INTEGRAL UNIVERSITY, LUCKNOW

INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF ALLIED AND HEALTHCARE SCIENCES

BACHELOR OF SCIENCE IN DIALYSIS TECHNOLGY
(B. Sc. DT)

SYLLABUS

YEAR/ SEMESTER: III/V

Integral University, Lucknow

Department of Allied and Healthcare Sciences

Study and Evaluation Scheme

Program: B.Sc. Dialysis Technology Semester-V

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	DT301	Applied Dialysis Technology	Core	2	1	0	40	20	60	40	100	2:1:0	3
2	DT302	Research methodology	Core	2	1	0	40	20	60	40	100	2:1:0	3
3	DT303	Biomedical Instrumentations	Core	2	1	0	40	20	60	40	100	2:1:0	3
4	DT304	Basics of Nephrology	Core	2	1	0	40	20	60	40	100	2:1:0	3
5	DT305	Medical disorder and Intensive Care	Core	2	1	0	40	20	60	40	100	2:1:0	3
PRACTICAL													
1	DT306	Applied Dialysis Technology Lab	Core	0	0	4	40	20	60	40	100	0:0:2	2
2	DT307	Medical Disorder And Intensive Care Lab	Core	0	0	4	40	20	60	40	100	0:0:2	2
3	DT308	Clinical Posting	Core	0	0	12	40	20	60	40	100	0:0:6	6
Total				**10**	**05**	**20**	**320**	**160**	**480**	**320**	**800**	**25**	**25**

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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	DT301	Applied Dialysis Technology	Core	√	√	√	√		√	√	3,4
2	DT302	Medical disorder and Intensive Care	Core	√	√	√	√		√	√	3,4
3	DT303	Biomedical Instrumentations	Core	√	√	√	√		√	√	3,4
4	DT304	Basics of Nephrology	Core	√	√	√	√		√	√	3,4
5	DT305	Research Methodology	Core	√	√	√	√		√	√	3,4
PRACTICAL											
1	DT306	Applied Dialysis Technology - lab	Core	√	√	√	√		√	√	3,4
2	DT307	Medical disorder and Intensive Care -lab	Core	√	√	√	√		√	√	3,4
3	DT308	Clinical Posting	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

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**DT301**	**Title of the Course**	**APPLIED DIALYSIS TECHNOLOGY**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	**2**	**1**	**0**	**3**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	Understand advanced dialysis techniques, manage dialysis in special clinical conditions, and apply knowledge of associated complications, rehabilitation, and innovations in dialysis car.						

Course Outcomes	
CO1	To Explain the dialysis management of patients with complex conditions such as congestive heart failure, advanced liver disease, HIV, HBsAg, HCV positivity, poisoning, failed transplants, and pregnancy.
CO2	To Describe advanced dialysis modalities including hemodiafiltration, hemoperfusion, SLED, MARS, continuous therapies, and different types of peritoneal dialysis.
CO3	To Understand the psychological aspects, rehabilitation needs, and complications associated with long-term dialysis such as infections, bone disease, aluminum toxicity, diabetes, and hypertension.
CO4	To Demonstrate knowledge of specialized dialysis techniques including nocturnal, online, and daily dialysis, and their clinical applications.
CO5	To Apply knowledge of telemedicine in dialysis care, renal anemia management, and dialysis in special populations like infants and children.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Dialysis in Special Situations**	Patients with congestive cardiac failure Advanced liver disease Patients positive for HIV, HBsAg& HCV Failed transplant Poisoning cases Pregnancy.	7	CO1
2	**Special Dialysis Procedures**	Hemodialysis Apparatus: Types of Dialyser & Membrane, Composition & Types of Continuous therapies in hemodialysis Different modalities of peritoneal dialysis Hemodiafiltration, Hemoperfusion, Sled, Mars	8	CO2
3	**Special problems in Dialysis Patients**	• Psychology & rehabilitation • Diabetes • Hypertension • Infections • Bone diseases • Aluminum toxicity	7	CO3
4	**Recent Advances in Hemodialysis**	• Nocturnal dialysis • Online dialysis • Daily dialysis	8	CO4
5	**Telemedicine in Dialysis Practice**	Telemedicine in dialysis practice Renal anaemia management Dialysis in infants & children	**7**	**CO5**

Reference Books:

1. **Daugirdas' Handbook of Dialysis** – John T. Daugirdas
2. **Clinical Dialysis** – Allen R. Nissenson & Richard N. Fine
3. **The Essentials of Peritoneal Dialysis** – S.K. Agarwal
4. CFA Culling, (1974), Handbook of Histopathological and Histochemical techniques: Including Museum Techniques, 3rd edition, Butter worth publishers.

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/VARUGHESEGEORGE/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	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
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	-	-	3	1	-	1	-	1
CO4	1	3	1	2	-	-	-	1	3	-	-	2	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	
DT301	Applied Dialysis Technology	✓	✓	✓	✓		✓	✓	3,4

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**DT302**	**Title of the Course**	**RESEARCH METHODOLOGY**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	**2**	**1**	**0**	**3**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	This course introduces students to fundamental principles of research methodology, including study design, data collection, statistical analysis, and ethical considerations in scientific research. On completion of this course, students will be able to apply statistical tools in various fields in their practical life						

Course Outcomes	
CO1	Understand the basics of research, types of research, and their significance.
CO2	Formulate research questions, hypotheses, and study designs.
CO3	learning how to gather and analyze data and creating effective graphs, charts, and tables to visually communicate data insights.
CO4	Course aims to equip students with the skills to critically analyze existing research within their field and writing a comprehensive literature review
CO5	Course typically aims to equip students with the ability to develop a well-structured research proposal, including a thorough literature review, appropriate methodology, and a compelling presentation to effectively communicate

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**INTRODUCTION OF RESEARCH METHODOLOGY**	• Meaning, objectives, characteristics & significance. • Types of research: qualitative & quantitative. • Basic elements of research: variables – types- independent, dependent, active, attribute, continuous and categorical, characteristic and relationships	6	CO1
2	**RESEARCH DESIGN AND SAMPLING METHODS**	• Research design: meaning, features, types: Observational vs. Experimental research • Types of sampling: Probability and Non-probability sampling • Sample size calculation and statistical power • Sample test**:** use of distribution, test for single mean, equality of mean paired- t test, test for equality of variance, chi- square test	6	CO2
3	**DATA COLLECTION AND ANALYSIS**	• Data collection: classification, tabulation and methods of collecting data. • Types of data: Primary vs. Secondary data • Methods of data collection: Surveys, Questionnaires, Interviews, and Observations. • Statistics: definition, aim, scope, importance and limitation of statistics	6	CO3
4	**SCIENTIFIC WRITING AND LITERATURE REVIEW**	• Review of related literature: Importance of literature review and referencing. • Identification of the related literature. • Organizing the related literature.	6	CO4
5	**RESEARCH PROPOSAL AND PRESENTATION SKILL**	• Preparing a research proposal – Title, Objectives, Methodology, Budgeting • Research proposal: research proposal or synopsis, introduction, procedure for collecting and treating data, bibliography, time and budget schedule. • Writing a thesis/dissertation – Structure and formatting guidelines • How to prepare poster and oral presentations for conferences	6	CO5

- **Reference Books:**

1. Ananthanarayan R. and Paniker C.K.J. (2009) Textbook of Microbiology. 8th edition, University Press Publication.
2. BrooksG.F.,CarrollK.C.,ButelJ.S.,MorseS.A.andMietzner,T.A.(2013).
3. Adelberg's Medical Microbiology. 26th edition. McGraw Hill Publication.
4. Willey JM, Sherwood LM, and Woolverton CJ. (2013) Prescott, Harleyand Klein's Microbiology. 9th edition. McGraw Hill Higher Education.
5. Goldsby RA, Kindt TJ, Osborne BA. (2007). Kuby's Immunology. 6th edition W.H. Freeman and Company, NewYork.

e-Learning Source:

1. https://www.babcock.edu.ng/oer/lecture_notes/mlsc/MLSC%20417%20HISTORY%20OF%20MICROBIOLOGY.ppt
2. https://www.tru.ca/_shared/assets/Microbiology_Lab_Safety39696.pdf
3. https://www.healthline.com/health/what-is-antiseptic

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

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	
DT302	Research methodology	✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**DT303**	**Title of the Course**	**BIOMEDICAL INSTRUMENTATIONS**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	**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	Understand human physiological systems and sources of biomedical signals.
CO2	Explain types, components, and design constraints of medical instrumentation systems.
CO3	Describe bioelectric signals (ECG, EEG, EMG, etc.) and related electrodes.
CO4	Understand basics of diagnostic imaging systems (X-ray, CT, MRI, etc.)
CO5	Outline therapeutic devices and emerging biomedical technologies

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Fundamentals of Medical Instrumentation**	Anatomy and Physiological systems of the body, Sources of biomedical signals, Basic Medical Instrumentation System, Performance Requirement of Medical Instrumentation System, Intelligent Medical Instrumentation System, General] Constraints in design of Medical Instrumentation System, Types of Biomedical Instrumentation Systems.	6	CO1
2	**Bioelectric Signals and Electrode**	Origin of Bioelectric Signals, Bioelectric Signals – Electrocardiogram (ECG), Electroencephalogram (EEG), Electromyogram (EMG), Electroretinogram (ERG), Electrooculogram (EOG). Purpose of Electrode paste, Electrodes for ECG, EEG and EMG.	6	CO2
3	**Modern Imaging Systems**	Basic concepts and fundamentals of – X-ray machines, Computed Tomography, Nuclear Medical Imaging system, Magnetic Resonance Imaging system, ultrasonic Imaging system, Thermal Imaging system.	6	CO3
4	**Modern Imaging Systems**	Basic concepts and fundamentals of – Cardiac Pacemaker, Cardiac Defibrillators, Physiotherapy and Electrotherapy Equipment, Haemodialysis Machines, Lithotriptors, Anaesthesia Machine, Ventilators, Radiotherapy Equipment, Automated Drug delivery systems.	6	CO4
5	**Recent Trends in Biomedical**	Basic concepts and Applications in Biomedical- LASER, BIOMEMS and Nano Technology, Biomaterials and Implants, Artificial Organs, Rehabilitation Engineering.	6	CO5

Reference Books:

1 Leslie Cromwell, “Biomedical Instrumentation and measurement”, Prentice hall of India, New Delhi, 1997.

2 John G. Webster, “Medical Instrumentation Application and Design”, John Wiley and sons, New York, 1998.

3 Joseph J.carr and John M. Brown, “Introduction to Biomedical equipment technology”, John Wiley and sons, New York, 1997

4. RanjanaChawla, Practical Clinical Biochemistry: Methods andInterpretations.

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	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.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
DT303	Biomedical Instrumentations	✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2025-2026							
Course Code	**DT304**	**Title of the Course**	**BASICS OF NEPHROLOGY**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	**2**	**1**	**0**	**3**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	Understand renal disorders and apply basic principles of diagnosis, management, and prevention.						

Course Outcomes: After the successful course completion, learners will develop following attributes:	
CO1	To Understand renal physiology and complications during pregnancy, including pre-existing kidney conditions.
CO2	To Explain renal vascular disorders and hypertension, including both nonpharmacologic and pharmacologic treatments.
CO3	To Describe hereditary and congenital kidney diseases, focusing on pathophysiology, diagnosis, stages, and management.
CO4	To Identify causes, diagnosis, and complications of renal dysfunction in cancer patients
CO5	To Discuss chemotherapy-induced nephrotoxicity and outline prevention, monitoring, and management strategies

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Pregnancy and Renal Disease**	Pregnancy and renal diseases Pregnancy with Preexisting Kidney Diseases Renal Physiology in Normal Pregnancy Renal Complications in Normal Pregnancy.	8	CO1
2	**Renal Vascular Disorders & Hypertension Associated renal Diseases**	Renal vascular disorders & hypertension associated renal diseases Nonpharmacologic Prevention and Treatment of Hypertension Pharmacologic Treatment of Hypertension	8	CO2
3	**Hereditary and Congenital Diseases of the Kidney**	Hereditary and Congenital Diseases of the Kidney Autosomal Dominant Polycystic Kidney Disease Other Cystic Kidney Diseases	8	CO3
4	**Diabetic Nephropathy**	• Pathophysiology • Stages & Diagnosis • Management & Treatment • Complications & Progression	8	CO4
5	**Renal Disease in Cancer Patients**	• **Causes of Renal Dysfunction in Cancer** (e.g. tumor lysis syndrome, obstructive uropathy, nephrotoxic drugs) • **Chemotherapy-Induced Nephrotoxicity** (e.g. cisplatin, methotrexate, immune checkpoint inhibitors) • **Diagnosis & Monitoring of Renal Function** (eGFR, creatinine, urine output, biomarkers) • **Management & Preventive Strategies** (dose adjustment, hydration, nephroprotective measures)	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/a0lWFQvQKw8
2. https://youtu.be/qhiMmNZjHRg
3. https://youtu.be/-znHCAu5OnY

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

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	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	
DT304	Basics of Nephrology	√	√	√			√	√	**3,4**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**DT305**	**Title of the Course**	**MEDICAL DISORDER AND INTENSIVE CARE**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	**2**	**1**	**0**	**3**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	To Understand and manage a wide range of systemic diseases and critical care conditions with emphasis on diagnosis, treatment, ICU protocols, and emergency interventions.						

Course Outcomes: After the successful course completion, learners will develop following attributes:	
CO1	To Identify and manage cardiovascular and respiratory diseases, including ICU care and life support measure
CO2	To Understand neurological, renal, gastrointestinal, and liver disorders with emphasis on critical care
CO3	To Explain fluid, electrolyte, acid-base imbalances, and apply principles of ABG interpretation and correction
CO4	To Apply infection control practices in ICU and manage sepsis, MODS, and nutritional support.
CO5	To Recognize special health conditions including pregnancy, obesity, diabetes, HIV, poisoning, and emergency interventions.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Cardiac and Respiratory disease**	1. Cardio vascular diseases a. Hypertension, Ischemic heart diseases, Myocardial Infarction, arrhythmias b. Heart failure, shock - types, causes c. Cardiac care in ICU: hypertension, hypotension, arrhythmias, cardiac arrest, ACLS 2. Respiratory diseases a. Pneumonia, tuberculosis, b. Chronic obstructive pulmonary disease, asthma c. Pleural effusion, pneumothorax d. Interstitial lung disease e. Pulmonary Oedema, Acute Lung Injury and Acute Respiratory Distress Syndrome f. Respiratory care in ICU: airway care, tracheostomy care, endotracheal intubation, mechanical ventilation, care of ventilated patient, complications and weaning.	6	CO1
2	**Neurological, Renal, GI and infectious diseases**	1 Neurological, Renal, GI and infectious diseases. Neurological diseases Polio myelitis, Gullian Barre Syndrome, Myasthenia Gravis, epilepsy, Cerebro-vascular accident / stroke Head injury and Trauma Care 2. Renal Diseases a. Acute kidney injury b. chronic kidney disease c. Renal failure: types, etiology, complications, corrective measures d. Urinary tract infections: Definition, types of UTI, risk factors, diagnosis, treatment e. Renal stone diseases, inherited and cystic renal diseases f. Nephrotic syndromes- definition, clinical features, causes & types 3. Gastro intestinal and Liver Diseases a. Gastritis / APD, peptic ulcer b. Acute gastroenteritis c. Hepatitis, Hepatic failure, alcoholic liver disease Infectious diseases: Dengue, malaria	6	CO2
3	**Blood, fluid, electrolyte and acid base abnormalities**	Blood, fluid, electrolyte and acid base abnormalities Blood loss and Anemia, thrombocytopenia Fluid and electrolyte disorders- Hyponatremia, hypernatremia, hypokalemia& hyperkalemia: Etiology, clinical presentation and management Disorders of calcium, phosphorous & magnesium ions. Acid- base disorders : Basics of ABG Metabolic acidosis & metabolic alkalosis: pathophysiology, etiology , clinical features and management	6	CO3
4	**Infection Control and Nutrition in ICU**	Infection control in ICU: prevention of cross infection, personal protection, antibiotics and policy. Sepsis, multi-organ failure, Multi-organ dysfunction syndrome Nutrition and Fluid balance - total parenteral nutrition, nasogastric tube	6	CO4
5	**Health problems in Specific conditions and Toxicology**	Health problems in specific conditions a. Pregnancy - antenatal care, disorders in pregnancy b. Obesity c. Diabetes mellitus d. HIV infections and AIDS Poisoning and drug over dosing a. Classification of poisons, Principles of treatment of poisoning and Primary care. Poisons and drug over dosing requiring ventilation, b. Drowning & Hanging	6	CO5

Reference Books:

1. Abbas AK ,LichtmanAH,PillaiS.(2007).CellularandMolecularImmunology.6thedition Saunders Publication, Philadelphia.
2. Goldsby RA, Kindt TJ, Osborne BA. (2007). Kuby's Immunology. 6th edition W.H. Freeman and Company, New York.
3. Murphy K, Travers P,Walport M. (2008).Janeway's Immunobiology.7th edition Garland Science Publishers, New York.
4. Delves P,Martins,BurtonD,RoittIM.(2006).Roitt'sEssential Immunology.11thedition Wiley- Blackwell Scientific Publication, Oxford.

e-Learning Source:

1. https://en.wikipedia.org/wiki/Immune_system
2. https://www.creative-diagnostics.com/blog/index.php/immunogen-antigen-hapten-epitope-and-adjuvant/
3. https://www.webmd.com/rheumatoid-arthritis/an-overview-of-rheumatic-diseases

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

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	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.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
DT305	Medical disorder and Intensive Care	√	√	√	√		√	√	3,4

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**DT306**	**Title of the Course**	**APPLIED DIALYSIS TECHNOLOGY LAB**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	**0**	**0**	**4**	**2**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The student will Gain practical skills in setting up and operating dialysis equipment, performing vascular access, assisting in minor procedures, and providing safe and effective dialysis care.						

Course Outcomes	
CO1	To Demonstrate the ability to set up and operate dialysis machines, including preparation and closing procedures.
CO2	To Perform vascular access techniques such as AV cannulation, fistula/graft cannulation, and central venous catheter initiation.
CO3	To Prepare dialysis concentrates, manage reuse protocols, and perform isolated ultrafiltration based on clinical needs.
CO4	To Execute manual and automated peritoneal dialysis procedures effectively and safely.
CO5	To Assist in minor clinical procedures, perform basic suturing, maintain sterile conditions, and demonstrate CPR techniques.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contac t Hrs.**	**Mapped CO**
1	**DIALYSIS TECHNIQUES**	1. **Dialysis in Special Conditions** – Setup for CCF, liver disease, HIV/HBsAg/HCV, pregnancy, poisoning, transplant failure 2. **Advanced Hemodialysis Techniques** – Hemodiafiltration, Hemoperfusion, SLED, MARS overview – Dialyser & membrane types 3. **Peritoneal & Continuous Therapies** – CAPD vs APD, CRRT demonstration – Modality selection based on case scenarios 4. **Complications & Patient Support** – Infection control, renal bone disease, aluminum toxicity – Anemia management, counseling & rehabilitation 5. **Innovations & Pediatrics** – Nocturnal, online, daily dialysis – Dialysis in children – Telemedicine applications in dialysis	40	CO1 CO2 CO3 CO4 CO5

1. Kasi Viseswaran, Basics of Renal Diseases, Fluid, Electrolytes & Acid-Base Balance, CBS Pub, 2 nd Edi, 2020.
2. Pradeepkumar, Text book of Renal System and its disorders, Taneesha publishers.
3. Kasi Viseswaran, Essential Nephrology, CBS Publications& Distributors pvt.
4. Muhammad Rafiqual Alam, Manual of Clinical Nephrology, CBS Publications pvt.
5. John T Daugirdas, Hand book of Chronic Kidney Disese management, Wolters, 2nd Edi, 2014
6. Irfan.K.moinuddin & David J Leehey, Handbook of Nephrology, Nephrology Publ, 5th edi, 2013.
7. Schrier R.W, Diseases of the Kidney and The Urinary Tract.

e-Learning Source:

1. https://www.sathyabama.ac.in/sites/default/files/course-material/2020-10/UNIT-I_15.pdf
2. https://juniperpublishers.com/rapsci/pdf/RAPSCI.MS.ID.555586.pdf
3. **https://ourworldindata.org/world-population-growth**

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11		PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	1	2	-	-	-	1	2	1	-		-	1	2	-	3
CO2	2	3	2	2	-	-	-	1	3	1	-		-	2	1	-	2
CO3	1	3	1	2	-	-	-	1	2	-	-		-	1	2	-	3
CO4	2	3	1	2	-	-	-	1	3	-	-		-	2	3	-	3
CO5	1	3	1	2	-	-	-	1	2	1	-		-	1	2	-	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	
DT306	Applied Dialysis Technology Lab	✓	✓	✓	✓		✓	✓	**3,4**

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EFFECTIVE FROM SESSION: 2025-26							
Course Code	**DT307**	**Title of the Course**	**MEDICAL DISORDER AND INTENSIVE CARE LAB**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	**0**	**0**	**4**	**2**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	Understand the principles of patient monitoring, operation and maintenance of ICU equipment, drug						

Course Outcomes	
CO1	To Understand the principles and techniques of monitoring critically ill patients, including vital signs, ECG, fluid balance, and hemodynamic parameters.
CO2	To Operate ICU devices such as monitors and ventilators, and apply appropriate settings based on different clinical conditions.
CO3	To Identify and manage commonly used drugs in intensive care, including inotropes, sedatives, and emergency medications.
CO4	To Perform basic troubleshooting and routine maintenance of ICU equipment including monitors, ventilators, and infusion devices.
CO5	To Demonstrate knowledge of general ICU care and safe intra- and inter-hospital transport of critically ill patients with airway, drains, and support systems.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Medical Disorder & Intensive Care**	1 Monitoring of Patients 2. Operating devices, ventilator and monitor settings for different clinical conditions 3. Drugs used in Intensive Care 4. Trouble shooting and maintenance of monitors, equipments and ventilators General care and transport of ICU patient - eye, skin, bladder care, position, airways, drains, catheters. Transport of critically ill patient to and out of ICU, transport of patient with drains, airway, inotropes, mechanical ventilator. Monitoring in critical care: vital signs, drains, ECG, fluid intake & output, invasive hemodynamic and central venous pressure monitoring central venous pressure monitoring.	40	CO1 CO2 CO3 CO4 CO5

Reference Books:

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

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11		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.**
DT307	Medical Disorder and Intensive Care Lab	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	**3,4**
		✓	✓	✓	✓		✓	✓	

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	**DT308**	**Title of the Course**	**CLINICAL POSTING**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	**V**	0	0	12	6
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	Students will engage in clinical practice in biochemistry department to enhance their clinical skills and apply contemporary knowledge gained during teaching sessions.						

Course Outcomes	
CO1	To learn the punctuality and interaction with colleague and supporting staff during clinical training.
CO2	To develop assessment skills.
CO3	To develop appropriate treatment protocol.
CO4	To understand the importance of documentation of the case record and case presentation.
CO5	To develop discipline and improve overall quality of clinical work.

CLINICAL POSTING ASSESSMENT FORM

Name of Student:		**Session:**	
Enrolment Number:		**Date:**	
Name of Subject:		**Subject code:**	
Topics:			

S. No.	Point to be Considered	Max. Marks	Marks Obtained
1.	Punctuality	4	
2.	Interaction with colleagues and supporting staff	2	
3.	Maintenance of case records	3	
4.	Presentation of case during rounds	2	
5.	Maintained OT records	2	
6.	OT Manners	2	
7.	Rapport with patients	2	
8.	Assistance during operative procedures	3	
9.	Discipline	2	
10.	Overall quality of clinical work	3	
	TOTAL SCORE	**25**	

(Name and signature of In-charge) **(Head, Paramedical)**

GUIDELINES FOR CLINICAL TRAINING PROGRAM

The students of Post Graduate B.Sc. DT program must spend above mentioned allotted time period in the hospital based clinical training for specified clinical experiences to meet the objectives of the training program. This period of practical and theoretical experience will enable the students to acquire competency and experience to perform as an independent practice and will enable to adjust to the real practical life in different units in the hospital settings.

S.No.	Program Name	Year/Semester	Duration of Training
1.	B.Sc. DT	II Year/ V Semester	4 Months
2.		II Year/ V Semester	4 Months
3.		III Year/ V Semester	4 Months
4.		IIIYear/ V Semester	4 Months

By the successful completion of this clinical training period, the student is expected to fulfil the objectives of the program and will be examination as given below:

S.No.	Program Name	Year/Semester	Case file	Practical on Case	Voice/Viva	Attendance
1.	B.Sc. DT	II Year/ V Semester	10 Marks	10 Marks (1 Long Case and 2 Short Case)	25 Marks	5 Marks
2.		II Year/ V Semester				
3.		III Year/ V Semester				
4.		III Year/ V Semester				

EVALUATION OF CLINICAL POSTING

BDT- Students has to prepare 1 long case and 2 short cases during their clinical posting. The evaluation for internal clinical examination of 50 marks will be distributed:

Cases during clinical posting=25 marks. Viva voce =20 marks Attendance=5 marks

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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
DT308	CLINICAL POSTING	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		√	√	√			√	√	**3,4,11**