

**SYLLABUS FOR DIALYSIS TECHNICIAN 1ST YEAR
TWO YEAR PROGRAMME**

PAPER-1

Anatomy and Physiology

DT-101

Human Biology and Introduction to Renal system

ANATOMY & PHYSIOLOGY

Module 1: Introduction to anatomy

Scope of Anatomy and Physiology - Definitions and Terms in Anatomy and Physiology- Structure and function of human cell - Elementary tissues of human body- Brief account on Composition of Blood - functions of blood elements - Blood Group and coagulation of blood, Inflammation, Cellular adaptation, Cell injury & cell death.

Module 2: Cardio Vascular System

Structure and functions of various parts of the heart, arterial and venous system, brief account on common cardiovascular disorders

Module 3: Respiratory System

various parts of respiratory system and their functions, Physiology of Respiration

Module 4: Digestive System

names and various parts of digestive system-Liver, Spleen, Gall Bladder, Pancreas, Buccal Cavity, Pharynx, Esophagus, Stomach, intestine etc.- physiology of digestion and absorption

Module 5: Urinary System

various parts of urinary system and its function-structure and function of kidneys-physiology of urine formation - pathophysiology of renal disease and edema

Module 6: Reproductive System

physiology and anatomy of Male & Female reproductive system-Prostate & Uterus & Ovaries etc

Module 7: Musculoskeletal System

Classification of bones & joints, structure of skeleton –structure of skeletal muscle – physiology of muscle contraction

Module 8: Nervous System

Various parts of nervous system- Brain and its parts –functions of nervous system - Spinal Cord & Nerves

Module 8: Ear, Nose, Throat and Eye

Elementary knowledge of structure and functions of organs of taste, smell, hearing, vision

Module 9: Endocrine System

Endocrine glands ,their hormones and functions-Thyroid, Parathyroid, Suprarenal, Pituitary, and Thymus

Module 10: Haemopoietic and Lymphatic System

Name of the blood vessels & lymph gland locations

Module 11: Surface Anatomy & Surface Markings of Human Body

Practical's

Study of Human Skeleton parts with skeletal models..

Study with charts and models of all organ systems mentioned above.

Microscopic slides examination of elementary human tissues, cells

REFERENCES

1. Solomon. E.A., (2008) Introduction to Human Anatomy and Physiology 3rd Ed, Saunders: St Louis.
2. Chaurasia, B.D., & Garg, K., (2012) *Human Anatomy Regional and Applied*. CBS Publications: New Delhi
3. T.S. Ranganathan – *A text book of Human Anatomy*
4. Fattana, Human anatomy (Description and applied) *Saunders's & C P Prism Publishers*, Bangalore – 1991

INTRODUCTION TO KIDNEY DISEASE

Module 1: Assessment and Diagnostic studies of the Urinary system

Physical assessment of a person with kidney disease, basics of assessment, list various diagnostic tests done for kidney diseases, Laboratory tests, imaging studies, normal values, interpretation of the tests including the roles and responsibilities of a technologist.

Module 2: Classification of renal diseases

Define renal disorders, introduction to the classification of the various types of renal disorders

Module 3: Glomerular diseases – causes, types & pathology

Definition, etiology, type's pathophysiology, medical and surgical management

Module 4: Tubulointerstitial diseases & Renal vascular disorders

Definition, etiology, type's pathophysiology, medical and surgical management

Module 5: Acute Kidney Injury

Definition, etiology, type's pathophysiology, medical and surgical management

Module 6: End stage renal diseases – causes & pathology

Definition, etiology, types pathophysiology, medical and surgical management

Module 7: Pathology of kidney in hypertension, diabetes mellitus, pregnancy

Definition, etiology, type's pathophysiology, medical and surgical management

Module 8: Pathology of peritoneum – peritonitis – bacterial, tubercular & sclerosing Peritonitis

Definition, etiology, types pathophysiology, medical and surgical management

Module 9: Pathology of urinary tract infections

Definition of UTI's, Common organisms involved, etiology, pathophysiology of UTI, Medical and surgical management

Module 10: Pyelonephritis & tuberculosis pyelonephritis

Definition, etiology, types pathophysiology, medical and surgical management

Module 11: Dialysis in the intensive care setting

Emergency care & Intensive care of a dialysis patient, Principles of Extracorporeal Short Wave Lithotripsy, Plasmapheresis, CRRT & SLED, common Urosurgical procedures & instruments and their maintenance, Preparation of dialysis patients for various surgical procedure and post-operative Dialysis support, Basic and advanced cardiac life support.

INTRODUCTION TO KIDNEY DISEASE (Practical overview)

1. Care of Patient with CKD
2. Care of Patient with ARF
3. Health teaching on prevention of UTI
4. Health teaching on prevention of peritonitis

REFERENCES

1. Davison A.M., (2010) *Oxford textbook of Nephrology* Volume 4 Oxford University Press
2. Brenner B.M., et al. (2011) *Brenner and Rector's The Kidney* 9th Ed, Elsevier Health Sciences
3. Schrier R.W., (2006) *Diseases of the Kidney and the urinary tract* (Vol I, II, & III) 8th Ed, Lippincott Williams & Wilkins
4. Claude Jacobs (1996) *Replacement of Renal Function by Dialysis* Springer
5. Nissenson, A. R., Fine R.N., (2002) *Textbook of Dialysis therapy* 3rd Ed Hanley & Belfus

Module 9: Endocrine System

Endocrine glands ,their hormones and functions-Thyroid, Parathyroid, Suprarenal, Pituitary, pituitary and Thymus

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BIOCHEMISTRY

Course Hours (Theory): 30 hrs

Course Hours (Practicum): 20 hrs

COURSE OBJECTIVES: On completion of this course the students will be able to:

1. Define biochemistry and explain the major complex biomolecules of the cell.
2. Enumerate the chemical structure, classification and functions of proteins, lipids and carbohydrates.
3. Comprehend the classification & function of nucleic acids and enzymes.
4. Explain the biochemical structure of vitamins, its classification and the functions of vitamins and minerals.
5. List the various hormones, its action and function.
6. Describe acids and bases, the mechanism of homeostasis and acid base balance

BIOCHEMISTRY (Theory outline)

Module 1: Carbohydrates

Glucose and Glycogen Metabolism

Module 2: Proteins:

Classification of proteins and functions

Module 3: Lipids:

Classification of lipids and functions

Module 4: Enzymes

Definition – Nomenclature – Classification – Factors affecting enzyme activity – Active site – Coenzyme – Enzyme Inhibition – Units of enzyme – Isoenzymes – Enzyme pattern in diseases.

Module 5: 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 – Kwashiorkor

Module 6 : Acids and bases:

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

BIOCHEMISTRY SYLLABUS FOR PRACTICALS

- 1 Benedict's test
2. Heat coagulation tests

REFERENCES

1. Teitz, *Clinical Chemistry*. W.B. Saunders Company Harcourt (India) Private Limited New Delhi.
2. Vasudevan D. & Sree Kumari S., *Text Book of Bio Chemistry for Medical Students*, Jaypee Brothers, New Delhi.
3. Biochemistry, U. Satyanarayan, Books and Allied (P) Ltd. Kolkata-India
4. Das Debajyothi, *Biochemistry*, Academic Publishers Calcutta.

PHARMACOLOGY

Course Hours (Theory): 50 hrs

Practical hours: 50 hrs

COURSE OBJECTIVES: On completion of the course the students will be able to:

1. Describe the various drugs used for the treatment of kidney diseases and dialysis: which includes antibiotics, anti microbials, ionotropes, diuretics and anti – convulsants.
2. List, classify and describe in detail the various anti – hypertensives , their action, indication, side effects and adverse drug responses.
3. Describe the dialyzability of drugs.
4. Comprehend the drug adjustments to be made for varying degrees of renal dysfunction.
5. Enumerate the action, indication, dosage, routes & side effects in detail of erythropoietin and intra venous iron.
6. Comprehend and describe the action, indication, dosage, route of administration & side effects of heparin in Hemodialysis.

7. Comprehend the use of various anti septics, formalin, sodium hypochlorite and hydrogen peroxide and its uses in sterilization and disinfection of dialysers, tubings and dialyser machine.

