

AC- 06/04/2024

Item No-4.12



**Rayat Shikshan Sanstha's
KARMAVEER BHAURAO PATIL COLLEGE VASHI
(AUTONOMOUS COLLEGE)
Sector-15- A, Vashi, Navi Mumbai - 400 703**

Syllabus for F.Y.B.Sc. Dialysis Technology.

Technology Program: Dialysis Technology.

Course: F.Y.B.Sc. Dialysis Technology.

**(National Education Policy-2020
Academic year 2024-2025)**

Rayat Shikshan Sanstha's
**Karmaveer Bhaurao Patil College Vashi Autonomous
College**

Syllabus

Sr. No.	Heading	Particulars
1	Title of Course	F.Y.B.Sc. Dialysis Technology
2	Eligibility for Admission	12th Science and equivalent [of recognized Boards]
3	Passing Marks	40%
4	Ordinances/Regulations (if any)	-----
5	No. of Years/Semesters	One year/Two semester
6	Level	U.G.
7	Pattern	Semester
8	Status	Revised0
9	To be implemented from Academic year	2024-2025

Preamble

Background:

Chronic kidney disease is the sixth fastest-growing cause of death globally and around 1.7 million people are estimated to die annually because of acute kidney injury globally. In India, it is estimated that a population of over 7.8 million people are living with chronic kidney diseases. The prevalence of chronic kidney disease (CKD) is increasing rapidly in India, according to the CKD registry. This progressive disease remains silent in its early stages, with the majority of patients being diagnosed in Stage 4 or Stage 5. However, there are only two scientifically validated treatments worldwide that can help patients with Stage 5 CKD survive and live: Dialysis and Kidney Transplant. Key concern in our country today in treating this ever-increasing patient numbers is availability of good dialysis centers and most importantly the lack of enough trained dialysis technicians!

Introduction to program:

In this program, an individual will get trained to provide dialysis treatment for renal failure patients. This academic course is designed to provide comprehensive training in clinical care as well as research. This course will train the undergraduates with great knowledge and skills which are required in the present era by providing dialysis training with good infrastructure.

The undergraduates will gain knowledge in operating and maintaining dialysis machines providing patient care. The Dialysis Technologist works as a member of a multidisciplinary team along with the Nephrologist and Clinicians to plan and implement the prescription for performing all the different modalities of Renal Replacement Therapies. It describes the principles and techniques of dialysis technician practices.

Educational Pedagogy:

The course design is based on NEP 2020 guidelines where learner is given a choice to have vertical mobility while pursuing this program. His annualized credits earned will be banked to allow his subsequent year's enrollment.

The four-year degree program is designed as –

- 1st year BSC with Certification in Assistance to Dialysis Technology**
- 2nd Year BSC with Diploma in Dialysis Technology**
- 3rd Year BSC with Bachelor's Degree in Dialysis Technology.**
- 4th Year BSC with Bachelor's Honors in Dialysis Technology**

The pedagogical design is based on the core objective of making students job ready and hence a lot of focus is given in learner's engagement through Industry based skilling i.e. in Hospitals.

As anyone who seeks admission in this program comes from non-healthcare background, hence the course starts with a platform setting training to make learner understand the typicality and Dos and Don'ts of Healthcare Organizations.

Industry interface is divided into 3 phases of learning as –

- Observer ship – Objective is to see in practice in industry what is being taught in the class room through clinical sessions on the subject.
- On The Job Training – Objective is to learn the job skills by working with someone in industry.

- Internship – Working independently, but under supervision as per defined job role. Considering that the program needs to empower job readiness of learners, a lot of focus is kept in active engaging Life Skills workshops. These cover topics like Self Awareness, Objective setting, Team Work, Leadership Development, Time Management, Communication Skills, Interpersonal abilities etc.

Program also focuses in creating a better path for students to pursue their higher education opportunities in healthcare sector. As such special skill enhancing modules like Basic Life Support, Bed Side Care, Hospital Administration and Public Health etc. are included in the curriculum. This will help learners to get into PG programs like Masters in Hospital Management or Masters in Hospital Administration or Masters in Public Health.

As regards to the Core expertise of the program on Dialysis Technology, key subjects that get covered are –

- **Platform setting subjects:**
Anatomy, Physiology, human diseases & Hospital practices and protocols covering Medical Terminology, Bio Medical waste management, Infection Control, Personal Hygiene etc.
- **Dialysis Techniques**
It describes the principles and techniques of dialysis technician practices. The subject is treated from a technician's view of the dialysis unit requirements and of the job she/he has to perform. Subsequent chapters focus on the importance of a technician's personal attitude; the equipment used in a dialysis unit, including dialysis equipment; dialyzer, dialysate used in the dialysis unit; and some important principles involved in cannulation, dissimulation, reverse osmosis...
- **Microbiology:**
Common types of bacteria, their characteristics, Mode of spread and effects, principles of asepsis, disinfection and prevention of cross infection. Microbiology application to Dialysis department as prevention and corrective measures taken at various locations like Reverse Osmosis Water Plant, Dialysis Unit and the department over all.
- **Fundamentals Dialysis technology:**
After undergoing training in subject of this medical sciences, students are trained to learn basic principles of dialysis, learn equipment and dialysis machine, types of dialysis, importance of dialysis, assist the senior technician to perform dialysis. Students will learn to take vital parameters of patient, they also will learn pre and post care of patients in dialysis

Key Objectives of this program:

- To implement NEP 2020 through this Vocational Skills development program
- Learners will inculcate right attitude, skills and knowledge to do the job role of Dialysis Technologist as required by the industry.
- Program will also empower learners' abilities to pursue higher education in medical industry

After completing this program, learner will exhibit following skills and knowledge as Dialysis Technologist:

- Support and work as a link between patient and Nephrologist in dialysis technology unit
- Prepare Pre – Monitoring of Patient
- Prepare the dialysis machine prior to the procedure, including cannulation preparation and dialysate Preparation.
- Sterilize the machine and instruments.
- Take vital parameters like pulse, blood pressure, oxygen saturation, Weight
- To learn & follow directives given by Nephrologist
- Assist cannulation procedure
- Perform basic nursing procedures like IV Catheterization,
- Monitor the patient in pre-dialysis, intra-Dialysis, post-dialysis phase.
- Perform Cardio-pulmonary resuscitation in emergency
- Prepare dialyzer and dialysate.
- Use basic monitors, equipment's.
- Maintain all records in a proper way.
- Carry out all steps as per check list before & after dialysis
- Provide psychological support to the patient.
- Basic dialysis unit management
- Good communicator & allied health professional.

Scheme of examination for Each Semester

Continuous Internal Evaluation: 40 Marks

Common Test 20 Marks & 20 Marks for Assignment, Projects, Group discussion, Open book test, online test etc. based on Units of each paper.

Semester End Examination: 60 Marks will be as follows –

I.	Theory: The Semester End Examination for theory course work will be conducted as per the following scheme.	
	Each theory paper shall be of two hours duration.	
	All questions are compulsory and will have internal options.	
	Q – I	Subject questions from Unit – I (having internal options.) 15 M
	Q – II	Subjective questions from Unit – II (having internal options.) 15 M
	Q – III	Subjective questions from Unit – III (having internal options.)15 M
	Q- IV	Objective type questions based on all the Units with equal weightage. 15 M
II.	Practical	The Semester End Examination for practical course work will be conducted as per the following scheme.
Sr. No.	Particulars of Semester End Practical Examination	Marks%
1	Laboratory Work	80%
2	Journal	10%
3	Viva	10%
	TOTAL	100%

Program Outcomes (POs)

PO-1	<p>Disciplinary Knowledge: Understanding different modalities and their functions in Dialysis technology like Ro water plant, Dialysis machine, Dialyzer, Dialysate etc through on the job training and internships in the hospitals.</p>
PO-2	<p>Communication Skills: Develop various communication skills such as reading, listening and speaking skills etc., which we will help in expressing ideas and views clearly and effectively.</p>
PO-3	<p>Critical Thinking: Think creatively to propose novel ideas in explaining the scientific data, facts and figures related to science and technology.</p>
PO-4	<p>Analytical Reasoning and Problem Solving: Identify, describe, formulate, interpret, analyze the data systematically and solve theoretical and numerical problems in the diverse areas of science and technology and provide alternate solutions to the problems.</p>
PO-5	<p>Sense of Inquiry: Curious for asking relevant questions like why and how for better understanding of the basic concepts, fundamental principles, scientific theories and applications related to the study.</p>
PO-6	<p>Use of Modern Tools: Use of modern tools, equipment, instrumentation and laboratory techniques to design and perform the experiments and write the programs in different languages (software).</p>
PO-7	<p>Research Skills: Ability to search for, find, collect, analyze, interpret and evaluate information/data that is relevant to the subjects related to science and technology being studied.</p>
PO-8	<p>Application of Knowledge: Develop scientific outlook with respect to the subjects related to science and technology and also participate in various social and cultural activities.</p>
PO-9	<p>Ethical Awareness: Imbibe ethical and social values in personal and social life leading to cultured and civilized personality.</p>

PO-10	<p>Teamwork: Work effectively within the groups and individuals, participate and take initiative for various field-based situations related to science, technology and society at large.</p>
PO-11	<p>Environment and Sustainability: Understand how development in science and technology and interdisciplinary subjects are taking place for protecting our environment and sustainable developments.</p>
PO-12	<p>Lifelong Learning: Ability of self-driven to explore, learn and gain knowledge and new skills to improve the quality of life and sense of self-worth by paying attention to the ideas and goals throughout the life.</p>

***Note: [1] Remembering, [2] Understanding, [3] Applying,[4] Analyzing, [5] Evaluating, 6] Creating.**

Name of the Specific Program: B.Sc. Dialysis Technology (DT) Program Specific Outcomes (PSO)

At the end of four year program students will understand and be able to

PSO-1	The program will provide students with a thorough understanding of the principles and techniques of Dialysis technology, including anatomy and physiology, surgical procedures, and patient care.
PSO-2	To understand various disorder of renal & common diseases causing renal failure and commonly used investigation for patient with renal disease
PSO-3	Demonstrate a comprehensive understanding of the basic principles and concepts of dialysis, including indications, contraindications, and the underlying mechanisms of dialysis therapies.
PSO-4	Demonstrate comprehensive understanding of microbiology concept relevant t to dialysis procedure
PSO-5	Demonstrate polite and strategic communication skills, grooming skills, professional etiquettes and leadership qualities
PSO-6	Students will learn machine set up, calibrate, and prepare dialysis equipment for use, ensuring accurate and safe delivery of dialysis treatments.
PSO-7	Learning the advancement in dialysis technology, their upkeep and error minimization.
PSO-8	Understand the pharmacology of drugs commonly used in dialysis treatment and manage medication administration and monitoring effectively.
PSO-9	Understanding the larger scope of medical profession and creating an opportunity for higher education in hospital management domain and overseas work opportunities.
PSO-10	Develop ability to understand the structure and development methodology of software system and demonstrate use of different modern technical tools like table style, shapes, charts, graphs, data tools, and solve basic & mathematical problem & statistics & learn to create error free documents using excel, word & power point

Course Outcome (CO)		
Course Code	Name of the Course	Course outcomes
UGDTC101	General Human Anatomy & Physiology	<p>CO1. Explain the morphology, physiology of skeletal system along with the physiology of muscle contraction in co-ordination with the joints, their articulation and skin [1-3]*</p> <p>CO2. Describe & explain the composition, function of various body fluids like blood, lymph cardiovascular and respiratory system their significance and related disorders. [2]*</p> <p>CO3. Classify the peripheral nervous system, nerves and morphology of special senses & Discuss diseases, disorders, and conditions commonly found in healthcare occupations [4]*</p>
UGDTC102	Fundamentals of Hospital Practices & Protocols	<p>CO1. Recognize, define, and spell terms related to the pathology and treatment of body systems. Analyze and apply knowledge to a real-life scenario. Define common word roots, combining forms, suffixes, and prefixes. Identify and describe the major functions and structures of the body systems [1]*</p> <p>CO2. Explain methods to prevent the spread of infection. Summarize the engineering, work practice, and environmental controls that protect against healthcare-associated infections AND Identify barriers and personal protective equipment for protection from exposure to potentially infectious material and Improve their general hygiene routine and personal image. Understand the importance and benefits of self-care.[5-4]*</p> <p>CO3 Implement strategies for Standard and Transmission-Based Precautions in healthcare settings. Prevent the spread of germs and disease by using the correct techniques for hand hygiene. Protect oneself and those served by technologist recognizing the chain of infection[3]*</p>
UGDTGE103	Introduction to Microbiology 1	<p>CO1 Definition, types & classification micro-organisms</p> <p>CO2 Types of Bacteria & it's characteristics</p> <p>CO3 Mode of transmission & diseases</p>
UGDTAEC-104	Communication Skill	<p>CO1. Understanding and improving General vocabulary, properly understand the meaning and implement in academics through formal communication[1&2]*</p> <p>CO2. Applying parts of speech while framing sentences. Additionally, they will learn all the kinds of sentences that are required while having a basic interaction in English with anyone[3]</p> <p>CO3. Understanding the time mentioned in the sentences by identifying action verbs & helping verbs and then frame sentences mentioning about the proper work/event happened on specific time.</p> <p>[1&2]*</p>

Course Outcome (CO) Practical

Course Code	Name of the Course	Course outcomes
UGDTCP101	Human Anatomy & Physiology & Diseases	<p>CO1: Understanding the correlation of macro and micro structure of organs of body with body systems</p> <p>CO2: Correlating, functions of tissues and organs with the body systems</p> <p>CO3: Applying the anatomy and physiology principles to study diseases by case studies</p>
UGDTCP102	Norms of Healthcare Industry	<p>CO1: understanding principles of infection control</p> <p>CO2: applying rules of bio management</p> <p>CO3: learning and applying norms of personal hygiene</p>
UGDTGEP 103	Introduction to Microbiology - 1	<p>CO1 Orientation to Microbes, use and care of microscope & identification of Equipment's in microbiology.</p> <p>CO2 Smear preparation and identification of micro-organisms</p> <p>CO3 Gram staining and Acid-fast staining</p>

Course Outcome (CO)

Course Code	Name of the Course	Course outcomes
UGDTC201	Principles of Dialysis	CO1 Understanding primary principles on which dialysis unit is built and functions for, learning the basic duties of dialysis technician, describing the broadly definition of dialysis. [2*] CO2 Learning structure of urinary system, understanding microscopic functional unit nephron, describing urine constituents .[2&3*] CO3 Relating anatomical facts with functions of urinary system, understanding normal urine formation process, applying role of dialysis machine to counter abnormal kidney functions[3 & 4*]
UGDTC202	Dialysis Technique	CO1 Learning hemodialysis machine principles, describe the machine specifications, illustrating dialysis fluid processing. [2*] CO2 Stepwise analysis of patient interface to be ready for dialysis including vital parameters, cognizing safety majors and complications during process, incorporating accurate steps of dialysis.[3&4*] CO3 Learning ethical, consensual documentation, inculcating legal practices before and after procedure, perform duties to help dialysis technician in the dialysis unit.[2&4*]
UGDTGE203	Introduction to Microbiology -2	CO1 Introduction to Mycology & virology CO2 Clinical microbiology techniques CO3 Microbiology: Applied to DT
UGDTAEC204	Functional English	CO1. Learning report writing will make practice objective and passive form of writing. Additionally, the will learn to draft and present a Power Point Presentation that will be an aid while they present their views on certain topics. [1]* CO2. Creating the respective Resume and Job application for applying in various organizations and Understanding formal, informal, spoken & written English that will bridge the gap between their thoughts and words [2-3]* CO3. Students will dramatize (Role-pay) the certain topics to get involved in context and to experience the intention behind those sentences. [4&6]*

Course Outcome (CO) Practical

Course Code	Name of the Course	Course outcomes
UGDTCP201	Principles of Dialysis	<p>CO1. Observing dialysis unit lay out. [1 & 2*]</p> <p>CO2. Learning dialysis machine components. [2&3*]</p> <p>CO3. Understanding protocols to handle patient to be connected to dialysis [2 & 4*]</p>
UGDTCP202	Dialysis Technique	<p>CO1. Preparing machine for dialysis [2&3*]</p> <p>CO2. Checking n learning process if quality of water treatment [2&3*]</p> <p>CO3. Keeping medical aid ready to handle emergency or complication along with all documentation. [3*]</p>
UGDTGEP203	Introduction to Microbiology -2	<p>CO1 Observe different types of fungi in atmosphere</p> <p>CO2 Observe & understand Antibiotic Sensitivity test</p> <p>CO3 Microbiology applied to Dialysis Department: RO Plant, Dialysis Machine and the entire department</p>

**F.Y.BSc. Dialysis Technology
NEP-2020
Semester 1**

Paper 1 [UGDTC101]: General Human Anatomy & Physiology MAJOR				
Course Code	Unit	Topics	Credits	L/week
UGDTC101	I	Human Anatomy	4	4
	II	Human Physiology		
	III	Human Diseases		
Paper 2[UGDT102]: Fundamentals of Hospital Practices & Protocols MINOR				
UGDTC102	I	Medical Terminology	4	4
	II	Infection control		
	II	BMW & Personal Hygiene		
Paper 3: [UGDTGE103]: Introduction to Microbiology-1 GENERIC				
UGDTGE103	I	Definition, types & classification microbes	2	2
	II	Common types of bacteria & their characteristics		
	III	Mode of transmission & diseases		
Paper 4: [UGDTAEC104]: Communication Skill AEC				
UGDTAEC 104	I	Vocabulary and Meanings	2	2
	II	Word class Nouns, Verbs, Adjectives and Adverbs		
	III	Tenses		
Semester 1 Practical				
UGDTCP101	MAJOR	Understanding of Human body Functions	2	2
UGDTCP102	MINOR	Norms of Healthcare Industry	2	2
UGDTGEP104	GE	Introduction to Microbiology-1	1	1

- We have designed special practical for this module to enhance allied healthcare professional skills of the learner

**F.Y.BSc. Dialysis Technology
NEP-2020
Semester 2**

Paper 1 [UGDT201]: Principles of Dialysis MAJOR				
Course Code	Unit	Topics	Credits	L/week
UGDTC201	I	Introduction to Dialysis	4	4
	II	Renal Anatomy & Physiology		
	III	Renal Physiology		
Paper 2: [UGDT202]: Dialysis Techniques MINOR				
UGDTC202	I	Dialysis Equipment and its Components	4	4
	II	Patient Interface		
	III	Legal & Ethical issues in Dialysis		
Paper 3: [UGOTGE203]: Introduction to Microbiology - 2 OE				
UGDTGE 203	I	Introduction to Mycology & virology	2	2
	II	Clinical Micro- biology Techniques		
	II	Microbiology: Applied to DT		
Paper 4 [UGOTAEC204]: Communication Skill AEC				
UGDTAEC 204	I	Effective Writing	2	2
	II	Spoken skills and Communication activities		
	III	Understanding Language Expression forms		
Semester 2 Practical				
UGDTCP201	MAJOR	Paper 1 – Principles of Dialysis	2	2
UGDTCP202	MINOR	Paper 2 – Dialysis Techniques	2	2
UGDTGEP 202	GE	Introduction to Microbiology - 2	1	1
*Exit option with certification with 44 Credits (Additional 10 Credits SDP, IKS ,Yoga/Music/Dance, Internship)				

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**F.Y.BSc. Dialysis Technology
NEP-2020
Semester 1**

Paper I MAJOR		
Course Code	Title	Credits
UGDTC101	GENERAL ANATOMY & PHYSIOLOGY	4
Unit I	<p>Human Anatomy.</p> <ul style="list-style-type: none"> • Cell Structure & Function, • Tissues Structure & Function • Body Membranes Structure & Function • Body Cavities, • Body Fluid Collection Procedures Clinical Relevance <p>Study of Organ system and clinical relevance</p> <ul style="list-style-type: none"> • Digestive system • Respiratory system • Circulatory system • Excretory system • Nervous system • Skeletal system • Endocrine system • Reproductive system • Lymphatic system 	
Unit II	<p>Human physiology</p> <ul style="list-style-type: none"> • Blood: Structure & Functions • Cell types, Plasma, Serum • Blood Transfusion, Grouping, Cross matching • Digestion • Respiration and Breathing Mechanism • Circulation • Excretion & Filtration of Urine • Hormones Reproduction • Menstruation • Metabolism of Carbohydrates, Fats, Proteins. 	
Unit III	<p>Human Communicable Diseases,</p> <ul style="list-style-type: none"> • Bacterial, • Viral • Fungal • Protozoal • Parasites • Non communicable Diseases (Metabolic Diseases) • Kidney • pancreas • Heart • Liver • Gall bladder • Blood • Thyroid • Brain 	

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**F.Y.BSc. Dialysis Technology
NEP-2020
Semester 1**

Paper I MINOR		
Course Code	Title	Credits
UGDTC102	FUNDAMENTALS OF HOSPITAL PRACTICES & PROTOCOL	4
Unit I	Medical Terminologies <ul style="list-style-type: none"> • Prefixes Roots, • Suffixes, • Short forms, • Abbreviations, Meanings • Medical Terminologies in Alphabets 	
Unit II	Infection control <ul style="list-style-type: none"> • Introduction to Infection Control • Universal precautions Safety measures. • Modes of Transmission • Sterilization methods: Autoclave Disinfectants Sanitizers Personal Protective Equipment PPE use. 	
Unit III	BMW & Personal hygiene <ul style="list-style-type: none"> • Demonstrate Hand Wash steps • Demonstrate methods of Donning(wearing) & Doffing(removing) of PPE • Demonstration of BMW bags • Methods of Segregation • Categories & Containers • Pretreatment Temporary Storage • Transportation, Disposal • Safety measures • Waste management in Epidemics and Pandemics 	

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F.Y.BSc Dialysis Technology
NEP-2020
 Semester 1

Paper III		
UGDTGE 103	Title	Credits
	Introduction to Microbiology-1	2
Unit I	Definition, types & classification of microorganisms <ul style="list-style-type: none"> • Microbial Diversity and Classification • Types of Micro-organisms (bacteria, viruses, fungi, etc and Their Roles • Microbial Classification Systems 	
Unit II	Types of Bacteria & it's characteristics <ul style="list-style-type: none"> • Morphological Diversity: cocci (spherical), bacilli (rod-shaped), spirilla (spiral-shaped), and vibrio's (comma-shaped) • Metabolic Diversity: Aerobic respiration, anaerobic respiration, fermentation, and photoautotroph • Basic staining techniques: Gram staining, AFB staining, spore staining, etc. 	
Unit III	Mode of transmission & diseases <ul style="list-style-type: none"> • Direct Contact Transmission: sexually transmitted infections (STIs), skin infections like impetigo, and respiratory infections such as influenza or COVID-19 • Indirect Contact Transmission: gastrointestinal infections (e.g., norovirus, E. coli), respiratory infections (e.g., influenza, common cold), and some skin infections (e.g., MRSA) • Airborne Transmission: tuberculosis, measles, chickenpox, and COVID-19. 	

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**F.Y.BSc. Dialysis Technology
NEP-2020
Semester 1**

Paper IV – AEC		
UGDTAEC 104	Title	Credits
	COMMUNICATION SKILL	2
Unit I	Vocabulary and meanings <ul style="list-style-type: none"> • Word study • Basic communication • Common Errors 	
Unit II	Word class <ul style="list-style-type: none"> • Nouns, Verbs, Adjectives, and Adverbs • Conjunction, Preposition, Pronouns, • Determines Types of Sentences • Compound, and Complex Structures 	
Unit III	Tenses <ul style="list-style-type: none"> • Simple Past, Present Perfect, Past Perfect. • Simple + Progressive Aspect, Modal Verbs • Conditional Sentences, Verbs, and Idiom's 	

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F.Y.BSc. Dialysis Technology
NEP-2020
Semester 1 Practical

Course code	Title	Credit
UGDTCP101	Human anatomy and physiology and diseases <ol style="list-style-type: none"> 1. Identification of Organs 2. Determination of the Physiological Processes of systems, 3. Marking of Organs by Surface Anatomy 4. Case studies of diseases 	2
UGDTCP102	Norms of Healthcare Industry <ol style="list-style-type: none"> 1. Demonstrate Hand Wash steps 2. Demonstrate methods of Donning(wearing) & Doffing (removing) of PPE 3. Demonstration of BMW bags 4. Demonstrate Respiratory Etiquettes 5. Identification of Personal Protective Equipment 6. Evaluate Epidemic and Pandemic Precautions 	2
UGDTGEP103	Introduction to Microbiology-1 <ol style="list-style-type: none"> 1. Orientation to Diagnostic microbiology use and care of microscope& identification of Equipment's in microbiology 2. Smear preparation and identification of micro organism 3. Gram staining and Acid- fast staining 	1

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**F.Y.BSc. Dialysis Technology
NEP-2020
Semester 2**

Paper I MAJOR

CourseCode	Title	Credits
UGDTC201	Principles of Dialysis	4
Unit I	Introduction to Dialysis <ul style="list-style-type: none"> • Definition, history and types of Dialysis • General lay out of Dialysis center: Reception Area, Treatment Area, Nurse Station, Water Treatment room, Storage Area, Staff Break room. • Job role and responsibilities of Dialysis technician • A typical work flow study of Dialysis procedure 	
Unit II	Renal Anatomy <ul style="list-style-type: none"> • Gross Anatomy: Structure: Kidney, Ureter, Bladder, Urethra • Micro anatomy: Kidney-capsule, cortex, medulla, pelvis. • Nephron - Bowman's capsule, Glomerulus, proximal convoluted tubule, loop of Henle, distal convoluted tubule, collecting duct. • Vasculature & Nerve supply • Physiology- functions of each part, glomerular filtration rate (GFR) concept, factors affecting GFR. • Urine formation process & composition: Filtration, secretion, excretion, Physical & Chemical composition 	
Unit III	Renal Physiology <ul style="list-style-type: none"> • Functions: Kidney, ureter, bladder, urethra • Nephron: Stages of urine formation: Ultra filtration, reabsorption, secretion • Glomerular Filtration Rate: GFR • Composition of urine: Physical and chemical properties of Normal and abnormal urine 	

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**F.Y.BSc. Dialysis Technology
NEP-2020
Semester 2**

Paper- II MINOR		
Course Code	Title	Credit
UGDTC202	Dialysis Techniques	4
Unit I	<p>Introduction to Dialysis Equipment and its Components</p> <ul style="list-style-type: none"> • Hemodialysis Machine specifications: Controls & treatment parameters. • Dialysis delivery system • Safety of Dialysis delivery system • Dialyzer machine specifications • Dialysis fluid specification • Water treatment system: General layout 	
Unit II	<p>Patient Interface</p> <p>Patient Education and Orientation, Treatment Initiation and Monitoring, Safety Measures.</p> <p>Monitoring of vital signs like BP, Pulse, ECG, Dry weight etc.</p> <p>View to dialysis complications: Hypotension, muscle cramp, electrolyte imbalance, fluid over load etc.</p> <p>Administration of medications: IV, Oral, sub cutaneous.</p> <p>Patient engagement and feedback essential for optimizing treatment outcomes</p>	
Unit III	<p>Legal & Ethical Issues in Dialysis</p> <ul style="list-style-type: none"> • Introduction • Patient acceptance criteria • Informed consent, justice & Dialysis • Ethical Guidelines • Legal issues concerning withholding & withdrawal of Dialysis 	

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**F.Y.BSc. Dialysis Technology
NEP-2020
Semester 2**

Paper III OE		
Course Code	Title	Credit
UGDTGE203	Introduction to Microbiology - 2	2
Unit I	Introduction to Mycology & virology <ul style="list-style-type: none"> • Introduction to Mycology • Introduction to virology • Diseases caused by fungi & viruses 	
Unit II	Clinical microbiology techniques <ul style="list-style-type: none"> • Antibiotic sensitivity • Montoux test • Case study 	
Unit III	Microbiology: Applied to DT <ul style="list-style-type: none"> • Preventive & corrective measures taken to avoid any microbes infections across Water treatment plant, Dialyzer machine and entire department • Swab collection through fistula and catheter for lab testing • Deep cleaning of the unit 	

- We have designed special practical for this module to enhance allied healthcare professional skills of the learner

**F.Y.BSc. Dialysis technology
NEP-2020
Semester 2**

Paper IV AEC		
CourseCode	Title	Credit
UGDTAEC204	Functional English	2
Unit I	1.Effective writing 1.1.1. Objectives 1.1.2. Resume, Job Application and Report Writing 1.1.3. Power of Technology, Making a PPT	
Unit II	1.Spoken Skills and Communication Activities 2.1.1. Different styles of Spoken and Written English 2.1.2. Introducing Yourself and Role Playing 2.1.3. Asking questions/Answering questions	
Unit III	1.Understanding Language expression forms 3.1.1. Debates/Arguments and Listening Skills 3.1.2. Casual Conversation and Listening Skills 3.1.3. Reading a Narrative Passage	

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**F.Y.BSc. Dialysis Technology
NEP-2020
Semester 2: Practical: - Observer ship at Hospital**

Course Code	Title	Credit
UGDTCP201	Principles of Dialysis – <ul style="list-style-type: none"> • Typical layout of Dialysis Unit: Location, patient area, Services, Special plumbing requirements, Dietary facility department etc. • Hemodialysis area • Preparation work & storage area • Main machine: The primary device used to perform hemodialysis, filtering and purifying the patient's blood. • Vital Signs Monitors: • Hemodialysis Catheters: • Fistula Needle: • Dialysate Solution: • Water Treatment System: • Emergency Equipment: 	2
UGDTCP202	Dialysis Techniques: <ul style="list-style-type: none"> • To Understand Maintenance and Cleaning of Equipment • To Understand Calibration and Quality Control of Machines • To Understand Emergency Preparedness: • To Understand Patient Comfort and Safety • To Understand Water Quality Management • To Understand Documentation and Record-Keeping 	2
UGDTGEP203	Introduction to Microbiology -2 <ul style="list-style-type: none"> • Observe different types of fungi in atmosphere • Observe & understand Antibiotic Sensitivity test • Microbiology applied to Dialysis Department: RO Plant, Dialysis Machine and the entire department 	1

We have designed special practical for this module to enhance allied healthcare professional skills of the learner

References:

1. iTransform Handbook on Anatomy, Physiology

2. iTransform Handbook on Foundation Program
3. iTransform Handbook on Medical Terminologies
4. Textbook on Renal Dialysis – Dr. B.C. Bhagavan



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