

DHANALAKSHMI SRINIVASAN UNIVERSITY
SAMAYAPURAM - 621112



SYLLABUS FOR BACHELOR OF SCIENCE IN DIALYSIS TECHNOLOGY

HEALTH FOR ALL

DIALYSIS TECHNOLOGY

I YEAR

S.NO	NAME OF THE SUBJECTS	TOTAL HOURS ALLOTTED
1.	ANATOMY, PHYSIOLOGY AND BIOCHEMISTRY	120 HOURS
2.	NUTRITION AND PRINCIPLE OF NURSING CARE	120 HOURS
3.	*ENGLISH	60 HOURS
4.	*COMPUTER	60 HOURS
5.	CLINICAL	1000 HOURS

***INTERNAL PAPERS**

II YEAR

S.NO.	NAME OF THE SUBJECTS	TOTAL HOURS ALLOTTED
1.	MICROBIOLOGY PATHOLOGY I & II AND PHARMACOLOGY	90 HOURS
2.	COMMUNITY MEDICINE AND BASIC MEDICAL ELECTRONICS	60 HOURS
3.	CLINICAL	1000 HOURS

III YEAR SUBJECT

S.NO	NAME OF THE SUBJECTS	TOTAL HOURS ALLOTTED
1.	DIALYSIS TECHNOLOGY	60 HOURS
2.	RENAL DISEASE THERAPEUTICS	60 HOURS
3.	CLINICAL	1000 HOURS

I YEAR

BASIC ANATOMY

THEORY

Introduction to Anatomy

Basic Anatomical terminology

- **Osteology** - Upper limb – clavicle, scapula, humerus, radius, ulna Lower limb - femur, hipbone, sacrum, tibia, fibula Vertebral column
- **Thorax** – Intercostal space, pleura, bony thoracic cage, ribs sternum & thoracic vertebrae
- **Lungs** – Trachea, bronchial tree
- **Heart** – Surface anatomy of heart, chambers of the heart, valves of the heart, major blood vessels of heart, pericardium, coronary arteries.

Blood Vessels (Vein + artery) Anatomy / Course of Vessel.

- **Myology** – Muscles of thorax, muscles of upper limb (arm & fore arm) Flexor and extensor group of muscles (origin, insertion, nerve supply, action)
- **Histology** – Types of tissue
 - (a) Epithelia - Squamous Glandular Transitional Cartilage
 - (b) Connective tissue – bone, fibrous tissue, muscle

Excretory system – Histology of Kidney, Ureter and Bladder structure of nephrons

PRACTICALS

Histology – Slides for identification and general features and **Vein / ARTERY –Surface Anatomy**

PHYSIOLOGY

THEORY

1) The Cell:

- (i) Cell Structure and functions of the various organelles.
- (ii) Endocytosis and exocytosis
- (iii) Homeostasis
- (iv) Functions of Nephron
- (v) Acid base balance and disturbances of acid base balance (Alkalosis, Acidosis)

2) The Blood:

- (i) Composition of Blood, functions of the blood and plasma proteins.
- (ii) Erythropoiesis, pathological and Physiological variation of the RBC.
- (iii) Structure, function and metabolism of Hemoglobin
- (iv) Erythrocyte Sedimentation Rate.
- (v) Detailed description about WBC.
- (vi) Platelets, coagulation of blood, anti coagulants, bleeding disorders.
- (vii) Blood groups and Rh factor

3) Cardio-Vascular System:

- (i) Physiological Anatomy of the heart
- (ii) Heart sounds
- (iii) Cardiac cycle, Cardiac output.
- (iv) Auscultatory areas.
- (v) Cardiac murmurs.
- (vi) Arterial pressures, blood pressure
- (vii) Hypertension
- (viii) Hormonal regulations for arterial pressure and determination of arterial Blood pressure.
- (ix) Basics of Electro cardiogram (ECG)
- (x) Applied physiology of coronary circulation.
- (xi) Foetal circulation
- (xii) Circulatory shock.

4) Respiratory system:

- (i) Physiological Anatomy of Respiratory tract.
- (ii) Respiratory movements.
- (iii) Exchange of Respiratory gases in the Alveoli.
- (iv) Non-Respiratory functions of Lungs
- (v) Transport of Respiratory gases in the blood.
- (vi) Artificial Respiration.

5) Excretory system:

- (i) Renal function tests
- (ii) Mechanism of GFR
- (iii) Concentrating Mechanism of Tubules
- (iv) Physiology of Bladder Function
- (v) Physiology of Electrolyte balance
- (vi) Renal disorders.
- (vii) Functions of Kidney and Regulation of Hypertension / EPO secretion

6) Endocrine system:

- Functions of the pituitary gland, thyroid glands, parathyroid glands, adrenal and pancreatic Hormones.

7) Digestive system:

- (i) Physiological Anatomy of the GIT.
- (ii) Food Digestion in the mouth, stomach, intestine
- (iii) Absorption of foods
- (iv) Role of bile in the digestion.

PRACTICAL

- 1) The compound Microscope
- 2) Estimation of Hemoglobin – By sahli’s method
- 3) Determination of ESR-By westergren’s method
- 4) Determination of Blood Groups.
- 5) Determination of packed cell volume.
- 6) Measurement of human blood pressure.
- 7) Examination of Respiratory system..
- 8) Identification of Normal ECG.(wave pattern)
- 9) Kidney function tests

BIO-CHEMISTRY

Carbohydrate

Chemical structure, function-Classification-Monosaccharides-Disaccharides-Polysaccharides-Homopolysaccharides-Heteropolysaccharides- Glycoproteins

Proteins:

- Amino acids
- Classification-Structure of proteins
- Determination of protein structure
- Properties of proteins-Denaturation
- Classification of proteins-Antigen, Antibody Types
- Plasma proteins
- Blood clotting.

Lipids:

- Chemical structure,
- functions, Classification-fatty acids
- Triacylglycerols, Phospholipids, glycoproteins, Lipoproteins- Steroids
- Amphipathic lipids.

Nucleic acids:

- Purines and pyrimidine
- -Structure of DNA – Watson & Crick model of DNA
- Structure of RNA
- Types of RNA

Enzymes:

- Definition – Nomenclature
- Classification – Factors affecting enzyme activity
- Active site – Coenzyme – Enzyme Inhibition
- Mechanism of enzyme action
- Units of enzyme – Iso enzymes – Enzyme pattern in diseases.

Vitamins & Minerals:

- Fat soluble vitamins(A,D,E,K)
- Water soluble vitamins – B-complex vitamins principal elements(Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chlorine and sulphur)
- Trace elements – Calorific value of foods
- Basal metabolic rate(BMR)
- respiratory quotient(RQ)
- Specific dynamic action(SDA)
- Balanced diet
- Marasmus – Kwasoirkar

Hormones:

- Classification – Mechanism of action – Hypothalamic hormones –
- Pitutary Anterior, posterior
- Thyroid – Adrenal cortex,
- Adrenal medulla – GI hormones

Acids and bases:

- Definition, pH, Henderson – Hasselbalch equation, Buffers, Indicators
- Normality,
- Molarity, Molality

BIOCHEMISTRY SYLLABUS FOR PRACTICALS – (UNDER – GRADUATES)

QUALITATIVE TESTS OF MONOSACCHARIDES (GLUCOSE AND FRUCTOSE)

- 1 Molisch's test
- 2 Fehling's test
- 3 Benedict's test
- 4 Seliwanoff's test

QUALITATIVE TESTS OF LIPIDS

- 1 Solubility tests
- 2 Emulsification tests
- 3 Saponification tests

QUALITATIVE TESTS OF PROTEINS

- 1 Isoelectric precipitation tests
- 2 Heat coagulation tests

FIRST YEAR

NUTRITION

In the teaching of nutrition, stress shall be laid on basic principles of the subject with More emphasize on its applied aspects.

(i) Goal:

The broad goal of the teaching of undergraduate students in nutrition aims at providing an introduction to the science of nutrition, comprehensive knowledge of nutrients and Planning a diet according to the nutritional requirements of the patients.

(ii) Objectives:

(A) Knowledge:

At the end of the course the student shall be able to:

- (a) Comprehend the relation of diet to health and disease;
- (b) Classify various nutrients;
- (c) Plan a diet according to the nutritional need of a particular patient.

(B) Skills

At the end of the course the student shall be able to;

- (a) Prepare basic diet plans for patients of various kidney diseases.

SYLLABUS

The course in Nutrition is to provide an understanding of the nutritional needs of the Patients with kidney diseases and to learn to plan appropriate diet for them.

- 1 Introduction to science of nutrition
- 2 Food pattern and its relation to health
- 3 Factors influencing food habits, selection and food stuffs
- 4 Classification of Nutrients, Macro nutrients and Micro nutrients
- 5 Proteins – types, sources requirements and deficiencies of proteins
- 6 Carbohydrates sources, requirements & efficiency
- 7 Fats – types, sources, requirements, deficiency and excess of fats
- 8 Water – sources of drinking water, requirements, preservation of water
- 9 Minerals – types, sources, requirements deficiencies of minerals
- 10 Vitamins – types, sources, requirements deficiencies of vitamins

PRINCIPLES OF NURSING

In the teaching of the principles of nursing, stress shall be laid on basic principles of the subject with more emphasis on its applied aspects.

(i) Goal:

The broad goal of the teaching of undergraduate students in the Principles of nursing aims at providing comprehensive knowledge of the principles of asepsis, assessment of vital signs, dressings, small procedures, assisting the physician in the care of the sick patient and adequate documentation of therapy instituted.

(ii) Objectives

(A) Knowledge:

At the end of the course the student shall be able to:

- (a) Explain the principles of asepsis and its necessity in the clinical area
- (b) Assess the medical condition of the patient with respect to his vital signs
- (c) Triage the patient needing immediate medical attention.

(B) Skill

At the end of the course the student shall be able to;

- (a) Perform small procedures like bed making, insertion of intravenous canulae, administer Injections, cleaning and dressing of wounds, care of bed ridden patients, bladder catheterization.
- (b) Assist the physician in procedures and therapy of patients
- (c) Document all treatments undertaken with medico-legal completeness

(C) Integration:

At the end of the integrated teaching the student shall acquire an integrated knowledge of nursing principles and its importance in the care of the sick patient.

SYLLABUS

The course in Principles of Nursing is to provide understanding of essential principles in the care of the sick patient as well as to learn the skills needed to assist the physician in the practice of dialysis therapy.

- 1 Bed making
- 2 Bladder catheterization
- 3 Injections – intravenous, intramuscular, subcutaneous
- 4 Care of bed ridden patients,
- 5 Documentation
- 6 Collection of blood, urine and stool specimens and their transfer aseptic precautions to the laboratory

Nice to Know

- 1 Introduction of vascular dialysis independently
- 2 Minor suturing

ENGLISH

Communication:

Role of communication Defining Communication Classification of communication Purpose of communication Major difficulties in communication Barriers to communication Characteristics of successful communication – The seven Cs Communication at the work place Human needs and communication “Mind mapping” Information communication

Comprehension passage:

Reading purposefully Understanding what is read Drawing conclusion Finding and analysis

Explaining:

How to explain clearly Defining and giving reasons Explaining differences explaining procedures giving directions

Writing business letters:

How to construct correctly Formal language Address Salutation Body Conclusion

Report writing:

Reporting an accident Reporting what happened at a session Reporting what happened at a meeting

BASICS OF COMPUTER
COURSE CONTENT

Introduction to computer:

- I/O devices – memories – RAM and ROM
- Different kinds of ROM – kilobytes, MB, GB their conversions – large computer Medium, Micro, Minicomputers
- Different computer languages
- Number system – Binary and decimal conversions
- Different operating system – MS DOS
- Basic commands – MD, CD, DIR, TYPE and COPY CON commands
- Networking – LAN, WAN, MAN (only basic ideas)

Typing text in MS word

- Manipulating text
- Formatting the text – using different font sizes, bold, italics
- Bullets and numbering – Pictures, file insertion
- Aligning the text and justify
- choosing paper size
- adjusting margins
- Header and footer
- Inserting page No's in a document
- Printing a file with options
- Using spell check and grammar
- Find and replace
- Mail merge
- Inserting tables in a document.

Creating table in MS-Excel

- Cell editing – Using formulas and functions
- Manipulating data with excel
- Using sort function to sort numbers and alphabets
- Drawing graphs and charts using data in excel Auto formatting
- Inserting data from other worksheets.

Preparing new slides using MS-POWERPOINT

- Inserting slides
- slide transition and animation

- Using templates
- Different text and font sizes
- slides with sounds
- Inserting clip arts, pictures, tables and graphs
- Presentation using wizards.

Introduction to Internet

- Using search engine
- Google search
- Exploring the next using Internet
- Explorer and Navigator
- Uploading and Download of files and images
- E-mail ID creation
- Sending messages
- Attaching files in E-mail
- Introduction to “C” language
- Different variables, declaration, usage
- Writing small programs using functions and sub – functions

PRACTICAL

- Typing a text and aligning the text with different formats using MS- Word
- Inserting a table with Proper alignment and using MS-Word
- Create mail merge document using MS- Word to prepare greetings for 10 friends
- Preparing a slide show with transition, animation and sound effect using MS-PowerPoint
- Customizing the slide show and inserting pictures and tables in the slides using MS-PowerPoint
- Creating a worksheet using MS-Excel with data and use of functions
- Using MS-Excel prepare a worksheet with text, date time and data
- Preparing a chart and pie diagrams using MS-Excel
- Using Internet for searching, uploading files, downloading files creating e-mail ID
- Using C language writing programs using functions

SECOND YEAR

MICROBIOLOGY

(i) Goal

- The broad goal of the teaching of undergraduate students in microbiology
- Aims at providing comprehensive knowledge of the hepatotropic viruses
- The human immunodeficiency virus (HIV)
- Opportunistic infections
- Microbiology of urinary tract infections
- Microbiology of vascular access infection

(ii) Objective

(A) Knowledge:

At the end of the course the student shall be able to:

- (a) Comprehend the pathogenicity of viruses relevant in the dialysis patient including Mode of infection universal precautions,
- (b) Vaccinations and universal precautions
- (c) Comprehend the common pathogens causing urinary tract infections and its Pathogenesis
- (d) Comprehend the common pathogens causing vascular access infection (femoral, Jugular, subclavian catheters) and prevention of infection
- (e) Comprehend the sampling methods for culture and sensitivity of various patient samples
- (f) Comprehend Capd Exit Site Infection And Pertionitis

(B) Skills:

At the end of the course the student shall be able to

- (a) Use aseptic precautions for procedures to prevent infection.
- (b) Send blood and other samples collected appropriately for purposes of culture and Sensitivity

(c) Integration:

- From the integrated teaching,
- The student shall be to comprehend the need for universal precautions, Safety mechanisms including vaccination in the prevention of blood borne infections.

SYLLABUS

The course in Microbiology is to provide an understanding of the structure of the pathogens involved in urinary tract infections and viruses in the dialysis area as a Foundation for the scientific study and practice of dialysis therapy.

1. Basic of Classification

- Bacterology
- Mycology
- Virology
- Identification – technique

2. Introduction to microbiology:

- General principles of microbial pathogenesis
- Viral infections
- Bacterial infections
- Fungal infections
- Parasitic infections

3. Applied microbiology in special situation

Hepatitis B, C viruses in detail:

- Mode of transfusion,
- Universal precautions
- Vaccinations
- Human immunodeficiency virus (HIV)
- Mode of transfusion
- Universal Precautions
- Opportunistic infections
- Vascular access infection (femoral, jugular, subclavian catheters)
- Urinary tract infections
- Sampling methodologies for culture & sensitivityCandida infection

(The students should know the importance of each of the following Terminology (ie..Definition) rather than the detailed process involved in the Genesis**

of the individual pathology.)

PATHOLOGY-

1. Introduction to pathology

- Cellular adaptation,
- Cell injury & cell death.
- Cellular response to stress and noxious stimuli.
- Cellular adaptations of growth and differentiation.
- Causes of cell injury
- Mechanisms of cell injury
- Reversible and irreversible cell injury. Morphology of cell injury and necrosis
- Examples of cell injury and necrosis Apoptosis
- Sub cellular responses to injury Intercellular accumulations Pathologic calcification
- Cellular aging

2. Inflammation

- General features of inflammation
- Historical highlights
- Acute inflammation
- Chemical mediators of inflammation
- Outcomes of acute inflammation
- Morphologic patterns of acute inflammation
- Summary of acute inflammation
- Chronic inflammation
- Systemic effects of inflammation
- Consequences of defective or excessive inflammation

3. Basics of Immunity and Immunity disorders.

- General Features Of The Immune System
- Disorders Of The Immune System

4. Neoplasia. Definitions

- Nomenclature
- Biology of tumor growth benign and malignant neoplasms
- Epidemiology
- Molecular basis of cancer
- Molecular basis of multistep carcinogenesis
- Carcinogenic agents and their cellular interactions
- Host defense against tumors-Tumor immunity
- Clinical features of tumors

5. Environmental and nutritional disorders.

- Environmental and disease
- Common environmental and occupational exposures
- Nutrition and disease Coronary artery disease.

PATHOLOGY-II

In the teaching of pathology, stress shall be laid on basic principles of the subject with more emphasis on its applied aspects

(i) Goal:

The broad of the teaching of undergraduate students in pathology aims at providing comprehensive knowledge of the urinary system, kidney diseases (including Chronic Kidney Disease), Pathology of the kidney in various disease states, pathology of the Peritoneum and pathology of urinary tract infections.

(ii) Objectives:

(A) Knowledge:

At the end of the course the student shall be able to;

- (a) Comprehend the congenital abnormalities of urinary system;
- (b) Classify kidney diseases including glomerular, tubulointerstitial and vascular Diseases;
- (c) Comprehend the causes and the pathology of Chronic Kidney Disease;
- (d) Comprehend the pathology of the kidney on various disease states;
- (e) Comprehend the pathology of the peritoneum in peritonitis;
- (f) Comprehend the pathology of urinary tract infections.

(B) Skills

At the end of the course the student shall be able to;

- (a) Teach preventive strategies of urinary tract infections,
- (b) Explain to patients the mechanisms to slow down the progression of Chronic Kidney Disease;
- (c) Explain prevention of peritonitis to patients on peritoneal dialysis.

(C) Integration:

From the integrated teaching, the student shall be able to comprehend the measures to prevent and slow the course of Chronic Kidney Disease and prevent urinary tract Infections and peritonitis....

SYLLABUS

The course in Pathology is to provide an understanding of the pathology of Urinary tract Infections, peritonitis and Chronic Kidney Disease.

- 1 Congenital abnormalities of urinary system
- 2 Classification of renal diseases
- 3 Glomerular diseases – causes, types & pathology
- 4 Tubulointerstitial diseases
- 5 Renal vascular disorders
- 6 End stage renal diseases – causes & pathology
- 7 Pathology of kidney in hypertension, diabetes mellitus, pregnancy
- 8 Pathology of peritoneum – peritonitis – bacterial, tubular & sclerosing peritonitis
- 9 Pathology of urinary tract infections
- 10 Pyelonephritis & tuberculous pyelonephritis

PHARMACOLOGY

(i) Goal:

The broad of the teaching of undergraduate students in pharmacology aims at Providing an introduction to the pharmacology of drugs related to kidney diseases andDialysis technology.

(ii) Objectives:

(A) Knowledge:

At the end of the course the student shall be able to:

- (a) Comprehend the various drugs used in kidney diseases and dialysis; especiallyAntibiotics, anti microbials, inotropes and diuretics anti - convulsants
- (b) Classify antihypertensives according to their action and specific indications;
- (c) Learn about dialyzability of drugs;
- (d) Comprehend the adjustments for varying degrees of renal dysfunction;
- (e) Comprehend the indications, dose and side effects of erythropoietin andintravenous iron
- (f) Comprehend the dose of heparin to be used in Hemodialysis, side effects and useof Protamine sulfata;
- (g) Comprehend use of formalin, sodium hypochlorite and hydrogen peroxide, etc used For sterilizing dialysers, tubings and machine as disinfectants and cleaningthe Dialysis machines and other antiseptics like alcohol, betadine, chlorhexidine, Ethylene oxide etc
- (h) Comprehend composition of dialysate solutions and peritoneal dialysis solutions;
- (i) Comprehend indications for and use of potassium exchange resins.
- (j) Use of various phosphate binders and oral and iv preparations of Vit D and theirMonitoring

(B) Skills:

At the end of the course the student shall be able to;

- (a) Prepare basic medication plan for patients with kidney diseases;
- (b) Prepare Hemodialysis dialysate concentrates.

SYLLABUS

The course in pharmacology is to provide an understanding of the drug therapy of the Patients with kidney diseases including those on dialysis and to learn to plan appropriate Prescription for them.

- 1 IV fluid therapy with special emphasis in renal diseases
- 2 Diuretics – classification, actions, dosage, side effects & contraindications
- 3 Anti hypertensives – classification, actions, dosage, side effects & Contraindications, special reference during dialysis, vasopressors, drugs used in Hypotension
- 4 Drugs & dialysis – dose & duration of administration of drugs
- 5 Dialyzable drugs – phenobarbitone, lithium, methanol etc.
- 6 Vitamin d & its analogues, phosphate binders, iron, folic acid & other vitamins of therapeutic value
- 7 Erythropoietin in detail
- 8 Heparin including low molecular weight heparin
- 9 Protamine sulphate
- 10 Formalin, sodium hypochlorite, hydrogen peroxide – role as disinfectants & adverse effects of residual particles applicable to formalin
- 11 Haemodialysis concentrates – composition & dilution (acetate & bicarbonates)
- 12 Peritoneal dialysis fluid in particular hypertonic solutions – composition
- 13 Potassium exchange resins with special emphasis on mode of administration

SYLLABUS – II YEAR DIALYSIS TECHNOLOGY

MISCELLANEOUS

Community Medicine

- I. Epidemiology and Epidemiological Methods / Approach / Rates / Mortality / Morbidity and Disease transmission
- II. Epidemiology of Communicable diseases
- III. Epidemiology of Non-communicable diseases
- IV. Bio-medical waste Management
- V. Disaster Management
- VI. Information, Communication and Health Education.

Basics of Medical Electronics

- Physical Principle and various parts of equipments used in Dialysis Technology (Haemodialysis machine, CRRT machine, APD machine) and monitoring devices (multiparameter monitors in ICU)
- Care and cleaning and Maintenance of Equipments used in Dialysis Technology

Procedural skills

- Insertion of intravenous canulae
- Cleaning and dressing of wounds and vascular access sites and peritoneal catheter exit site
- Assisting the physician in procedures like minor surgery, Minor suturing
- Removal of sutures and vascular access, CAPD etc
- Planning diets including renal diets

B.Sc. DIALYSIS TECHNOLOGY

III YEAR SYLLABUS

DIALYSIS TECHNOLOGY

(i) Goal:

The broad goal of the teaching of undergraduate students in dialysis technology aims at providing an in-depth knowledge of Hemodialysis and Peritoneal and Peritoneal dialysis Therapy.

(ii) Objectives:

(A) Knowledge:

- (a) Comprehend the various modalities of renal replacement therapy with knowledge of Merits and demerits of each;
- (b) Comprehend the principles of Hemodialysis and Peritoneal dialysis;
- (c) Learn how to offer Dialytic therapy for renal failure patients;
- (d) Learn the various forms of Hemodialysis and when each is to be applied;
- (e) Learn to manage complications of dialysis therapy;
- (f) Learn dialysis therapy in various special groups of patients e.g., unstable patients in The intensive care unit, children, cardiac patients etc;
- (g) Learn Plasmapheresis, Continuous therapies
- (h) Manage anticoagulation on patients on dialysis;
- (i) Measure the adequacy of dialysis
- (j) Administer various drugs in emergencies and as a routine
- (k) Use blood transfusion

(B) Skills:

At the end of the course the student shall be able to: At the end of the course the student shall be able to;

- (a) Start and close Hemodialysis sessions independently;
- (b) Successfully Cannulate arterio-venous fistulae for Hemodialysis;
- (c) Train patients and their caregivers in performing peritoneal dialysis;
- (d) Do water maintenance for the Hemodialysis room;
- (e) Maintain Hemodialysis machines with respect to regular disinfection;
- (f) Operate Hemodialysis machines, CAPD cycler machines independently
- (g) Participate in Conduct of renal transplant programme.
- (h) Use pulse oximeters, pressure monitors defibrillators correctly

SYLLABUS

The course in dialysis technology is to provide an understanding of the various forms of renal replacement therapy and successful performance of the same in patients with renal Failure.

TEACHING SCHEDULE

PART I

- 1 History, types of Dialysis,
- 2 Principles of Dialysis, quantification of adequacy
- 3 Dialysis Team-rights-responsibilities-patient doctor relationship
- 4 Dialysis reuse
- 5 Dialyser Membranes
- 6 Vascular Access – Temporary & Permanent
- 7 Equipment – Accessories – Function
- 8 Computer applications in Dialysis
- 9 Dialysate delivery system
- 10 Composition of Dialysate
- 11 High flux / high efficiency dialysis
- 12 Continuous Renal Replacement Therapy / Slow Low Efficiency Dialysis
- 13 Complications in dialysis patients
- 14 Water treatment-pre treatment, deionizer, Reverse Osmosis
- 15 Dialysis in Neonates, infants & children
- 16 Renal data maintenance Teaching Hours – 20 Hrs.

PART II

- 1 Machine and patient monitoring during Hemodialysis
- 2 Patient Assessment – Pre, intra & post dialysis
- 3 Lab data analysis
- 4 Acute and chronic dialysis prescription
- 5 Medications in dialysis patients
- 6 Nutrition management in dialysis patients
- 7 Anticoagulation
- 8 Infection control and universal precautions
- 9 Psychosocial aspects & patient education
- 10 Quality assurance in dialysis
- 11 Complications of Hemodialysis – Acute & chronic
- 12 Acute and Chronic Peritoneal Dialysis
- 13 History, access, physiology of Peritoneal Dialysis
- 14 PD – Transport kinetics, Ultrafiltration, UF, Intermittent PD,
Continuous Ambulatory Peritoneal Dialysis, Automated Peritoneal
Dialysis, Dialysis Solutions, Novel uses of PD
15. Infectious and non infectious complications of PD
16. Renal transplant co-ordination
(Recipient and donor workup, psychosocial and legal aspects, cadaver donor

Maintenance, principles of post operative management and follow-up)

- 1 Preparation of dialysis patients for various surgical procedure and post operativeDialysis support
- 2 Basic and advanced cardiac life support

RENAL DISEASE THERAPEUTICS

In the teaching of concepts of disease and clinical evaluation of patients, stress shall beLaid on basic principles of the subject with more emphasize on its applied aspects

(i) Goal:

The broad goal of the teaching of undergraduate students in concepts of disease and Clinical evaluation aims at providing an introduction to various kidney disease and theirEvaluation.

(ii) Knowledge

At the end of the course the student shall be able to:

- (a) Comprehend the various presentations of kidney diseases;
- (b) Learn how to diagnose and evaluate patients with various disease conditions like Acute renal failure, Nephrotic / nephritic syndrome, urinary tract infection, Asymptomatic urinary abnormalities, Chronic Kidney Disease (especially stage v) renal stone diseases, obstructive nephropathies, congenital & inherited renal diseases, pregnancy associated renal diseases, renal vascular disorders and hypertension associated renal diseases, renal vascular disorders and hypertension associated renal diseases;
- (c) Learn to order appropriate test towards confirmation of diagnosis;
- (d) Learn to initiate therapy in each of these conditions;
- (e) Learn the appropriate time of referral to nephrology services in each of theconditions.
- (f) Screening for renal diseases in the community and hospital patients.

(B) Skills:

At the end of the course the student shall be able to;

- (a) Collect medical history from patients with various kidney diseases;
- (b) Clinically examine patients with kidney diseases and orderappropriate Investigations;
- (c) Write rational prescriptions for patients with kidney diseases.

SYLLABUS

The course in concepts of disease and clinical evaluation is to provide an understanding of the nature of various diseases and evaluation of the same.

- 1 Acute renal failure
- 2 Nephrotic syndrome – primary & secondary
- 3 Nephritic syndrome
- 4 Urinary track Infection – Urinary track infections
- 5 Asymptomatic urinary abnormalities
- 6 Chronic Kidney Disease
- 7 Renal stone diseases
- 8 Obstructive nephropathies
- 9 Congenital & inherited renal diseases
- 10 Pregnancy associated renal diseases
- 11 Renal vascular disorders & hypertension associated renal diseases

REFERENCES

- 1 Clinical text of Nephrology By John Fegally
- 2 Text book of Nephrology –Oxford and Brenner Rector (Reference only)
- 3 Textbook of Dialysis therapy – Nissenson (Reference only)
- 4 Textbook of Peritoneal Dialysis – Ram Gokal (Reference only)
- 5 Handbook of dialysis – John T. Daugirdas
- 6 NANT and Oxford -Text books of Dialysis for technologist

ONE YEAR COMPULSORY ROTATORY INTERNSHIP:-

8 MONTHS – MAINTENANCE HEMODIALYSIS

2 MONTHS- ICU DIALYSIS

2 MONTHS – CONTINUOUS AMBULATORY PERITONEAL DIALYSIS.

B.Sc. Degree in Dialysis Technology
Scheme of Examination Theory Paper – Ist Year

S. No.	Paper	Subject	Internal Assessment (IA)		Theory		Practical		Viva	
			Max	Min	Max	Min	Max	Min	Max	Min
1	Paper I	Anatomy, Physiology and Biochemistry	50	25	100	50	50	25	-	-
2	Paper II	Nutrition and Principle of Nursing Care	50	25	100	50	50	25	-	-

Internal Paper

S. No.	Subject	Internal Assessment		Theory	
		Max	Min	Max	Min
1.	*English	50	25	100	50
2.	*Computer	50	25	100	50

- English and Computer are internal papers.

Internal Assessment

Theory (20)	Practical (20)	Log Book/Project/Record(10)
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- Wherever there is no Log Book/Project/Record work the 10 mark be added to the Practical of the respective subject.

B.Sc. Degree in Dialysis Technology - II Year

S. No.	Papers	Subject	Internal Assessment (IA)		Theory		Practical		Viva	
			Max	Min	Max	Min	Max	Min	Max	Min
1.	Paper - I	Microbiology Pathology I & II and Pharmacology	50	25	100	50	-	-	-	-
2.	Paper - II	Community Medicine and Basic Medical Electronics	50	25	100	50	-	-	-	-

B.Sc. Degree in Dialysis Technology

III Year

Sl. No.	Papers	Subject	Internal Assessment (IA)		Theory		Practical		Viva	
			Max	Min	Max	Min	Max	Min	Max	Min
1.	Paper - I	Dialysis Technology	50	25	100	50	50	25	50	25
2	Paper - II	Renal Disease Therapeutics	50	25	100	50	50	25	50	25