – I (Lab)	-	-	2	1	Core	AECC
3	35895	BCVT323	Introduction to Cardiac care Technology – I (Lab)	-	-	4	2	Core	AECC
TOTAL HOURS							**19**		

[3] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

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Sharda School of Allied Health Sciences

Programme: B. Sc. Cardio Vascular Technology (BCVT)

Semester: 4

Batch: 2023-2027

S. No.	Paper ID	Course Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course[4]: 13. CC 14. AECC 15. SEC 16. DSE
				L	T	P			
THEORY									
1	36087	BCVT411	Medicine relevant to cardiac care technology –II	2	1	-	3	Core	CC
2	36088	BCVT412	Applied Pathology – II	2	1	-	3	Core	CC
3	36089	BCVT413	Applied Microbiology – II	2	1	-	3	Core	CC
4	36090	BCVT414	Applied Pharmacology – II	2	1	-	3	Core	CC
5	36091	BCVT415	Introduction to Cardiac care Technology – II	2	1	-	3	Core	CC
6		OPE	Open Elective course	2	-	-	2	Elective	AECC, SEC
Practical									
1	36092	BCVT421	Applied Pathology – II (Lab)	-	-	2	1	Core	CC, AECC
2	36093	BCVT422	Applied Microbiology – II (Lab)	-	-	2	1	Core	CC, AECC
3	36094	BCVT423	Introduction to Cardiac care Technology – II (Lab)	-	-	4	2	Core	CC, AECC
TOTAL HOURS							**21**		

[4] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

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Sharda School of Allied Health Sciences

Programme: B. Sc. Cardio Vascular Technology (BCVT)

Semester: 5

Batch: 2023-2027

S. No.	Paper ID	Course Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course[5]: 17. CC 18. AECC 19. SEC 20. DSE
				L	T	P			
THEORY									
1	36279	BCVT511	Cardiac Care Technology – Clinical - I	3	1	-	4	Core	CC
2	36280	BCVT512	Cardiac Care echnology – Applied - I	3	1	-	4	Core	CC
3	36281	BCVT513	Cardiac care Technology – Advanced - I	3	1	-	4	Core	CC
4	INC001	BCVT514	Faculty-Student Industry Connect Course	2	-	-	2		
Practical									
1	36282	BCVT521	Cardiac care Technology – Clinical – I (Lab)	-	-	2	1	Core	CC, AECC
2	36283	BCVT522	Cardiac care Technology – Applied – I (Lab)	-	-	2	1	Core	CC, AECC
3	36284	BCVT523	Cardiac care Technology – Advanced – I (Lab)	-	-	2	1	Core	CC, AECC
4	31350	RBL001	Research Based Learning - 1	-	-	0	0		
TOTAL HOURS							**17**		

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Sharda School of Allied Health Sciences

Programme: B. Sc. Cardio Vascular Technology (BCVT)

Semester: 6

Batch: 2023-2027

S. No.	Paper ID	Course Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course[6]: 21. CC 22. AECC 23. SEC 24. DSE
				L	T	P			
THEORY									
1		BCVT611	Cardiac care Technology – Clinical – II	3	1	-	4	Core	CC
2		BCVT612	Cardiac care Technology – Applied – II	3	1	-	4	Core	CC
3		BCVT613	Cardiac care Technology – Advanced – II	3	1	-	4	Core	CC
4			Biostatistics & Research Methodology	2	-	-	2	Core	CC
5		OPE	Open Elective course	2	-	-	2	Elective	AECC, SEC
PRACTICAL									
1		BCVT621	Cardiac care Technology – Clinical – II (Lab)	-	-	2	1	Core	CC, AECC
2		BCVT622	Cardiac care Technology – Applied – II (Lab)	-	-	2	1	Core	CC, AECC
3		BCVT623	Cardiac care Technology – Advanced – II (Lab)	-	-	2	1	Core	CC, AECC
4		RBL002	Research Based Learning - 2	-	-	0	0		
TOTAL HOURS							**19**		

SHARDA UNIVERSITY

Sharda School of Allied Health Sciences

Programme: B. Sc Cardio Vascular Technology (BCVT)

Semester: 7

Batch: 2023-2027

S. No.	Paper ID	Course Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course[7]: 25. CC 26. AECC 27. SEC 28. DSE
				L	T	P			
PRACTICAL									
1		BCVT721	Cardiovascular Technology Internship & Project work – I	-	-	40	20	Core	CC
2		RBL003	Research Based Learning-3	-	-	2	2	Core	
TOTAL HOURS-							22		

SHARDA UNIVERSITY

Sharda School of Allied Health Sciences

Programme: B. Sc. Cardio Vascular Technology (BCVT)

Semester: 8

Batch: 2023-2027

S. No.	Paper ID	Course Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course[8]: 29. CC 30. AECC 31. SEC 32. DSE
				L	T	P			
PRACTICAL									
1		BCVT821	Cardiovascular Technology Internship & Project work - II	-	-	40	20	Core	CC
2		RBL004	Research Based Learning-4	-	-	2	2		
TOTAL HOURS-							22		

Note :

1) Value added course is mandatory for each student of every year (List of VAC are enclosed in Annexure 1) and it is a non-graded course.
2) Open elective course is mandatory for each student of every year (List of approved open elective course offered by the University are enclosed as Annexure 2) and it will be audit mode.
3) In each academic session, project work/Clinical Posting/Community connect Programme will be provided to the students.
4) B.sc in cardiovascular technology 4 year (Clinical training & internship is non graded)

Clinical training and internship: every student who has passed in all the theory and practical examination of all the years will have to undergo one year compulsory internship in at least 100 bedded hospital.

Course Modules
of
B.SC. CARDIO VASCULAR TECHNOLOGY
(BCVT)

HAN 101 - HUMAN ANATOMY-I THEORY

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: 1**	
1	Course Code	**HAN 101**	
2	Course Title	**HUMAN ANATOMY-I**	
3	Credits	**4**	
4	Contact Hours (L-T-P)	**3-1-0**	
	Course Status	Compulsory	
5	Course Objective	To evaluate the Human Anatomy - dissection consistency, theoretical knowledge and knowledge application, to undertake research based training in Anatomy and 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.	
6	Course Outcomes	**CO1: D**efining, listing and learning the facts about the anatomical structure of human body. **CO2:Corelate human anatomical** anatomical structure with function **CO3: I**dentifying, locating and demonstrating the various anatomical structures of human body. **CO4: P**erforming, implementing and applying the concept for better understanding of various anatomical structures of human body **CO5: A**nalyzing, categorizing, comparing and differentiating various anatomical structures of human body. **CO6** : Evaluate , understand and applying the various anatomical structures of human body	
7	Course Description	• The goal of the **anatomy course** is to provide details about the Cells and its organelles , Locomotion and support	
8	Outline syllabus	**Theory & practical**	CO mapping
	Unit 1	**Introduction of Anatomy**	
	A	Introduction to Anatomy (division, planes, Semesterinology for direction & movements).	CO1, CO2
	B	Cell and its organelles	CO1,CO3

		Tissue: Connective & Epithelium- definition, classification, example and function	
	C	Glands- classification, describe serous and mucus glands with example. Basic tissue classification with examples.	CO1,CO4, CO5
	Unit 2	**Locomotion and support**	
	A	Cartilage – types and histology Bones – classification, development, histology.(including radiographic study)	CO2,CO5
	B	Joints – classification with examples. Synovial joint (including radiographic study)	CO2,CO6
	C	Muscles – classification and histology (name of muscles of the body)	CO2,CO5
	Unit 3	**Cardiovascular system**	
	A	Heart- size, location, chambers, exterior and interior. Blood supply of heart (Branches of aorta and surface anatomy of all major arteries and veins of body), Heart failure, valvular heart disease.	CO3, CO4, CO6
	B	surface marking heart, Systemic, pulmonary& portal circulation	CO3,CO5
	C	Lymphatic system	CO3,CO4
	Unit 4	**Gastro intestinal system**	
	A	Parts of GIT, oral cavity (lips, tongue, salivary gland with histology), tonsil(gross anatomy and histology)	CO4, CO6
	B	Gross anatomy and histology of esophagus, Stomach, Intestine.	CO4, CO6
	C	Accessory digestive organs (Gross anatomy and histology of liver, pancreas, spleen, gallbladder)	CO4, CO5 CO6
	Unit 5	**Respiratory system**	
	A	Part of respiratory system, Respiratory epithelium.	CO5, CO6
	B	Nose, nasal cavity, larynx, trachea Lungs and Bronchopulmonary segment	CO4, CO5, CO6

	C	Histology and radiographic study of lungs, Paranasal sinuses			CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25	25	50	
	Text Books	1.Handbook of general anatomy ,BD chaurasia. 2.Human anatomy vol 1,2,3 ,B D chaurasia.			
	Referenced book	**1.Color Atlas of Cytology, Histology, and Microscopic Anatomy - Bio Nica** **2.Netter's Concise Radiologic Anatomy - MedEd Connect** **3. Textbook of Clinical Embryology Vishram Singh,** **4. Gray's Anatomy: The Anatomical Basis of Clinical Practice,** **5. Last's anatomy , regional and applied,Chummy S. sinnatamby** **6. Gray's Anatomy for students, Richard L Darke** **7. Textbook of human histology, Inderbir singh**			

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	3	2	2	2	2	2	1	2
CO2	1	1	3	2	1	2	2	2	1	2
CO3	2	2	3	1	2	2	2	1		2
CO4	1	2	3	2	2	2	2	3	2	2
CO5	3	2	3	1	3	1	1	1	2	2
CO6	3	2	2	1	2	3	1	2	2	2

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
HAN 101	**Human Anatomy-I**	2.00	2.33	1.33	1.50	2.00	1.83	1.33	1.83	1.66	1.83

HPY 101 - HUMAN PHYSIOLOGY-I THEORY

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: I**	
1	Course Code	**HPY 101**	
2	Course Title	**HUMAN PHYSIOLOGY-I**	
3	Credits	**4**	
4	Contact Hours (L-T-P)	**4-0-0**	
	Course Status	Compulsory	
5	Course Objective	● 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 the human 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 define the importance of general physiology of the human body CO2: To explain the importance of nerve muscle physiology CO3: To define the importance, function of Blood along with clinical importance CO4:To explain in detail about the information about Cardiovascular system CO5: To describe the respiratory system and its function CO6:To explain about Digestive system of the body	
7	Course Description	● General & nerve muscle physiology ● Blood ● Cardiovascular system ● The respiratory system ● Digestive system	
8	Outline syllabus	**Theory**	Outline syllabus

			Theory
	Unit 1	**Cell Structure, Nerve Tissue, Muscles**	CO1
	A	Cell and cell organelle Structure & function, transport across cell membrane, homeostasis, membrane potential.	CO1
	B	Structure & functions of nerve tissues, physiological properties of nerve fibers, nerve fiber types & functions.	CO1
	C	Neuromuscular junction, Difference between skeletal muscle, smooth muscle & cardiac muscle.	CO1
	Unit 2	**BLOOD**	CO2
	A	Composition & functions of blood, plasma proteins & hemoglobin.	CO2
	B	Erythrocytes, jaundice, leucocytes & platelets.	CO2
	C	Blood coagulation, blood groups & immunity	CO2
	Unit 3	**Cardiovascular System**	CO3
	A	Cardiac Muscle, physiological anatomy of the heart & blood vessels, cardiac cycle.	CO3
	B	Conducting system of heart, Heart sounds & ECG.	CO3
	C	Heart Rate, Cardiac Output, Blood Pressure & Pulse.	CO3
	Unit 4	**Respiratory System**	CO4
	A	Physiological anatomy & functions of respiratory system, airways, dead space, graph of lung volume & capacities.	CO4
	B	Transport of Gases. Physiology of Exercise & High Altitude.	CO4
	C	Regulation of respiration & Hypoxia.	CO4
	Unit 5	**Gastrointestinal System**	CO5, CO6
	A	Physiological anatomy of GIT, Saliva, Mouth & Oesophagus.	CO5, CO6

	B	Stomach, Pancreas, Liver & Gall Bladder.			CO5, CO6
	C	Small Intestine, Large Intestine, Digestion and Absorption in GIT.			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25	25	50	
	Text Books	1. Textbook Of Physiology Volume 1 & 2 AK Jain			
	Referenced book	1.Guyton and Hall Textbook of Medical Physiology 2.Medical Physiology-GK Pal and Parvati Pal			

Course code	Course Name		PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
	HUMAN PHYSIOLOGY-I	CO1	3	3	3	3	1	2	3	2	3
		CO2	3	3	2	3	1	2	3	2	2
		CO3	3	3	3	3	2	3	3	1	3
		CO4	3	3	3	3	2	1	2	1	3
		CO5	3	3	3	3	2	3	2	1	3
		CO6	3	3	3	3	1	1	3	1	2
		Avg PO attainted	3.0	3.0	2.8	3.0	1.5	2.0	2.66	1.33	2.66

Total: 14.15
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

BCY 101 - BIOCHEMISTRY-I THEORY

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: 1**	
1	Course Code	**BCY 101**	
2	Course Title	**BIOCHEMISTRY -I**	
3	Credits	**3**	
4	Contact Hours (L-T-P)	**2-1-0**	
	Course Status	Compulsory	
5	Course Objective	• To train the students in the management of medical laboratory along with handling a variety of laboratory chemicals and instruments including electronic and advanced equipment's used in modern medical laboratories. • 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: Student are able to know the importance of sampling techniques CO2: Student are able to develop the understanding about the importance of different types of glassware's	

		CO3: Student are able to Students are able to build the ability to understand the importance of different types of equipment's CO4: Student are able to develop the importance of acid, base and buffer CO5: Student are able to develop the understanding about the importance of chemistry of biomolecules CO6:: Student are able to Students are able to build the ability to understand the function of biomolecules in the biological system	
7	Course Description	● Introduction of Glassware's ● Introduction of Laboratory Equipment's ● 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 **Theory**		CO mapping
	Unit 1	**Introduction of Glassware's and laboratory equipment's**	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, CO3
		a. Different types of samples such as urine, blood, stool, tissue etc. and various techniques to preserve the samples. b. Preparation of percentage and normal solution. c. Preparation of molar and molal solution.	

	Unit 3	**Acid, Base, Indicators and Nutrition**	CO1, CO3, CO4, CO6
		a. Acid- base indicators: Definition, concept, mechanism of action. b. Importance of nutrition: Calorific values, Respiratory quotient, Energy requirement of a person - Basal metabolic rate. c. Balanced diet, recommended dietary allowances, Role of carbohydrates, lipid and protein in diet.	
	Unit 4	**Carbohydrate Chemistry**	CO4, CO5, CO6
		1. Definition, general classification with examples. 2. Glycosidic bond, Structures, composition, sources, properties and functions of Monosaccharide's and Disaccharides. 3. Structures, composition, sources, properties and functions of Oligosaccharides and Polysaccharides.	
	Unit 5	**Lipid Chemistry**	CO5, CO6
		a. Definition, classification, properties and functions of Fatty acids. b. Triacylglycerol and Phospholipids. c. Cholesterol, Essential fatty acids and their importance, Lipoprotein.	

CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	0	3	3	3	3	3	3	2	3
CO2	3	2	2	3	3	3	2	3	3
CO3	0	0	3	3	3	3	3	3	3
CO4	3	3	3	0	3	3	3	2	3
CO5	3	3	3	3	2	3	3	3	3
CO6	3	3	3	3	2	3	3	3	3
Avg PO attainted	2.00	2.33	2.83	2.50	2.67	3.00	2.83	2.67	3.00

PAT 101 - PATHOLOGY I

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: I**	
1	Course Code	**PAT 101**	
2	Course Title	**PATHOLOGY-I**	
3	Credits	**4**	
4	Contact Hours (L-T-P)	**4-0-0**	
	Course Status	Compulsory	
5	Course Objective	• 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 define the importance of Haematology CO2: To explain the importance of Laboratory safety guidelines CO3: To explain the importance of Hb, PCV estimation CO4: To describe the importance of Section cutting and Biomedical waste management CO5: To define the importance of Blood Bank CO6: To explain the techniques used in Blood banking	
7	Course Description	• 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	**Haematology**	CO1, CO3,
	A	Introduction to Haematology: Normal collection of blood, their structure and function.	CO1, CO3,
	B	Various anticoagulants used in Haematology	CO1, CO3,
	C	Various instruments and glassware's used in Haematology	CO1, CO3,
	Unit 2	**Laboratory safety precautions, Blood Compositions**	CO2, CO4
	A	Definition, composition, function and formation of blood,	CO2,
	B	Various anticoagulants, their uses, mode of action, merits, demerits.	CO4
	C	Morphology of normal blood cells and their identification, preparation and staining procedure for blood smear, Preparation of stains e.g. Leishman, Wright, Giemsa, J.B Stain	CO2,
	Unit 3	**Haematological tests**	CO3, CO4, CO5
	A	Hb, PCV, ESR & Normal haemostasis	CO3, CO4, CO5
	B	Bleeding time, Clotting time, Prothrombin time	CO3, CO4, CO5
	C	Quality assurance in hematology	CO3, CO4, CO5
	Unit 4	**Tissue Processing**	CO4, CO6
	A	Section cutting and Tissue processing for routine paraffin sections	CO4, CO6
	B	Decalcification of tissues & Staining of tissues – H& E staining	CO4, CO6
	C	Biomedical waste management	CO4, CO6
	Unit 5	**Blood Banking**	CO5, CO6

	A	Introduction of Blood bank			CO5, CO6
	B	Blood grouping and Rh type			CO5, CO6
	C	Cross matching			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25	25	50	
	Text Books	1. Clinical diagnosis by Laboratory method by Todd and Sanford by Davidsohn-Wells, W.B. Saunders, 2016 2. Laboratory Technology by Ramnic Sood, January 2015, Jaypee Brothers Medical Publishers			
	Reference Book	1. Practical Haematology by Dacie and Lewis, Eleventh Edition • 2011, Barbara J. Bain, Imelda Bates 2. Text book of Pathology by Krishna, V. Krishna (Author), Orient Longman, 2004 3. Clinical Laboratory Hematology "McKenzie Shirlyn", Pearson Education Limited 4. Laboratory Manual of Clinical Pathology and Hematology. Santosh Kumar Mondal, CBS Publishers and distributors pvt ltd 5. Textbook of Histology. Leslie Gartner. Elsevier 6. ESSENTIALS OF HEMATOLOGY. SHIRISH M KAWTHALKAR Jaypee Brothers Medical Publishers; Third Edition (2020)			

Course code	Course Name		PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO 2	PSO 3
	PATHOLOGY – I	CO1	3	3	3	3	1	2	3	1	2
		CO2	3	3	2	2	2	1	2	2	1
		CO3	3	3	3	3	2	2	3	2	1
		CO4	3	3	3	2	1	1	3	1	1
		CO5	3	3	3	1	1	1	3	1	1
		CO6	3	3	3	1	1	1	3	1	1
		Avg PO attainted	3.0	3.0	2.83	2.0	1.33	1.33	2.83	1.33	1.16

Total: 14.42
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

MIB 101 – MICROBIOLOGY -I

School: SSAHS		**Batch : 2023 -27**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: I**	
1	Course Code	**MIB 101**	
2	Course Title	**MICROBIOLOGY-I**	
3	Credits	**4**	
4	Contact Hours (L-T-P)	**4-0-0**	
	Course Status	Compulsory	
5	Course Objective	• 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 explain about the Introduction and classification of microbiology CO2 : To explain about the Growth and nutrition in bacteria CO3: To define the importance of immunology and immune system CO4: To explain the importance of General Parasitology CO5:To define the importance of bacteriology CO6: To apply the possible analysis and mechanism involved in the microbial diversity	
7	Course Description	• Introduction of microbiology • Introduction to immunology and immune system • Hypersensitivity and vaccines • General bacteriology • Systemic bacteriology	

8	Outline syllabus **Theory**		CO mapping
	Unit 1	**Introduction and classification of microbiology**	CO1
	A	History and contribution of various scientist in microbiology, Medical Microbiology Semesterinologies, and Importance and applications of medical Microbiology	CO1
	B	Various structure size and shape of bacteria. Use of microscope in the study of bacteria	CO1
	C	Classification of microorganisms, Bacterial taxonomy, General properties: morphology and anatomy	CO1
	Unit 2	**Microbial Growth and nutrition**	CO1, CO2
	A	Microbial nutrient and growth, Culture media and their types and identification system, application in diagnostic bacteriology	CO1, CO2
	B	Nutrition of bacteria, Growth and multiplications of bacteria, factor affecting microbial growth	CO1, CO2
	C	Definition of Sterilization, antiseptic and disinfection Principles and use of equipments of sterilization namely Hot Air oven, Autoclave and Serum Inspissator	CO1, CO2
	Unit 3	**Immunology and Immune system**	CO3
	A	Innate and acquired immunity, organ and cells involved in immune response	CO1, CO2
	B	Definition of Hypersensitivity and types	CO1, CO3
	C	Immunity (vaccines) Immunity vaccines, types of vaccine and immunization Principles and interpretation of commonly done serological tests namely Widal, ,HIV and ELISA technique Types of Antigen Antibody reaction	CO1, CO4
	Unit 4	**Parasitology**	CO1, CO4
	A	Introduction, classification and General features of parasites	CO1, CO4
	B	Characteristic features of Metazoa and Prtozoa	CO1,

					CO4
	C	Morphology, life cycle, laboratory diagnosis of Amoebiasis, Plasmodium, Tape worms			CO1, CO4
	Unit 5	**Bacteriology**			CO5, CO6
	A	Introduction, Diversity, classification, general features, pathogenicity, diagnosis, treatment and prevention of Mycobacterium tuberculosis, Mycobacterium leprae Enterobacteriaceae: coliform, proteus, Staphylococcus aureus, Steptococcus pneumoniae.			CO5, CO6
	B	Diarrhoea: Salmonella, Shigella, Vibrio			CO5, CO6
	C	Food poisoning: Clostridium			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25	25	50	
	Text Books	1.General Microbiology by Hans Günter Schlegel, C. Zaborosch, M. Kogut, 7th ed, Cambridge University Press, 1986			
	Reference Books	1. General Microbiology by Roger Y. Stanier Roger Y Stanier (Author), John L Ingraham (Author), Mark L Wheelis (Author), 5th Edition,Palgrave Macmillan,1999			

Course code	Course Name		PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
BMT 108	MICROBIOLOGY-I	CO1	3	3	3	2	1	1	3	1	1
		CO2	3	3	2	3	1	2	3	1	2

		CO3	3	3	3	3	2	2	3	2	1
		CO4	3	3	3	3	1	1	3	2	1
		CO5	3	3	3	3	2	1	3	2	1
		CO6	3	3	3	3	2	3	3	1	3
		Avg PO attainted	3.0`	3.0	2.83	2.83	1.5	1.66	3.0	1.5	1.5

BCVT115 : Basics of Hospital and Data Management

School: SSAHS		**Batch : 2023-26**	
Programme: BCVT		**Current Academic Year: 2023**	
Branch: CVT B.Sc Cardiovascular Technology		**Semester: 1**	
1	Course Code	**BCVT 115**	
2	Course Title	**Basics of Hospital and Data Management**	
3	Credits	**2**	
4	Contact Hours (L-T-P)	**2-0-0**	
	Course Status	Compulsory	
5	Course Objective	1. Able to understand the techniques management and organizational behaviour 2. Able to understand the quality control and hospital information system 3. Able to understand the principle of CDM 4. Able to know data management 5. Able to manage material and inventory control,storage, equipment/operation . 6. Able to understand the techniques management and organizational behaviour 7. Able to understand the quality control and hospital information system 8. Able to understand the principle of CDM 9. Able to know data management 10. Able to manage material and inventory control,storage, equipment/operation . 11. Able to understand health and wellbeing	
6	Course Outcomes	CO1: To name the techniques management and organizational behaviour CO2: To explain the importance of quality control and hospital information system CO3: To apply the importance of CDM CO4: To analyze the documents in data management and material management and inventory control	

		CO5: To explain storage techniques and equipments/operation management CO6 : To elaborate basic concept of health and wellbeing.	
7	Course Description	Introduction to Management Organizational behaviour Quality Control Hospital Information System Introduction and Principles of CDM Documents in data Management Material management and Inventory Control Storage Equipment/ Operations management Concept of health and wellbeing	
8	Outline syllabus **Theory**		CO mapping
	Unit 1	**Introduction to Management:**	
		a) Definition, Concepts, b) Principles, various models, c) Management components i.e. Planning, Organizing, Staffing, Motivating, Leading, Co-ordination and Controlling.	CO1
	Unit 2	**Organizational behavior & Quality Control**	
		a) Concept of Organizational Behavior,Major Components of organizational behavior – Personality development, Motivation, Group, Leadership,Cooperation and Conflict b) Definition of Quality, Dimensions of Quality, c) Basic concepts of Total Quality Management, Quality Awards	CO2,CO3
	Unit 3	**Hospital Information System and Principles of CDM**	

		a) Hospital Information System,Management and software applications in registration, billing, investigations, reporting, medical records management, information processing, b) Security and ethical challenges, CDM Process; Data entry methods of CDM, c) SOPs on CDM; Data coding and decoding; Medical Dictionaries			CO4,CO6, CO5
	Unit 4	**Documents in data Management & Storage:**			CO1
		a) Prescription, Case Report form, Source documents**,** Informed consent form, Patient information sheet, b) Clinical study report,, c) Log books, Master files			
	Unit 5	**Material & Equipment management and Inventory Control:**			CO2
		a) Concept, Materials Planning, Classification of Materials-Consumable and Non consumable, working out quantities required, forecasting,Budgeting, various costs of inventory,Inventory techniques-ABC, SDE / VED Analysis, EOQ models. b) hospital equipment repair and maintenance, types of maintenance,job orders, equipment maintenance log books, AMCS, **c)** outsourcing of maintenance services,quality and reliability,			
	Mode of examination	Theory			
	Weightage Distribution for Theory	CA	MTE	ETE	
		25%	25%	50%	

CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1			2	2	3	3	1	2	3
CO2		2	2	2	3	3	2	2	3
CO3		1	2	3	3	3	2	2	3
CO4		2	2	3	3	3	1	2	3
CO5			1	2	2	3	1	2	3
CO6	2	2	3	3	3	3	2	2	3
AVERAGE PO ATTAINMENT	0.3	1.1	2	2.5	2.8	3	1.5	2	3

Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

HAN 151- HUMAN ANATOMY-1 LAB

School: SSAHS		**Batch : 2023-26**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT CVT		**Semester: 1**	
1	Course Code	**HAN 151**	
2	Course Title	**HUMAN ANATOMY–I LAB**	
3	Credits	**1**	
4	Contact Hours (L-T-P)	**0-0-2**	
	Course Status	Compulsory	
5	Course Outcomes	CO1: To explain about Anatomy and its importance CO2: To describe the importance of epithelium, cartilage and bones CO3: To define the importance of skeletal (TS & LS), smooth and cardiac muscle CO4: To analyze the importance of artery, vein, lymph node, spleen, tonsil and thymus CO5: To explain the importance of respiratory system CO6: To know the applied aspects of various systems of human body.	
6	Course Description	• To define Histology of types of epithelium, serous, mucus and mixed salivary gland, cartilages, bones, skeletal (TS & LS), smooth and cardiac muscles.	
7	Outline syllabus	**PRACTICAL'S**	CO mapping
	Unit 1	**Epithelium and salivary gland**	CO1
	A	Histology of epithelium and salivary gland,	CO1
	B	Histology of cartilage, compact and cancellous bone.	CO1
	C	Histology of muscle tissue.	CO1
	Unit 2	**Bones & Joints**	CO2
	A	Demonstration of all bone.	CO2
	B	Radiograph of bones & joints.	CO2
	C	Demonstration of all body muscles	CO2
	Unit 3	**Lymph Node**	CO3

	A	Histology of Tonsil & Thymus			CO3
	B	Histology of lymph node			CO3
	C	Histology of spleen.			CO3
	Unit 4	**Heart and blood vessels**			CO4, CO6
	A	Histology of blood vessels			CO4, CO6
	B	Demonstration of heart and related structure			CO4, CO6
	C	Radiograph related to heart			CO4, CO6
	Unit 5	**Lungs Structure**			CO5, CO6
	A	Demonstration and histology of lung			CO5, CO6
	B	Demonstration of lung related structure.			CO5, CO6
	C	Radiograph related to lungs.			CO5, CO6
	Mode of examination	Practical			
	Weightage Distribution	CA	CE	ETE	
		25	25	50	
	Text Books	1.Human anatomy vol 1,2,3 ,B D chaurasia.			
	Reference Books	1.Color Atlas of Cytology, Histology, and Microscopic Anatomy - Bio Nica 2.Netter's Concise Radiologic Anatomy - MedEd Connect			

Course code	Course Name		PO1	PO2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3
	HUMAN ANATOMY-I (LAB)	CO1	3	3	3	3	2	3	2	3	3
		CO2	3	3	2	3	3	3	2	2	3
		CO3	3	3	3	3	2	1	3	3	3
		CO4	3	3	3	3	2	3	2	2	3
		CO5	3	3	3	3	2	2	3	1	3
		CO6	3	3	3	3	1	1	2	2	3
		Avg PO attainted	3.0	3.0	2.8	3.0	2.0	2.1	2.33	2.16	3.0

HPY 151 - HUMAN PHYSIOLOGY –I (LAB)

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-2024**	
Branch: CVT CVT		**Semester: 1**	
1	**Course Code**	**HPY 151**	
2	**Course Title**	**HUMAN PHYSIOLOGY –I (LAB)**	
3	**Credits**	**1**	
4	**Contact Hours (L-T-P)**	**0-0-2**	
5	Course Outcomes	CO1: To define the Physiology and its importance CO2: To explain the importance of Compound microscope CO3: To experiment with hemoglobin estimation CO4:To simplify blood group detection CO5: To interpret Total Red Blood Cell Count and total Leucocyte Count CO6:To estimate and interpret ESR and PCV.	
6	Course Description	• Study of Compound Microscope • Estimation of Hemoglobin Concentration • Total Red Blood Cell Count. • Total Leucocyte Count. • BT, CT, Blood Group Estimation and Demonstration	
	Practical's		CO mapping
	Unit 1	**Study of Compound Microscope**	CO2,CO1
		a. Introduction to the microscope b. Parts of microscope c. Focusing the slide under microscope.	

	Unit 2	**Estimation of Hemoglobin Concentration, ESR & PCV**	CO3,CO1
		a. Methods of estimating Hb concentration b. Method of estimating ESR c. Demonstration of PCV	
	Unit 3	**Total Red Blood Cell Count**	CO5,CO1
		a. Briefing of Neubauer chamber b. Preparing the slide for calculating RBC count c. Calculation	
	Unit 4	**Total Leucocyte Count**	CO5,CO1
		a. Briefing of Neubauer chamber b. Preparing the slide for calculating TLC count c. Calculation	
	Unit 5	**Bleeding Time, Clotting Time, Blood Group Estimation**	CO6,CO4,CO1
		a. Demonstration of methods of doing Bleeding time. **b.** Demonstration of methods of doing clotting time c. Demonstration of Blood group estimation	
	Mode of examination	Practical's	
	Weightage Distribution for Practical's	CA: 25% / MTE: 0% / ETE: 75%	
	Text book/s*	Textbook: ● Manual Of Practical Physiology, AK Jain Reference: ● Ghai's A Textbook of Practical Physiology	

	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	2	1	3	2	-	-	2	2	2
CO2	1	-	-	3	1	1	2	2	2
CO3	2	2	2	2	-	-	2	2	2
CO4	2	2	2	2	1	1	2	2	2
CO5	2	2	2	2	-	-	2	2	2
COCO6	2	2	2	2	-	-	2	2	2
Average PO attainment	1.8	1.5	1.8	2.2	0.3	0.3	2	2	2

BCY 151 - BIOCHEMISTRY –I (LAB)

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-2024**	
Branch: CVT CVT		**Semester: 1**	
1	**Course Code**	**BCY 151**	
2	**Course Title**	**BIOCHEMISTRY –I(LAB)**	
3	**Credits**	**1**	
4	**Contact Hours (L-T-P)**	**0-0-2**	
5	Course Outcomes	CO1: Student are able to know the importance of sampling techniques CO2: Student are able to develop the understanding about the importance of different types of glass wares CO3: Students are able to build the ability to understand the importance of different types of equipment's CO4: Student are able to know the importance of acid and base CO5: Student are able to develop the understanding about the importance of buffers CO6: Students are able to build the ability to understand the properties of different types of reagents	
6	Course Description	• Introduction of Glassware's • Introduction of Laboratory Equipment's • Safety of measurements in Laboratory, • Preparation of Solutions • DeSemesterination of strength of acids and bases	
	Practical's		CO mapping
	Unit 1	**Introduction to Laboratory equipments**	CO1, CO2
		a. pH meter, Centrifuge machine b. Colorimeter, Water bath c. Oven, Autoclave, Weighing balance	

	Unit 2	**Introduction to Laboratory glassware's**			CO1, CO2, CO4
		a. Beaker, Volumetric flask, b. Test tube, Measuring cylinder, c. Centrifuge tube, Conical flask			
	Unit 3	**Safety measures and Lab protocols**			CO3, CO4, CO6
		a. Safety measurements in Biochemistry lab b. General laboratory protocols c. Awareness in a lab			
	Unit 4	**Preparation of acid and bases of different concentrations**			CO4, CO5 ,CO6
		a. Preparation of acids of different concentration b. Preparation of bases of different concentration c. Preparation of solutions of different concentration			
	Unit 5	**Titration**			CO4,CO5, CO6
		a. DeSemesterination of the strength of NaOH solution b. DeSemesterination of the strength of HCl solution c. DeSemesterination of the strength of NH_4OH solution			
	Mode of examination	Theory and Practical			
	Weightage Distribution for Theory	CA	MTE	ETE	
		25%	25%	50%	
	Weightage Distribution for Practical's	CA	Viva	ETE	
		25%	25%	50%	

	Text book/s*	1) A text book of Medical Biochemistry by Chatterjee & Shinde	
	Reference Books	1) Text book of biochemistry for Medical students by Vasudevan and Sreekumari 2) Biochemistry by Lehringer 3) Clinical chemistry by Varley Harpers Illustrated Biochemistryby Robert K.M.	

CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	0	3	3	3	3	3	3	2	3
CO2	3	2	2	3	3	3	2	3	3
CO3	0	0	3	3	3	3	3	3	3
CO4	3	3	0	3	3	3	3	2	3
CO5	0	0	3	3	2	3	3	3	3
CO6	3	3	3	3	2	3	3	3	3
Avg PO attainted	1.50	1.83	2.33	3.00	2.67	3.00	2.83	2.67	3.00

PAT 151 - PATHOLOGY-I LAB

School: SSAHS		**Batch : 2023-26**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: I**	
1	Course Code	**PAT 151**	
2	Course Title	**PATHOLOGY –I LAB**	
3	Credits	**1**	
4	Contact Hours (L-T-P)	**0-0-2**	
	Course Status	Compulsory	
5	Course Outcomes	CO1: To define the importance of Haematology CO2: To explain the importance of ABO blood grouping CO3: To describe the importance of WBC, RBCs, Platelets estimation CO4: To explain the importance of Bleeding time CO5: To define the importance of Clotting time CO6: To explain the advanced centrifugation techniques	
6	Course Description	• Introduction to Haematology • Laboratory safety guidelines • Estimation of Bleeding time • Estimation of Clotting time • Estimation of Hb and Prothrombin time	
7	Outline syllabus	**PRACTICAL'S**	CO mapping
	Unit 1	**Sahli's & ESR**	CO1, CO2
	A	Collection of Blood sample, Plasma separation	CO1, CO2
	B	Hemoglobin (Hb) estimation Sahli 's method	CO1, CO2
	C	Estimation of ESR	CO1, CO2
	Unit 2	**Blood Grouping**	CO2, CO3, CO4

	A	ABO Blood Grouping			CO2, CO3, CO4
	B	Bleeding Time. Clotting Time			CO2, CO3, CO4
	C	Differential leukocyte count (DLC) Preparation of blood smear			CO2, CO3, CO4
	Unit 3	**Blood Cells**			CO3, CO4, CO4
	A	Total White Blood Cell Count in Blood			CO3, CO4, CO4
	B	Total Red Blood Cell Count in Blood			CO3, CO4, CO4
	C	Estimation of Platelets count in Blood			CO3, CO4, CO4
	Unit 4	**BT & CT**			CO4, CO6
	A	Preparation of EDTA Vials			CO4, CO6
	B	Bleeding Time.			CO4, CO6
	C	Clotting Time,			CO4, CO6
	Unit 5	**Centrifuge**			CO5, CO6
	A	Types of Centrifuges,			CO5, CO6
	B	Centrifugation technique			CO5, CO6
	C	Principle, Application and uses			CO5, CO6
	Mode of examination	Practical			
	Weightage Distribution	CA	CE	ETE	
		25	25	50	
	Text Books	1. Clinical diagnosis by Laboratory method by Todd and Sanford by Davidsohn-Wells, W.B. Saunders, 2016			

	Reference Books	1. Laboratory Technology by Ramnic Sood, January 2015, Jaypee Brothers Medical Publishers 2. Practical Haematology by Dacie and Lewis, Eleventh Edition • 2011, Barbara J. Bain, Imelda Bates Text book of Pathology by Krishna, V. Krishna (Author), Orient Longman, 2004	

Course code	Course Name		PO1	PO2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3
	PATHOLOGY- I (LAB)	CO1	3	3	3	3	1	2	2	1	1
		CO2	3	3	2	3	1	2	3	1	2
		CO3	3	3	3	3	1	2	3	1	3
		CO4	3	3	3	3	2	1	2	1	2
		CO5	3	3	3	3	2	2	3	1	2
		CO6	3	3	3	3	1	1	3	1	2
		Avg PO attainted	3.0	3.0	2.8	3.0	1.3	1.6	2.66	1.0	2.0

School: SSAHS		**Batch : 2023-26**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: I**	
1	**Course Code**	**MIB 151**	
2	**Course Title**	**MICROBIOLOGY–I (LAB)**	
3	**Credits**	**1**	
4	**Contact Hours (L-T-P)**	**0-0-2**	
5	Course Outcomes	CO1: To understand the importance of Staining of bacterial strains CO2: To understand the importance of culture media CO3: To understand the importance of serological tests CO4: To understand the importance of parasite staining CO5: To understand the staining of of important bacteria	
6	Course Description	• Bacteriology • Virology • Mycology • Parasitology • Bacterial Growth	
	Practical's		CO mapping
	Unit- 1	a) Gram staining b) Acid fast staining c) Handling of microscope, Use of microscope, Safety measures	CO1
	Unit-2	a) Use of culture media b) Nutrient broth, nutrient agar,blood agar c) Demonstration and sterlization of equipments – Hot Air oven, Autoclave, Bacterial filters	CO2
	Unit-3	Demonstration of common serological tests – a) Widal, b) HIV c) ELISA	CO3
	Unit-4	Slide demonstration of a) Amoebiasis b) Plasmodium	CO4
	Unit 5	Staining of a) Staphylococci b) Salmonella	CO5

		c) Clostridium			
	Mode of examination	Theory and Practical			
	Weightage Distribution for Theory	CA	MTE	ETE	
		25%	25%	50%	
	Weightage Distribution for Practical's	CA	MTE	ETE	
		25%	0%	75%	
	Text book/s*	1. Anathanarayana & Panikar Medical Microbiology 2. Roberty Cruckshank – Medical Microbiology – The Practice of Medical Mircrobiology			
	Reference Books	1. Chatterjee – Parasitology – Interpretation to Clinical medicine 2. Rippon – Medical Mycology 3. Emmons – Medical mycology 4. Basic laboratory methods in Parasitology, 1st Ed, J P Bros, New Delhi 5. Basic laboratory procedures in clinical bacteriology, 1st Ed, J P Brothers 6. Medical Parasitology – Ajit Damle			

CO1	3	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

BCVT 2ND SEMESTER

HAN 201 - HUMAN ANATOMY-II

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT			
		Semester: 2	
1	Course Code	**HAN 201**	
2	Course Title	**HUMAN ANATOMY-II**	
3	Credits	**3**	
4	Contact Hours (L-T-P)	**2-1-0**	
	Course Status	Compulsory	
5	Course Objective	• To develop as research scientists and research based teachers for schools of allied health sciences both locally and externally. 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 and 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.	
6	Course Outcomes	CO1: To describe the anatomy of Urinary system CO2: To explain the importance of Reproductive system CO3: To define the position and function of Endocrine glands CO4: To explain the importance of parts of Nervous system CO5: To analyze the importance and location of sensory organs CO6: To explain the applied anatomy of various systems of human body.	
7	Course Description	• Urinary system • Reproductive system • Endocrine glands • Nervous system • Sensory organs	
7	Outline syllabus	**Theory**	CO mapping
	Unit 1	**Urinary system**	CO1, CO6
	A	Parts of Urinary system and functions	CO1, CO6

	B	Kidney, ureter, urinary bladder, male and female urethra			CO1, CO6
	C	Histology of kidney, ureter and urinary bladder			CO1, CO6
	Unit 2	**Reproductive system**			CO2
	A	Parts of male reproductive system (gross and histology)			CO2
	B	Parts of female reproductive system, (gross and histology),.			CO2
	C	Embryology: Gametogenesis, ovulation, fertilization,Fetal circulation, Placenta.			CO2
	Unit 3	**Endocrine glands**			CO3, CO6
	A	Name and functions of all endocrine glands			CO3, CO6
	B	Pituitary gland and thyroid gland (gross and histology)			CO3, CO6
	C	Parathyroid gland, suprarenal gland (gross and histology)			CO3, CO6
	Unit 4	**Nervous system**			CO4
	A	Neuron, Classification of Nervous system, Cerebrum(structure and functional areas), cerebellum, Brainstem.			CO4
	B	Spinal cord with spinal nerve, Spinal and cranial Meanings, Ventricles and cerebrospinal fluid circulation.			CO4
	C	Names of basal nuclei, Blood supply of brain, Cranial nerves, Meningitis, Hydrocephalus.			CO4,
	Unit 5	**Sensory organ**			CO5, CO6
	A	Skin: Skin histology, Appendages of skin			CO5, CO6
	B	Eye: parts of eye, extra ocular muscle and blood supply.			CO5, CO6
	C	Ear: Parts of ear. Tongue- Structure ,muscles, motor and sensory supply.			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25	25	50	
	Text Books	1.Human anatomy vol ,2,3 ,4 B D chaurasia.			

	Reference books	**1.Color Atlas of Cytology, Histology, and Microscopic Anatomy - Bio Nica** **2.Netter's Concise Radiologic Anatomy - MedEd Connect** **3. Textbook of Clinical Embryology Vishram Singh,** **4. Gray's Anatomy: The Anatomical Basis of Clinical Practice,** **5. Last's anatomy , regional and applied,Chummy S. sinnatamby** **6. Gray's Anatomy for students, Richard L Darke** **7. Textbook of human histology, Inderbir singh**	

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	1	2	1	1	3	2	3
CO2	3	2	1	2	2	1	1	3	2	2
CO3	2	1	2	1	1	1	2	3	2	2
CO4	3	1	1	2	2	2	2	2	2	3
CO5	3	2	1	1	1	2	1	3	3	2
CO 6	3	2	2	3	2	2	3	3	3	2

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**		PSO2	PSO3
	HUMAN ANATOMY-II	2.83	1.66	1.33	1.66	1.66	1.5	1.66	2.83	2.33	2.33

HPY 201 – Human Physiology-II

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT CVT		**Semester: 2**	
1	Course Code	**HPY**	
2	Course Title	**Human Physiology-II**	
3	Credits	**3**	
4	Contact Hours (L-T-P)	**2-1-0**	
	Course Status	Compulsory	
5	Course Objective	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 define the physiology of the different system of the human body.	

		CO2: To explain the importance, function and function of Excretory system of body CO3:To apply the information about Endocrine system CO4: To simplify the Nervous system and its function CO5: To explain the reproductive system and its function CO6:To elaborate special senses of the body	
7	Course Description	● Physiology of Excretion system ● Endocrine system ● Nervous system ● Reproductive system ● Special Senses	
8	Outline syllabus **Theory**		CO mapping
	Unit 1	**Excretory system**	CO1,CO2
		a. Physiological anatomy of kidney, structure and functions of excretory system, structure of nephron. b. Mechanism of formation of Urine. & mechanism of concentration and dilution of urine.	

		c. The Counter Current System: Physiology of micturition and Regulation of Body Temperature in Humans.	
	Unit 2	**Endocrine system**	CO3,CO1
		a. General principles of endocrinology, The pituitary Gland. b. The Thyroid Gland, The parathyroid, Calcitonin and Vitamin D. c. The Adrenal Cortex & Pancreas.	
	Unit 3	**Reproductive system**	CO4CO1
		a. Changes during Puberty, Classification of Male sex hormones and their functions, Spermatogenesis & semen. b. Changes during Puberty, Classification and Functions of female sex hormones, menstruation, ovulation and contraception. c. Physiological changes during pregnancy, functions of placenta and physiology of lactation.	
	Unit 4	**Nervous system**	CO5,CO1
		a. Organisation of Nervous system, The Synapse , Physiology of receptor organs for special and general sensation, physiology of reflex	

		action, classification and properties of reflexes. b. Intro to Sensory and motor system. Functions of hypothalamus, thalamus, basal ganglia, cerebrum & cerebellum. c. Autonomic nervous system, Cerebrospinal Fluid and Blood Brain Barrier.			
	Unit 5	**Special Senses**			CO6,CO1
		a. Taste and Olfaction. b. Vision—structure and function of eye, errors of refraction & their correction. Colour blindness. c. Hearing—structure and function of ear, general outline of mechanism of hearing and perception of sound.			
	Mode of examination	Theory			
	Weightage Distribution for Theory	CA	MTE	ETE	
		25%	25%	50%	
	Text book/s*	1. Text book of Physiology by Guyton 2. Human Physiology by Chatterjee			

	Reference Books	1. Concise Medical Physiology by sujith K Choudhary 2. Review of Medical Physiology by Ganong A text book of Physiology by A.K.Jain	

CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	3				2		1	1	2
CO2	3	3	2		2		1	1	2
CO3	3	3	3		2		2		2
CO4	3	3	3				1	2	2
CO5	3	3	3		2		1	2	2
O6	3	3	3		3		1	2	2
VERAGE O TTAINME T	3	2.5	2.3	0	0.3	0	1.17	1.3	2

BCY 201 - BIOCHEMISTRY- II

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: 2**	
1	Course Code	**BCY 201**	
2	Course Title	**BIOCHEMISTRY –II**	
3	Credits	**3**	
4	Contact Hours (L-T-P)	**2-1-0**	
	Course Status	Compulsory	
5	Course Objective	• To train the students in the management of medical laboratory along with handling a variety of laboratory chemicals and instruments including electronic and advanced equipment's used in modern medical laboratories. • To make the students able to do routine laboratory testing under stipulated conditions. • To prepare specimens and operate machines that automatically analyze samples. • To provide the conceptual basis for understanding biochemical and particularly address the fundamental mechanisms of the biomolecules to facilitate the life.	
6	Course Outcomes	CO1: Student are able to know the importance of amino acid chemistry CO2: Student are able to develop the understanding about the importance of Enzymes CO3: Students are able to build the ability to understand the importance of Minerals CO4: Student are able to know the importance of vitamins in biological system CO5: Student are able to develop the understanding about the importance of chemistry of nucleic acid CO6: Students are able to build the ability to understand the importance cellular constituents and cell biology	

7	Course Description	• Amino-acid Chemistry • Enzymes • Mineral metabolism • Vitamins • Cell Biology, Nucleotide and Nucleic acid Chemistry	
8	Outline syllabus **Theory**		CO mapping
	Unit 1	**Amino-acid Chemistry**	CO1, CO2
		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 quartenary structure of proteins	
	Unit 2	**Enzymes**	CO1, CO2, CO3
		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**	CO2, CO3, CO6
		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**	CO4, CO5
		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**	CO5, CO6
		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.	

CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	3	0	3	3	3	3	3	2	3
CO2	3	2	2	3	0	3	2	3	3
CO3	0	3	0	3	3	3	3	3	3
CO4	3	3	3	0	3	3	3	2	3
CO5	3	3	3	3	2	3	3	3	3
CO6	3	3	3	3	2	3	3	3	3
Avg PO attainted	2.50	2.33	2.33	2.50	2.17	3.00	2.83	2.67	3.00

PAT 201 - PATAHOLOGY- II

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: 2**	
1	Course Code	**PAT 201**	
2	Course Title	**PATHOLOGY II**	
3	Credits	**4**	
4	Contact Hours (L-T-P)	**4-0-0**	
	Course Status	Compulsory	
5	Course Objective	• To introduce basic principles and application relevance of clinical disease for students who are in preparation for laboratory technologists. • The content of rigorous course provide 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 define the importance of Histopathology CO2: To explain the importance of Grossing and mounting techniques CO3: To describe the importance of Clinical pathology CO4: To analyze the importance of Urine examination CO5: To define the importance of examination of body fluids CO6: To analyze the importance of embedding and mounting techniques	
7	Course Description	• Introduction to Histopathology • Grossing and mounting techniques • Clinical pathology • Urine collection and examination	

		• Examination of body fluid	
7	Outline syllabus **Theory**		CO mapping
	Unit 1	**Introduction To Histopathology, Microscopy, Equipments**	CO1, CO2
	A	Introduction to histopathology and laboratory organization, Laboratory equipment, uses and maintenance, Laboratory hazards and safety precautions.	CO1, CO2
	B	Types of Microscope: Compound microscope-optical system, magnification, and maintenance	CO1, CO2
	C	Microtome -Types, Uses, Parts, different types of microtome knives, care & maintenance. Automated tissue processor components, working & precautions during use, Tissue floating bath	CO1, CO2
	Unit 2	**Tissue processing**	CO2, CO3, CO4
	A	Processing of histological tissues	CO2, CO3, CO4
	B	Reception, Recording and labeling of tissue specimens, Fixation, and various simple fixatives	CO2, CO3, CO4
	C	Processing of histological tissues for paraffin embedding, Embedding, and embedding media, Decalcification.	CO2, CO3, CO4
	Unit 3	**Various Microtomes, uses and application**	CO3, CO6
	A	Microtomes-various types, their working principle and maintenance, Microtomes knives and knife sharpening (honing and stropping) cutting faults and remedies	CO3, CO6
	B	Dye Chemistry, Theory and practice of staining-Hematoxylin and Eosin	CO3, CO6
	C	Introduction, Preparation & Fixation of specimen- Kaiserling solution-1 & Kaiserling solution-2 Precaution taken for the Fixation of Specimens.The mounting of pathological specimens, Storage of Specimens. Mounting of Museum Specimens	CO3, CO6
	Unit 4	**Fixation**	CO4, CO5
	A	Introduction, Preparation & Fixation of specimen	CO4, CO5
	B	Precaution taken for the Fixation of Specimens.	CO4, CO5
	C	The mounting of pathological specimens,	CO4, CO5

	Unit 5	**Embedding and mounting**			CO5, CO6
	A	1. Processing of histological tissues for paraffin embedding, Embedding, and embedding media,			CO5, CO6
	B	2. Decalcification			CO5, CO6
	C	3. Storage of Specimens. Mounting of Museum Specimens			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25	25	50	
	Text Books	• Clinical diagnosis by Laboratory method by Todd and Sanford by Davidsohn-Wells, W.B. Saunders, 2016 • Laboratory Technology by Ramnic Sood, January 2015, Jaypee Brothers Medical Publishers •			
	Reference Books	• Practical Haematology by Dacie and Lewis, Eleventh Edition • 2011, Barbara J. Bain, Imelda Bates • Text book of Pathology by Krishna, V. Krishna (Author), Orient Longman, 2004 • Histopathology Techniques by Culling • Cytology by Koss •			

Course code	Course Name		PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
	PATHOLOGY- II	CO1	3	3	3	3	2	1	3	3	1
		CO2	3	3	2	3	2	1	3	2	1
		CO3	3	3	3	3	2	1	3	3	1
		CO4	3	3	2	3	2	1	3	3	1
		CO5	3	3	3	3	2	1	3	3	1
		CO6	3	3	3	3	2	1	3	3	1
		Avg PO attainted	3.0	3.0	2.6	3.0	2.0	1.0	3.0	2.83	1.0

School: SSAHS		**Batch : 2023 -27**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: 2**	
1	Course Code	**MIB 201**	
2	Course Title	**MICROBIOLOGY-II**	
3	Credits	**4**	
4	Contact Hours (L-T-P)	**4-0-0**	
	Course Status	Compulsory	
5	Course Objective	1. Able to collect and dispatch specimen for routine investigation 2. Able to interpret commonly done bacteriological and serological investigations 3. Able to control hospital infections 4. Able to manage biomedical waste management 5. Able to understand immunisation schedule	
6	Course Outcomes	CO1: To understand the Systemic Bacteriology CO2: To understand the importance of Virology CO3: To understand the importance of Mycology CO4: To understand the importance of Parasitology CO5: To understand the importance of Hospital acquired infection	
7	Course Description	• Classification, growth and nutrition of microorganism • Systemic bacteriology • Parasitology • Mycology • Virology • Hospital infection, Biomedical waste management	
8	Outline syllabus **Theory**		CO mapping
	Unit 1	**Systemic Bacteriology**	
	A	Morphology, cultivation, diseases caused ,laboratory diagnosis including specimen collection of the following bacteria(the classification, antigenicstructure and pathogenicity are not to be taught)	CO1

	B	Staphyloccci, Streptococci, Pneumococci, Gonococci, Menigococci,	CO1
	C	C. Diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, Escherichia coli, Klebsiella, Proteus, vibrio cholerae, Pseudomonas & Spirochetes	CO1
	Unit 2	**Virology**	
	A	Virology: Introduction, classification, general features, pathogenicity, diagnosis, treatment and prevention.	CO2
	B	Taxonomy and general features of viruses	CO2
	C	Cultivation of virus, Orthomyxovirus, Paramyxovirus, Hepatitis, Herpesvirus, HIV	CO2
	Unit 3	**Mycology**	
	A	Mycology: Introduction and classification	CO3
	B	General features of fungus Opportunistic fungi Subcutaneous and Systemic mycoses	CO3
	C	Morphology, diseases caused and lab diagnosis of following fungi , Candida, Cryptococcus, Dermatophytes	CO3
	Unit 4	**Parasitology**	
	A	Parasitology: Introduction and classification and general features of parasites	CO4
	B	Pathogenicity, diagnosis, treatment and prevention of parasites, Plasmodium, Amoebiasis,	CO4
	C	Pathogenicity, diagnosis, treatment and prevention of parasites Roundworm, Hookworm, Giardiasis	CO4
	Unit 5	**Hospital acquired infection**	
	A	Definition of Hospital acquired infection , Investigation prevention and control of Hospital infection.	CO5
	B	Causative agents, transmission methods of Hospital acquired infection	CO5
	C	Biomedical waste management, Principle Practice an applications	CO5

BCVT 216 - Basics of Hospital and Data Management

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVTCVT		**Semester: 2nd**	
1	Course Code	**BCVT 216**	
2	Course Title	**Basics of Hospital and Data Management**	
3	Credits	**2**	
4	Contact Hours (L-T-P)	**2-0-0**	
	Course Type	Open elective	
5	Course Objective	To define the techniques, management and organizational behaviour and quality control and hospital information system	
6	Course Outcomes	CO1: To analyze the techniques management and organizational behaviour CO2: To evaluate the importance of quality control CO3: To evaluate the importance of CDM CO4: To evaluate the importance of documents in data management and material management and inventory control CO5: To interpret storage techniques and equipments/operation management CO6: To evaluate the importance of hospital information system	
7	Course Description	To define the techniques, management and organizational behaviour and quality control and hospital information system	
8	Outline syllabus		CO Mapping
	Unit 1	**Documents in data Management**	
	A	Prescription, Case Report form, Source documents**,** Informed consent form, Patient information sheet,	CO1,
	B	Clinical study report,	CO1
	C	Log books, Master files	CO1, CO6
	Unit 2	**Material management and Inventory Control:**	
	A	Concept, Materials Planning, Classification of Materials-Consumable and Non consumable, working out quantities required, forecasting,	CO2
	B	Budgeting, various costs of inventory,	CO2
	C	Inventory techniques-ABC, SDE / VED Analysis, EOQ models.	CO2, CO6
	Unit 3	**Storage**	
	A	Importance and functions of storage,	CO3
	B	Location and layout of stores,	CO3
	C	Management of receipts and issue of materials from stores, Warehousing costs, Stock verification	CO3, CO6
	Unit 4	**Equipment/ Operations management:-1**	
	A	hospital equipment repair and maintenance, types of maintenance,	CO4
	B	job orders, equipment maintenance log books, AMCS,	CO4

	C	outsourcing of maintenance services,			CO4, CO6
	Unit 5	**Equipment/ Operations management:-2**			
	A	quality and reliability,			CO5
	B	concept of failure, equipment history and documents, replacement policy, calibration tests, spare parts,			CO5
	C	stocking techniques and polices			CO5, CO6
	Mode of examination	Theory/Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	
	Text book/s*				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	1	3	3	3	3	3	3
CO2	2	2	2	1	3	3	3	3	3	3
CO3	2	2	2	1	3	3	3	2	3	3
CO4	2	2	2	1	3	3	3	3	3	3
CO5	2	2	2	1	3	3	3	3	3	3
CO6	2	2	3	3	2	1	1	2	3	1

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT216	**BASICS OF HOSPITAL AND DATA MANAGEMENT -II**	2	2	2.16	1.33	2.83	2.66	2.66	2.66	3	2.66

Total: 23.24
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

HAN 251 - HUMAN ANATOMY –II (LAB)

School: SSAHS		**Batch : 2023 -27**	
Programme: BCVT		**BCVT**	
		Semester: II	
1	Course Code	**HAN 251**	
2	Course Title	**HUMAN ANATOMY –II (LAB)**	
3	Credits	**1**	
4	Contact Hours (L-T-P)	**0-0-2**	
	Course Status	Compulsory	
5	Course Outcomes	CO1: To define about the importance of urinary system CO2: To describe the location and importance of glands CO3: To explain the importance and role of different types of nerves CO4: To define the importance and parts of Brain CO5: To describe the importance and location of Sensory organs CO6:To analyze and applied aspects of various systems of human body.	
6	Course Description	To define the importance of all the body systems and importance of it in our body.	
7	Outline syllabus	**PRACTICAL'S**	CO mapping
	Unit 1	**Urinary Tract Infection**	CO1, CO6
	A	Demonstration of parts of urinary system	CO1, CO6
	B	Histology of kidney, ureter and urinary bladder	CO1, CO6
	C	Radiograph related to urinary system	CO1, CO6
	Unit 2	**Reproductive System**	CO2
	A	Demonstration of reproductive organ	CO2
	B	Radiograph related to reproductive system	CO2
	C	Function of reproductive organ	CO2
	Unit 3	**Nervous system**	CO3
	A	Demonstration of brainstem and spinal cord	CO3

	B	Demonstration of cerebrum		CO3
	C	Demonstration of cerebellum		CO3
	Unit 4	**Glands**		CO4, CO6
	A	Demonstration of glands		CO4 , CO6
	B	Histology of pituitary gland and thyroid gland.		CO4, CO6
	C	Histology of parathyroid and suprarenal gland.		CO4, CO6
	Unit 5	**Sensory organs**		CO5, CO6
	A	Histology of thick skin & thin skin		CO5, CO6
	B	Histology of tongue		CO5, CO6
	C	Demonstration of tongue		CO5, CO6
	Mode of examination	Practical		
	Weightage Distribution	CA	ETE	
		25	75	
	Text Books	**1.Color Atlas of Cytology, Histology, and Microscopic Anatomy - Bio Nica** **2.Netter's Concise Radiologic Anatomy - MedEd Connect**		

Course code	Course Name		PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2	PSO 3
	HUMAN ANATOMY-II (LAB)	CO1	3	3	3	3	2	1	3	2	1
		CO2	3	3	2	3	2	1	3	1	1
		CO3	3	3	3	3	2	3	3	1	1
		CO4	3	3	3	3	2	2	3	2	1
		CO5	3	3	3	3	2	1	3	2	1
		CO6	3	3	3	3	2	2	3	1	1
		Avg PO attainted	3.0	3.0	2.83	3.0	2.0	1.66	3.0	1.5	1.0

HPY 251 - HUMAN PHYSIOLOGY –II (LAB)

School: SSAHS		**Batch : 2022-25**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: 2**	
1	**Course Code**	**HPY 251**	
2	**Course Title**	**HUMAN PHYSIOLOGY –II (LAB)**	
3	**Credits**	**1**	
4	**Contact Hours (L-T-P)**	**0-0-2**	
5	Course Outcomes	CO1: To find out DLC estimation CO2: To explain TLC estimation CO3: To apply the importance of arterial blood pressure measurement CO4: To examine Radial pulse measurement CO5:To explain Blood indices measurement Co6: To formulate hematology and clinical physiology.	
6	Course Description	• 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,CO6
		a. Introduction of DLC b. Preparation of Blood Smear c. Staining of smear	
	Unit 2	**Differential Leucocyte Count -2**	CO2,CO6
		a. Fixation of smear b. Identification of cells c. Counting of DLC from microscope.	
	Unit 3	**Arterial Blood Pressure measurement**	CO3,CO6

		a. Introduction of Arterial Blood pressure b. Palpatory method c. Auscultatory method			
	Unit 4	**Radial Pulse measurement**			CO4,CO6
		a. Introduction of Radial pulse b. Rate , character of pulse c. Rhythm, volume of pulse.			
	Unit 5	**Effect of posture on Blood pressure**			CO5,CO6
		a. Arterial BP in lying position b. Arterial BP in sitting position c. Arterial BP in standing position.			
	Mode of examination	Practical's			
	Weightage Distribution for Practical's	CA	MTE	ETE	
		25%	0%	75%	
	Text book/s*	Textbook: ● Manual Of Practical Physiology, AK Jain Reference: ● Ghai's A Textbook of Practical Physiology			

BCY 251 -BIOCHEMISTRY –II(LAB)

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT CVT		**Semester: 2**	
1	**Course Code**	**BCY 251**	
2	**Course Title**	**BIOCHEMISTRY –II(LAB)**	
3	**Credits**	**1**	
4	**Contact Hours (L-T-P)**	**0-0-2**	
5	Course Outcomes	CO1: Build the ability to understand the importance of different types of acids CO2: Create the knowledge about the importance of different types of bases CO3: Develop the understanding to know the importance of different types of solutions CO4: Build the ability to understand the importance of different types of reagents CO5: To understand the importance of biomolecules CO6: To understand various ways to identify the biomolecules	
6	Course Description	● 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	**Preparation of reagents of different concentration**	CO1, CO2
		a) Preparation of acid of different concentration b) Preparation of bases of different concentration	

		c) Preparation of reaagents of different concentration			
	Unit 2	Qualitative analysis of Carbohydrates-1			CO1, CO2, CO4
		a) Molisch' test b) Iodine test c) Benedict's test			
	Unit 3	Qualitative analysis of Carbohydrates-2			CO1, CO3, CO4
		a) Barfoed's test b) Seliwanoff's test c) Hydrolysis of Sucrose			
	Unit 4	Qualitative analysis of Proteins			CO4, CO5,CO6
		a) Biuret test b) Esbach test c) Xanthoproteic test			
	Unit 5	**Qualitative analysis of Proteins**			CO5,CO6
		a) Hopkins cole test b) Millon's test c) Sulphur test of cysteine			
	Mode of examination	Theory and Practical			
	Weightage Distribution for Theory	CA	MTE	ETE	
		25%	25%	50%	
	Weightage Distribution for Practical's	CA	VIVA	ETE	
		25%	25%	50%	

	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 Lehringer 4. Clinical chemistry by Varley 5. Harpers Illustrated Biochemistry by Robert K.M.	

CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	0	3	3	3	3	3	3	2	3
CO2	3	2	0	3	3	3	2	3	3
CO3	3	0	3	3	3	3	3	3	3
CO4	0	3	3	0	3	3	3	2	3
CO5	3	3	3	3	2	3	3	3	3
CO6	3	3	3	3	2	3	3	3	3
Avg PO attainted	2.00	2.33	2.50	2.50	2.67	3.00	2.83	2.67	3.00

PAT 251 - PATHOLOGY-II LAB

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: II**	
1	Course Code	**PAT 251**	
2	Course Title	**PATHOLOGY–II LAB**	
3	Credits	**1**	
4	Contact Hours (L-T-P)	**0-0-2**	
	Course Status	Compulsory	
5	Course Outcomes	CO1: To define the importance of Histopathology testing CO2: To explain the importance of instruments in Histopathology CO3: To describe the importance of section cutting CO4: To define the importance of Tissue processing CO5: To analyze the importance of tissue staining CO6: To explain the importance of H&E staining	
6	Course Description	• Histopathology • Instrumentation in histopathology • Section cutting • Tissue processing for routine paraffin sections • Staining of tissues-H & E staining	
7	Outline syllabus	**PRACTICAL'S**	CO mapping
	Unit 1	**Instruments of Histopathology-1**	CO1, CO2
	A	To demonstrate organization of histopathology Laboratory	CO1,CO2
	B	To Study the principle & use of various instrument in histopathology laboratory	CO1, CO2
	C	Microscope, Microtome, microtome blades	CO1, CO2
	Unit 2	**Instruments of Histopathology-II**	CO1, CO2, CO4
	A	To Study the principle & use of wax bath, slide warmer, tissue floating bath, digital balance used in histopathology laboratory	CO1, CO2, CO4

	B	To demonstrate principle, construction & working of Compound microscope			CO1, CO2, CO4
	C	Electron Microscope			CO1, CO2, CO4
	Unit 3	**Fixation**			CO1, CO3, CO4
	A	Process of reception, recording & labeling of various histopathology specimen.			CO1, CO3, CO4
	B	To prepare various fixatives			CO1, CO3, CO4
	C	Demonstrate the process of tissue fixation in Histopathology.			CO1, CO3, CO4
	Unit 4	**Embedding**			CO4, CO5,CO6
	A	To demonstrate the principle and method of tissue embedding using paraffin wax.			CO4, CO5,CO6
	B	To demonstrate the process of decalcification of calcified tissue before processing.			CO4, CO5,CO6
	C	To demonstrate the process of Washing and preparation of wash buffer			CO4, CO5,CO6
	Unit 5	**Microtomy**			CO5, CO6
	A	To study principle, working, maintenance of Microtome & Honing & stropping tecHniques			CO5, CO6
	B	Used for correcting fault and remedies of microtome knives			CO5, CO6
	C	To demonstrate principle and method of Hematoxylin and eosin staining techniques			CO5, CO6
	Mode of examination	Practical			
	Weightage Distribution	CA	CE	ETE	
		25	25	50	
	Text Books	1. Clinical diagnosis by Laboratory method by Todd and Sanford by Davidsohn-Wells, W.B. Saunders, 2016 2. Laboratory Technology by Ramnic Sood, January 2015, Jaypee Brothers Medical Publishers			

		3. Practical Haematology by Dacie and Lewis, Eleventh Edition • 2011, Barbara J. Bain, Imelda Bates **4.** Text book of Pathology by Krishna, V. Krishna (Author), Orient Longman, 2004 **5.** An Introduction to medical laboratory technology, F.J. Baker et al., Butter works and co. , London. **6.** Bancroft and Stevens ,Theory and practice of Histological Techniques, Butterworth's London	

Course code	Course Name		PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2	PSO 3
	PATHOLOGY- II	CO1	3	3	3	3	2	1	3	3	1
		CO2	3	3	2	3	2	1	3	2	1
		CO3	3	3	3	3	2	1	3	3	1
		CO4	3	3	2	3	2	1	3	3	1
		CO5	3	3	3	3	2	1	3	3	1
		CO6	3	3	3	3	2	1	3	3	1
		Avg PO attainted	3.0	3.0	2.66	3.0	2.0	1.0	3.0	2.83	1.0

MIB 251 - MICROBIOLOGY–II (LAB)

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: 2**	
1	**Course Code**	**MIB 251**	
2	**Course Title**	**MICROBIOLOGY–II (LAB)**	
3	**Credits**	**1**	
4	**Contact Hours (L-T-P)**	**0-0-2**	
5	Course Outcomes	CO1: To understand the importance of Staining of bacterial strains CO2: To understand the importance of Viral infections CO3: To understand the importance of Fungal infections CO4: To understand the importance of parasite staining CO5: To understand the importance of biomedical waste management through visit	
6	Course Description	• Bacteriology • Virology • Mycology • Parasitology • Hospital acquired infections	
	Practical's		CO mapping
	Unit- 1	Staining of a) Staphyloccci b) Bacillus c) Pseudomonas	CO1
	Unit-2	Lab diagnosis of a) Herpes b) Hepatitis, HIV, Rabies c) Poliomyelitis	CO2
	Unit-3	Lab diagnosis of a) candida, Cryptococcus b) dermatophytes	CO3

		c) opportunistic fungi			
	Unit-4	Stool examination for a) Ova b) Cyst c) Parasite			CO4
	Unit 5	a) Visit to hospital for demonstration of biomedical waste management-1 (Observation) b) Visit to hospital for demonstration of biomedical waste management-2 (Working) c) Visit to hospital for demonstration of biomedical waste management-3 (Disposal)			CO5
	Mode of examination	Theory and Practical			
	Weightage Distribution for Theory	CA	MTE	ETE	
		25%	25%	50%	
	Weightage Distribution for Practical's	CA	MTE	ETE	
		25%	0%	75%	
	Text book/s*	7. Anathanarayana & Panikar Medical Microbiology 8. Roberty Cruckshank – Medical Microbiology – The Practice of Medical Mircrobiology 9. Chatterjee – Parasitology – Interpretation to Clinical medicine 10. Rippon – Medical Mycology 11. Emmons – Medical mycology 12. Basic laboratory methods in Parasitology, 1st Ed, J P Bros, New Delhi 13. Basic laboratory procedures in clinical bacteriology, 1st Ed, J P Brothers 14. Medical Parasitology – Ajit Damle			

CO1	3	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

CO1	3	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

BCVT 3RD SEMESTER

School: SSAHS		**Batch: 2023-27**	
Programme: BCVT		**Current Academic Year: 2024-2025**	
Branch: CVT		**Semester: 3rd**	
1	Course Code	BCVT 311	
2	Course Title	Medicine Relevant to Cardiac care technology - I	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Type	Compulsory	
5	Course Objective	This course provides students to evaluates the concept of Haematology, respiratory system, renal system and CNS and to understand the CVS disease and problems of metabolic syndrome and age specified problem.	
6	Course Outcomes	CO1: To define the CVS disease CO2: To Describe the concepts of Haematology CO3: To Apply the concepts of Respiratory system CO4: To Analyze the concept of CNS CO5: To assess the importance of metabolic syndrome and age specified problems CO6: To evaluate the concept of Renal system	
7	Course Description	To understand the knowledge of cardiovascular system, renal system, CNS, respiratory system and medicine relevant to cardio care technology.	
8	Outline syllabus		CO Mapping
	Unit 1	**Cardiovascular system-1**	
	A	Ischemic Heart Disease- General, Angina pectoris	CO1,
	B	Ischemic Heart Disease- MI	CO1
	C	Rheumatic heart disease	CO1, CO6
	Unit 2	**Cardiovascular system-2**	
	A	Congenital heart disease	CO2
	B	Hypertension	CO2
	C	Aortic Aneurysm	CO2, CO6
	Unit 3	**Cardiovascular system-3**	
	A	Cardiomyopathy	CO3
	B	Peripheral vascular disease	CO3
	C	Pulmonary edema and LV failure	CO3, CO6
	Unit 4	**Haematology**	
	A	Anaemia	CO4
	B	Bleeding disorders	CO4
	C	Laboratory tests used to diagnose bleeding disorders (in brief)	CO4CO6
	Unit 5	**Respiratory system**	

	A	Respiratory system – General			CO5
	B	Chronic obstructive airway diseases (COPD)			CO5
	C	Concept of obstructive versus restrictive pulmonary disease PFT and its interpretation			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	
	Text book/s*	1. Harrison principle of internal medicine 2. Davidson principle and practice of medicine			

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	3	1	3	2	1	2	2	2	3
CO2	3	3	2	2	3	2	3	2	3	2
CO3	2	3	2	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	2	2
CO5	2	2	2	2	2	2	2	2	2	2
CO6	1	2	3	1	2	3	1	2	3	1
PO Attainment	2.1	2.6	2.1	2.3	2.5	2.3	2.3	2.1	2.5	2.1

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT-311	Medicine Relevant to Cardiac care technology - I	2	2	2.16	1.33	2.83	2.66	2.66	2.66	3	2.66

Total: 20
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2024-2025**	
Branch: CVT		**Semester: 3rd**	
1	Course Code	BCVT 312	
2	Course Title	APPLIED PATHOLOGY I	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Type	Compulsory	
5	Course Objective	• This course provides students the basic principles and application relevance of clinical disease for students who are in preparation for laboratory technologists. 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, INRs, and aPTT's, for the proper diagnosis and effective treatment of patients with hematologic, bleeding, and thrombotic disorders.	
6	Course Outcomes	CO1: To Describe the importance of haematology CO2: To analyse the importance of Special haematological tests CO3: To interpret the importance of Haemostasis and coagulation CO4: To evaluate the importance of types of Anaemia CO5: To define the importance of Bone marrow biopsy study CO6: Integrate the importance of Quality control in Histopathology	
7	Course Description	Applied pathology provides students with knowledge and understanding of the haematology, anaemia, bone marrow biopsy study.	
8	Outline syllabus		CO Mapping
	Unit 1	**Haematology**	
	A	Definition, classification Laboratory investigations for Anaemia's including megaloblastic anaemia, iron deficiency anaemia, haemolytic anaemia	CO1,
	B	Definition, classification, and laboratory diagnosis of leukaemia, Bone marrow composition & function, aspiration of bone marrow, preparation of Bone marrow slides and staining	CO1
	C	Thalassemia: Alpha Thalassemia	CO1, CO6
	Unit 2	**Special haematological tests**	
	A	Sickling tests and Osmotic fragility test, DeSemesterination HBF and HBA2, Haemoglobin electrophoresis, Investigation of G6PD deficiency.	CO2
	B	Plasma haptoglobin and demonstration of hemosiderin in urine.	CO2
	C	Tests for autoimmune haemolytic anaemia, Measurement of abnormal Hb pigments	CO2, CO6
	Unit 3	**Haemostasis and coagulation**	

	A	A Haemophilia, Idiopathic Thrombocytopenic Purpura. Normal haemostasis, mechanism of blood coagulation and normal fibrinolytic system. Collection of blood and anticoagulants used in coagulation studies.			CO3
	B	Investigation of haemostatic mechanism-BT, CT, whole blood coagulation time test, PT., Assay of clotting factors.			CO3
	C	Tests for fibrinolytic activity- Euglobulin, clot lysis test and platelet function tests.			CO3, CO6
	Unit 4	**Anaemia**			
	A	Investigation of megaloblastic anaemia and iron deficiency anaemia			CO4
	B	B12 and folate assay and Schilling test			CO4
	C	Estimation of serum iron and iron binding capacity			CO4, CO6
	Unit 5	**Bone marrow biopsy study**			
	A	Needle aspiration and surgical biopsy technique			CO5
	B	Preparation of smears and staining. Demonstration of LE cells, Cytochemistry.			CO5
	C	Administration in haematology and quality control			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	
	Text book/s*	• Harrison principle of internal medicine • Davidson principle and practice of medicine			

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	3	1	3	2	1	2	2	2	3
CO2	3	3	2	2	3	2	3	2	3	2
CO3	2	3	2	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	2	2
CO5	2	2	2	2	2	2	2	2	2	2
CO6	1	2	3	1	2	3	1	2	3	1
PO Attainment	2.1	2.6	2.1	2.3	2.5	2.3	2.3	2.1	2.5	2.1

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO 3
BCVT-312	APPLIED PATHOLOGY I	2	2	2.16	1.33	2.83	2.66	2.66	2.66	3	2.66

Total: 15.8
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch :** 2023-27	
Programme: BCVT		**Current Academic Year: 2024-25**	
Branch: CVT		**Semester: 3rd** Semester	
1	Course Code	BCVT 313	
2	Course Title	Applied Microbiology – 1	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Type	Compulsory	
5	Course Objective	This course provide a knowledge about health care associated infections, antimicrobial resistance, methodology of disinfection equipment's, central supply department, sterilization techniques.	
6	Course Outcomes	CO1:To describe the importance of health care associated infection and antimicrobial resistance CO2: To evaluate the importance of disease communicable in hospitals and preventive measures CO3:To interpret the the various ways of microbiological surveillance and sampling CO4: To Appraise the importance of diagnosing diseases CO5: To Evaluate the importance of sterilization techniques CO6: To Integrate the approaches for decision making and well being.	
7	Course Description	This course provides a knowledge about Health care associated infections and antimicrobial resistance, Disease communicable to healthcare workers in hospital set up and its preventive measure,Microbiological surveillance and sampling, Sterilization and importance of sterilization.	
8	**Outline syllabus**	**Theory**	**CO Mapping**
	Unit 1	**Health care associated infections and antimicrobial resistance-1**	
	A	Infections that patients acquire during the course of receiving treatment for other conditions within a healthcare setting like a) Methicillin Resistant Staphylococcus aureus infections,	CO 1
	B	Infections caused by Clostridium difficle,	CO1
	C	Vancomycin resistant enterococci etc	CO1
	Unit 2	**Health care associated infections and antimicrobial resistance-2**	
	A	Catheter related blood stream infections, Ventilator associated pneumonia, Catheter Related urinary tract infections.	CO2
	B	Surveillance of emerging resistance and changing flora.	CO2
	C	The impact and cost attributed to Hospital Associated infection.	CO2, CO6

	Unit 3	**Disease communicable to healthcare workers in hospital set up and its preventive measure-1**				
	A	Occupationally acquired infections in healthcare professionals by respiratory route Tuberculosis				CO3
	B	Varicella-zoster				CO3, CO6
	C	Respiratory syncytial virus etc				CO3
	Unit 4	**Disease communicable to healthcare workers in hospital set up and its preventive measure-2**				
	A	Occupationally acquired infections in healthcare professionals by respiratory route Blood borne transmission (HIV, Hepatitis B, Hepatitis C, Cytomegalovirus, Ebola virus etc)				CO4
	B	Oro faecal route (Salmonella, Hepatitis A etc)				CO4
	C	Direct contact (Herpes Simplex Virus etc)				CO3, CO6
	Unit 5	**Disease communicable to healthcare workers in hospital set up and its preventive measure-3**				
	A	Preventive measures to combat the spread of these infections by monitoring				CO5
	B	Control				CO5, CO6
	C	Observation				CO5
	Mode of Examination	Theory				
	Weightage distribution	CA	MTE	ETE		
		25%	25%	50%		

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	3	1	3	2	1	2	2	2	3
CO2	3	3	2	2	3	2	3	2	3	2
CO3	2	3	2	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	2	2
CO5	2	2	2	2	2	2	2	2	2	2
CO6	1	2	3	1	2	3	1	2	3	1
PO Attainment	2.1	2.6	2.1	2.3	2.5	2.3	2.3	2.1	2.5	2.1

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO 3
BCVT-313	Applied Microbiology - 1	2	2	2.16	1.33	2.83	2.66	2.66	2.66	3	2.66

Total: 14.8
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch:** 2023-27	
Programme: BCVT		**Current Academic Year: 2024-25**	
Branch: CVT		**Semester: 3rd semester**	
	Course Code	BCVT 314	
2	Course Title	Applied Pharmacology - I	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Status	Compulsory	
5	Course Objective	This course enable to understand the basic scientific concepts and principles related to pharmacokinetics, pharmacodynamics and able to analyse the drug metabolism, drug-drug interaction, route of administration, drug action, drug efficacy and potency, drug toxicity etc.	
6	Course Outcomes	CO1: To define the concepts of pharmacological principles CO2: To apply the mechanism of action of ANS drugs, CVS drugs, anaesthetic drugs CO3: To evaluate the mechanism of action of analgesics, antihistaminic, antiemetics drugs CO4: To analyse the mechanism of action of CNS stimulants, depressants, emergency drugs CO5: To define the mechanism of action of diuretics , corticosteroids CO6:To interpret the methods of chemotherapy.	
7	Course Description	This course enable to understand Pharmacological principles, Autonomic nerves system,Cardiovascular drugs, Anaesthetic drugs, Antihistamine and Antiemetics, CNS stimulants and depressants and inhalational gas and emergency drugs.	
8	Outline syllabus	Theory	CO Mapping
	Unit 1	**Pharmacological principles**	
	A	General concepts about Pharmacodynamic	CO1
	B	Pharmacokinetic	CO1
	C	Principles involved in drug activity	CO1
	Unit 2	**Autonomic nerves system**	
	A	Anatomy & functional organisation.	CO2
	B	List of drugs acting an ANS including dose, route of administration, indications	CO2
	C	contra indications and adverse effects	CO2
	Unit 3	**Cardiovascular drugs**	
	A	antihypertensives, antiarrhythmic, cardiac glycosides, sympathetic and nonsympathetic inotropic agents	CO2
	B	coronary vasodilators, antianginal and antifailure agents, lipid lowering & antiatherosclerotic drugs	
	C	drugs used in haemostasis, cardioplegic drugs, primary solutions, drugs used in shock	

	Unit 4	**Anaesthetic drugs**			
	A	Definition of general and local anaesthetics., Classification of general anaesthetics.			CO4
	B	Pharmacokinetics and Pharmacodynamics of inhaled anaesthetic agents. Intravenous general anaesthetic agents.			**CO4**
	C	Local anaesthetics – classification mechanism of action, duration of action and methods to prolong the duration of action. Preparation, dose and routes of administration			
	Unit 5	**Analgesics drugs**			
	A	Definition and classification			CO5
	B	Routes of administration, dose, frequency of administration			CO5
	C	Side effects and management of non-opioid and opioid analgesics			CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	3	1	3	2	1	2	2	2	3
CO2	3	3	2	2	3	2	3	2	3	2
CO3	2	3	2	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	2	2
CO5	2	2	2	2	2	2	2	2	2	2
CO6	1	2	3	1	2	3	1	2	3	1
PO Attainment	2.1	2.6	2.1	2.3	2.5	2.3	2.3	2.1	2.5	2.1

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT-314	Applied Pharmacology - I	2	2	2.16	1.33	2.83	2.66	2.66	2.66	3	2.66

Total: 20
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch: 2023-27**	
Programme: BCVT		**Current Academic Year: 2024-25**	
Branch: CVT		**Semester: 3rd**	
1	Course Code	BCVT 315	
2	Course Title	Introduction to Cardiac Care Technology - I	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Status	Compulsory	
5	Course Objective	To course enables students to become a trained, qualified cardiovascular technician capable of working independently or in association with a higher setup. It also helps to integrate knowledge and skills of cardiovascular technology to provide health care solutions for the benefit of the society.	
6	Course Outcomes	CO1: To analyse knowledge of human cardiovascular and its related system in the diagnosis, cardiovascular disorder & it's management. CO2: To apply and implement clinical & scientific activities related the profession of cardiovascular technology. CO3: To evaluate future challenges through lifelong learning & training process related to cardiac health. CO4: To define diagnosis and solve complex problems arising during cardiovascular care of the patients. CO5: To apply modern tools and techniques in the field of cardiovascular technology for patient compliance. CO6: Create the activities will help the students to develop exposure about patient handling.	
7	Course Description	This course provides an information about Introduction of Electrocardiography,Safety measurements during Echocardiography procedures & Limitation,Patient preparation during Electrocardiography, Echocardiography, Treadmill Test, introduction of different types of Pacemakers, Introduction of Valvular Heart Disease, Coronary Artery Disease, & Congestive Heart Disease,	
8	Outline syllabus: Theory		CO Mapping
	Unit 1	**ECG Basic Principles**	
	A	Electrocardiography & its paper.	CO1
	B	Basic ECG and deflections & its ECG basic action.	CO1
	C	The leads: Standard Limb, Pericardial Lead, 'V' lead & 'AV' lead Basic ECG Deflections	CO1
	Unit 2	**Normal EG The 'p' wave**	
	A	The genesis of 'qrs'complex, T wave, the ST segment, The' U' wave.	CO2
	B	Rate & Rhythm.	CO2
	C	Morphology of 'P' wave. qrs complex, & T wave.	CO2
	Unit 3	**Electric Axis**	
	A	Pericardial Pattern of ECG.	CO3,CO6
	B	So called rotation of the heart –The QT interval	CO3

	C	The Electric Field			CO3
	Unit 4	**Chamber Enlargement**			
	A	Atrial enlargement, LV Hypertrophy, RV Hypertrophy.			CO4,CO6
	B	Principles of Bundle Branch B locks, LBBB, RBBB.			CO4
	C	The Hemiblocks.			CO4
	Unit 5	**Exercise Stress Testing.**			
	A	Exercise & its protocols			CO5,CO6
	B	Electrocardiography Measurements			CO5
	C	Exercise Testing-Indications & Techniques			CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	
	Text book/s*				

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	3	1	3	2	1	2	2	2	3
CO2	3	3	2	2	3	2	3	2	3	2
CO3	2	3	2	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	2	2
CO5	2	2	2	2	2	2	2	2	2	2

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT-315	Introduction to Cardiac Care Technology - I	1.5	2.1	2.3	1.3	1.6	2.3	2.3	2.1	1.8	2

Total: 19.3
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

BCVT 4TH SEMESTER

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2024-2025**	
Branch: CVT Cardiovascular Technology		**Semester: 4**	
1	Course Code	**BCVT 411**	
2	Course Title	**Medicine Relevant to Cardiac Care Technology - II**	
3	Credit Hours	4	
4	Contact Hours (L-T-P)	**3-1-2**	
	Course Status	Compulsory	
5	Course Objective	The course is an introduction to cardiovascular disease to make the students able to do routine investigation to identy various cardiac disease and provind assistance to cardiologist.	
6	Course Outcomes	CO1: To analyse the concepts of cardiovascular system CO2: To evaluate the importance of Hematology CO3: To describe the concepts of Respiratory sytem CO4: To interpret the concepts of CNS CO5: To integrate the age specified problems CO6: To analyse the importance of metabolic syndrome and age specified problems	
7	Course Description	This course provides knowlwdge about cardiovascular system hematology, CNS ,Respiratory System, DM ,etc	
8	Outline syllabus		CO Mapping
	Unit 1	**Renal system**	
	A	ARF & CRF	CO1
	B	End stage renal disease	CO1
	C	Role of dialysis and renal transplantation in its management	CO1
	Unit 2	**Central Nervous System**	
	A	Autonomic nervous system Sympathetic	CO2
	B	ANS- Parasympathetic system	CO2
	C	Brief mention of CNS disorders & their etiology	CO2
	Unit 3	Diabetes mellitus	
	A	Diabetes mellitus-Type1&2	CO2
	B	Other	CO2
	C	Obesity	CO2

	Unit 4	Pregnancy	
	A	Pregnancy-physiological variation	CO2, CO3
	B	Pregnancy-nutritional requirements	CO2, CO3
	C	Pregnancy-complication	CO2, CO3
	Unit 5	Paediatric patient	
	A	Paediatric patient-Neonate	**CO2,CO3**
	B	Paediatric patient-Infant	**CO2,CO3**
	C	Elderly patient	**CO2,CO3**

	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2	3	3	3	2	1	1	2	1
CO2	3	3	2	3	2	2	1	3	1	2
CO3	1	2	3	3	2	1	3	1	1	1
CO4	1	2	3	3	2	1	3	2	1	1
CO5	3	3	3	2	3	1	2	3	3	2
CO6	3	2	3	1	1	1	1	2	2	1

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT-411	**Medicine Relevant to Cardiac Care Technology - II**	2	2.33	2.83	2.5	2.5	2.16	1.33	2	1.66	1.33

Total: 20.64
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2024-2025**	
Branch: CVT Cardiovascular Technology		**Semester: 4**	
1	Course Code	**BCVT 412**	
2	Course Title	**Applied Pathology - II**	
3	Credit Hours	4	
4	Contact Hours (L-T-P)	**2-2-0**	
	Course Status	Compulsory	
5	Course Objective	• To introduce basic principles and application relevance of clinical disease for students who are in preparation for laboratory technologists andto provides knowledge of the structure and function of the major organ systems, including the molecular, biochemical and cellular mechanisms for maintaining homeostasis.	
6	Course Outcomes	CO1: To interprete use of Instrumentation CO2: To analyse of basic techniques used in pathology. CO3: To analyse staining technique CO4: To gain knowledge of mounting technique CO5: To know the concept of record maintenance CO6: To know importance of Computers in Laboratory	
7	Course Description	Applied pathology provides students with knowledge and understanding of the haematology, anaemia, bone marrow biopsy study.	
8	Outline syllabus		CO Mapping
	Unit 1	**Instrumentation :**	
	A	Automated tissue processor, Microtomes, knives, knife sharpeners and ultra-microtome	CO1
	B	Freezing microtome and cryostat	CO1
	C	Automatic slide stainer	CO1
	Unit 2	**Techniques**	
	A	Routine paraffin section cutting.	CO2

	B	Frozen section	CO2
	C	Cryostat section studies	CO2
	Unit 3	**Staining techniques**	
	A	Special stains for carbohydrates,	CO2
	B	Special stain for connective tissue, nervous tissue, bone tissue, collagen fibres, elastic fibres etc.	CO2
	C	Special stains for lipids, organisms, fungi, parasites, pigments and deposits in tissues	CO2
	Unit 4	**Mounting techniques**	
	A	Various mounts and mounting techniques	CO2, CO3
	B	Electron microscope, scanning electron microscope, dark ground and Fluorescent microscope	CO2, CO3
	C	**Maintenance of records and computer application:**	CO2, CO3
	Unit 5	Paediatric patient	
	A	Microphotography and its applications, maintenance of records and filing of slides	**CO2,CO3**
	B	ICDs classification and coding	**CO2,CO3**
	C	Application of computers in pathology.	**CO2,CO3**

	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2	3	3	3	2	1	1	2	1
CO2	3	3	2	3	2	2	1	3	1	2
CO3	1	2	3	3	2	1	3	1	1	1
CO4	1	2	3	3	2	1	3	2	1	1
CO5	3	3	3	2	3	1	2	3	3	2
CO6	3	2	3	1	1	1	1	2	2	1

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT-412	**Applied Pathology - II**	2	2.33	2.83	2.5	2.5	2.16	1.33	2	1.66	1.33

Total: 20.64
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2024-2025**	
Branch: CVT Cardiovascular Technology		**Semester: 4**	
1	Course Code	**BCVT 413**	
2	Course Title	**Applied Microbiology – II**	
3	Credit Hours	4	
4	Contact Hours (L-T-P)	**2-1-2**	
	Course Status	Compulsory	
5	Course Objective	• To introduce basic principles and application relevance of clinical disease for students who are in preparation for laboratory technologists andto provides knowledge of the structure and function of the major organ systems, including the molecular, biochemical and cellular mechanisms for maintaining homeostasis.	
6	Course Outcomes	CO1;To gain knowledge of health care associated infections, antimicrobial resistance, CO2:To nnalyse the health care associated disease. CO3; To able to Perform microbiological surveillance and sampling. CO4;To know the methodology of disinfection of instruments, patient care unit, CO5;To analyse various methods of sterilization of room, CO6To interpret methodology of disinfection equipments, central supply department, sterilization techniques	
7	Course Description	Applied pathology provides students with knowledge and understanding of the haematology, anaemia, bone marrow biopsy study.	
8	Outline syllabus		CO Mapping
	Unit 1	Microbiological surveillance and sampling-1	
	A	Required to deSemesterine the frequency of potential bacterial pathogens including ,Streptococcus pneumoniae,	CO1
	B	Haemophilus influenzae, and Moraxella catarrhalis and	CO1
	C	Also to assess the antimicrobial resistance	CO1
	Unit 2	Microbiological surveillance and sampling-2	
	A	rinse technique,	CO2
	B	direct surface agar plating technique.	CO2
	C	other	CO2
	Unit 3	Importance of sterilization:	
	A	Disinfection of instruments used in patient care: Classification, different methods, advantages and disadvantages of the various methods	CO2
	B	Disinfection of the patient care unit	CO2

	C	Infection control measures for ICU's	CO2
	Unit 4	Sterilization	
	A	Rooms: Gaseous sterilization, one atmosphere uniform glow discharge plasma (OAUGDP)	CO2, CO3
	B	Equipments: classification of the instruments and appropriate methods of sterilization	CO2, CO3
	C	Central supply department: the four areas and the floor plan for instrument Cleaning, high-level disinfecting and sterilizing areas	CO2, CO3
	Unit 5	Preparation of materials for autoclaving	
	A	Packing of different types of materials,	**CO2,CO3**
	B	loading,	**CO2,CO3**
	C	holding time and unloading.	**CO2,CO3**

	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2	3	3	3	2	1	1	2	1
CO2	3	3	2	3	2	2	1	3	1	2
CO3	1	2	3	3	2	1	3	1	1	1
CO4	1	2	3	3	2	1	3	2	1	1
CO5	3	3	3	2	3	1	2	3	3	2
CO6	3	2	3	1	1	1	1	2	2	1

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT-413	**Applied Microbiology – II**	2	2.33	2.83	2.5	2.5	2.16	1.33	2	1.66	1.33

Total: 20.64
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2024-2025**	
Branch: CVT Cardiovascular Technology		**Semester: 4**	
1	Course Code	**BCVT 414**	
2	Course Title	**Applied Pharmacology – II**	
3	Credit Hours	3	
4	Contact Hours (L-T-P)	**2-1-0**	
	Course Status	Compulsory	
5	Course Objective	1. To introduce the basic scientific concepts and principles related to pharmacokinetics, pharmacodynamics, and understand the drug metabolism, drug-drug interaction, route of administration, drug action, drug efficacy and potency, drug toxicity etc.	
6	Course Outcomes	CO1: To analyse the concepts of paharmacological principles CO2: To access the mechanism of action of ANS drugs, CVS drugs, anaesthetic drugs CO3: To access the mechanism of action of analgesics, antihistaminic, antiemetics drugs CO4: Tointerpret the mechanism of action of CNS stimulants,depressants, emergency drugs CO5: To interpret the mechanism of action of diuretics, cheomtherpy, corticosteroids CO6: To interpret the mechanism of action ofcheomtherpy, corticosteroids .	
7	Course Description	Applied pathology provides students with knowledge and understanding of the haematology, anaemia, bone marrow biopsy study.	
8	Outline syllabus		CO Mapping
	Unit 1	**Antihistamine and Antiemetics**	
	A	Classification, Mechanism of action,	CO1
	B	adverse effects,	CO1
	C	Preparations, dose and routes and administration	CO1
	Unit 2	**CNS stimulants and depressants and inhalational gas and emergency drugs**	
	A	alcohol, Sedatives, hypnotics and narcotics,CNS stimulants,neuromuscular blocking agents and muscle relaxants	CO2
	B	pharmacological protection of organs during CPB	CO2
	C	inhalational gaes and emergency drugs	CO2
	Unit 3	**Pharmacotherapy of respiratory disorders**	

	A	Introduction – Modulators of bronchial smooth muscle tone and pulmonary vascular smooth muscle tone	CO2,CO6
	B	Pharmacotherapy of bronchial asthma	CO2
	C	Pharmacotherapy of cough	CO2
	Unit 4	**Corticosteroids, Diuretics, Chemotherapy of infections**	
	A	Corticosteroids-Classification, mechanism of action, adverse effects and complications. Preparation, dose and routes of administration	CO2, CO3
	B	Diuretics	CO2, CO3
	C	Chemotherapy of infections	CO2, CO3
	Unit 5	**Miscellaneous**	
	A	IV fluids- various preparations and their usage. Electrolyte supplements	**CO2,CO3,CO6**
	B	Immunosuppressive agents	**CO2,CO3**
	C	New drugs included in perfusion technology.	**CO2,CO3**

	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2	3	3	3	2	1	1	2	1
CO2	3	3	2	3	2	2	1	3	1	2
CO3	1	2	3	3	2	1	3	1	1	1
CO4	1	2	3	3	2	1	3	2	1	1
CO5	3	3	3	2	3	1	2	3	3	2
CO6	3	2	3	1	1	1	1	2	2	1

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT-414	**Applied Pharmacology – II**	2	2.33	2.83	2.5	2.5	2.16	1.33	2	1.66	1.33

Total: 20.64

Strength of Correlation

1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**

3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch : 2023-27**
Programme: BCVT		**Current Academic Year: 2024-2025**
Branch: CVT Cardiovascular Technology		**Semester: 4**
1	Course Code	**BCVT 415**
2	Course Title	Introduction to Cardiac Care Technology - II
3	Credit Hours	5
4	Contact Hours (L-T-P)	**3-1-2**
	Course Status	Compulsory
5	Course Objective	This course enables students to become a trained, qualified cardiovascular technician capable of working independently or in association with a higher setup and to integrate knowledge and skills of cardiovascular technology to provide health care solutionsfor the benefit of the society.
6	Course Outcomes	CO1: To apply knowledge of human cardiovascular and it's related system in the diagnosis.. CO2: To plan and implement clinical & scientific activities related the profession of cardiovascular technology. CO3: To tackle future challenges through lifelong learning & training process related to cardiac health. CO4: To diagnose and solve complex problems arising during cardiovascular care of the patients. CO5: To utilize modern tools and techniques in the field of cardiovascular technology for patient compliance. CO6: To apply knowledge of cardiovascular disorder & it's management.
7	Course Description	Applied pathology provides students with knowledge and understanding of the haematology, anaemia, bone marrow biopsy study.
8	Outline syllabus		CO Mapping
	Unit 1	**Echocardiography**	
	A	Basic Principles of E chocardiography.	CO1
	B	Modalities of Echo (M- mode, 2D, Color Doppler).	CO1
	C	Transoesophageal Echocardiography.	CO1
	Unit 2	**Instrumentations.**	
	A	Basic pulse echo system & Transducer.	CO2
	B	Pulse generation & Echo Detection.	CO2
	C	Modalities, Display & Record.	CO2

	Unit 3	Echocardiographic Examination.	
	A	Selecting Transducer's, Position of the patient, Placement of the Transducer.	CO2,CO6
	B	Setting Control (M –mode Labelling, 2D Echo, Normal Variants, Semesterinology.	CO2
	C	Identification of Segments.	CO2
	Unit 4	Doppler Echocardiography	
	A	Introduction to Doppler Color Echocardiography the Doppler principles, Doppler ultrasound techniques, Color Doppler flow Imaging, Clinical application of Doppler Echocardiograph.	CO2, CO3
	B	Physical principles & Instrumentation in Spectral & Color Doppler flow imaging, Physical principles & Doppler effect, The Doppler Echocardiography system. Blood Flow Pattern (Laminar & Non Laminar).	CO2, CO3
	C	a) Doppler Echo Modes (Continuous Doppler System, Pulsed Doppler System, High pulse repetition frequency). •	CO2, CO3
	Unit 5	**Contrast Echocardiography**	
	A	Echo measurements-' ASE ' recommendation.	**CO2,CO3, CO6**
	B	Types of dye's used.	**CO2,CO3**
	C	Nephrotoxic effect of dye used in contrast echo.	**CO2,CO3**
	Mode of examination	Theory	
	Weightage Distribution	CA: 25% / MTE: 25% / ETE: 50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2	3	3	3	2	1	1	2	1
CO2	3	3	2	3	2	2	1	3	1	2
CO3	1	2	3	3	2	1	3	1	1	1
CO4	1	2	3	3	2	1	3	2	1	1
CO5	3	3	3	2	3	1	2	3	3	2
CO6	3	2	3	1	1	1	1	2	2	1

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO 3
BCVT-415	Introduction to Cardiac Care Technology - II	2	2.33	2.83	2.5	2.5	2.16	1.33	2	1.66	1.33

Total: 20.64
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

BCVT 5TH SEMESTER

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2025-2026**	
Branch: CVT Cardiovascular Technology		**Semester: 5**	
1	Course Code	**BCVT 511**	
2	Course Title	Cardiac Care Technology – clinical – I	
3	Credit Hours	4	
4	Contact Hours (L-T-P)	**3-1-2**	
	Course Status	Compulsory	
5	Course Objective	The course is an introduction to cardiovascular disease to make the students able to do routine investigation to identy various cardiac disease and provind assistance to cardiologist	
6	Course Outcomes	CO1: To define normal ECG, basic abnormalities of ECG in various disease. CO2: To evaluate ECHO findings in various diseases. CO3: To assist cardiologist in cardiovascular disease. CO4: To analyse coronary and peripheral angiography views. CO5: To assess the quantitative analysis of glucose CO6: To integrate the principles of machines used in Cath labs.	
7	Course Description	Cardiac care technology provides student to examine the ECG ,Echocardiography, Holter monitoring,Treadmill Stress Testing in various Diseases also it helps to treat the student.	
8	Outline syllabus		CO Mapping
	Unit 1	**Interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD & CHD**	
	A	Normal ECG	CO1
	B	Abnormalities	CO1
	C	Interpretation	CO1
	Unit 2	**Echo in rheumatic heart disease**	
	A	Echo in mitral stenosis, mitral incompetence,	CO2
	B	aortic stenosis, aorticincompetence, pulmonary hypertension.	CO2
	C	Post AVR, post MVR. Prosthetic valve malfunction, LA clot.	CO2
	Unit 3	**Echo in congenitial heart disease**	
	A	Echo in ASD, VSD, PDA,	CO2
	B	pulmonary stenosis, aortic stenosis,	CO2
	C	coarctation of aorta, TOF. dextrocardia.	CO2

	Unit 4	**Echo in ischemic Heart Disease.**	
	A	Echo in acute myocardial infarction, old myocardial infarction and	CO2, CO3
	B	other ischemic heart disease related conditions,	CO2, CO3
	C	LV aneurysm,Measurements of all cardiac chambers,Assessment of cardiac function,Abnormalities	CO2, CO3
	Unit 5	**Echo in other cardiovascular disease**	
	A	Echo in various types of cardio myopathy infective endocardities diseases of aorta,	**CO2,CO3**
	B	Mitral valve prolapse,	**CO2,CO3**
	C	Myxoma and other cardio vascular diseases, Echo in pericardial disease,Pericardial effusion, Cardiac temponade, Constructive pericarditis.	**CO2,CO3**

	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2	3	3	3	2	1	1	2	1
CO2	3	3	2	3	2	2	1	3	1	2
CO3	1	2	3	3	2	1	3	1	1	1
CO4	1	2	3	3	2	1	3	2	1	1
CO5	3	3	3	2	3	1	2	3	3	2
CO6	3	2	3	1	1	1	1	2	2	1

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT511	Cardiac Care Technology – clinical – I	2	2.33	2.83	2.5	2.5	2.16	1.33	2	1.66	1.33

Total: 20.64
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2025-2026**	
Branch: CVT Cardiovascular Technology		**Semester: 5**	
1	Course Code	**BCVT 512**	
2	Course Title	Cardiac Care Technology Applied- I	
3	Credit Hours	4	
4	Contact Hours (L-T-P)	**3-1-2**	
	Course Status	Compulsory	
5	Course Objective	The course is an introduction to cardiovascular disease to make the students able to do routine investigation to identy various cardiac disease and provind assistance to cardiologist	
6	Course Outcomes	CO1: To define normal ECG, basic abnormalities of ECG in various disease. CO2: To evaluate ECHO findings in various diseases. CO3: To assist cardiologist in cardiovascular disease. CO4: To analyse coronary and peripheral angiography views. CO5: To assess the quantitative analysis of glucose CO6: To integrate the principles of machines used in Cath labs.	
7	Course Description	Cardiac care technology provides student to examine the ECG ,Echocardiography, Holter monitoring,Treadmill Stress Testing in various Diseases also it helps to treat the student.	
8	Outline syllabus		CO Mapping
	Unit 1	**ECG in myocardial infarction**	
	A	Definition of myocardial infarction, Diagnosis of myocardial infarction,	CO1
	B	ECG criteria for myocardial infarction,	CO1
	C	ECG in anterior wall, inferior wall,	CO1
	Unit 2	**ECG in rheumatic heart disease**	
	A	Definition of rheumatic heart disease,	CO2
	B	Valvular invovement in rheumatic heart disease,	CO2
	C	ECG in mitral stenosis, mitral incompetence, aortic stenosis and aortic incompetenance	CO2
	Unit 3	**ECG in hypertension**	
	A	Definition of hypertension,	CO2
	B	How to record blood pressure,	CO2
	C	ECG in hypertension	CO2
	Unit 4	**ECG in congenital heart disease**	
	A	Common congenital heart disease ASD, VSD, PDA,	CO2, CO3
	B	pulmonary stenosisaortic stenosis, coarctation of aorta,	CO2, CO3

	C	TOF, definition of all these conditions ,	CO2, CO3
	Unit 5	**ECG in other conditions**	
	A	ECG in various types of cardiomyopathy, myxoedema,	**CO2,CO3**
	B	pericardial effusion, acute pericardities and other vascular diseases.	**CO2,CO3**
	C	Bundle branch block, WPW syndrome, dextrocardia	**CO2,CO3**

	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2	3	3	3	2	1	1	2	1
CO2	3	3	2	3	2	2	1	3	1	2
CO3	1	2	3	3	2	1	3	1	1	1
CO4	1	2	3	3	2	1	3	2	1	1
CO5	3	3	3	2	3	1	2	3	3	2
CO6	3	2	3	1	1	1	1	2	2	1

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT 512	Cardiac Care Technology Applied- I	2	2.33	2.83	2.5	2.5	2.16	1.33	2	1.66	1.33

Total: 20.64
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2025-2026**	
Branch: CVT		**Semester: 5**	
1	Course Code	**BCVT 513**	
2	Course Title	Cardiac Care Technology Advanced- I	
3	Credit Hours	**8**	
4	Contact Hours (L-T-P)	**3-1-0**	
	Course Status	Compulsory	
5	Course Objective	The course is an introduction to cardiovascular disease to make the students able to do routine investigation to identy various cardiac disease and provind assistance to cardiologist	
6	Course Outcomes	CO1: To analyse the type of disease along with its treatment. CO2: To diagnose the patient the type of disease CO3: To assist cardiologist in cath lab. CO4: To access echo machine. CO5: To assess the doctor during patient emergency. CO6: To assist surgeons during bypass surgery.	
7	Course Description	Cardiac care technology provides student to examine the ECG ,Echocardiography, Holter monitoring,Treadmill Stress Testing in various Diseases also it helps to treat the student.	
8	Outline syllabus		CO Mapping
	Unit 1	**Cardiac monitoring**	
	A	Definition,	CO 1
	B	Purpose of cardiac monitoring,	CO1
	C	How to Recognise various arrhythmias	CO1
	Unit 2	**Interpretation of TMT**	
	A	Criteria for TMT positive test contraindication for TMT conditions where TMT is not useful,	CO1
	B	Complications that may occur in TMT room and its management	CO1
	C	Indications	CO1
	Unit 3	**Use of defibrillator**	
	A	Indications,	CO1
	B	How to use the defibrillator,	CO1

	C	Complications during the procedure and its management	CO1
	Unit 4	**Management of cardiac arrest and Myocardial perfusion scan**	
	A	Cardiac arrest Definition, Causes external cardiac massage,	CO1,CO2
	B	Artificial respiration and other drugs and procedures used in the management of Cardiac arrest	CO1,CO2
	C	MPI-Procedures,usefullness of myocardial perfusion scan precautions	CO1,CO2
	Unit 5	**Cardiac arrhythmias and Electrolyte disturbances**	
	A	Cardiac arrhythmiss-Bradyarrhythmia and Tachy arrhythmias and ECG diagnosis of all rhythm disturbances. Sinus arrhythmia, APC, FPC, VPC, VF, VT, AF, SVT, I^0HB, II^0HB, complete heart block	CO1,CO2
	B	I^0HB, II^0HB, complete heart block	CO1,CO2
	C	Electrolyte imbalance-ECG in hypokelemia, hyperkelemia	CO1,CO2
	Mode of Examination	Theory	
	Weightage distribution	CA: 25% / MTE: 25% / ETE: 50%	
	Text Book	• West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised By Hargar FV, Shuggart SG, & Palgne Palacio June, Macmillian Publishing Company New York. • Sethi Mohini (2005) Institution Food Management New Age International Publishers • Tripati P C & Reddy PW (2008) Principles of Management 3rd edition Tata Mc Graw Hill Book Company • Knight J B & Kotschevar LH (2000) Quantity Food Production Planning & Management 3rd edition John Wiley & Sons • Dessler Gary (2007) Human Resource Management 11th edition Prentice Hall New Jersey	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	2	1	2	3	2	1	-	3
CO2	2	2	2	2	1	3	2	1	3	-
CO3	3	1	1	1	1	3	2	1	-	2
CO4	2	1	2	2	2	1	2	-	2	1
CO.5	2	2	1	1	2	2	2	2	3	-
CO6	-	1	1	1	1	3	2	1	-	2

Course Code	**Course Name**	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO 3
BCVT-513	Cardiac Care Technology Advanced-I	2.00	1.33	1.33	1.00	3.00	3.00	0.50	1	1.3	1.3

Total: 15.76

Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

BCVT 6TH SEMESTER

School: SSAHS		**Batch : 2023-27**
Programme: BCVT		**Current Academic Year: 2025-2026**
Branch: CVT		**Semester: 6**
1	Course Code	**BCVT 611**
2	Course Title	Cardiac Care Technology Clinical- II
3	Credit Hours	**8**
4	Contact Hours (L-T-P)	**3-1-0**
	Course Status	Compulsory
5	Course Objective	The course is an introduction to cardiovascular disease to make the students able to do routine investigation to identify various cardiac disease and provind assistance to cardiologist
6	Course Outcomes	CO1: To analyse the type of disease along with its treatment. CO2: To diagnose the patient the type of disease CO3: To assist cardiologist in cath lab. CO4: To access echo machine. CO5: To assess the doctor during patient emergency. CO6: To assist surgeons during bypass surgery.
7	Course Description	Cardiac care technology provides student to examine the ECG ,Echocardiography, Holter monitoring,Treadmill Stress Testing in various Diseases also it helps to treat the student.
8	Outline syllabus		CO Mapping
	Unit 1	**Cardiac catheterisation laboratory**	
	A	a) General details of cardiac catheterisation equipment;	CO 1
	B	b) How to handle the machine, common problems one may come across;	CO1
	C	c) How to overcome it, radiation hazards.	CO1
	Unit 2	**Materials used in the cathlab**	
	A	All catheters, balloons, guidewires, pacemakers contrast material;	CO1
	B	Other material used in the cardiac catheterisation laboratory;	CO1
	C	Sterilization of all these materials	CO1
	Unit 3	**Right heart catheterisation**	

	A	Procedure;Cath position;	CO1
	B	Oxymetry at various levels;	CO1
	C	Angios done and its interpretation	CO1
	Unit 4	**Left heart catheterisation and Coronary angiogram**	
	A	Procedure;Cath position; Oxymetry at various levels;	CO1,CO2
	B	Angios done and its interpretation	CO1,CO2
	C	Artificial respiration and other drugs and procedures used in the management of Cardiac arrestprecautions	CO1,CO2
	Unit 5	**Peripheral angiogram**	
	A	Procedure,Materials used, Type and amount dye used, Indications and contraindications, Various pictures recorded in various angles and gross interpretation	CO1,CO2
	B	Type and amount dye used, Indications and contraindications,	CO1,CO2
	C	Various pictures recorded in various angles and gross interpretation	CO1,CO2
	Mode of Examination	Theory	
	Weightage distribution	CA: 25% / MTE: 25% / ETE: 50%	
	Text Book	• West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised By Hargar FV, Shuggart SG, & Palgne Palacio June, Macmillian Publishing Company New York. • Sethi Mohini (2005) Institution Food Management New Age International Publishers • Tripati P C & Reddy PW (2008) Principles of Management 3rd edition Tata Mc Graw Hill Book Company • Knight J B & Kotschevar LH (2000) Quantity Food Production Planning & Management 3rd edition John Wiley & Sons • Dessler Gary (2007) Human Resource Management 11th edition Prentice Hall New Jersey	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	2	1	2	3	2	1	-	3
CO2	2	2	2	2	1	3	2	1	3	-
CO3	3	1	1	1	1	3	2	1	-	2
CO4	2	1	2	2	2	1	2	-	2	1
CO.5	2	2	1	1	2	2	2	2	3	-
CO6	-	1	1	1	1	3	2	1	-	2

Course Code	**Course Name**	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO 3
BCVT-611	Cardiac Care Technology Advanced-I	2.00	1.33	1.33	1.00	3.00	3.00	0.50	1	1.3	1.3

Total: 15.76

Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2025-2026**	
Branch: CVT		**Semester: 6**	
1	Course Code	**BCVT 612**	
2	Course Title	Cardiac Care Technology Applied- II	
3	Credit Hours	**8**	
4	Contact Hours (L-T-P)	**3-1-0**	
	Course Status	Compulsory	
5	Course Objective	The course is an introduction to cardiovascular disease to make the students able to do routine investigation to identify various cardiac disease and provind assistance to cardiologist	
6	Course Outcomes	CO1: To analyse the type of disease along with its treatment. CO2: To diagnose the patient the type of disease CO3: To assist cardiologist in cath lab. CO4: To access echo machine. CO5: To assess the doctor during patient emergency. CO6: To assist surgeons during bypass surgery in cardiovascular disease.	
7	Course Description	Cardiac care technology provides student to examine the ECG ,Echocardiography, Holter monitoring, Treadmill Stress Testing in various Diseases also it helps to treat the student.	
8	Outline syllabus		CO Mapping
	Unit 1	**Stress Echo**	
	A	procedure	CO 1
	B	indications	CO1
	C	Precautions	CO1
	Unit 2	**Peripheral Doppler**	
	A	Procedure and	CO1
	B	usefullness of peripheral Doppler	CO1
	C	indications and contraindications	CO1
	Unit 3	**Coronary angioplasty**	
	A	Procedure,	CO1
	B	Materials used,	CO1
	C	Complication one may encounter and how to manage it	CO1
	Unit 4	**Peripheral Angioplasty and Fetal echocardiogram**	
	A	Procedure, Materials used,	CO1,CO2
	B	Complication one may encounter and how to manage it	CO1,CO2
	C	Fetal Echo-Procedure, Basic interpretation	CO1,CO2

		indications	
	Unit 5	**Contrast echocardiogram and Myocardial contrast echo**	
	A	procedure usefullness of contrast echocardiogram	CO1,CO2
	B	indications	CO1,CO2
	C	Myocardial contrast echo-indications Contraindications,procedure	CO1,CO2
	Mode of Examination	Theory	
	Weightage distribution	CA: 25% / MTE: 25% / ETE: 50%	
	Text Book	• West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised By Hargar FV, Shuggart SG, & Palgne Palacio June, Macmillian Publishing Company New York. • Sethi Mohini (2005) Institution Food Management New Age International Publishers • Tripati P C & Reddy PW (2008) Principles of Management 3rd edition Tata Mc Graw Hill Book Company • Knight J B & Kotschevar LH (2000) Quantity Food Production Planning & Management 3rd edition John Wiley & Sons • Dessler Gary (2007) Human Resource Management 11th edition Prentice Hall New Jersey	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	2	1	2	3	2	1	-	3
CO2	2	2	2	2	1	3	2	1	3	-
CO3	3	1	1	1	1	3	2	1	-	2
CO4	2	1	2	2	2	1	2	-	2	1
CO.5	2	2	1	1	2	2	2	2	3	-
CO6	-	1	1	1	1	3	2	1	-	2

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO 3
BCVT-612	Cardiac Care Technology Applied-II	2.00	1.33	1.33	1.00	3.00	3.00	0.50	1	1.3	1.3

Total: 15.76

Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

CARDIAC CARE TECHNOLOGY -ADVANCED-II

School: SSAHS		**Batch : 2023-27**
Programme: BCVT		**Current Academic Year: 2025-2026**
Branch: CVT		**Semester: 6**
1	Course Code	**BCVT 613**
2	Course Title	Cardiac Care Technology Advanced- II
3	Credit Hours	**8**
4	Contact Hours (L-T-P)	**3-1-0**
	Course Status	Compulsory
5	Course Objective	The course is an introduction to cardiovascular disease to make the students able to do routine investigation to identify various cardiac disease and provind assistance to cardiologist
6	Course Outcomes	CO1: To analyse the type of disease along with its treatment. CO2: To diagnose the patient the type of disease CO3: To assist cardiologist in cath lab. CO4: To access echo machine. CO5: To assess the doctor during patient emergency. CO6: To assist surgeons during bypass surgery in cardiovascular disease.
7	Course Description	Cardiac care technology provides student to examine the ECG ,Echocardiography, Holter monitoring,Treadmill Stress Testing in various Diseases also it helps to treat the student.
8	Outline syllabus		CO Mapping
	Unit 1	**Valvoplasties and Coil closure ,Device Closure**	
	A	Procedure, Indications,	CO 1
	B	Complications and treatment of ballons, mitral valvuloplasty, ballon aortic valvuloplasty ballon pulmonary valvuloplasty and balloon tricuspid valvuloplasty.	CO1
	C	Coil Closure Device Closure- Procedure Indications Materials used for coil and device closure of PDA	CO1
	Unit 2	**Peripheral Doppler**	
	A	Procedure and	CO1
	B	usefullness of peripheral Doppler	CO1
	C	indications and contraindications	CO1

	Unit 3	**Device closure of ASD**				
	A	Procedure,				CO1
	B	Indications;				CO1
	C	Materials used for device closure of ASD				CO1
	Unit 4	**Electrophysiological studies**				
	A	Basic knowledge of EP studies				CO1,CO2
	B	Mapping and				CO1,CO2
	C	Ablation				CO1,CO2
	Unit 5	**Oxymetry and Pressure Recording**				
	A	Oxymeter-Handling of the instrument; Usefulness of the instrument, normal and abnormal values				CO1,CO2
	B	Pressure recording-Handling of the instrument				CO1,CO2
	C	Pressures in various chambers, normal and abnormal values				CO1,CO2
	Mode of Examination	Theory				
	Weightage distribution	CA	MTE	ETE		
		25%	25%	50%		
	Text Book	• West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised By Hargar FV, Shuggart SG, & Palgne Palacio June, Macmillian Publishing Company New York. • Sethi Mohini (2005) Institution Food Management New Age International Publishers • Tripati P C & Reddy PW (2008) Principles of Management 3rd edition Tata Mc Graw Hill Book Company • Knight J B & Kotschevar LH (2000) Quantity Food Production Planning & Management 3rd edition John Wiley & Sons • Dessler Gary (2007) Human Resource Management 11th edition Prentice Hall New Jersey				

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	2	1	2	3	2	1	-	3
CO2	2	2	2	2	1	3	2	1	3	-
CO3	3	1	1	1	1	3	2	1	-	2
CO4	2	1	2	2	2	1	2	-	2	1
CO.5	2	2	1	1	2	2	2	2	3	-
CO6	-	1	1	1	1	3	2	1	-	2

Course Code	**Course Name**	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO 3
BCVT-613	Cardiac Care Technology Advanced-II	2.00	1.33	1.33	1.00	3.00	3.00	0.50	1	1.3	1.3

Total: 15.76

Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

BCVT 614: Biostatistics & Research Methodology

School: SSAHS		**Batch : 2023-27**		
Programme: BCVT		**Current Academic Year: 2025-2026**		
Branch: CVT		**Semester : 6**		
1	Course Code	**BCVT 614**		
2	Course Title	Biostatistics & Research Methodology		
3	Credit Hours	**2**		
4	Contact Hours (L-T-P)	**2-0-0**		
	Course Status	Compulsory		
5	Course Objective	The course enable students, comprehend research issues and to identify research questions and formulate research hypothesis with various techniques of research design and data collection .		
6	Course Outcomes	CO1: To understand the basic concepts and methods of research. CO2: To enable students comprehend research issues CO3: To apply the application of descriptive statistics on data. CO4: To equip students with various techniques of research design and data collection CO5: To enable students to synthesize quantitative data crunching techniques CO6: To enable students to synthesize qualitative data crunching techniques		
7	Course Description	To help the students to understand the basic principles of biostatistics & research methodology and applied to draw the inferences from the data		
8	Outline syllabus **Theory**			

Unit 1	**Introduction to Research**	CO1, CO2
A	• Meaning of research,	CO1, CO2
	• Types of research	CO1, CO2
	• Research Process	CO1, CO2
	Literature Review	CO1,CO2
		CO1, CO2

B	• Literature review basics • Primary data • Secondary data and exploration	CO1, CO2
C	**Theoretical Framework and Hypothesis Formulation**	CO1,CO2
	• Types of variables	CO1, CO2
	• Exogenous and Endogenous variables	CO1, CO2
	• Formulation of Hypothesis and Research question	CO1, CO2
Unit 2	**Research Design**	CO2,CO3
A	• Types of Research design	CO2,CO3
	• Instrument design, Scale formation	CO2,CO3
B	• Basics Biostatistics	CO1, CO3
C	• Methods of data collection	CO2,CO3
	• Questionnaires creation	CO2,CO3
	• Sampling Design	CO2,CO3
Unit 3	**Data Analysis & Interpretation**	
A	· Descriptive Analysis	CO3,CO4
	· Normality tests	CO2,CO3
B	· Outlier tests.	CO1, CO3
C	· Hypothesis testing	CO3,CO4
Unit 4	**Referencing**	CO2,CO3
A	· APA format	CO4,CO5
	· MLA format	CO2,CO3
B	· Harvard Style	CO4,CO5
	· IEEE format	CO2,CO3
C	· **Report Writing**	CO4,CO5
Unit 5	**Ethical Practices in Research**	CO2,CO3
A	· Plagiarism	CO5,C06
B	· Introduction to plagiarism software	CO5,C06
C	· Legal, Governmental and other norms	CO5,C06
Mode of examination	Theory/Jury/Practical/Viva	
Weightage Distribution	CA / MTE / ETE	
	25% / 25% / 50%	
Text book/s*	1. Research Methodology- CR Kothari 2. Statistics in Medicine-Colton-Little Brown. Boston	
Other References	1. Adler, Stier and Clark, How it's done: An Invitation to Social Research 3. Cooper, Schindler , Social Sciences Research Methods: How to start and finish yourthesis, book, or article	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	2	1	2	3	2	1	-	3
CO2	2	2	2	2	1	3	2	1	3	-
CO3	3	1	1	1	1	3	2	1	-	2
CO4	2	1	2	2	2	1	2	-	2	1
CO.5	2	2	1	1	2	2	2	2	3	-
CO6	-	1	1	1	1	3	2	1	-	2

Course Code	**Course Name**	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO 3
BCVT-614	Biostatistics & Research Methodology	2.00	1.33	1.33	1.00	3.00	3.00	0.50	1	1.3	1.3

Total: 15.76

Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

BCVT PRACTICAL

1st semester

School: SSAHS		**Batch: 2023-2027**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: I**	
1	Course Code	**BCVT121**	
2	Course Title	**HUMAN ANATOMY –I (LAB)**	
3	Credits	**1**	
4	Contact Hours (L-T-P)	**0-0-2**	
	Course Status	Minor Elective (VAC)	
5	Course Objective	To define about the importance of artery, vein, lymph node, spleen, tonsil and thymus	
6	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 muscle CO4: To know the importance of artery, vein, lymph node, spleen, tonsil and thymus CO5:To know the importance of respiratory system CO6:To know the importance of cardiac muscle.	
7	Course Description	To define Histology of types of epithelium, serous, mucus and mixed salivary gland, cartilages, bones, skeletal (TS & LS), smooth and cardiac muscles.	
8	Outline syllabus		CO Mapping
	Unit 1		**CO1**
		Histology of epithelium and salivary gland, Histology of cartilage, compact and cancellous bone. Histology of muscle tissue	
	Unit 2		**CO2**
		Demonstration of all bone. Radiograph of bones & joints. Demonstration of all body muscles.	
	Unit 3		**CO3, CO6**
		Histology of vessels. Histology of lymph node, Histology of spleen.	
	Unit 4	.	**CO4**
		Histology of tonsil and thymus Demonstration of heart and related structure Radiograph related to heart.	
	Unit 5		**CO5**
		Demonstration of lung	

		Demonstration of lung related structure. Radiograph related to lungs.			
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	CE	ETE	
		25%	25%	50%	
	Text book/s*	Laboratory Manual Understanding Human Anatomy and Physiology by William Davis A text book of Anatomy by BD Chaurasia A text book of human Anatomy by T.S. Ranganathan			
	Other References	-			

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3
CO1	3	2	3	3	2	3	2	3	2	2	2	3
CO2	3	2	2	3	3	3	2	1	2	2	2	3
CO3	3	2	3	3	2	3	2	-	2	2	2	3
CO4	-	2	3	3	-	3	2	-	2	2	2	3
CO5	3	2	2	3	2	3	2	3	2	2	2	3
CO6	-	3	3	2	3	2	3	-	1	-	3	3

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BND 121	**HUMAN ANATOMY –I (LAB)**	2	2.16	2.6	2.8	2	2.8	2.1	1.6	2.1	3

Total: 23.16
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch: 2023-2027**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: I**	
1	Course Code	**BCVT122**	
2	Course Title	**PHYSIOLOGY –I (LAB)**	
3	Credits	3	
4	Contact Hours (L-T-P)	**2-1-0**	
	Course Status	Minor Elective (VAC)	
5	Course Objective	To define the importance of hemoglobulin , ESR and PCV and importance of compound microscope .	
6	Course Outcomes	CO1: To know about Physiology and its importance CO2: To know the importance of Compound microscope CO3: To know the importance of hemoglobin estimation CO4:To know the importance of blood group detection CO5: To know the importance of Total Red Blood Cell Count CO6: To know the importance of total Leucocyte Count	
7	Course Description	To define study of compound microscope and total red blood cell count and total leucocyte count and estimation of hemoglobulin concentration.	
8	Outline syllabus		CO Mapping
	Unit 1	Study of Compound Microscope	**CO1**
		Briefing Demonstration Practical	
	Unit 2	**Estimation of Haemoglobin Concentration**	**CO2**
		Briefing Demonstration Practical	
	Unit 3	Total Red Blood Cell Count and	**CO3, CO6**
		Briefing Demonstration Practical	
	Unit 4	Total Leucocyte Count	**CO4**
		Briefing Demonstration Practical	
	Unit 5	**Bleeding Time, Clotting Time, Blood Group Estimation and Demonstration of ESR & PCV.**	**CO5**
		BT & CT Blood Groups Demonstration of ESR & PCV	

	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	CE	ETE	
		25%	25%	50%	
	Text book/s*	Laboratory Manual Understanding Human Anatomy and Physiology by William Davis A text book of Anatomy by BD Chaurasia A text book of human Anatomy by T.S. Ranganathan			
	Other References	-			

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3
CO1	3	2	3	3	2	3	2	3	2	2	2	3
CO2	3	2	2	3	3	3	2	1	2	2	2	3
CO3	3	2	3	3	2	3	2	-	2	2	2	3
CO4	-	2	3	3	-	3	2	-	2	2	2	3
CO5	3	2	2	3	2	3	2	3	2	2	2	3
CO6	-	3	3	2	3	2	3	-	1	-	3	3

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BND 122	**PHYSIOLOGY –I (LAB)**	2	2.16	2.6	2.8	2	2.8	2.1	1.6	2.1	3

Total: 23.16
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch: 2023-2027**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: I**	
1	Course Code	**BCVT123**	
2	Course Title	**BIOCHEMISTRY –I (LAB)**	
3	Credits	**1**	
4	Contact Hours (L-T-P)	**0-0-2**	
	Course Status	Minor Elective (VAC)	
5	Course Objective	To define about the importance of sampling techniques and importance of glasswares and to create the ability among students to understance the properties of different types of reagents.	
6	Course Outcomes	CO1: Student are able to know the importance of sampling techniques CO2: Student are able to develop the understanding about the importance of different types of glass wares CO3: Students are able to build the ability to understand the importance of different types of equipment's CO4: Student are able to know the importance of acid and base CO5: Student are able to develop the understanding about the importance of buffers CO6: Students are able to build the ability to understand the properties of different types of reagents	
7	Course Description	This Practical provides anIntroduction of Glassware's , Laboratory Equipment's Safety of measurements in Laboratory,Preparation of Solutions and deSemesterination of strength of acids and bases	
8	Outline syllabus		CO Mapping
	Unit 1		**CO1**
		Introduction to Laboratory apparatus -1 Introduction to Laboratory apparatus -2 Maintenance of Laboratory apparatus -3	
	Unit 2		**CO2**
		Introduction to Laboratory glassware's -1 Introduction to Laboratory glassware's -2 Maintenance of Laboratory glassware's.	
	Unit 3		**CO3, CO6**
		Safety measurements in Biochemistry lab General laboratory protocols Awareness in a lab	
	Unit 4		**CO4**
		Preparation of acids of different concentration Preparation of bases of different concentration Preparation of solutions of different concentration	
	Unit 5	DeSemesterination of the strength of NaOH solution	**CO5**

		DeSemesterination of the strength of HCl solution DeSemesterination of the strength of NH_4OH solution			
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	CE	ETE	
		25%	25%	50%	
	Text book/s*	A text book of Medical Biochemistry by Chatterjee & Shinde Text book of biochemistry for Medical students by Vasudevan and Sreekumari Biochemistry by Lehringer Clinical chemistry by Varley Harpers Illustrated Biochemistryby Robert K.M.			
	Other References	-			

CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	3	3	2	3
CO2	3	2	2	3	3	3	2	3	3
CO3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	2	3
CO5	3	3	3	3	2	3	3	3	3
CO6	3	3	3	3	2	3	3	3	3
Avg PO attainted	3.00	2.83	2.83	3.00	2.67	3.00	2.83	2.67	3.00

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT123	**BIOCHEMISTRY –I (LAB)**I	2	2.16	2.6	2.8	2	2.8	2.1	1.6	2.1	3

Total: 23.16
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch: 2023-2027**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: I**	
1	Course Code	**BCVT124**	
2	Course Title	**PATHOLOGY–I (LAB)**	
3	Credits	**1**	
4	Contact Hours (L-T-P)	**0-0-2**	
	Course Status	Minor Elective (VAC)	
5	Course Objective	To define about the importance Rh blood grouping system , advanced centrifugation techniques and platelets estimation.	
6	Course Outcomes	CO1: To define the importance of Haematology CO2: To analyze the importance of ABO blood grouping CO3: To define the importance of WBC, RBCs, Platelets estimation CO4: To evaluate the importance of Bleeding time CO5: To evaluate the importance of Clotting time CO6: To define the advanced centrifugation techniques	
7	Course Description	Pathology practical provides anIntroduction to Haematology, Laboratory safety guidelines, Estimation of Bleeding time, Estimation of Clotting time, Estimation of Hb and Prothrombin time	
8	Outline syllabus		CO Mapping
	Unit 1		**CO1**
		Blood sample, Plasma separation Hemoglobin (Hb) estimation Shali 's method Estimation of ESR	
	Unit 2		**CO2**
		ABO Blood Grouping Bleeding Time. Clotting Time, Differential leukocyte count (DLC) Preparation of blood smear	
	Unit 3		**CO3, CO6**
		Total White Blood Cell Count in Blood Total Red Blood Cell Count in Blood Estimation of Platelets count in Blood	
	Unit 4		**CO4**
		Preparation of EDTA Vials Bleeding Time. Clotting Time,	
	Unit 5	Types of Centrifuges, Centrifugation technique Principle, Application and uses	**CO5**

	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	CE	ETE	
		25%	25%	50%	
	Text book/s*	1) Histopathology Techniques by Culling 2) Cytology by Koss 3) Clinical diagnosis by Laboratory method by Todd and Sanford 4) Laboratory Technology by Ramnic Sood 5) Practical Haematology by Dacie and Lewis 6) Text book of Pathology by Krishna			
	Other References	-			

CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	3	3	2	3
CO2	3	2	2	3	3	3	2	3	3
CO3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	2	3
CO5	3	3	3	3	2	3	3	3	3
CO6	3	3	3	3	2	3	3	3	3
Avg PO attainted	3.00	2.83	2.83	3.00	2.67	3.00	2.83	2.67	3.00

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT124	**PATHOLOGY –I (LAB)**I	2	2.16	2.6	2.8	2	2.8	2.1	1.6	2.1	3

Total: 23.16
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch: 2023-2027**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: I**	
1	Course Code	**BCVT125**	
2	Course Title	**MICROBIOLOGY –I (LAB)**	
3	Credits	**1**	
4	Contact Hours (L-T-P)	**0-0-2**	
	Course Status	Minor Elective (VAC)	
5	Course Objective	To define about the importance of sampling techniques and importance of glasswares and to create the ability among students to understance the properties of different types of reagents.	
6	Course Outcomes	CO1: To analyse the importance of compound microscopy CO2: To evaluate the importance of sterilizartion CO3: To analyze the importance of serological tests CO4: To interpret gram staining CO5: To know about biomedical waste management CO6: To analyse importance of biomedical waste management	
7	Course Description	Microbioligy practical deals with use of Microscopy, Clinical pathology and Hematology	
8	Outline syllabus		CO Mapping
	Unit 1		**CO1**
		Handling of microscope Use of microscope Safety measures	
	Unit 2		**CO2**
		Use of culture media Nutrient broth, nutrient agar,blood agar Chacolate agar, Mac conkey medium, LJ media, Robertson Cooked meat media, Potassium tellurite media with growth,	
	Unit 3		**CO3, CO6**
		Demonstration and sterlization of equipments – Hot Air oven, Autoclave, Bacterial filters Mac with LF & NLF, NA with staph Antibiotic susceptibility test Other	
	Unit 4		**CO4**
		Demonstration of common serological tests – Widal, VRDL, ELISA	
	Unit 5	Gram staining	**CO5**

		Acid fast staining Applied			
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	CE	ETE	
		25%	25%	50%	
	Text book/s*	15. Anathanarayana & Panikar Medical Microbiology 16. Roberty Cruckshank – Medical Microbiology – The Practice of Medical Mircrobiology			
	Other References	-			

CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	3	3	2	3
CO2	3	2	2	3	3	3	2	3	3
CO3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	2	3
CO5	3	3	3	3	2	3	3	3	3
CO6	3	3	3	3	2	3	3	3	3
Avg PO attainted	3.00	2.83	2.83	3.00	2.67	3.00	2.83	2.67	3.00

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT125	**MICROBIOLOGY –I (LAB)**	2	2.16	2.6	2.8	2	2.8	2.1	1.6	2.1	3

Total: 23.16
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

BCVT 2TH SEMESTER

School: SSAHS		**Batch: 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-2024**	
Branch: CVT		**Semester:2nd semester**	
1	Course Code	**BCVT221**	
2	Course Title	**HUMAN ANATOMY –II (LAB)**	
3	Credits	**1**	
4	Contact Hours (L-T-P)	**0-0-2**	
	Course Status	Compulsory	
5	Course Objective	To define the importance of all the body systems and importance of it in our body.	
6	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 CO6:To interpret locations of nerve.	
7	Course Description	This course investigates and defines detailed knowledge of the importance of urinary system , role of different types of nerves, importance and parts of brain .	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Demonstration of parts of urinary system	CO1
	B	Histology of kidney, ureter and urinary bladder	CO1
	C	Radiograph related to urinary system	CO1, CO6
	Unit 2		
	A	Demonstration of reproductive organ	CO2
	B	Radiograph related to reproductive system	CO2, CO6
	Unit 3		
	A	Demonstration of eyeball	CO3, CO6
	B	Histology of eyeball	CO3, CO6
	Unit 4		
	A	Demonstration of glands	CO4
	B	Histology of pituitary gland and thyroid gland.	**CO4**
	C	Histology of parathyroid and suprarenal gland	CO4, CO6
	Unit 5		
	A	Histology of thick skin	CO5

	B	Histology of thin skin			CO5
	C	Demonstration of brain and spinal cord			CO5, CO6
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	Viva Voce	ETE	
		25%	25%	50%	

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	1	2	2	1	3	2	3
CO2	3	2	1	2	2	1	1	3	2	2
CO3	2	1	2	1	1	1	2	3	2	2
CO4	3	1	1	2	2	2	2	2	2	3
CO5	3	2	1	1	1	2	1	3	3	2
CO 6	3	2	2	3	2	2	3	3	3	2

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT221	HUMAN ANATOMY -II	2.83	1.66	1.33	1.66	1.33	1.66	2.83	2.33	2.33	2.33

Total: 20.5
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-2024**	
Branch: CVT		**Semester: 2nd**	
1	Course Code	**BCVT 222**	
2	Course Title	**PHYSIOLOGY –II (LAB)**	
3	Credits	**1**	
4	Contact Hours (L-T-P)	**0-0-2**	
	Course Status	Compulsory	
5	Course Objective	To learn about the importance of hematology and clinical physiology, Radial pulse measurement and all other test which are done for the detection of any disease.	
6	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 Co6: To know the importance of hematology and clinical physiology.	
7	Course Description	**Physiology is about the detailed study of all the systems which are part of our body**	
8	Outline syllabus		CO Mapping
	Unit 1	**Differential Leucocyte Count -1**	
	A	Briefing	CO1
	B	Demonstration	CO1
	C	Practical –Preparation of Blood Smear	CO1, CO6
	Unit 2	**Differential Leucocyte Count -2**	
	A	Staining of smear	CO2
	B	Fixation of smear	CO2
	C	Identification of cells	CO2, CO6
	Unit 3	**Arterial Blood Pressure measurement**	
	A	Briefing	CO3
	B	Demonstration	CO3
	C	Practical	CO3, CO6
	Unit 4	**Radial Pulse measurement**	
	A	Briefing	CO4
	B	Demonstration	CO4
	C	Practical	CO4, CO6
	Unit 5	**Effect of posture on Blood pressure**	
	A	Briefing	CO5
	B	Demonstration	CO5
	C	Practical	CO5, CO6
	Mode of examination	Practical	

	Weightage Distribution	CA	Viva Voce	ETE	
		25%	25%	50%	

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	1	3	3	3	3	3	3
CO2	2	2	2	1	3	3	3	3	3	3
CO3	3	2	3	3	3	3	3	2	3	3
CO4	2	2	2	1	3	3	3	3	3	3
CO5	2	2	2	1	3	3	3	3	3	3
CO6	2	2	3	3	2	1	1	2	3	2

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PS O3
BCVT222	PHYSIOLOGY-II	2.16	2	2.3	1.66	2.83	2.66	2.66	2.66	3	2. 83

Total: 24.76

Strength of Correlation

1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**

3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-2024**	
Branch: CVT		**Semester: 2nd**	
1	Course Code	**BCVT 223**	
2	Course Title	**BIOCHEMISTRY –II(LAB)**	
3	Credits	**1**	
4	Contact Hours (L-T-P)	**0-0-2**	
	Course Status	Compulsory	
5	Course Objective	To define the students about importance of different types of acifds and reagents which are used in laboratory.	
6	Course Outcomes	CO1: Build the ability to understand the importance of different types of acids CO2: Create the knowledge about the importance of different types of bases CO3: Develop the understanding to know the importance of different types of solutions CO4: Build the ability to understand the importance of different types of reagents CO5: To understand the importance of biomolecules CO6: To introduce variations in types biomolecules	
7	Course Description	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.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Preparation of acids of different concentration-1	CO1
	B	Preparation of acids of different concentration-2	CO1
	C	Preparation of acids of different concentration-3	CO1, CO6
	Unit 2		
	A	Preparation of bases of different concentration-1	CO2
	B	Preparation of bases of different concentration-2	CO2
	C	Preparation of bases of different concentration-3	CO2, CO6
	Unit 3		
	A	Preparation of solutions of different concentration-1	CO3
	B	Preparation of solutions of different concentration-2	CO3
	C	Preparation of solutions of different concentration-3	CO3, CO6
	Unit 4		
	A	Qualitative analysis of Carbohydrates-1	CO4
	B	Qualitative analysis of Carbohydrates-2	CO4
	C	Qualitative analysis of Carbohydrates-3	CO4, CO6
	Unit 5		
	A	Qualitative analysis of Proteins -1	CO5
	B	Qualitative analysis of Proteins-2	CO5

	C	Qualitative analysis of Proteins -3			CO5, CO6
	Mode of examination	Practical			
	Weightage Distribution	CA	Viva Voce	ETE	
		25%	25%	50%	

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	1	3	3	3	3	3	3
CO2	2	2	2	1	3	3	3	3	3	3
CO3	2	2	2	1	3	3	3	2	3	3
CO4	2	2	2	1	3	3	3	3	3	3
CO5	2	2	2	1	3	3	3	3	3	3
CO6	2	2	3	3	2	1	1	2	3	1

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT223	**BIOCHEMISTRY LAB -II**	2	2	2.16	1.33	2.83	2.66	2.66	2.66	3	2.66

Total: 23.24
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch: 2023-27**	
Programme: BCVT224		**Current Academic Year: 2023-2024**	
Branch: CVT		**Semester:2nd semester**	
1	Course Code	**BCVT 224**	
2	Course Title	**PATHOLOGY II (LAB)**	
3	Credits	**1**	
4	Contact Hours (L-T-P)	**0-0-2**	
	Course Status	Compulsory	
5	Course Objective	To understand the importance of instruments used in histopathology laboratory and detailed knowledge of tissue processing and staining .	
6	Course Outcomes	CO1: To define the importance of Histopathology testing CO2: To understand the importance of instruments in Histopathology CO3: To apply the importance of section cutting CO4: To analyze the importance of Tissue processing CO5: To define the importance of tissue staining CO6: To understand the importance of H&E staining	
7	Course Description	This course defines about the techniques and importance of Histopathology, Instrumentation in histopathology, Section cutting, Tissue processing for routine paraffin section, Staining of tissues-H & E staining	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	To demonstrate organization of histopathology Laboratory	CO1
	B	To Study the principle & use of various instrument in histopathology laboratory	CO1
	C	Microscope, Microtome, microtome blades	CO1
	Unit 2		
	A	To Study the principle & use of wax bath, slide warmer, tissue floating bath, digital balance used in histopathology laboratory	CO2
	B	To demonstrate principle, construction & working of Compound microscope	CO2
	C	Electron Microscope	CO2
	Unit 3		
	A	Process of reception, recording & labeling of various histopathology specimen.	CO3
	B	To prepare various fixatives	CO3
	C	Demonstrate the process of tissue fixation in Histopathology	CO3
	Unit 4		
	A	To demonstrate the principle and method of tissue embedding using paraffin wax.	CO4

	B	To demonstrate the process of decalcification of calcified tissue before processing.			**CO4**
	C	To demonstrate the process of Washing and preparation of wash buffer			CO4
	Unit 5				
	A	To study principle, working, maintenance of Microtome & Honing & stropping tecHniques			CO5
	B	Used for correcting fault and remedies of microtome knives			CO5
	C	To demonstrate principle and method of Hematoxylin and eosin staining techniques			CO5
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	Viva Voce	ETE	
		25%	25%	50%	

Pos COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	1	2	1	2	3	-	-
CO2	3	2	2	2	1	1	2	2	-	-
CO3	2	1	2	3	3	2	1	2	-	-
CO4	3	2	1	2	1	2	1	2	-	-
CO5	3	2	1	1	1	1	2	2	-	-
CO6	3	2	1	3	3	3	2	3	-	-

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT224	PATHOLGY-II	2.8	1.8	1.6	2	1.8	1.6	1.6	2.3	-	-

Total: 16.5
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch: 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-2024**	
Branch: CVT		**Semester:2nd semester**	
1	Course Code	**BCVT225**	
2	Course Title	**MICROBIOLOGY –II (LAB)**	
3	Credits	**1**	
4	Contact Hours (L-T-P)	**0-0-2**	
	Course Status	Compulsory	
5	Course Objective	To define the importance of gram staining and biomedical waste management , sterilisation techniques .	
6	Course Outcomes	CO1: To define the importance of compound microscopy CO2: To define the importance of sterilizartion CO3: To define the importance of serological tests CO4: To define the importance of gram staining CO5: To define the importance of biomedical waste management CO6: To evaluate results in serological tests	
7	Course Description	This course defines about all the microbiological test , clinical pathology and haematological tests.	
8	Outline syllabus		CO Mapping
	Unit 1	Stool examination	
	A	Ova	CO1
	B	Cyst	CO1
	C	Parasite	CO1
	Unit 2	Lab diagnosis	
	A	candida, Cryptococcus	CO2
	B	dermatophytes	CO2
	C	opportunistic fungi	CO2
	Unit 3	Lab diagnosis	
	A	Herpes	CO3
	B	Hepatitis, HIV, Rabies	CO3
	C	Poliomyelitis	CO3
	Unit 4		
	A	Visit to hospital for demonstration of biomedical waste management-1	CO4
	B	Visit to hospital for demonstration of biomedical waste management-2	**CO4**
	C	Visit to hospital for demonstration of biomedical waste management-3	CO4
	Unit 5		
	A	Anaerobic culture methods-1	CO5
	B	Anaerobic culture methods-2	CO5
	C	Anaerobic culture methods-3	CO5

	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	Viva Voce	ETE	
		25%	25%	50%	

Pos COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	1	2	1	2	3	-	-
CO2	3	2	2	2	1	1	2	2	-	-
CO3	2	1	2	3	3	2	1	2	-	-
CO4	3	2	1	2	1	2	1	2	-	-
CO5	3	2	1	1	1	1	2	2	-	-
CO6	3	2	1	3	3	3	2	3	-	-

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT225	MICROBIOLOGY-II	2.8	1.8	1.6	2	1.8	1.6	1.6	2.3	-	-

Total: 16.5
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

3rd Semester

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2024-2025**	
Branch: CVT		**Semester: 3rd**	
1	Course Code	BCVT 321	
2	Course Title	APPLIED PATHOLOGY (LAB)	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective	This course provides information about 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.	
6	Course Outcomes	CO1: To define the importance of haematological parameters CO2: To analyse the importance of Instrumentation CO3: To evaluate the importance of staining techniques CO4: To understood the importance of Total white blood cell count CO5: To analyse the importance of ESR CO6: To create the importance of Wintrobs and westergreen methods of ESR	
7	Course Description	• Haemoglobin estimation • DeSemesterination of Haematocrit • Red blood cell count • Total white blood cell count • Erythrocyte sedimentation rate	
8	Outline syllabus: Practical		CO Mapping
	Unit 1	**Haematological investigations**	
	A	Haemoglobin estimation	CO1
	B	To estimate serum iron and total iron binding capacity.	CO1
	C	To detect whether the given specimen is G6PD deficient or normal	CO1
	Unit 2	**Instrumentation**	
	A	Microscopy (Morphology of normal blood cells and their identification)	CO2,CO6
	B	Sterilization instrument (Autoclave, Hot air oven, Laminar air flow)	CO2,CO6
	C	Lab Safety and instrumentation.	CO2,CO6
	Unit 3	**Staining techniques centrifuges**	
	A	centrifugation technique, principle, application uses Cytochemical staining on the given smears	CO3,CO6
	B	PAS, SBB, MPO, LAP and Perl's reaction.	CO3,CO6
	C	Haematology Auto analysers (Principles, application, uses)	CO3

	Unit 4	**Total white blood cell count**			
	A	Briefing			CO4
	B	Demonstration			CO4
	C	Practical			CO4
	Unit 5	**Erythrocyte sedimentation rate**			
	A	Briefing			CO5
	B	Demonstration			CO5
	C	Practical			CO5
	Mode of examination	Practical			
	Weightage Distribution	CA	Viva voce	ETE	
		25%	25%	50%	
	Text book/s*	Textbook of Biochemistry By D.M. Vasudevan Biochemistry by U. Satyanarayan Textbook of Biochemistry by Chatterjee &Shinnde			

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	3	1	3	2	1	2	2	2	3
CO2	3	3	2	2	3	2	3	2	3	2
CO3	2	3	2	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	2	2
CO5	2	2	2	2	2	2	2	2	2	2

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT 321	APPLIED PATHOLOGY (LAB)	2.3	2.3	1.3	2	1.8	2	1.6	1.5	-	-

Total: 14.8
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch: 2023-27**	
Programme: BCVT		**Current Academic Year: 2024-2025**	
Branch: CVT		**Semester: 3rd**	
1	Course Code	BCVT 322	
2	Course Title	Applied Microbiology - I (LAB)	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Type	Compulsory	
5	Course Objective	Applied microbiology enables student to understand health care associated infections, antimicrobial resistance, also to understand health care associated disease communicable to health care workers in hospital setup and its preventive measures and Perform microbiological surveillance and sampling.	
6	Course Outcomes	CO1: To Describe the importance of autoclaving & quality control CO2: To understand the importance of Collection of specimens CO3. To describe the importance performing disinfection CO4: Analyse importance of sterility testing CO5: Assess the importance of Interpretation of results of sterility testing CO6: Integrate the importance of quality control	
7	Course Description	This practical provides information about Principles of autoclaving & quality control of Sterilization,Collection of specimens from outpatient units, inpatient units, minor operation theatre and major operation theatre for sterility testing.	
8	Outline syllabus		CO Mapping
	Unit 1	**Principle of autoclaving**	
	A	Methods	CO1,
	B	Observations	CO1
	C	Precautions	CO1, CO6
	Unit 2	**Quality control of sterilization**	
	A	Methods	CO2
	B	Observations	CO2
	C	Precautions	CO2, CO6
	Unit 3	**Collection of specimen-1,2**	
	A	Methods	CO3
	B	Observations	CO3
	C	Precautions	CO3, CO6
	Unit 4	**The various methods employed for sterility testing**	
	A	Methods	CO4
	B	Observations	CO4
	C	Precautions	CO4, CO6
	Unit 5	**Interpretation of result of sterility testing**	
	A	Disinfection of wards, OT	CO5

	B	Disinfection of Laboratory			CO5
	C	Equipment			CO5, CO6
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	CE		
			Viva-voce	ETE	
		25%	25%	50%	
			75%		
	Text book/s*	• A Textbook of Basic and Applied Microbiology • Basic Medical Microbiology			

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	3	1	3	2	1	2	2	2	3
CO2	3	3	2	2	3	2	3	2	3	2
CO3	2	3	2	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	2	2
CO5	2	2	2	2	2	2	2	2	2	2
PO Attainment										

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT 322	Applied Microbiology - I (LAB)	2.3	2.3	1.3	2	1.8	2	1.6	1.5	-	-

Total: 19.1
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch : 2023-27**	
Programme: BCVT		**Current Academic Year: 2024-2025**	
Branch: CVT		**Semester: 3rd**	
1	Course Code	BCVT 323	
2	Course Title	INTRODUCTION TO CARDIAC CARE TECHNOLOGY (LAB) - I	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Compulsory	
5	Course Objective	This course enables students to become a trained, qualified cardiovascular technician capable of working independently or in association with a higher setup and to integrate knowledge and skills of cardiovascular technology to provide health care solutions for the benefit of the society.	
6	Course Outcomes	CO1: To define the importance of Electrocardiography. CO2: To apply the importance of Echocardiography. CO3: To analyse the importance of Treadmill Test. CO4: To evaluate the importance of different types of Stress Test. CO5: To analyse the importance of different types of Pacemakers. CO6: To evaluate modes in Echocardiography	
7	Course Description	It provides an information about Introduction of ECG, introduction of Echocardiography, Introduction of Treadmill Test & Safety Precautions, Pacemaker & its uses, Pulse Oximeter & its uses.	
8	Outline syllabus: Practical		CO Mapping
	Unit 1		
	A	Examine the cardiovascular System.	CO1
	B	Explain the different types of machines used to diagnose cardiovascular disease.	CO1
	C	Explain about the coronary artery disease.	CO1
	Unit 2		
	A	Explain about the procedure of ECG.	CO2,CO6
	B	Explain the different types of leads and electrodes present in ECG Device.	CO2,CO6
	C	Explain about the Einthoven's triangle.	CO2,CO6
	Unit 3		
	A	To study the Epicardial pacing technique.	CO3,CO6
	B	To study the working of pulse oximeter.	CO3,CO6
	C	To study about coronary heart disease.	CO3
	Unit 4		
	A	Explain the pre-test preparation of a patient for Echocardiography.	CO4
	B	To demonstrate the Indication's & Contra-indications of an Echocardiography.	CO4
	C	Explain the different kinds of acoustic windows in Echocardiography.	CO4
	Unit 5		
	A	To demonstrate the different types of delivery routes in echocardiography	CO5

	B	Explain the procedure to do an Echocardiography with a neat labelled diagram.			CO5
	C	Explain about the different kinds of views in Echocardiography.			CO5
	Mode of examination	Practical			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	
	Text book/s*	Textbook of Biochemistry By D.M. Vasudevan Biochemistry by U. Satyanarayan Textbook of Biochemistry by Chatterjee &Shinnde			

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	3	1	3	2	1	2	2	2	3
CO2	3	3	2	2	3	2	3	2	3	2
CO3	2	3	2	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	2	2
CO5	2	2	2	2	2	2	2	2	2	2

Course Code	**Course Name**	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	PSO1	PSO 2	PSO 3
BCVT 323	INTRODUCTION TO CARDIAC CARE TECHNOLOGY (LAB)	2.3	2.3	1.3	2	1.8	2	1.6	1.5	-	-

Total: 14.8
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch: 2023-27**	
Programme: BCVT		**Current Academic Year: 2023-24**	
Branch: CVT		**Semester: 3rd**	
1	Course Code	BCVT 324	
2	Course Title	**INTRODUCTION TO CARDIAC CARE TECHNOLOGY (LAB)**	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Type	Compulsory	
5	Course Objective	This course provides student a knowledge of ECG. , Treadmill Test & Safety Precautions, Pacemaker & its uses, Pulse Oximeter & its uses.	
6	Course Outcomes	CO1: To interpret Electrocardiography. CO2: To acquire knowledge of Echocardiography. CO3: To analyse technique of Treadmill Test. CO4: To interpret types of Stress Test. CO5: To analyse the importance of different types of Pacemaker. CO6: To analyse working of Pacemaker.	
7	Course Description	This course provides student a knowledge of ECG. , Treadmill Test & Safety Precautions, Pacemaker & its uses, Pulse Oximeter & its uses.	
8	Outline syllabus		CO Mapping
	Unit 1	**Cardiovascular Diagnosis**	
	A	cardiovascular System.	CO1,
	B	types of machines used to diagnose cardiovascular disease.	CO1
	C	coronary artery disease.	CO1, CO6
	Unit 2	**Electrocardiography**	
	A	the procedure of ECG.	CO2
	B	types of leads and electrodes present in ECG Device.	CO2
	C	t the Einthoven's traingle.	CO2, CO6
	Unit 3	**Pacemaker**	
	A	Epicardial pacing technique.	CO3
	B	working of pulse oximeter.	CO3
	C	coronary heart disease.	CO3, CO6
	Unit 4	**Echocardiography**	
	A	pretest preparation of a patient for Echocardiography.	CO4
	B	Indication's & Contra-indication's of an Echocardoigraphy.	CO4
	C	different kind's of acoustic window's in Echocardiography.	CO4, CO6
	Unit 5	**Echo Delivery Routs, Procedure**	
	A	different types of delivery routes in echocardiography	CO5

	B	procedure to do an Echocardiography with a neat labelled diagram.			CO5
	C	different kind's of of view's in Echocardiography.			CO5, CO6
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	CE		
			Viva-voce	ETE	
		25%	25%	50%	
			75%		
	Text book/s*	• A Textbook of Basic and Applied Microbiology • Basic Medical Microbiology			

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	3	1	3	2	1	2	2	2	3
CO2	3	3	2	2	3	2	3	2	3	2
CO3	2	3	2	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	2	2
CO5	2	2	2	2	2	2	2	2	2	2
PO Attainment										

Course Code	**Course Name**	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO3
BCVT 324	**INTRODUCTION TO CARDIAC CARE TECHNOLOGYI (LAB) I**	3	1.66	1.0	1	3	1.83	1	1.16	1.5	1

Total: 19.1
Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

4th Semester

School: SSAHS		**Batch:** 2023-27
Programme: BCVT		**Current Academic Year: 2024-2025**
Branch: CVT		**Semester: 4th Semester**
1	Course Code	BCVT 421
2	Course Title	**APPLIED PATHOLOGY –II (LAB)**
3	Credits	1
4	Contact Hours (L-T-P)	**0-0-2**
	Course Status	Core
5	Course Objective	To evaluate the Human Anatomy - dissection consistency, theoretical knowledge and knowledge application, to undertake research based training in Anatomy and 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.
6	Course Outcomes	CO1: To understand the importance of ABO blood grouping CO2: To understand the importance of Rh typing CO3: To understand the importance of Cross matching CO4: To understand the importance of Blood transfusion CO5: To understand the importance of donor selection CO6 To understand the importance of blood bank advanced techniques

7	Course Description	**This course is concerned with** ABO blood grouping Rh typing, Cross matching, Blood transfusion	
8	Outline syllabus		CO Mapping
	Unit 1	**ABO blood grouping**	
	A	ABO grouping and Rh types by tube method	CO1
	B	Rh typing by indirect antiglobulin method.	CO1
	C	Identification of blood group antibodies	CO1
	Unit 2	**Rh typing**	
	A	Collection of blood for cross matching from a blood bag,	CO2
	B	Selection of donor or component separation	CO2
	C	Selection of blood bags for component preparation	CO2, CO6
	Unit 3	**Blood Bank**	
	A	Collection of blood for cross matching from a blood bag,	CO3
	B	Selection of donor or component separation,Major and minor cross-matching. Direct and Indirect antiglobulin method. Gel technology of blood grouping and compatibility testing	CO3
	C	Selection of blood bags for component preparation	CO3
	Unit 4	**Blood Transfusion**	
	A	Haemapheresis: pertaining to Leucocytes, platelets, and plasma.	CO4
	B	Writing standard operating procedures.	**CO4**
	C	Platelet pheresis, Blood component preparation on component extractor	CO4, CO6
	Unit 5	**Screening of donor's blood**	
	A	Preparation of washed red blood cells.	CO5
	B	Preparation of platelet concentrates by buffy coat method	CO5
	C	Testing of haematological parameters of blood products	CO5, CO6

	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	1	3	1	1	1	1	3
CO2	3	2	1	1	3	1	1	2	3	-
CO3	3	1	1	1	3	2	1	1	-	-
CO4	3	1	1	1	3	2	1	-	2	1
CO5	3	2	1	1	3	2	1	2	3	-
CO6	3	2	1	1	3	3	1	1	-	2

Course Code	**Course Name**	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO3
BCVT 421	**APPLIED PATHOLOGY –II (LAB)**	3	1.66	1.0	1	3	1.83	1	1.16	1.5	1

Total: 16.15

Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch:** 2023-27	
Programme: BCVT		**Current Academic Year: 2024-2025**	
Branch: CVT		**Semester: 4th Semester**	
1	Course Code	BCVT 422	
2	Course Title	**Applied Microbiology - II (LAB)**	
3	Credits	1	
4	Contact Hours (L-T-P)	**0-0-2**	
	Course Status	Core	
5	Course Objective	Applied microbiology enables student to understand health care associated infections, antimicrobial resistance, it also to understand health care associated disease communicable to health care workers in hospital setup and its preventive measures and toPerform microbiological surveillance and sampling.	
6	Course Outcomes	CO1: To analyse the importance of autoclaving CO2: To access Collection of specimen CO3: To evaluate sterility testing CO4: To perform the process of disinfection CO5: To evaluate Interpretation of results of sterility testing CO6: To analyse the importance of quality control	
7	Course Description	**This course is concerned with** ABO blood grouping Rh typing, Cross matching, Blood transfusion	
8	Outline syllabus		CO Mapping
	Unit 1	Interpretation of result of sterility testing	
	A	Interpretation	CO1
	B	Analysis	CO1
	C	Result	CO1
	Unit 2	Disinfection of wards	

	A	Methods			CO2
	B	Observation			CO2
	C	Precaution			CO2, CO6
	Unit 3	Disinfection of OT			
	A	Methods			CO3
	B	Observation			CO3
	C	Precaution			CO3
	Unit 4	Disinfection of Laboratory			
	A	Methods			CO4
	B	Observation			**CO4**
	C	Precaution			CO4, CO6
	Unit 5	Equipments			
	A	Observation			CO5
	B	Maintenance			CO5
	C	Sterilization			CO5, CO6
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	1	3	1	1	1	1	3
CO2	3	2	1	1	3	1	1	2	3	-
CO3	3	1	1	1	3	2	1	1	-	-
CO4	3	1	1	1	3	2	1	-	2	1
CO5	3	2	1	1	3	2	1	2	3	-
CO6	3	2	1	1	3	3	1	1	-	2

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO3
BCVT 422	**Applied Microbiology - II (LAB)**	3	1.66	1.0	1	3	1.83	1	1.16	1.5	1

Total: 16.15

Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch:** 2023-27
Programme: BCVT		**Current Academic Year: 2024-2025**
Branch: CVT		**Semester: 4th Semester**
1	Course Code	BCVT 423
2	Course Title	**INTRODUCTION TO CARDIAC CARE TECHNOLOGY - II (LAB)**
3	Credits	1
4	Contact Hours (L-T-P)	**0-0-2**
	Course Status	Core
5	Course Objective	This practical enables students to become a trained, qualified cardiovascular technician capable of working independently or in association with a higher setup and also integrate knowledge and skills of cardiovascular technology to provide health care solutionsfor the benefit of the society. After the copletion of Programme, candidates become well known in teccniques such as Electrocardiography, Echocardiography,Treadmill Test/Stress test,Doppler Ultrasonography and contrast Echo.
6	Course Outcomes	CO1: To apply knowledge of human cardiovascular and it's related system in the diagnosis,cardiovascular disorder & it's management. CO2: To plan and implement clinical & scientific activities related the profession of cardiovascular technology. CO3: To tackle future challenges through lifelong learning & training process related to cardiac health. CO4: To diagnose and solve complex problems arising during cardiovascular care of the patients. CO5: To utilize modern tools and techniques in the field of cardiovascular technology for patient compliance. CO6: To analyze cardiovascular Disease in various regions.

7	Course Description	**This course is concerned with** ABO blood grouping Rh typing, Cross matching, Blood transfusion	
8	Outline syllabus		CO Mapping
	Unit 1	**Echocardiography**	
	A	Basic Principles of E chocardiography.	CO1
	B	Modalities of Echo (M- mode, 2D, Color Doppler).	CO1
	C	Transoesophageal Echocardiography.	CO1
	Unit 2	**Instrumentations.**	
	A	Basic pulse echo system & Transducer.	CO2
	B	Pulse generation & Echo Detection.	CO2
	C	Modalities, Display & Record.	CO2, CO6
	Unit 3	Echocardiographic Examination .	
	A	Selecting Transducer's, Position of the patient, Placement of the Transducer.	CO3
	B	Setting Control (M –mode Labelling, 2D Echo, Normal Variants, Semesterinology.	CO3
	C	Identification of Segments.	CO3
	Unit 4	Doppler Echocardiography	
	A	Introduction to Doppler Color Echocardiography the Doppler principles, Doppler ultrasound techniques, Color Doppler flow Imaging, Clinical application of Doppler Echocardiograph.	CO4
	B	Physical principles & Instrumentation in Spectral & Color Doppler flow imaging, Physical principles & Doppler effect, The Doppler Echocardiography system. Blood Flow Pattern (Laminar & Non Laminar).	**CO4**
	C	Doppler Echo Modes (Continuous Doppler System, Pulsed Doppler System, High pulse repetition frequency).	CO4, CO6
	Unit 5	**Contrast Echocardiography**	

	A	Echo measurements-‘ ASE ‘ recommendation.			CO5
	B	Types of dye’s used.			CO5
	C	Nephrotoxic effect of dye used in contrast echo.			CO5, CO6
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	1	3	1	1	1	1	3
CO2	3	2	1	1	3	1	1	2	3	-
CO3	3	1	1	1	3	2	1	1	-	-
CO4	3	1	1	1	3	2	1	-	2	1
CO5	3	2	1	1	3	2	1	2	3	-
CO6	3	2	1	1	3	3	1	1	-	2

Course Code	**Course Name**	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO3
BCVT 423	**INTRODUCTION TO CARDIAC CARE TECHNOLOGY - II (LAB)**	3	1.66	1.0	1	3	1.83	1	1.16	1.5	1

Total: 16.15

Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

5th Semester

School: SSAHS		**Batch:** 2023-27
Programme: BCVT		**Current Academic Year: 2025-2026**
Branch: CVT		**Semester: 5th Semester**
1	Course Code	BCVT 521
2	Course Title	**Cardiac Care Technology-Clinical- I (LAB)**
3	Credits	2
4	Contact Hours (L-T-P)	0-0-4
	Course Status	Core
5	Course Objective	Graduates will be able to understand normal ECG, and basic abnormalities of ECG in various diseases, apart from it he/she would be able to understand findings of ECHO in various diseases. Students will also be able to know equipment details, handling and radiation hazards of cardiac catheterization lab and materials used in cath. Lab and their sterilization technique also he/she would be able to know different aspects of coronary angiography and peripheral angiogram.
6	Course Outcomes	CO1: To define ECG, and to interpret the readings and find any abnormalities. CO2: To understand the ECHO in mitral stenosis, mitral incompetence, ECHO in aortic stenosis, aortic incompetence, pulmonary hypertension, also to understand ECHO in Post AVR, post MVR, Prosthetic valve malfunction, LA clot. To understand the measurements of all cardiac chambers and assessment of cardiac function, and to find any abnormalities. CO3: To apply the Echo in ASD, VSD, PDA, pulmonary stenosis, aortic stenosis, coarctation of aorta, TOF, Dextrocardia CO4: To analyse Echo in acute myocardial infarction, old myocardial infarction and other ischemic heart disease related conditions, and LV aneurysm. CO5: To evaluate ECHO in various types of cardio myopathy infective endocarditis diseases of aorta, Mitral valve prolapse, Myxoma and other cardio vascular disease. CO6 : To build up knowledge for ECHO techniques, and ECG also to infer its readings.
7	Course Description	a) **Cardiac care technology** is concerned with the understanding of findings of ECHO in various disease Myxoma and other cardio vascular disease. Students will also be able to know equipment details, handling and

		radiation hazards of cardiac catheterization lab and materials used in cath. Lab and their sterilization technique.	
8	Outline syllabus		CO Mapping
	Unit 1	**To know about ECG.**	
	A	Normal ECG	CO1
	B	Abnormalities	CO1
	C	Interpretation	CO1
	Unit 2	**To understand the importance of ECHO in mitral stenosis.**	
	A	Echo in mitral stenosis, mitral incompetence,	CO2
	B	Echo in aortic stenosis, aortic incompetence, pulmonary hypertension	CO2
	C	Echo in Post AVR, post MVR. Prosthetic valve malfunction, LA clot.	CO2, CO6
	Unit 3	**To understand ECHO in ASD, VSD, and PDA.**	
	A	Echo in ASD, VSD, PDA,	CO3
	B	Pulmonary stenosis, aortic stenosis,	CO3
	C	Coarctation of aorta, TOF. Dextrocardia	CO3
	Unit 4	**To understand about acute myocardial infarction, old myocardial infarction**	
	A	Echo in acute myocardial infarction, old myocardial infarction and	CO4
	B	other ischemic heart disease related conditions,	**CO4**
	C	LV aneurysm	CO4, CO6
	Unit 5	**To know about endocarditis diseases of aorta**	
	A	Echo in various types of cardio myopathy infective endocarditis diseases of aorta,	CO5

	B	Mitral valve prolapse,			CO5
	C	Myxoma and other cardio vascular disease.			CO5, CO6
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	1	3	1	1	1	1	3
CO2	3	2	1	1	3	1	1	2	3	-
CO3	3	1	1	1	3	2	1	1	-	-
CO4	3	1	1	1	3	2	1	-	2	1
CO5	3	2	1	1	3	2	1	2	3	-
CO6	3	2	1	1	3	3	1	1	-	2

Course Code	**Course Name**	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO3
BCVT 521	**Cardiac Care Technology -Clinical- I (LAB)**	3	1.66	1.0	1	3	1.83	1	1.16	1.5	1

Total: 16.15

Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch:** 2023-27
Programme: BCVT		**Current Academic Year: 2025-2026**
Branch: CVT		**Semester: 5th Semester**
1	Course Code	BCVT 522
2	Course Title	**Cardiac Care Technology-Applied- I (LAB)**
3	Credits	2
4	Contact Hours (L-T-P)	0-0-2
	Course Status	Core
5	Course Objective	Graduates will be able to understand normal ECG, basic abnormalities of ECG in various disease, and will be able to understand findings of ECHO in various diseases. Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab and will be able to know materials used in cath. lab and their sterilization technique also he/she would be able to know different aspects of coronary angiography and peripheral angiogram.
6	Course Outcomes	CO1: To define ECG, and to interpret the readings and find any abnormalities. CO2: To understand the ECHO in mitral stenosis, mitral incompetence, ECHO in aortic stenosis, aortic incompetence, pulmonary hypertension, also to understand ECHO in Post AVR, post MVR, Prosthetic valve malfunction, LA clot. To understand the measurements of all cardiac chambers and assessment of cardiac function, and to find any abnormalities. CO3: To apply the Echo in ASD, VSD, PDA, pulmonary stenosis, aortic stenosis, coarctation of aorta, TOF, Dextrocardia CO4: To analyse Echo in acute myocardial infarction, old myocardial infarction and other ischemic heart disease related conditions, and LV aneurysm. CO5: To evaluate ECHO in various types of cardio myopathy infective endocarditis diseases of aorta, Mitral valve prolapse, Myxoma and other cardio vascular disease. CO6 : To build up knowledge for ECHO techniques, and ECG also to infer its readings.
7	Course Description	b) **Cardiac care technology** is concerned with the understanding of findings of ECHO in various disease Myxoma and other cardio vascular disease. Students will also be able to know equipment details, handling and radiation hazards of cardiac catheterization lab and

		materials used in cath. Lab and their sterilization technique.	
8	Outline syllabus		CO Mapping
	Unit 1	**To know about abnormalities in the data of ECG.**	
	A	Normal ECG	CO1
	B	Abnormalities	CO1
	C	Interpretation	CO1
	Unit 2	**To understand the Semester like AVR, Post MVR , LA clot etc.**	
	A	Echo in mitral stenosis, mitral incompetence,	CO2
	B	Echo in aortic stenosis, aortic incompetence, pulmonary hypertension	CO2
	C	Echo in Post AVR, post MVR. Prosthetic valve malfunction, LA clot.	CO2, CO6
	Unit 3	**To understand ECHO in Pulmonary stenosis, aortic stenosis.**	
	A	Echo in ASD, VSD, PDA,	CO3
	B	Pulmonary stenosis, aortic stenosis,	CO3
	C	Coarctation of aorta, TOF. Dextrocardia	CO3
	Unit 4	**To understand about ischemic heart disease related conditions.**	
	A	Echo in acute myocardial infarction, old myocardial infarction and	CO4
	B	other ischemic heart disease related conditions,	**CO4**
	C	LV aneurysm	CO4, CO6
	Unit 5	**To know about Mitral valve prolapse and its related complications.**	
	A	Echo in various types of cardio myopathy infective endocarditis diseases of aorta,	CO5

	B	Mitral valve prolapse,			CO5
	C	Myxoma and other cardio vascular disease.			CO5, CO6
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	1	3	1	1	1	1	3
CO2	3	2	1	1	3	1	1	2	3	-
CO3	3	1	1	1	3	2	1	1	-	-
CO4	3	1	1	1	3	2	1	-	2	1
CO5	3	2	1	1	3	2	1	2	3	-
CO6	3	2	1	1	3	3	1	1	-	2

Course Code	**Course Name**	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO3
BCVT 522	**Cardiac Care Technology -Applied- I (LAB)**	3	1.66	1.0	1	3	1.83	1	1.16	1.5	1

Total: 16.15

Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch:** 2023-27
Programme: BCVT		**Current Academic Year: 2025-2026**
Branch: CVT		**Semester: 5th Semester**
1	Course Code	BCVT 523
2	Course Title	**Cardiac Care Technology-Advanced- I (LAB)**
3	Credits	2
4	Contact Hours (L-T-P)	0-0-2
	Course Status	Core
5	Course Objective	Students will be able to understand normal ECG, basic abnormalities of ECG in various disease and be able to understand findings of ECHO in various diseases. Students will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab and will be able to know materials used in cath. lab and their sterilization technique. Students will be able to know different aspects of coronary angiography and peripheral angiogram.
6	Course Outcomes	CO1: To define ECG, and to interpret the readings and find any abnormalities. CO2: To understand the ECHO in mitral stenosis, mitral incompetence, ECHO in aortic stenosis, aortic incompetence, pulmonary hypertension, also to understand ECHO in Post AVR, post MVR, Prosthetic valve malfunction, LA clot. To understand the measurements of all cardiac chambers and assessment of cardiac function, and to find any abnormalities. CO3: To apply the Echo in ASD, VSD, PDA, pulmonary stenosis, aortic stenosis, coarctation of aorta, TOF, Dextrocardia CO4: To analyse Echo in acute myocardial infarction, old myocardial infarction and other ischemic heart disease related conditions, and LV aneurysm. CO5: To evaluate ECHO in various types of cardio myopathy infective endocarditis diseases of aorta, Mitral valve prolapse, Myxoma and other cardio vascular disease. CO6 : To build up knowledge for ECHO techniques, and ECG also to infer its readings.
7	Course Description	**Cardiac care technology advanced** is concerned with the understanding of Cardiac monitoring, Interpretation of TMT use of defibrillator, Management of cardiac arrest, Myocardial perfusion scan, Cardiac arrhythmia, Electrolyte disturbance, Holter monitoring, Valvoplasties, Coil closure and device closure of PDA, Device closure of ASD,VSD, Pressure recording, pacing, pregnancy, nuclear cardiology.
8	Outline syllabus	CO Mapping

	Unit 1	**To know about monitoring.**	
	A	Definition,	CO1
	B	Purpose of cardiac monitoring	CO1
	C	How to Recognise various arrhythmias How to set up a intensive coronary care unit and usefullness of ICCU.	CO1
	Unit 2	**Interpretation of TMT**	
	A	Criteria for TMT positive test contraindication for TMT conditions where TMT is not useful	CO2
	B	Complications that may occur in TMT room and its management.	CO2
	C	Others	CO2, CO6
	Unit 3	**Use of defibrillator**	
	A	Indications,	CO3
	B	How to use the defibrillator	CO3
	C	Complications during the procedure and its management	CO3
	Unit 4	**Management of cardiac arrest**	
	A	Definition	CO4
	B	Causes external cardiac massage	CO4
	C	Artificial respiration and other drugs and procedures used in the management of Cardiac arrest	CO4, CO6
	Unit 5	**Myocardial perfusion scan**	
	A	Procedure of myocardial perfusion scanning,	CO5
	B	Usefullness of myocardial perfusion scan	CO5
	C	Precautions during myocardial perfusion scanning.	CO5, CO6
	Mode of examination	Practical/Viva	

	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	1	3	1	1	1	1	3
CO2	3	2	1	1	3	1	1	2	3	-
CO3	3	1	1	1	3	2	1	1	-	-
CO4	3	1	1	1	3	2	1	-	2	1
CO5	3	2	1	1	3	2	1	2	3	-
CO6	3	2	1	1	3	3	1	1	-	2

Course Code	**Course Name**	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO3
BCVT 523	**Cardiac Care Technology -Advanced- I (LAB)**	3	1.66	1.0	1	3	1.83	1	1.16	1.5	1

Total: 16.15

Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

6th Semester

School: SSAHS		**Batch:** 2023-27
Programme: BCVT		**Current Academic Year: 2025-2026**
Branch: CVT		**Semester: 6th Semester**
1	Course Code	BCVT 621
2	Course Title	**Cardiac Care Technology-Clinical – II (LAB)**
3	Credits	1
4	Contact Hours (L-T-P)	0-0-2
	Course Status	Core
5	Course Objective	Students will be able to understand normal ECG, basic abnormalities of ECG in various disease and be able to understand findings of ECHO in various diseases. Students will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab and will be able to know materials used in cath. lab and their sterilization technique. Students will be able to know different aspects of coronary angiography and peripheral angiogram.
6	Course Outcomes	CO1: To define ECG, and to interpret the readings and find any abnormalities. CO2: To understand the ECHO in mitral stenosis, mitral incompetence, ECHO in aortic stenosis, aortic incompetence, pulmonary hypertension, also to understand ECHO in Post AVR, post MVR, Prosthetic valve malfunction, LA clot. To understand the measurements of all cardiac chambers and assessment of cardiac function, and to find any abnormalities. CO3: To apply the Echo in ASD, VSD, PDA, pulmonary stenosis, aortic stenosis, coarctation of aorta, TOF, Dextrocardia CO4: To analyse Echo in acute myocardial infarction, old myocardial infarction and other ischemic heart disease related conditions, and LV aneurysm. CO5: To evaluate ECHO in various types of cardio myopathy infective endocarditis diseases of aorta, Mitral valve prolapse, Myxoma and other cardio vascular disease. CO6 : To build up knowledge for ECHO techniques, and ECG also to infer its readings.
7	Course Description	**Cardiac Care Technology-Clinical – II** is about understanding of interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD & CHD, also to know about Echo in RHD, CHD, IHD, pericardial disease and other CVD, assessment of cardiac function and **c**ardiac catheterization and coronary angiogram

8	Outline syllabus		CO Mapping
	Unit 1	**To know about pericardial effusion.**	
	A	Pericardial effusion,	CO1
	B	Cardiac temponade,	CO1
	C	Constructive pericarditis	CO1
	Unit 2	**To know about cardiac catheterisation equipment.**	
	A	General details of cardiac catheterisation equipment;	CO2
	B	How to handle the machine, common problems one may come across;	CO2
	C	How to overcome it, radiation hazard	CO2, CO6
	Unit 3	**Materials in cath lab**	
	A	All catheters, balloons, guidewires, pacemakers contrast material;	CO3
	B	Other material used in the cardiac catheterisation laboratory;	CO3
	C	Sterilization of all these materials	CO3
	Unit 4	**To know about Catheterisation**	
	A	Procedure; Cath position;	CO4
	B	Oxymetry at various levels;	CO4
	C	Angios done and its interpretation	CO4, CO6
	Unit 5	**To know about angiogram**	
	A	Procedure, Materials used,	CO5
	B	Type and amount dye used, Indications and contraindications,	CO5
	C	Various pictures recorded in various angles and gross interpretation	CO5, CO6
	Mode of examination	Practical/Viva	

	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	1	3	1	1	1	1	3
CO2	3	2	1	1	3	1	1	2	3	-
CO3	3	1	1	1	3	2	1	1	-	-
CO4	3	1	1	1	3	2	1	-	2	1
CO5	3	2	1	1	3	2	1	2	3	-
CO6	3	2	1	1	3	3	1	1	-	2

Course Code	**Course Name**	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO3
BCVT 621	**Cardiac Care Technology -Clinical – II (LAB)**	3	1.66	1.0	1	3	1.83	1	1.16	1.5	1

Total: 16.15

Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch:** 2023-27
Programme: BCVT		**Current Academic Year: 2025-2026**
Branch: CVT		**Semester: 6th Semester**
1	Course Code	BCVT 622
2	Course Title	**Cardiac Care Technology-Applied II (LAB)**
3	Credits	1
4	Contact Hours (L-T-P)	0-0-2
	Course Status	Core
5	Course Objective	Students will be able to understand normal ECG, basic abnormalities of ECG in various disease and be able to understand findings of ECHO in various diseases. Students will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab and will be able to know materials used in cath. lab and their sterilization technique. Students will be able to know different aspects of coronary angiography and peripheral angiogram.
6	Course Outcomes	CO1: To define ECG, and to interpret the readings and find any abnormalities. CO2: To understand the ECHO in mitral stenosis, mitral incompetence, ECHO in aortic stenosis, aortic incompetence, pulmonary hypertension, also to understand ECHO in Post AVR, post MVR, Prosthetic valve malfunction, LA clot. To understand the measurements of all cardiac chambers and assessment of cardiac function, and to find any abnormalities. CO3: To apply the Echo in ASD, VSD, PDA, pulmonary stenosis, aortic stenosis, coarctation of aorta, TOF, Dextrocardia CO4: To analyse Echo in acute myocardial infarction, old myocardial infarction and other ischemic heart disease related conditions, and LV aneurysm. CO5: To evaluate ECHO in various types of cardio myopathy infective endocarditis diseases of aorta, Mitral valve prolapse, Myxoma and other cardio vascular disease. CO6 : To build up knowledge for ECHO techniques, and ECG also to infer its readings.
7	Course Description	**Cardiac Care Technology-Applied II (LAB)** is about understanding of interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD & CHD, also to know about Echo in RHD, CHD, IHD, pericardial disease and other CVD, assessment of cardiac function and **c**ardiac catheterization and coronary angiogram
8	Outline syllabus	CO Mapping

	Unit 1	**To know about pericardial effusion.**			
	A	Pericardial effusion,			CO1
	B	Cardiac temponade,			CO1
	C	Constructive pericarditis			CO1
	Unit 2	**To know about cardiac catheterisation equipment.**			
	A	General details of cardiac catheterisation equipment;			CO2
	B	How to handle the machine, common problems one may come across;			CO2
	C	How to overcome it, radiation hazard			CO2, CO6
	Unit 3	**Materials in cath lab**			
	A	All catheters, balloons, guidewires, pacemakers contrast material;			CO3
	B	Other material used in the cardiac catheterisation laboratory;			CO3
	C	Sterilization of all these materials			CO3
	Unit 4	**To know about Catheterisation**			
	A	Procedure; Cath position;			CO4
	B	Oxymetry at various levels;			CO4
	C	Angios done and its interpretation			CO4, CO6
	Unit 5	**To know about angiogram**			
	A	Procedure, Materials used,			CO5
	B	Type and amount dye used, Indications and contraindications,			CO5
	C	Various pictures recorded in various angles and gross interpretation			CO5, CO6
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	1	3	1	1	1	1	3
CO2	3	2	1	1	3	1	1	2	3	-
CO3	3	1	1	1	3	2	1	1	-	-
CO4	3	1	1	1	3	2	1	-	2	1
CO5	3	2	1	1	3	2	1	2	3	-
CO6	3	2	1	1	3	3	1	1	-	2

Course Code	**Course Name**	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO3
BCVT 622	**Cardiac Care Technology -Applied II (LAB)**	3	1.66	1.0	1	3	1.83	1	1.16	1.5	1

Total: 16.15

Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		**Batch:** 2023-27
Programme: BCVT		**Current Academic Year: 2025-2026**
Branch: CVT		**Semester: 6th Semester**
1	Course Code	BCVT 623
2	Course Title	**Cardiac Care Technology-Advanced II (LAB)**
3	Credits	1
4	Contact Hours (L-T-P)	0-0-2
	Course Status	Core
5	Course Objective	Students will be able to understand findings of Electrophysiological studies in human heart also about equipment details, handling of cardiac catheterization lab.
6	Course Outcomes	CO1. Graduates will be able to understand normal valve, basic abnormalities of Heart Valves in various disease, CO2.Graduates will be able to understand findings of Electrophysiological studies in human heart. CO3.Graduates will be able to know equipment details, handling of cardiac catheterization lab. CO4.Graduates will be able to know materials used in cath. lab and their sterilization technique CO5. Graduates will be able to know different aspects of ASD,VSD. And Temporary and permanent pacing CO6. Graduates will be able to know precaution & safe during procedure.
7	Course Description	**Cardiac Care Technology-Applied II (LAB)** is about understanding of **Cardiac monitoring** **Interpretation of TMT, Use of defibrillator, Management of cardiac arrest, Myocardial perfusion scan, Cardiac arrhythmias, Electrolyte disturbances, Holter monitoring, Valvoplasties, Coil closure and device closure of PDA and Device closure of ASD,VSD, Pressure recording, pacing, pregnancy, and nuclear cardiology**
8	Outline syllabus	CO Mapping
	Unit 1	**To know about Holter monitoring .**

	A	Procedure and			CO1
	B	Usefulness			CO1
	C	precautions			CO1
	Unit 2	**To know about Valvoplasties.**			
	A	Procedure,			CO2
	B	Indications,			CO2
	C	Complications and treatment of ballons, mitral valvuloplasty, ballon aortic valvuloplasty ballon pulmonary valvuloplasty and balloon tricuspid valvuloplasty.			CO2, CO6
	Unit 3	**To understand about Coil closure and device closure of PDA**			
	A	Procedure,			CO3
	B	Indications			CO3
	C	Materials used for coil and device closure of PDA			CO3
	Unit 4	**To know about Device closure of ASD**			
	A	Procedure,			CO4
	B	Indications;			CO4
	C	Materials used for device closure of ASD			CO4, CO6
	Unit 5	**To know about Device closure of VSD**			
	A	Procedure,			CO5
	B	Indications;			CO5
	C	Materials used for device closure of ASD			CO5, CO6
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	1	3	1	1	1	1	3
CO2	3	2	1	1	3	1	1	2	3	-
CO3	3	1	1	1	3	2	1	1	-	-
CO4	3	1	1	1	3	2	1	-	2	1
CO5	3	2	1	1	3	2	1	2	3	-
CO6	3	2	1	1	3	3	1	1	-	2

Course Code	**Course Name**	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO 2	PSO3
BCVT 623	**Cardiac Care Technology -Advanced II (LAB)**	3	1.66	1.0	1	3	1.83	1	1.16	1.5	1

Total: 16.15

Strength of Correlation
1. Addressed to **Slight (Low=1) extent** **2.** Addressed to **Moderate (Medium=2) extent**
3. Addressed to **Substantial (High=3) extent**

School: SSAHS		Batch : 2023-2027	
Programme: BCVT		Current Academic Year: **2026-2027**	
Branch: CVT		**Semester : 7**	
1	Course Title	BCVT 721	
2	Course Title	Cardiovascular Technology Internship & Project work	
3	Credit Hours	**20**	
3	Course Status	Compulsory	
4	Internship Objective	• To help the students to identify and understanding of cardiac disease development • To train the students for routine investigation of cardiac diseases. • To prepare students for providing assistance to cardiologists. • To provide the conceptual basis for understanding of various manoeuvre for diagnosis and interpretation of cardiac diseases. • To develop diagnostic skills in cardiovascular technology.	
5	Internship Outcomes	1. Graduates will be able to understand normal ECG, basic abnormalities of ECG in various diseases. 2. Graduates will be able to understand findings of ECHO in various diseases 3. Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab. 4. Graduates will be able to know materials used in cath. lab and their sterilization technique 5. Graduates will be able to know different aspects of coronary angiography and peripheral angiogram.	
6	Internship Description	• Electrocardiography (ECG) • Cardiac monitoring • Interpretation of TMT • Echocardiogram	

		• Use of defibrillator • Management of cardiac arrest • Myocardial perfusion scan • Cardiac arrhythmias • Electrolyte disturbances • Holter monitoring • Assessment of cardiac function • Cardiac catheterization and coronary angiogram/angioplasty • Valvoplasties • Coil closure and device closure of PDA • Device closure of ASD,VSD • Pressure recording, pacing, Procedure during pregnancy, nuclear cardiology	

1. The students will be posted to the following departments/section of the cardiology unit of a hospital in a span of 12 months.

S. No.	Department/Section
1.	Electrocardiography
2.	TMT & Holter monitor
3.	ECHO
4.	Cath Lab
5.	Cardiac OT
6.	ICU/CCU/Recovery Room

Guidelines for Project work

1. During internship and project work, students will have to maintain a file.
In the file, collected data & diagnostic procedure (or surgery) of patients should be recorded.
2. Project Work
On the given topic, student will collect the data of patients (as many as possible) and submit the project report before Viva Voce.
The project work will be taken up by a student on an area identified is the process of internship.
The assessment of the course will be done based on the following criteria:

i. Attendances
ii. Case Study
iii. Report
iv. Presentation

The report should base the following points:

i. Causes
ii. Risk Factors
iii. Prevalence
iv. Post Treatment Effects on Patients
v. Precautions Or Suggestions for Patients
vi. Conclusive Remarks (by Presenter)

Note - During the internship period, student must attend all mentioned departments for the given time period.

School: SSAHS		Batch : 2023-2027	
Programme: BCVT		Current Academic Year: **2026-2027**	
Branch: CVT		**Semester : 8**	
1	Course Title	BCVT 821	
2	Course Title	Cardiovascular Technology Internship & Project work	
3	Credit Hours	**20**	
3	Course Status	Compulsory	
4	Internship Objective	• To help the students to identify and understanding of cardiac disease development • To train the students for routine investigation of cardiac diseases. • To prepare students for providing assistance to cardiologists. • To provide the conceptual basis for understanding of various manoeuvre for diagnosis and interpretation of cardiac diseases. • To develop diagnostic skills in cardiovascular technology.	
5	Internship Outcomes	6. Graduates will be able to understand normal ECG, basic abnormalities of ECG in various diseases. 7. Graduates will be able to understand findings of ECHO in various diseases 8. Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab. 9. Graduates will be able to know materials used in cath. lab and their sterilization technique 10. Graduates will be able to know different aspects of coronary angiography and peripheral angiogram.	
6	Internship Description	• Electrocardiography (ECG) • Cardiac monitoring • Interpretation of TMT • Echocardiogram	

		• Use of defibrillator • Management of cardiac arrest • Myocardial perfusion scan • Cardiac arrhythmias • Electrolyte disturbances • Holter monitoring • Assessment of cardiac function • Cardiac catheterization and coronary angiogram/angioplasty • Valvoplasties • Coil closure and device closure of PDA • Device closure of ASD,VSD • Pressure recording, pacing, Procedure during pregnancy, nuclear cardiology	

1. The students will be posted to the following departments/section of the cardiology unit of a hospital in a span of 12 months.

S. No.	Department/Section
1.	Electrocardiography
2.	TMT & Holter monitor
3.	ECHO
4.	Cath Lab
5.	Cardiac OT
6.	ICU/CCU/Recovery Room

Guidelines for Project work

1. During internship and project work, students will have to maintain a file.
In the file, collected data & diagnostic procedure (or surgery) of patients should be recorded.
2. Project Work
On the given topic, student will collect the data of patients (as many as possible) and submit the project report before Viva Voce.
The project work will be taken up by a student on an area identified is the process of internship.
The assessment of the course will be done based on the following criteria:

v. Attendances
vi. Case Study
vii. Report
viii. Presentation

The report should base the following points:

vii. Causes
viii. Risk Factors
ix. Prevalence
x. Post Treatment Effects on Patients
xi. Precautions Or Suggestions for Patients
xii. Conclusive Remarks (by Presenter)

Note - During the internship period, student must attend all mentioned departments for the given time period.

Clinical Training and internship: Every student who has passed in all the theory and practical examinations of all the three years will have to undergo 1 year compulsory clinical training in at-least 250 bedded hospital as rotatory inter departmental internship as per schedule finalized by the Sharda School of Allied Health Sciences authorities. 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 Centre. The Regular participation of students in seminars / case presentations is mandatory and aimed to encourage them in learning research and development Programmes in Cardiovascular 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'.