



INTEGRAL UNIVERSITY, LUCKNOW
INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF PARAMEDICAL SCIENCES

**BACHELOR OF SCIENCE IN CARDIOVASCULAR
TECHNOLOGY
(B.Sc. CVT)**

SYLLABUS

YEAR/ SEMESTER: II/III



Integral University, Lucknow
Department of Paramedical Sciences
Study and Evaluation Scheme

Program: BSc. Cardiovascular Technology

Semester-III

S. N.	Course code	Course Title	Type of Paper	Period Per hr/week/sem			Evaluation Scheme				Sub. Total	Credit	Total Credits
				L	T	P	CT	TA	Total	ESE			
THEORIES													
1	CV201	Clinical Hematology - I	Core	2	1	0	40	20	60	40	100	2:1:0	3
2	CV202	Microbiology	Core	2	1	0	40	20	60	40	100	2:1:0	3
3	CV203	Pharmacology	Core	2	1	0	40	20	60	40	100	2:1:0	3
4	CV204	Medical Biochemistry -II	Core	2	1	0	40	20	60	40	100	2:1:0	3
5	CV205	Basics of Cardiovascular Technology	Core	2	1	0	40	20	60	40	100	2:1:0	3
6	ES101	Environmental Science	Core	2	1	0	40	20	60	40	100	2:1:0	3
PRACTICAL													
1	CV206	Clinical Hematology - I Lab	Core	0	0	4	40	20	60	40	100	0:0:2	2
2	CV207	Medical Biochemistry -II Lab	Core	0	0	4	40	20	60	40	100	0:0:2	2
3	CV208	Basics of Cardiovascular Technology Lab	Core	0	0	4	40	20	60	40	100	0:0:2	2
Total				12	06	12	360	180	540	360	800	24	24

S. N.	Course code	Course Title	Type of Paper	Attributes						United Nation Sustainable Development Goal (SDGs)	
				Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value		Professional Ethics
THEORIES											
1	CV201	Clinical Hematology - I	Core	√	√	√	√		√	√	3,4
2	CV202	Microbiology	Core	√	√	√	√		√	√	3,4
3	CV203	Pharmacology	Core	√	√	√	√		√	√	3,4
4	CV204	Medical Biochemistry -II	Core	√	√	√	√		√	√	3,4
5	CV205	Basics of Cardiovascular Technology	Core	√	√	√	√		√	√	3,4
6	ES101	Environmental Science	Core			√		√			3,4
PRACTICAL											
1	CV206	Clinical Hematology - I Lab	Core	√	√	√	√		√	√	3,4
2	CV207	Medical Biochemistry -II Lab	Core	√	√	√	√		√	√	3,4
3	CV208	Basics of Cardiovascular Technology Lab	Core	√	√	√	√		√	√	3,4

L: Lecture **T:** Tutorials **P:** Practical **CT:** Class Test **TA:** Teacher Assessment **ESE:** End Semester Examination,
AE= Ability enhancement, **DSE-** Discipline Specific Elective, **Sessional Total:** Class Test + Teacher Assessment **Subject Total:** Sessional Total + End Semester Examination (ESE)



Integral University, Lucknow

Effective from Session: 2024-25

Course Code	CV201	Title of the Course	CLINICAL HAEMATOLOGY- I	L	T	P	C
Year	II	Semester	III	2	1	0	3
Pre-Requisite	10+2 with Biology	Co-requisite	Nil				
Course Objectives	The hematology curriculum aims to prepare students in basic understanding of composition of blood. Students would also be introduced to laboratory waste management protocols, instrumentation, techniques and methods of estimating different parameters of blood. The academic emphasis of this module is that students would learn basic hematological techniques including blood coagulation tests, blood banking and automation.						

Course Outcomes

CO1	Students will be able to receive process and preserve the tissue samples and can efficiently about the RBCs. Structure and function
CO2	Students will be able to receive process and about the Anemia.
CO3	Students will be able to receive process of the Anemic Disease.
CO4	Students will be able to receive process and preserve the tissue samples and can efficiently perform Anemia of Diminished Erythropoiesis.
CO5	Students will be able to receive process and preserve the Hemolytic anemia.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	BLOOD	Structure and metabolism of RBCs. Structure of normal hemoglobin and its metabolism. Variation of size and shape.	6	CO1
2	ANEMIA	Definition of Anemia and its classification (Morphological and etiological) pathogenesis, laboratory investigations in a case of anemia.	6	CO2
3	ANEMIC DISEASE	Anemia of blood loss - acute and chronic.	6	CO3
4	ANEMIA OF DIMINISHED ERYTHROPOIESIS	Anemia of Diminished erythropoiesis: Iron deficiency anemia - pathogenesis, and laboratory investigations. Principle and procedure of special tests - Estimation of iron, TIBC, Transferrin Ferritin, Plasma hemoglobin, Perls Prussian blue staining. Macrocytic anemia - pathogenesis, and laboratory investigations of Megaloblastic anemia, pernicious anemia, pathogenesis, clinical features, laboratory investigations, test for Vit.B12, Folic acid, FIGLU test and Schilling test.	6	CO4
5	HEMOLYTIC ANEMIA	Features of Hemolytic anemia (extra vascular and intra vascular hemolysis). Hemolytic anemia of non-immune origin Sickle cell anemia, sickle cell trait, pathogenesis, clinical features, laboratory investigations. Principle and procedure of special test, Sickling test. Briefly about G-6-PD deficiency disease, tests for diagnosis, Hereditary spherocytosis and test for diagnosis (Osmotic fragility test, Heinz bodies). Immune-hemolytic anemia.	6	CO5

Reference Books:

1. Mukherjee .L. K(2017), Medical Laboratory Technology, Vol.1-3,3rd edition, Tata Mc-graw Hill..
2. SoodRammik,(2015), Text book of Medical Laboratory Technology,2nd edition, Jaypee Publications.
3. Wintrobe's Clinical Haematology,(2014),13th edition, Lippincott Williams &Wilkins.
4. De Gruchy's Clinical Haematology in Medical Practice,(2012),Sixth edition,Wiley Publications.
5. Dacie& Lewis Practical Haematology, (2011),11thedition, Elsevier Publications.

e-Learning Source:

1. <https://www.slideshare.net/peddanasunilkumar/introduction-to-pathology-ppt>
2. <https://www.ucsfhealth.org/medical-tests/semen-analysis#:~:text=Semen%20analysis%20is%20one%20of,have%20a%20male%20infertility%20problem.>
3. <https://www.youtube.com/watch?v=wZCKrseSIOE>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO-PSO CO	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-	1
CO2	1	3	1	3	-	-	-	1	3	-	-	3	-	2	-	2	-	1
CO3	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-	1
CO4	1	3	1	2	-	-	-	1	3	-	-	3	-	1	-	1	-	1
CO5	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
CV201	CLINICAL HAEMATOLOGY- I	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2024-25							
Course Code	CV203	Title of the Course	PHARMACOLOGY	L	T	P	C
Year	II	Semester	III	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The course will provide training in general pharmacology with special emphasis on common drugs used, routes of ministration, types of formulations, dose and frequency of administration, side effects and toxicity, management of toxic effects, drug interactions, knowledge of chemical and trade name, importance of manufacturing and expiry dates and instructions for handling of drugs.						

Course Outcomes: After the successful course completion, learners will develop following attributes:	
CO1	General Pharmacology & ANS: Possess a relevant knowledge in basic principles of pharmacology and its recent advances.
CO2	Autacoids, PNS & Resp. System: Understand the basic pharmacology of common drugs used, their importance in the overall treatment including Physiotherapy.
CO3	CVS, GIT & Miscellaneous: Understand the general principles of drug action and the handling of drugs by the body.
CO4	CNS & Hormones: Understand the contribution of both drug and physiotherapy factors in the outcome of treatment
CO5	Anti - Microbial Agents: Learn the various drugs such as Anti-leprotic& Anti-fungal Drugs, Anti-malarial Drugs, Anti-tubercular Drugs

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	GENERAL PHARMACOLOGY	Introduction to pharmacology-various terminologies-sources & routes of drug administration-Absorption & Factors modifying drug absorption – Distribution of drugs- Metabolism: Phase II, - Excretion: routes, modes & kinetics of elimination-Excretion- Mechanism of drug action in brief, synergism & antagonism and Factors modifying drug action-Adverse drug reactions-ADR reporting & monitoring – Drug interactions.	8	CO1
2	CENTRAL NERVOUS SYSTEM & RESPIRATORY SYSTEM	Introduction to CNS and Neurotransmitters, drugs used in insomnia, Sedatives and hypnotics-diazepam-alprazolam, anti-anxiety drugs, Antiepileptic-phenytoin, carbamazepine, sodium valproate, General Anesthetics – halothane, isoflurane, sevoflurane – Local Anesthetics – lignocaine – list of other drugs, Alcohols – ethyl alcohol –disulfuram, Anti parkinsonians – levodopa – carbidopa, Opioids – morphine – naloxone – tramadol – pentazocine, NSAIDs –aspirin – diclofenac – ibuprofen – paracetamol – Cox 2 inhibitors. Drugs used in bronchial asthma and cough	8	CO2
3	CARDIO VASCULAR SYSTEM & BLOOD	Drugs used in ischemic heart disease-nitrates-Calcium channel blockers-nifedipine, verapamil-list of other drugs – Beta blockers – propranolol, atenolol – metoprolol and antiplatelets – aspirin, clopidogrel, and names of other drugs-fibrinolytic drugs-streptokinase and other drugs, Drugs used in CCF-digoxin and list of other drugs useful in CCF, Shock. Diuretics: 4 groups – Thiazides, Loop diuretics, Potassium sparing and osmotic diuretics. Hypertension – outline of drugs used in hypertension, Rennin angiotensin system – ACE inhibitors – captopril, ramipril and names of other drugs – Receptor antagonist – losartan and list of other drugs, Antiarrhythmic drugs- classification – Quinidine, Lignocaine and amiodaron – Drugs for Hypercholesterolemia – statins. Drugs for anemia – oral & parenteral iron preparations, folic acid, vit B12 and erythropoietin. Coagulants and anticoagulants	8	CO3
4	HORMONES AND GIT	Contraceptives – oral and injectable, Corticosteroids – glucocorticoids – hydrocortisone-prednisolone-dexamethasone and names of topical steroids – Insulin – Oral hypoglycemic –sulphonyl urea’s, biguanides and others, Thyroid and Antithyroid drugs, Sex Hormones-Estrogen and antiestrogens, Progestin and Anti progestin’s, Androgen And anti-androgens. Emetics and anti-emetics-metoclopramide and domperidone, Drugs used in peptic ulcer, constipation-lactulose & Diarrhea-ORS-Loperamide.	8	CO4
5	CHEMOTHERAPY AND MISCELLANEOUS	Introduction – Beta lactum antibiotics: Penicillin’s – natural, semi synthetic penicillin’s – amoxicillin – cloxacillin-clauvulinic acid – sulbactam – Cephalosporin’s – cephalexin – cefuroxime – cefixime –ceftriaxone-cefepime, Broad spectrum antibiotics – Doxycycline – chloramphenicol-imipenem-Macrolides – erythromycin, azithromycin and others – Quinolones- ciprofloxacin and list of other drugs and sulfonamides- cotrimoxazole-Amino glycosides-gentamycin, amikacin and names of other drugs Anti TB-first line drugs, Anti leprosy-dapsone and clofazimine Anti-malarial- chloroquine-mefloquine and artemisinins, Anti-fungal- amphotericin B-fluconazole and topical drugs & Anti viral drugs- acyclovir and anti-HIV, Anti protozoals- metronidazole – Anthelmintics- albendazole-praziquantel. Anti-cancer drugs-Introduction – Anti metabolites- methotrexate- 6 mercapto purine- Alkylating agents-cyclophosphamide- busulphan and cisplatin – Plant products- vinblastin- vincristine-taxanes, antibiotics-actinomycin D- monoclonal antibodies. Immuno modulators- cyclosporine, tacrolimus, azathioprine and steroids.	8	CO5

Reference Books:

1. Dr. K.D. Tripathi Jaypee, Essential of Medical Pharmacology, Brothers Medical Publishers.
2. Gaddum Gaddum’s Pharmacology
3. Dr. R.S. Satoskar & Dr. S.D. Bhandarkar, Pharmacology & Pharmacotherapeutics Revised 19th Edition 2005 by Popular Prakashan
4. Krantx, & Carr, Pharmacology principle of Medical practice, Williams &Wilkins.
5. Goodman Pharmacological basis of Therapeutics, L. S. Gilman A

e-Learning Source:

1. <https://youtu.be/a0lWFQvOKw8>
2. <https://youtu.be/qhiMmNZjHRg>
3. <https://youtu.be/-znHCAu5OnY>
4. <https://youtu.be/t2tKyjj7u5Y>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	-	-	-	-	-	-	-	-	-	1	3	-	1	-	2
CO2	3	3	-	-	-	2	-	-	-	-	-	-	3	3	2	3	3
CO3	2	3	-	-	-	2	-	-	-	-	-	1	3	2	1	3	2
CO4	3	3	-	-	-	-	-	-	-	-	-	-	2	3	2	2	3
CO5	3	3	-	-	-	3	-	1	-	-	-	-	3	3	2	3	3

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
CV203	PHARMACOLOGY	√	√	√					3,4



Integral University, Lucknow

Effective from Session: 2024-25							
Course Code	CV204	Title of the Course	MEDICAL BIOCHEMISTRY-II	L	T	P	C
Year	II	Semester	III	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	This course deals with fundamentals of metabolism, metabolic disorders, laboratory test and instruments of Clinical Biochemistry.						

Course Outcomes: After the successful course completion, learners will develop following attributes:	
CO1	Students will be able to learn about metabolism of carbohydrates, HMP pathway & ETC
CO2	Students will be able to learn about blood glucose regulation mechanism and its disorder, ex- Diabetes Mellitus
CO3	Students will be able to learn about Proteins and their metabolism.
CO4	Students will be able to learn about Lipids, their structure, metabolic pathways and cholesterol metabolism
CO5	Students will be able to learn about Acid-Base balance mechanism, Blood chemistry profile, various techniques to monitor blood chemistry.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	METABOLISM OF CARBOHYDRATES	Introduction of Metabolism, Metabolism of Carbohydrates: Glycolysis, TCA cycle, Gluconeogenesis, Glycogenesis, Glycogenolysis, Hexose monophosphate Pathway. Biological Oxidation and Electron Transport Chain.	6	CO1
2	DIABETES MELLITUS	Blood glucose homeostasis and its regulation, Insulin, glucagon, C- peptide. Diabetes mellitus, types, clinical features, diabetic profile test, HbA1C, Fructosamine, GTT, Glycosuria, Hyperglycemia and Hypoglycemia.	6	CO2
3	PROTEINS	Metabolism of Proteins: Formation of ammonia, Transamination, Deamination, Urea, Cycle, Significance of Urea cycle, metabolism of Aromatic and Branched chain amino acids, Aminoaciduria.	6	CO3
4	LIPID	Metabolism of Lipids: Fatty acid synthesis, Beta oxidation of fatty acids, Ketone bodies and ketosis, Cholesterol metabolism, metabolism of Lipoproteins, Lipid profile, Hyperlipidemia, Dyslipidemia and Atherosclerosis.	6	CO4
5	ACID & BASE BALANCE	1. Acid- Base balance and pH: pH and its Regulation, Metabolic and Respiratory Disorders. 2. Principle, application, calibration and maintenance of colorimeter, Blood Chemistry analyzer, ABG analyzer, Flame photometer, Turbidimetry, Nephelometry.	6	CO5

Reference Books:

1. D M Vasudevan, Text book of Medical Biochemistry, Jaypee Publishers.
2. M N Chatterjee & Rana Shinde, Text book of Medical Biochemistry, Jaypee Publications.
3. Michael Cox, David L. Nelson, Lehninger Principles of Biochemistry, 7th edition, W.H. Freeman.
4. Ranjana Chawla, Practical Clinical Biochemistry: Methods and Interpretations.

e-Learning Source:

1. <https://youtu.be/t5DvF5OVr1Y>
2. <https://youtu.be/gggC9vctvBQ>
3. <https://youtu.be/ufvZ8bYtyO8>
4. <https://youtu.be/Q6R4o-oECxs>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	2	2	-	-	-	1	2	1	-	2	2	1	-	1	-
CO2	1	3	1	3	-	-	-	2	3	-	-	3	3	2	-	2	-
CO3	1	3	1	2	-	-	-	1	2	2	-	2	3	1	-	1	-
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	-
CO5	1	3	1	2	-	-	-	1	2	1	-	2	2	1	-	1	-

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation
Attributes & SDGs

Course Code	Course Title	Attributes						SDGs No.	
CV204	MEDICAL BIOCHEMISTRY-II	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>		<i>f</i>	<i>f</i>	



Integral University, Lucknow

Effective from Session:2024-25							
Course Code	CV205	Title of the Course	BASICS OF CARDIOVASCULAR TECHNOLOGY	L	T	P	C
Year	II	Semester	III	2	1	0	3
Pre-Requisite	NIL	Co-requisite	NIL				
Course Objectives	Students can understand the Basic concepts of cardiovascular technology. Students can learn about the medical conditions related to the cardiovascular system.						

Course Outcomes	
CO1	To understand the Basic Function of Heart
CO2	To understand the Gross Anatomy and Physiology of the Heart.
CO3	To understand the Non-invasive ECG techniques
CO4	To understand the purpose of ECG machines and related equipment
CO5	To understand the gas administration devices

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	ANATOMY AND PHYSIOLOGY OF HEART AND BLOOD VESSELS	1. Gross anatomy and physiology of the heart. 2. Systemic and pulmonary circulation, 3. Coronary structure. 4. Chest topography. 5. Surface marking of heart. 6. Conduction system of the heart	6	CO1
2	NONINVASIVE ECG	1. Technique of ECG recording 2. ECG leads system 3. ECG waves, intervals and segments - person, Osborn wave, delta wave, epsilon wave 4. ECG reporting exercise testing	6	CO2
3	NONINVASIVE ECHOCARDIOGRAPHY	1. Introduction and purposes, demonstration of machine parts, 2. Basic windows 3. Echocardiographic views 4. Imaging modes - two-dimensional (2d) imaging, m-mode imaging, doppler imaging, color-flow mapping.	6	CO3
4	INVASIVE TECHNOLOGIES	1. Introduction to Cath labs and biomedical equipment. 2. Radiation safety and protocols. 3. Catheterization of heart and angiography 4. Maintaining sterility and patient care	6	CO4
5	GAS ADMINISTRATION DEVICES	1. Gas administration devices (reducing valves, flow meters and regulators). A) simple oxygen administration devices. 2. Methods of controlling gas flow. 3. Reducing valves, flow meters, restrictors and regulators 4. Selection of device	6	CO5

Reference Books:

1. A Textbook of Electrocardiography - Goldberger.
2. Nanda's A Textbook of Echocardiography.
3. A Text of Cardiac Catheterization & Interventions. Dr. W. Grossman's D. Baim.
4. A Textbook of Cardiovascular Medicine. Dr. Bruanwald's.
5. A Textbook of Medicine. Davidsons.

e-Learning Source:

1. <https://youtu.be/t5DvF5OVr1Y>
2. <https://youtu.be/gggC9vctvBQ>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
	CO1	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-
CO2	1	3	1	3	-	-	-	1	3	-	-	3	-	2	-	2	-	1
CO3	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-	1
CO4	1	3	1	2	-	-	-	1	3	-	-	3	-	1	-	1	-	1
CO5	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
CV205	BASICS OF CARDIOVASCULAR TECHNOLOGY	√	√	√			√	√	3,4



Integral University, Lucknow

Effective from Session: 2024-25							
Course Code	CV206	Title of the Course	CLINICAL HAEMATOLOGY-I LAB	L	T	P	C
Year	II	Semester	III	0	0	4	2
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	<p>The hematology curriculum aims to prepare students in basic understanding of composition of blood. Students would also be introduced to laboratory waste management protocols, instrumentation, techniques and methods of estimating different parameters of blood.</p> <p>The academic emphasis of this module is that students would learn basic hematological techniques including blood coagulation tests, blood banking and automation.</p>						

Course Outcomes	
CO1	Students will be able to learn about Hemoglobin Detection Technique, Total RBC counting technique, PCV
CO2	Students will be able to learn about Red cell Indices, Blood smear, GBP
CO3	Students will be able to learn about G-6PD, Leucocyte count, ALC techniques
CO4	Students will be able to learn about toxic granulation of neutrophil, PT & NR, APTT
CO5	Students will be able to learn about SICKLE TEST, Plasma HB, Reticulocyte count techniques.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mappe d CO
1	HEMOGLOBIN DETECTION TECHNIQUE	1. Determination of hemoglobin by various methods.	60	CO1
2	TOTAL RBCCOUNTING TECHNIQUE	2. Determination of Total RBC count.		CO1
3	PCV	3. Determination of PCV.		CO1
4	RED CELL INDICES	4. Determination of red cell indices.		CO2
5	BLOOD SMEAR	5. Demonstration of hypochromic microcytic slide.		CO2
6	GBP	6. General blood picture.		CO2
7	G-6PD	7. Determination of G-6-PD.		CO3
8	LEUCOCYTE COUNT	8. Differential Leucocyte Count.		CO3
9	ALC	9. Absolute leucocyte count.		CO3
10	NEUTROPHIL	10. Demonstration of toxic granulation of neutrophil.		CO4
11	PT & NR	11. To perform PT and Calculate INR.		CO4
12	APTT	12. To perform APTT.		CO4
13	SICKLE TEST	13. To perform sickling test.		CO5
14	PLASMA HB	14. Determination of Plasma Hemoglobin.		CO5
15	RETICULOCYTE COUNT	15. To perform reticulocyte count.		CO5

Reference Books:

1. Praful B. Godkar: Textbook of Medical Laboratory Technology
2. Dr. Ramnik Sood: Textbook of Medical Laboratory Technology

e-Learning Source:

1. <https://www.slideshare.net/peddanasanilkumar/introduction-to-pathology-ppt>
2. <https://www.ucsfhealth.org/medical-tests/semen-analysis#:~:text=Semen%20analysis%20is%20one%20of,have%20a%20male%20infertility%20problem.>
3. <https://www.youtube.com/watch?v=wZCKrseSIOE>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-
CO2	1	3	1	3	-	-	-	1	3	-	-	3	-	2	-	2	-
CO3	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-
CO4	1	3	1	2	-	-	-	1	3	-	-	3	-	1	-	1	-
CO5	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
CV206	CLINICAL HAEMATOLOGY-ILAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>		<i>r</i>	<i>r</i>	



Integral University, Lucknow

Effective from Session: 2024-25

Course Code	CV208	Title of the Course	BASICS OF CARDIOVASCULAR TECHNOLOGY-LAB	L	T	P	C
Year	II	Semester	III	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	1. Students can understand the Basic concepts of cardiovascular technology. 2. Students can learn about the medical conditions related to the cardiovascular system						

Course Outcomes

CO1	To understand the Basic Function of Heart
CO2	To understand the Gross Anatomy and Physiology of the Heart.
CO3	To understand the Non-invasive ECG techniques
CO4	To understand the purpose of ECG machines and related equipment

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	History taking	Including the patient's demographic Data, Family history and Medical History.	30	CO1-4
2	General Physical Examination and assessment of vital signs	Heart rate, Blood pressure, Pulse rate		
3	Basic Systemic Examination	Vital sign measurement Pulse palpation and auscultation Vein observation Chest inspection, and palpation		
4	Demonstration of ECG	Concepts of ECG		

Reference Books:

1. A Textbook of Electrocardiography - Goldberger.
2. Nanda's A Textbook of Echocardiography.
3. A Text of Cardiac Catheterization & Interventions. Dr. W. Grossman's D. Baim.
4. A Textbook of Cardiovascular Medicine. Dr. Bruanwald's.

e-Learning Source:

1. <https://www.slideshare.net/DJASMINEPRIYA/histopathology-introduction>
2. <https://www.ijohsjournal.org/article.asp?issn=2231-6027;year=2018;volume=8;issue=2;spage=63;epage=67;aulast=Theresa>
3. <https://www.slideshare.net/varughegegeorge/hematoxylin-and-eosin-staining-67250220>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
	CO1	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	-
CO2	1	3	1	3	-	-	-	1	3	-	-	3	3	2	-	2	-	1
CO3	1	3	1	2	-	-	-	1	2	-	-	2	3	1	-	1	-	1
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	-	1
CO5	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	-	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course Code	Course Title	Attributes						SDGs No.	
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value		Professional Ethics
CV208	BASICS OF CARDIOVASCULAR TECHNOLOGY-LAB	f	f	f	f		f	f	3,4