

GURU KASHI UNIVERSITY



B.Voc. DIALYSIS TECHNOLOGY (3 years)

Session: 2024-25

Department of Paramedical Sciences

Graduate Attributes:

B.Sc. Renal Dialysis Technology is a 3+1-year degree program that deals with techniques used for treatment of end stage renal disease and acute kidney disease. Renal Dialysis Technology is a branch of paramedical science that deals with the study of the process of treating and removing excess water, solutes, and toxins from the blood of patients whose kidneys can no longer perform normal functions clearly. The course prepares students to administer haemodialysis treatments for patients with renal failure, under the governance of a nurse or physician. The B.Sc. Renal Dialysis Technology syllabus includes subjects such as Human Anatomy, Excretory System, Physiology, Pathology, Pharmacology, Hemodialysis, Peritoneal dialysis and others dialysis modalities. To be considered eligible to apply to this course, students must have passed Class 12 or equivalent from a recognized board with an aggregate of at least 50% marks. B.Sc. Renal Dialysis Technology degree holders will be able to find work in various sectors such as Hospitals, Universities, Health organizations etc.

Programme Learning Outcomes: After completion of this course graduates will be able to:

- Students learn about Human Anatomy, Human Physiology, Pathology of disease, Microbiology of causing pathogens, Pharmacology of drugs used in Human being.
- Students learn about Hemodialysis. Components of hemodialysis, indication, contraindication and complications
- Students learn about Peritoneal dialysis its components, indication, contraindication and complications.
- Students learn about Continuous renal replacement therapy its component, indication, contraindication and mechanism.
- Students learn about hem perfusion dialysis its components, indication, contraindication and complications.
- Students learn about plasmapheresis dialysis its components, indication, contraindication and complications.

Programme Structure

Semester: I

Sr. No.	Course Code	Course Name	Type of course	L	T	P	No. Of Credits
1	BVD101	Human Anatomy-I	Core	4	0	0	4
2	BVD102	Human Physiology-I	Core	4	0	0	4
3	BVD103	Basic Biochemistry	Core	4	0	0	4
4	BVD104	General Microbiology	Core	4	0	0	4
5	BVD105	Human Anatomy-I(Practical)	Skill based	0	0	4	2
6	BVD106	Human Physiology-I(Practical)	Skill based	0	0	4	2
7	BVD107	Basic Biochemistry (Practical)	Skill based	0	0	4	2
8	BVD108	General Microbiology (Practical)	Skill based	0	0	4	2
Total				16	0	16	24

Semester: II

Sr. No.	Course Code	Course Name	Type of course	L	T	P	No. Of Credits
1	BVD201	Human Anatomy-II	Core	4	0	0	4
2	BVD202	Human Physiology-II	Core	4	0	0	4
3	BVD203	Human Anatomy-II (Practical)	Skill based	0	0	4	2
4	BVD204	Human Physiology-II (Practical)	Skill based	0	0	4	2
5	BVD205	Patients with trauma to the head-neck region	Value Added Course	2	0	0	2
6	BVD299	MOOC	MOOC	0	0	0	3
7	BVD206	Pathology	Compulsory Foundation	2	0	0	2
8	BVD207	Pharmacology-I	Disciplinary Elective-II	3	0	0	3
9	BVD208	Computer science					
Total				15	0	08	23

Semester: III							
Sr. No	Course Code	Course Name	Type of course	L	T	P	No. Of Credits
1	BVD301	Applied Anatomy and Physiology Related to Renal Dialysis Technology	Core	4	0	0	4
2	BVD302	Applied Pharmacology Related to Renal Dialysis Technology	Core	4	0	0	4
3	BVD303	Applied Anatomy and Physiology related to Renal Dialysis Technology (Practical)	Skill based	0	0	4	2
4	BVD304	Applied Pharmacology related to Renal Dialysis Technology (Practical)	Skill based	0	0	4	2
5	BVD305	Medical Ethics and Biosafety	Elective Foundation	3	0	0	3
6	BVD399	MOOC	MOOC	-	-	-	2
Disciplinary Elective III (Any one of the following)							
7	BVD306	Psychology -	Disciplinary Elective-I	0	0	4	2
8	BVD307	Microbiology					
Disciplinary Elective III (Any one of the following)							

9	BVD308	Sociology	Disciplinary Elective-I	0	0	4	2
10	BVD309	Basics and Advanced Life Support					
Inter-Disciplinary Course							
11	XXX	XXX	IDC	2	0	0	2
Total				13	0	12	25

Semester: IV							
Sr. No.	Course Code	Course Name	Type of course	L	T	P	No. Of Credits
1	BVD401	Renal Dialysis Technology I	Core	4	0	0	4
2	BVD402	Renal Dialysis Technology II	Core	4	0	0	4
3	BVD403	Renal Dialysis Technology I (Practical)	Skill based	0	0	4	2
4	BVD404	Renal Dialysis Technology II (Practical)	Skill based	0	0	4	2
5	BVD405	Environmental Science and Community Medicine	Multidisciplina ry	3	0	0	3
Value Added Course (for other discipline students also)							
6	BVD406	Health Care	VAC	2	0	0	4
Disciplinary Elective V (Any one of the following)							

7	BVD407	Bio-Statistics and Research Methodology	Disciplinary Elective	3	0	0	3
8	BVD408	Basic Nutrition					
Total				16	0	08	24

Semester: V							
Sr. No.	Course Code	Course Name	Type of course	L	T	P	No. Of Credits
1	BVD501	Applied anatomy & physiology related to dialysis technology	Core	4	0	0	4
2	BVD502	Pharmacology related to dialysis technology	Core	4	0	0	4
3	BVD503	Concepts of Renal Disease and its Management	Core	4	0	0	4
4	BVD504	Applied anatomy & physiology related to dialysis technology	Skill based	0	0	4	2
5	BVD505	Applied anatomy & physiology related to dialysis technology	Skill based	0	0	4	2
6	BVD506	Research Methodology	AEC	2	0	0	2
7	BOA599	XXX	MOOC	0	0	0	3
8	BVD507	Pathology & pathophysiology	VAC	2	0	0	2
Disciplinary Elective VII (Any one of the following)							
9	BVD508	Basics in Renal Dialysis Technology	Disciplinary Elective	3	0	0	3
10	BVD509	Applied aspects of pathology & microbiology					

Total	19	0	08	26
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Semester: VI							
Sr. No.	Course Code	Course Name	Type of course	L	T	P	No. Of Credits
1	BVD601	Evaluative clinical training & internship (6 months)	Core	0	0	0	20
2	BVD602	Technical writing	Core	0	0	0	4
Total				0	0	0	24

Evaluation Criteria for Theory Courses

A. Continuous Assessment: [25 Marks]

CA1- Surprise Test (Two best out of three) (10 Marks)

CA2- Assignment(s) (10 Marks)

CA3- Term paper/ Quiz/Presentation (05 Marks)

B. Attendance (05 Marks)

C. Mid-Semester Test: (30 Marks)

D. End-Semester Exam: (40 Marks)

Semester -1st

Course Title: Human Anatomy-I

Course Code: BVD-101

L	T	P	Cr.VN
4	0	0	4

Total Hours 60

Learning Outcomes:

1. Learn about the various muscles, organs, bones, joints, tendons, ligaments, blood vessels and cells.
2. Identify cell organelles, blood components, function, skeletal system, circulatory system, lymphatic system, and structure.
3. Recognize the properties of nerve fiber, anatomy of neuralgia, synapse, CNS, CSF, brain, cranial nerves, and demonstration of reflexes.
4. Enlist the malfunctioning of the organs and diagnose the disorders.

Course Contents

UNIT-I

15 Hours

Introduction: human body as a whole Definition of anatomy and its subdivisions Anatomical nomenclature and terminology (planes & positions) Surface Anatomy of main structures and vessels Applied anatomy & Joints Musculoskeletal system Connective tissue & its modification, tendons, membranes, special connective tissue. Bone structure, blood supply, growth, ossification, and classification. Muscle classification, structure and functional aspect. Joints classification, structures of joints, movements, range, limiting factors, stability, blood supply Nerve supply, dislocations and applied anatomy

UNIT-II

15 Hours

Extremity (Lower & Upper extremities) Bony architecture Joints – structure, range of movement Muscles – origin, insertion, actions, nerve supply Major nerves – course, branches and implications of nerve injuries Development of limb bones, muscles and anomalies Radiographic identification of bone and joints Applied anatomy Lower extremity Bony architecture Joints – structure, range of movement Muscles – origin, insertion, actions, nerve supply Major nerves – course, branches and implications of nerve injuries Development of limb bones, muscles and anomalies Radiographic identification of bone and joints Applied anatomy

UNIT-III

15 Hours

Spine and thorax

Back muscles -Superficial layer Deep muscles of back, their origin, insertion, action and nerve supply. Vertebral column – Structure & Development, Structure & Joints of vertebra. Thoracic cage

Head and neck: Cranium Facial Muscles – origin, insertion, actions, nerve supply Temporal mandibular Joints – structure, types of movement

UNIT-IV**15 Hours**

Cardiovascular system (with relevant applied anatomy) Heart-Size, location, chambers. Circulation -Systemic & pulmonary Great vessels of the heart, branches of aorta. Overview of blood vessels of upper extremity and lower extremity Lymphatic system- (with relevant applied anatomy) Salient features of lymphatic organs (spleen, tonsil, thymus, lymph node)

UNIT-V**15Hours**

Gastro-intestinal system (with relevant applied anatomy) Parts of the gastrointestinal tract Gross anatomy of Tongue, stomach, small and large intestine, liver, gall bladder Pancreas and other digestive organs & related applied anatomy

Respiratory system (with relevant applied anatomy) Parts of respiratory system with salient gross features of lung Brief description of intercostal muscles and Para-nasal air sinuses

Transaction Modes

Video based teaching, Collaborative teaching, Case based teaching, Question Answer.

Suggested Readings

- Chaurasia, B. D. (2010). *BD Chaurasia's Human Anatomy*. CBS Publishers & Distributors Pvt. Ltd.
- Mescher, A. L. (2013). *Junqueira's basic histology: text and atlas (Vol. 12)*. 13th ed. New York: McGraw-Hill
- Halim, A. (2008). *Human Anatomy: Volume I: Upper Limb And Thorax*. IK International Pvt Ltd.
- Hallam, J. (2009). *Grey's Anatomy: Scalpels, sex and stereotypes*. *Medical Humanities*, 35(1), 60-61

Course Title: Human Physiology-I**Course Code: BVD-102**

L	T	P	Cr.
4	0	0	4

Total Hours 60**Learning Outcomes:**

1. Learn about the various muscles, organs, bones, joints, tendons, ligaments, blood vessels and cells.
2. Identify cell organelles, blood components, function, skeletal system, circulatory system, lymphatic system, and structure.
3. Recognize the properties of nerve fiber, anatomy of neuralgia, synapse, CNS, CSF, brain, cranial nerves, and demonstration of reflexes.

4. Enlist the malfunctioning of the organs and diagnose the disorders.

Course Contents

UNIT-I

15 Hours

Cell: morphology, Structure, and function of cell organelles Structure of cell membrane Transport across cell membrane Intercellular communication Homeostasis

Blood Introduction-composition & function of blood W.B.C., R.B.C., Platelets formation & functions, Immunity Plasma: composition, formation & functions, Plasma Proteins: -types & functions, Blood Groups types, significance, determination. Hemoglobin, Hemostasis Lymph-composition, formation, circulation & functions

UNIT-II

15 Hours

Cardiovascular system Conducting system-components, impulse conduction Heart valves Cardiac cycle-definition, phases of cardiac cycle. Cardiac output-definition, normal value, determinants. Stroke volume and its regulation. Heart rate and its regulation: Arterial pulse, Blood pressure-definition, normal values, factors affecting blood pressure. Shock-definition, classification, causes and features, Basic idea of ECG, Cardiovascular changes during exercise

UNIT-III

15Hours

Respiratory System Mechanics of respiration Lung volumes and capacities Pulmonary circulation, transport of respiratory gases Factors affecting respiration, Regulation of respiration-neural regulation, voluntary control and chemical regulation Hypoxia, Hypercapnoea, Hypocapnoea, Artificial respiration Disorders of respiration- dyspnoea, orthopnoea, hyperpnoea, hyperventilation, apnoea, Tachypnoea, Respiratory changes during exercise. Digestive System Digestion& absorption of nutrients, Gastro-intestinal secretions & their regulation Functions of Liver & Stomach

UNIT-IV

15 Hours

Nervous system Introduction, central and peripheral nervous system, functions of nervous system Reflexes-monosynaptic, polysynaptic, superficial, deep & withdrawal reflex Sense organ, receptors, electrical& chemical events in receptors. Sensory pathways for touch, temperature, pain, proprioception & others. Control of tone & posture: Integration at spinal, brain stem, cerebellar, basal ganglion levels, along with their functions. Motor mechanism: motor cortex, motor pathway: the descending tracts -pyramidal & extrapyramidal tracts-origin, course, termination & functions. Upper motor neuron and lower motor neuron paralysis. Special senses-eye, ear, nose, mouth Water excretion, Nerve Muscle Physiology Muscles-classification, structure, properties, Excitation, contraction, coupling, Motor unit, EMG, factors affecting muscle tension, Muscle tone, fatigue, exercise . Nerve –

structure and function of neurons, classification, properties Resting membrane potential & Action potential their ionic basis, All or None phenomenon Neuromuscular transmission Ionic basis of nerve conduction. Concept of nerve injury & Wallerian degeneration Synapses.

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question Answer

Suggested Readings

- Ashalatha, P. R., &Deepa, G. (2012). *Textbook of Anatomy & Physiology for Nurses*. JP Medical Ltd.
- Chatterjee, C. C. (2020). *Human Physiology*. (13 th edition). CBS Publisher and Distributor Pvt. Ltd. Colorimetry
- Heilbrunn, L. V. (1952). *General physiology*. Saunders, Philadelphia.
- Hall, J. E. 1. (2016). *Guyton and Hall textbook of medical physiology (13th edition.)*. Philadelphia, PA: Elsevier.

Course Title: Basic Biochemistry

Course Code: BVD-103

L	T	P	Cr.
4	0	0	4

Total Hours 60

Course Learning Outcomes:

1. Understanding Molecular Structures
2. Analyse Metabolic Pathways
3. Evaluate Enzyme Function and Kinetics:
4. Application of Biochemical Techniques.

Course Contents:

UNIT-I

15 Hours

Carbohydrates: Definition, function, and classification of carbohydrate. Monosaccharide, glycoside formation, oligosaccharides and polysaccharides. Glycolysis, catabolic fates of pyruvate, metabolic fate of Acetyl-CoA and Citric acid cycle, gluconeogenesis, glycogen metabolism, pentose phosphate pathway.

UNIT-II

15 Hours

Amino acids and proteins: Definition, structure, classification, essential & non-essential amino acids. Proteins definition and classification. Primary, secondary, tertiary and quaternary of proteins of proteins

UNIT-III

15 Hours

Vitamins: Definition and classification of vitamins, difference between fat soluble and water soluble vitamins. Water soluble vitamins and fat soluble vitamins

UNIT-IV

15 Hours

Lipids: Definition, classification and function of lipids. Fatty Acids, Triacylglycerols or Triacylgcerides or neutral fat. Fatty acid metabolism. Ketone body metabolism.

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question Answer

Suggested Readings

- *K.Thalayan, Basic of Radiological Physics*
- *K.Thalayan, Textbook of Radiological Safety*
- *Rehani, Advance Medical Physics*

* Latest editions of all the suggested books are recommended

Course Title: General Microbiology

Course Code: BVD-104

L	T	P	Cr.
4	0	0	4

Total Hours 60

Course Learning Outcomes:

1. Understanding laboratory Microscopy
2. Analyse classification of Bacteria, Morphology of bacteria
3. Evaluate Bacterial Culture and Identification
4. Application of Biochemical Techniques.

Course Contents:

UNIT-I

15 Hours

Safety measures in laboratory Microscopy: Principle, working and applications of Light microscope, Dark field, Phase contrast microscopy, Fluorescent & Electron microscopy Sterilization and Disinfection: Physical Methods of Sterilization, Chemical Methods of Sterilization, Methods of Disinfection

UNIT-II

15 Hours

Introduction and classification of Bacteria, Morphology of bacteria, Growth,

Nutrition & Metabolism of Bacteria Normal microbial flora of human body, role of normal flora, probiotics. Bacterial genetics- Bacterial DNA & RNA, Replication of bacteria. Microbial pathogenicity

UNIT-III

15

Hours

Bacterial Culture and Identification: Culture Media & Transport Media, Aerobic Bacterial Culture Techniques, Anaerobic Bacterial Culture Techniques, Sample collection and transport methods Bacterial identification techniques: Conventional methods, Automated culture techniques.

UNIT-IV

15

Hours

Smear preparation & Staining methods: Gram stain, Acid-fast stain, Negative stain, Spore stain Antimicrobial susceptibility testing: Principle and techniques of Diffusion Methods Dilution Methods Preservation techniques of bacteria

Course Title: Human Anatomy (Practical)

Course Code: BVD-105

L	T	P	Cr.
0	0	4	2

Learning Outcomes: After Completion of this course, the learner will be able to:

1. Demonstrate that Hormones, pituitary glands, thyroid glands, parathyroid glands, adrenal glands, and endocrine pancreas, help in employability.
2. Classify the different properties of nerve fibers, , synapse, CNS, CSF, brain, cranial nerves, and demonstration of reflexes.
3. Illustrate the anatomy of cell organelles, bskeletal system, circulatory system, lymphatic system, and its structure to help in employability.
4. Discuss the various muscles, organs, bones, joints, tendons, ligaments, blood vessels, and cells

List of Practical's / Experiments:

1. Identification and description of all anatomical structures.
2. Demonstration of dissected parts (upper extremity, lower extremity, thoracic & abdominal viscera, face and brain).
3. Demonstration of skeleton-articulated and disarticulated.
4. Surface anatomy: Surface land mark-bony, muscular and ligamentous. Surface anatomy of major nerves, arteries of the limbs.

Transaction Modes

Video based teaching, Collaborative teaching, Case based teaching, Question Answer.

Suggested Readings

- Chaurasia, B. D. (2010). *BD Chaurasia's Human Anatomy*. CBS Publishers & Distributors Pvt. Ltd.
- Mescher, A. L. (2013). *Junqueira's basic histology: text and atlas (Vol. 12)*. 13th ed. New York: McGraw-Hill
- Halim, A. (2008). *Human Anatomy: Volume I: Upper Limb And Thorax*. IK International Pvt Ltd.

Hallam, J. (2009). *Grey's Anatomy: Scalpels, sex and stereotypes*. *Medical Humanities*, 35(1), 60-61

Course Title: General Physiology(Practical)

Course Code: BVD106

L	T	P	Cr.
0	0	4	2

Learning Outcomes: After Completion of this course, the learner will be able to:

1. Explain the fundamental processes that occur within cells, including cellular respiration, membrane transport, and cellular communication.
2. Describe the structure and function of major organ systems in the human body, such as the cardiovascular, respiratory, nervous, and endocrine systems.
3. Demonstrate the properties of nerve fibers, function of neuralgia, synapse, CNS, CSF, brain, cranial nerves, demonstration of reflexes.
4. Provide knowledge about functioning of Hormones, pituitary gland, thyroid gland, parathyroid glands, adrenal glands, endocrine pancreas, help in employability

List of Practical's / Experiments:

1. Haemoglobinometry
2. White Blood Cell count
3. Red Blood Cell count
4. Determination of Blood Groups

5. Leishman's staining and Differential WBC count
6. Determination of packed cell Volume
7. Erythrocyte sedimentation rate [ESR]
8. Calculation of Blood indices
9. Determination of Clotting Time, Bleeding Time
10. Blood pressure recording
11. Auscultation for Heart Sounds
12. Artificial Respiration

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question Answer

Suggested Readings

- *Ashalatha, P. R., & Deepa, G. (2012). Textbook of Anatomy & Physiology for Nurses. JP Medical Ltd.*
- *Chatterjee, C. C. (2020). Human Physiology. (13 th edition). CBS Publisher and Distributor Pvt. Ltd. Colorimetry*
- *Heilbrunn, L. V. (1952). General physiology. Saunders, Philadelphia.*
- *Hall, J. E. 1. (2016). Guyton and Hall textbook of medical physiology (13th edition.). Philadelphia, PA: Elsevier.*

Course Title: BASIC BIOCHEMISTRY(Practical)

Course Code: BVD107

L	T	P	Cr.
0	0	4	2

Learning Outcomes: After Completion of this course, the learner will be able to:

1. Understand the structure and function of biomolecules (carbohydrates, proteins, lipids, nucleic acids)
2. Explain metabolic pathways and their regulation
3. Describe the mechanisms of enzyme action and inhibition
4. Understand the role of bioenergetics in cellular processes

5. Apply knowledge of biochemical principles to medical and health-related issues

List of Practical's / Experiments:

1. Identification of carbohydrates by Molisch's test.
2. Identification of reducing sugar by Benedict's test.
3. Identification of protein by Biuret's test.
4. Identification of ketose sugars by Seliwanoff's test.
5. Identification of reducing sugar by Osazone test.
6. Identification of cholesterol by Salkowski's test.

Course Title: Microbiology (Practical)

Course Code: BVD-108

L	T	P	Cr.
0	0	2	1

Learning Outcomes: After Completion of this course, the learner will be able to:

1. Understanding the structure, function, and diversity of microorganisms (bacteria, viruses, fungi, protozoa, and algae).
2. Knowledge of microbial growth, metabolism, and genetics.
3. Familiarity with microbial interactions and relationships (symbiosis, parasitism, commensalism).
4. Understanding of microbial roles in ecosystems, environment, and human health (disease, immunity, vaccination).
5. Familiarity with laboratory techniques for isolating, culturing, and identifying microorganisms.

List of Practical's / Experiments:

1. Microscope: Light & Compound Microscope
2. Staining: Grams staining, ZN staining, Negative stain

3. Preparation of commonly used culture media: Nutrient Agar, Blood Agar, Chocolate agar, Mac Conkey agar, Muller Hinton agar
4. Culture methods: Streak method, Lawn method, Stroke method, Stab method, Pour Plate method, Liquid method
5. Antibiotic susceptibility test: Diffusion methods, Dilution Methods

Semester 2nd

Course Title: Human Anatomy-II

Course Code: BVD201

L	T	P	Cr.
4	0	0	4

Total Hours 60

Learning Outcomes:

1. Learn about the various muscles, organs, bones, joints, tendons, ligaments, blood vessels and cells.
2. Identify cell organelles, blood components, function, skeletal system, circulatory system, lymphatic system, and structure.
3. Recognize the properties of nerve fibres, anatomy of neuralgia, synapse, CNS, CSF, brain, cranial nerves, and demonstration of reflexes.
4. Enlist the malfunctioning of the organs and diagnose the disorders.

Content

UNIT-I

15 Hours

Urinary system (with relevant applied anatomy) Parts of the urinary system Salient gross features of kidney, urinary bladder, ureter and urethra. Reproductive system Parts of male and female reproductive system with salient gross features of testis & uterus, ovary and fallopian tube

UNIT-II

15 Hours

Endocrine glands List of the endocrine glands, their position and salient gross features Hormones produced by each endocrine glands Embryology Spermatogenesis & oogenesis Ovulation, fertilization, Placenta, Fetal circulation

UNIT-III

15 Hours

Nervous system Classification of the nervous system, Definitions of central, peripheral, and autonomic nervous system Neuron- structure and

classification, neuroglia Names of lobes of Cerebrum and cerebellum, Parts of the brainstem (salient features only). Cerebrospinal fluid and its circulation, names of cranial nerves, spinal nerve, meninges, ventricles (salient features only).

UNIT-IV

15 Hours

Sensory organs Skin: Its appendages and functions. Eye: Parts of the eye and its structure Ear: Parts of ear- external, middle, and inner ear and contents.

Transactional modes

Video-based teaching, Collaborative teaching, Case based teaching, Question Answer

Suggested readings

- *K.Thalayan, Basic of Radiological Physics*
- *K.Thalayan, Textbook of Radiological Safety*
- *Rehani, Advance Medical Physics*

** Latest editions of all the suggested books are recommended*

Course Title: Human Physiology-II

Course Code: BVD202

L	T	P	Cr.
4	0	0	4

Total Hours 60

Learning Outcomes:

1. Learn about the various muscles, organs, bones, joints, tendons, ligaments, blood vessels and cells.
2. Identify cell organelles, blood components, function, skeletal system, circulatory system, lymphatic system, and structure.
3. Recognize the properties of nerve fibers, anatomy of neuralgia, synapse, CNS, CSF, brain, cranial nerves, and demonstration of reflexes.
4. Enlist the malfunctioning of the organs and diagnose the disorders.

Course Content

UNIT-I

15 Hours

Excretory system: Functions of kidneys, Composition of urine Mechanism of urine formation Regulations of body temperature Fluid and electrolyte balance Alterations in disease

UNIT-II

15 Hours

Sensory Organs: Functions of skin, eye, ear, nose, tongue Alterations in disease

UNIT-III

15 Hours

Endocrines Functions of the pituitary, Pineal gland, Thymus, Thyroid, Parathyroid, Pancreas, Suprarenal & placenta Alterations in disease

UNIT-IV

15 Hours

Reproduction of cells-DNA, Mitosis, Meiosis, Spermatogenesis, Oogenesis Functions of female reproductive organs: Functions of breast, female sexual cycle Introduction to embryology Functions of male reproductive organs: Fertility system Alterations in disease

UNIT-V

15 Hours

Lymphatic and Immunological system: Circulation of lymph Immunity Formations of T- Cells and B- Cells Types of Immune Response Antigens Cytokine

Transactional modes

Video-based teaching, Collaborative teaching, Case based teaching, Question Answer

Suggested readings

- *K.Thalayan, Basic of Radiological Physics*
- *K.Thalayan, Textbook of Radiological Safety and procedures.*
- *Rehani, Advance Medical Physics*

Course Title: Human Anatomy II (Practical)

Course Code: BVD203

L	T	P	Cr.
0	0	4	2

Total Hours 60

Learning Outcomes:

1. Learn about the various muscles, organs, bones, joints, tendons, ligaments, blood vessels and cells.
2. Identify cell organelles, blood components, function, skeletal system, circulatory system, lymphatic system, and structure.
3. Recognize the properties of nerve fibers, anatomy of neuralgia, synapse, CNS, CSF, brain, cranial nerves, and demonstration of reflexes.
4. Enlist the malfunctioning of the organs and diagnose the disorders.

List of Practical's / Experiments:

- 1 . various muscles, organs, bones, joints, tendons, ligaments, blood vessels and cells.
2. Identify cell organelles, blood components, function, skeletal system, circulatory system, lymphatic system, and structure.
3. Recognize the properties of nerve fibres, anatomy of neuralgia, synapse, CNS, CSF, brain, cranial nerves, and demonstration of reflexes.

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question Answer

Course Title: Human Physiology-II(Practical)

Course Code: BVD-204

L	T	P	Cr.
0	0	4	2

Learning Outcomes:

1. Acquire the knowledge of the relative contribution of each organ system in the maintenance of the Milieu Interior (Homeostasis)
2. Compare & contrast Functions of lipids, carbohydrates, proteins & cell organelles.
3. Classify Physiological functions of various systems, with special reference to Musculoskeletal, Neuro-motor, Cardio-respiratory, Endocrine, Uro- genital function, & alterations in function with aging
4. Conclude Properties of nerve fibers, function of neuroglia, synapse, CNS, CSF, brain, cranial nerves, demonstration of reflexes.

List of Practical's / Experiments:

1. human body –Composition of the body, Homeostasis, Introduction to the chemistry of life.
2. Function of lymph vessels, lymphatic tissue & organs, lymphatic's, spleen, tonsil, and thymus. Resistance & Immunity – Innate immunity, acquired immunity, humoral & cell-mediated immunity.
3. Nervous System – Properties of nerve fibers, function of neuroglia, synapse, CNS, CSF, brain, cranial nerves, demonstration of reflexes
4. Muscular System – Properties of skeletal muscle, cardiac muscle, smooth muscle, and body muscles.
5. Physiology of respiration, pulmonary function tests, gas exchange in lungs, transport of gases between lungs & tissues, regulation of

respiration

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Group study. ppts

Suggested Readings:

Agur, A. M., & Dalley, A. F. (2009). Grant's atlas of anatomy. Lippincott Williams & Wilkins.
Chaurasia, B. D. (2004). Human anatomy (p. 53). CBS Publisher.
Peate, I., & Nair, M. (2015). Anatomy and Physiology for Nurses at a Glance. John Wiley & Son

Course Title: Approach to patients with trauma to head-neck region

Course Code: BVD-205

L	T	P	Cr.
2	0	0	2

Learning Outcomes:

1. Differentiate between the three different classes of neck trauma, and give an example of each type.
2. Describe the three different anatomical zones of the neck, and give the key structures resident in each one.
3. Review the proper procedure for examination and evaluation of neck trauma injuries, including all appropriate diagnostic testing.
4. Outline interprofessional team strategies for improving care coordination and communication to improve outcomes with trauma to the neck.

Course Contents

UNIT-I

08 Hours

Mechanical injuries or wounds

(Definition of wound, injury, hurt, assault, battery.

(Classification of injuries, description of blunt force and sharp force injuries. Firearms – principles, types, examination and interpretation of fire arm wounds. Comparison microscopy.

Unit II

10 Hours

Medico-legal aspects of injuries: Difference between ante mortem and post-mortem injuries, determination of different types of injuries, defense wounds, hesitation cuts, fabricated injuries, simple and grievous hurt, suicidal, accidental and homicidal injuries, causes of death by mechanical injuries, legal classification of fatal injuries

Unit III

06 Hour

Assessment and Triage:

Primary Survey (ABCDE: Airway, Breathing, Circulation, Disability, Exposure)

Glasgow Coma Scale (GCS) assessment

Hemodynamic stability evaluation

Unit IV

12 Hours

Management:

Techniques for securing the airway in trauma patients

Use of cervical spine immobilization

Indications for intubation or surgical airway (e.g., cricothyrotomy)

Course Title: Pathology

L	T	P	Cr.
3	0	0	3

Course Code: BVD-206

Learning Outcomes:

1. understand the principles of immuno-pathology: Students will develop a comprehensive understanding of the fundamental principles and concepts of immuno-pathology.
2. Comprehend the principles of cytopathology: Students will gain knowledge of the principles and techniques of cytopathology.
3. Interpret immunological markers in disease diagnosis: Students will learn to interpret immunological markers used in disease diagnosis. They will understand the principles and techniques.
4. Perform immunological staining techniques: Students will develop practical skills in performing immunological staining techniques used in immuno-pathology.

Course Contents

UNIT 1

11 Hours

Immunopathology

Cells and organs of the immune system.

Antigens, antibodies, and humeral immune response.

UNIT 2

11 Hours

Allergy Rheumatologically diseases and investigations.

Infection and the immune system. Cancer Immunology. Tissue typing for kidney transplant.

UNIT 3

12 Hours

Cytopathology Exfoliative cytology

Preparation of vaginal and cervical smears PAP smears and its fixation, Preparation of PAP stains, cell blocks, Staining techniques (PAP, H&E and Giemsa), Interpretation of results

Various body fluid processing like Urine, Sputum, Fluids (Pleural, Pericardial and Peritoneal), CSF etc.

UNIT 4**11 Hours**

Aspiration Cytology principles, indications & utility of the technique with special emphasis on role of cytotechnologist in FNAC clinics, Barr body analysis

Transaction Modes

Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings:

Immunology by Ivan Roitt, Jonathan Brostoff and David Male

Medical Immunology by Daniel P Stites

Basic & Clinical Immunology by P. Daniel Fudenberg. H. Hugh and Stites

Introduction to Medical Laboratory Technology – F.J. Baker

Medical Laboratory Technology (Volume I & II) by Kanai, L.

Mukherjee, Swarajit Ghosh

Lynch's Medical Lab. Technology by Stanley S. Raphael

Course Title: Pharmacology - i

Course Code: BVD207

L	T	P	Cr.
3	0	0	3

Learning Outcomes: After Completion of this course, the learner will be able to:

1. To understand the terminologies and basic principles of pharmacokinetic and
2. pharmacodynamics involved in the use of drugs.
3. To understand the pharmacological action and mechanism of action of common drugs used for different disease conditions.
4. To know the therapeutic uses and adverse effects of common drugs used for different disease conditions

Course Contents**Unit I****11 Hours**

General considerations- Cholinergic system & drugs-Anticholinergic drugs- Adrenergic drugs-antiadrenergic drugs-Drugs acting on autonomic ganglia.

Unit II**11 Hours**

Skeletal muscle relaxants-Local anaesthetics, General anaesthetics-Ethyl & Methyl alcohol-Sedatives-Hypnotics-Antiepileptics-Antiparkinsonian drugs- Drugs used in mental illness-Opioid analgesics and Non opioid Analgesics- Nonsteroidal Antiinflammatory drugs

Unit III**11 Hours**

Cardiovascular drugs , Drugs affecting Blood & Blood formation and Drugs on Respiratory system

Unit IV

12 Hours

Cardiac glycosides, Antiarrhythmic drugs, Antianginal\drugs, Antihypertensives and Diuretics, Haematinics, Erythropoietin,, Drugs affecting coagulation, Fibrinolytic and Antiplatelet drugs, Treatment of cough and antiasthmatic drugs

Course Title: Computer Sciences

Course Code: BVD208

L	T	P	Cr.
3	0	0	3

Learning Outcomes: After Completion of this course, the learner will be able to:

1. Understand the principles of disease processes, including ethology, pathogenesis, and clinical manifestations.
2. Identify and classify various types of diseases, including inflammatory, infectious, neoplastic, and degenerative disorders.
3. Explain the mechanisms of tissue injury and repair.
4. Describe the role of laboratory tests in diagnosing and monitoring diseases.
5. Interpret histopathological and cytological findings.
6. Understand the relationship between disease and organ dysfunction.
7. Apply knowledge of pathology to clinical scenarios and case studies.
8. Recognize the importance of pathology in public health and disease prevention.
9. Describe the molecular and genetic basis of diseases.
10. Stay up-to-date with recent advances and developments in pathology.

Unit-I

11 Hours

□ Hardware, Software, system definition, Fundamentals of Networking, Internet, Performing searches and working with search engines, types of software, and its applications

Unit-II

11 Hours

Word processor, spreadsheet, presentations, other utility tools, Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, working with the shell and other standard utilities.

Unit-III

12 Hours

Comparison chart of conventional language, Programming Languages, Generations Of

Programming Languages, Compilers and Interpreters, Universal programming constructs based on SDLC, Variable, constant, identifiers, functions, procedures, if while, do – while, for and other Structures. Programming in C language, Data types, identifiers, functions and its types, arrays, union, structures and pointers

Unit IV

11 Hours

Introduction to object-oriented programming with C++: Classes, Objects, Inheritance Polymorphism, and Encapsulation. Introduction to databases, and query languages, Introduction to Bioinformatics.

Transaction Modes

Video based teaching, Collaborative teaching, Case based teaching, Question

Suggested Readings:

Text Books:

1. Peter Norton.,Introduction to Computers. 7th Edition, Tata McGraw Hill Education Private Limited 2010.
2. Gary B. Shelly, Thomas J. Cashman, Misty E. Vermaat., Microsoft Office 2007. 1stEdition, Delmar Cengage Learning 2010

Reference Books:

1. C programming tutorial (K&R version 4) Author(s) Mark Burgess
2. Red hat Linux 9 bible by Christopher Negus May 200

Semester 3rd

Course Title:: Applied Anatomy and Physiology related to Renal Dialysis Technology

Course Code: BVD301

L	T	P	Cr.
4	0	0	4

Total Hours 60

Learning Outcomes:

- 1 explain the Anatomy of Renal system with better knowledge on terminologies.
- 2 Will be able to explain to Physiological processes with understanding.
- 3 Will be able to provide better support during a Renal disorder with knowledge of Anatomy and Physiology.
- 4 To elaborate on various Physiological processes related to Renal system.

Course Contents

UNIT-I

12 Hours

Gross structures of Excretory system: Structure of kidney Structure of Ureter
Structure of Urinary Bladder Structure of Nephron
Embryology of Kidney Histology of Kidney

Unit- II

12 Hours

Vascular supply of Excretory System Renal artery & Renal vein
Jugular vein Subclavian vein. Femoral vein Artery & Veins used for the
creation of AV Fistula Innervations of the Kidney and Urinary Bladder
Peritoneum in general. Physiology related to Dialysis technology – Mechanism
of Urine Formation Filtration Reabsorption Concentration
Dilution Acidification Functions of Excretory system Excretory and
Regulatory functions Metabolic and Endocrine functions

Unit- III

12 Hours

Physiology of Micturition, Types of Bladder dysfunction Renal function Test
Regulatory functions of Excretory system : Role of Kidney in Blood Pressure
regulation in health and diseases Mechanism of Blood formation and
regulation Role of Kidney in Bone formation .

Unit- IV

12 Hours

Role of Kidney in Acid – Base Balance Other Endocrine functions of the
Kidney Body fluids and Electrolytes & their regulation in health and diseases
Disorders of Water Metabolism (Potassium, Sodium, Phosphate, Calcium)
Role of Peritoneum in Peritoneal Dialysis

Transactional modes

Video-based teaching, Collaborative teaching, Case based teaching, Question
Answer

Suggested Readings

1. *Human Anatomy – B D Chaurasia, 6th Edition, CBS, 2013.*
2. *Text Book of Medical Physiology – Guyton and Hall, 12th Edition, Saunders, 2010.*
3. *The Kidney – Brenner and Rector's, 9th Edition, Elsevier Health Sciences, 2012.*

**Course Title: APPLIED PHARMACOLOGY
RELATED TO RENAL DIALYSIS TECHNOLOGY**

Course Code: BVD302

L	T	P	Cr.
4	0	0	4

Total Hours 60

Learning Outcomes:

- 1 To develop understanding of various drugs and their Pharmacokinetics in relation to Renal System.
2. To introduce the Importance of Pharmacology in Dialysis Emergencies.
3. Will be able to explain various drug mechanisms, Route of Administration, Type of formulations,
4. dose, Frequency of administration, side effects and toxicity.
5. Will be able to recognize drug actions in their regimes in relation to Renal system conditions.

Course Contents

UNIT-I

15 Hours

Common Drugs used in Renal Medicine - I

- Diuretics
- Antihypertensives
- Antibiotics
- Steroids
- Vitamin-D analogues, Phosphate binders
- Immunosuppressive medications used in Renal Transplantation

UNIT-II

15 Hours

Common Drugs used in Renal Medicine - II

- IV Fluids in Renal patient
- Iron therapy in Dialysis
- Erythropoietin
- Chemicals used in Dialysis unit
- Hemodialysis Concentrates
- Peritoneal Dialysis Fluids
- Potassium exchange resins
- Replacement Fluids used for CRRT
- Vaccines used in Dialysis patients – Hepatitis B

UNIT-III

15 Hours

Drugs affecting Coagulation :

- Heparin including Low Molecular Weight heparin
- Warfarin
- Protamine Sulphate
- Regional Citrate Anticoagulation

Drugs preventing Coagulation :

- Antiplatelet drugs
- Thrombolytic agents

Cardiovascular drugs & Inotropic Drugs :

- Digoxin
- Beta – blockers
- Dopamine
- Dobutamine
- Adrenaline
- Isoprenaline

UNIT-IV

15 Hours

Vasodilators :

- Nitroglycerine
- Nitroprusside

Other drugs :

- Antihistamine
- Lipid Lowering agents
- Dialysable drugs
- Bicarbonate
- Potassium
- Magnesium

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question Answer

Suggested Readings

1. Pharmacology for Dental and Allied Health Sciences - PadmajaUdaykumar, 3rd Edition, CBS, 2012.
2. Essentials of Medical Pharmacology – K D Tripathi, 7th Edition, Jaypee Brothers Medical Publishers, 2013.
1. Pharmacology - Richard A.Harvey, 4th Edition, Saunders, 2009.
2. Pharmacology and Pharmacotherapeutics - R S Sataskar, 21st Edition, Popular Prakashan Ltd, 2015.

Course Title: Applied Anatomy and Physiology related to Renal Dialysis Technology(Practical)
Course Code: BVD303

L	T	P	Cr.
0	0	4	2

Total Hours: 30

Learning Outcomes:

1. To cover General Pharmacology with Special Emphasis on common drugs used, Route of Administration,
2. Type of formulations, Dose and frequency of administration, Side effects
3. To impart knowledge of chemical and trade names, importance of manufacturing, expiry dates and
4. instruction about handling each drug
5. Toxicity, Management of Toxic effects, Drug interactions

List of Practical/Experiments

1. Kidney Urinary Bladder Renal corpuscle
2. Glomerular apparatus
3. Nephron ((Renal corpuscle, Proximal tubule, Loop of Henle, Distal tubule and Collecting tubule)
4. Renal artery & Renal vein, Jugular vein, Subclavian vein, Femoral vein, Radial artery, Cephalic vein
5. Innervations of Kidney and Urinary Bladder
6. Peritoneum in general
7. Functions of Excretory system (Excretory, Regulatory, Metabolic and Endocrine functions)
8. Physiology of Micturition, Types of Bladder dysfunction
9. Renal function Tests
10. Physiology of Micturition
11. Types of Bladder dysfunction
12. Mechanism of Urine formation
13. Role of Kidney in Blood Pressure regulation in health and diseases
14. Mechanism of Blood formation and regulation
15. Role of Kidney in Bone formation

16. Role of Kidney in Acid – Base balance
17. Other Endocrine functions of the Kidney
18. Body fluids and Electrolytes & their regulation in health and diseases
19. Disorders of Water Metabolism (Potassium, Sodium, Phosphate, Calcium)
20. Role of Peritoneum in Peritoneal Dialysis

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question Answer

Course Title: Applied Pharmacology related to Renal Dialysis Technology (Practical)
Course Code: BVD304

L	T	P	Cr.
0	0	4	2

Total Hours: 30

Learning Outcomes:

1. To cover General Pharmacology with Special Emphasis on common drugs used, Route of Administration,
2. Type of formulations, Dose and frequency of administration, Side effects
3. To impart knowledge of chemical and trade names, importance of manufacturing, expiry dates and
4. instruction about handling each drug
5. Toxicity, Management of Toxic effects, Drug interactions

List of Practical/Experiments

1. Diuretics
2. Antihypertensives
3. Antibiotics
4. Steroids
5. IV Fluids in Renal patient

6. Iron therapy in Dialysis
7. Vitamin-D analogues, Phosphate binders
8. Erythropoiesis Stimulating Agents
9. Chemicals used in Dialysis unit including composition and mechanism of action
10. Hemodialysis Concentrates
11. Peritoneal Dialysis Fluids
12. Replacement Fluids used for CRRT
13. Chemicals used for Sterilization including Formaldehyde, Hydrogen Peroxide, Sodium Hypochlorite, Citrostereile, Renalin and its mechanism of action
14. Vaccines used in Dialysis patients – Hepatitis B
15. Immunosuppressive medications used in Renal Transplantation
16. Heparin including Low Molecular Weight heparin
17. Warfarin
18. Protamine Sulphate
19. Regional Citrate Anticoagulation
20. Antiplatelet drugs

Transactional modes

Video-based teaching, Collaborative teaching, Case based teaching, Question Answer

Reference Books

1. Pharmacology for Dental and Allied Health Sciences - Padmaja Udaykumar, 3rd Edition, CBS, 2012.
2. Essentials of Medical Pharmacology – K D Tripathi, 7th Edition, Jaypee Brothers Medical Publishers, 2013.
1. Pharmacology - Richard A. Harvey, 4th Edition, Saunders, 2009.
2. Pharmacology and Pharmacotherapeutics - R S Sataskar, 21st Edition, Popular Prakashan Ltd, 2015.

Course Title: Environmental Sciences

Course Code: BVD305

L	T	P	Cr.
3	0	0	3

Total Hours: 60

Learning Outcomes:

This course is focus on environmental studies. After learning this course students are able to understand nature of environmental studies, ecosystem,environment of pollution,social issues & environment

Course Contents

UNIT-I

10 Hours

Definition and key Concepts; philosophical considerations; epistemology of science; ethical terms; principles and theories; relevance to health care; ethics and the law issues: genetic engineering, stem cells, cloning, medical techniques, trans-humanism, bio-weapons.

UNIT-II

12 Hours

Define negligence, malpractice & liability; iatrogenic harm; Influence of ethics in general practice; Describe primary and secondary ethical principles; Hippocrates' oath; Professional codes of ethics; Describe the moral basis of informed consent and advance directives; research ethics – animal rights, ethics of human cloning, and stem cell research; ICMR guidelines.

UNIT-III

11 Hours

Genetic testing, genetic screening, Fertility and birth control, sex determination and sex selection, Reproductive control: assisted reproduction and ethics, pre-natal genetic counseling, pre-implantation genetic diagnosis, Ethical issues in applied medicine; Workers compensation.

UNIT-IV

12 Hours

Euthanasia and physician-assisted dying; end-of-life care; Physicians, patients and other: autonomy, truth telling & confidentiality; emerging issues: impact of medical advances on society; Use of genetic evidence in civil and criminal court cases; Challenges to public policy – to regulate or not to regulate; improving public understanding to correct misconceptions

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question Answer

Course Title: PSYCHOLOGY

Course Code: BVD306

L	T	P	Cr.
3	0	0	3

Learning Outcomes: After Completion of this course, the learner will be able to:

1. Understand the principles of disease processes, including etiology, pathogenesis, and clinical manifestations.
2. Identify and classify various types of diseases, including inflammatory, infectious, neoplastic, and degenerative disorders.
3. Explain the mechanisms of tissue injury and repair.
4. Describe the role of laboratory tests in diagnosing and monitoring diseases.
5. Interpret histopathological and cytological findings.

UNIT 1**10 Hours**

Basic Concepts of Psychology

Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology

-Structuralism – Gestalt – Functionalism – Behaviorism - Psychoanalysis – Humanistic. Fields of

Psychology - Work of a psychologist – Applications of psychology.

UNIT 2**11 Hours**

Learning principles and methods

Definition of learning, Factors In The Process of Learning Classical conditioning - Operant Conditioning –

The principle of reinforcement and Punishment. Theory of learning. Cognitive learning- Latent learning,

Insight learning, and Imitation.

UNIT 3**12 Hours**

Motivation, Emotion, Memory and forgetting

Motivation - Definition of motivation – Theories of motivation - Physiological basis of motivation –

Motivational factors in aggression – Self-actualization motivation. Emotion – Emotional expression –

Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process

theories of memory – Improving memory –Language and thought – Symbols and concepts – Structure –
Forms of thought - Thinking and reasoning – Concept formation.

UNIT 4

12 Hours

Development, Sensory Processes and Perception.

Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development Freud's

Stages of Psychosexual Development Physiological basis of behavior – The brain and nervous system –The

sensory process, Some general characteristic of senses – Five senses

, Perception: Organization – The role

of learning in perception – Perception and attention – Perceptual process.

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question Answer

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler, "Introduction to Psychology" – 7th Edition. Tata McGraw Hill Book Co. New Delhi, 1993.
2. Baron, R. A., & Byrne, D (2006), "Social psychology", New Delhi: Prentice hall of India private limited.
3. Elliot Aronson, Timothy D. Wilson, Robin M. Akert, Samuel R. Sommers, "Social psychology" 9th edition published by Pearson education, Inc., 2006
4. Shelley E. Taylor. "Health Psychology" Third Edition. McGraw Hill International Editions, 1995.
5. Swaminathan, V.D, Latha Sathish, "Psychology for Effective Living", Department of Psychology, University of Madras.
6. Coleman, James. 1980. "Abnormal Psychology and modern life". New Delhi: Tata McGraw Hill Ltd

Course Title: Microbiology

Course Code: BVD307

L	T	P	Cr.
3	0	0	3

Learning Outcomes: After Completion of this course, the learner will be able to:

1. Understand the principles and functions of renal dialysis technology.
2. Identify and explain the components of dialysis machines and equipment.
3. Demonstrate safe and effective operation of dialysis machines.
4. Understand water treatment and dialysate preparation processes.
5. Learn patient assessment and preparation for dialysis.

UNIT 1

11 Hours

Morphology Classification of micro organisms, size, shape and structure of bacteria. Use of microscope in the study of bacteria. Growth and nutrition Nutrition, growth and multiplications of bacteria, use of culture media in diagnostic bacteriology. Sterilisation and Disinfection Principles and use of equipment of sterilization namely Hot Air oven, Autoclave and serum inspiratory. Pasteurization, Anti septic and disinfectants.

UNIT II

10 Hours

Antimicrobial sensitivity test Immunology Immunity Vaccines, Types of Vaccine and immunization schedule Principles and interpretation of commonly done serological tests namely Widal, VDRL, ASLO, CRP, RF & ELISA. Rapid tests for HIV and HbsAg (Technical details to be avoided) Systematic Bacteriology Morphology, cultivation, diseases caused

UNIT III

12 Hours

,laboratory diagnosis including specimen collection of the following bacteria (the classification, antigenic structure and pathogenicity are not to be taught) Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococci, C diphtheria, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, Esch coli, Klebsiella, Proteus, vibrio cholerae, Pseudomonas & Spirochetes Parasitology Morphology, life cycle, laboratory diagnosis of following parasites E. histolytica, Plasmodium, Tapeworms, Intestinal nematodes

UNIT IV

12 Hours

Mycology Morphology, diseases caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes, opportunistic fungi. Virology General properties of viruses, diseases caused, lab diagnosis and prevention of following viruses, Herpes, Hepatitis, HIV, Rabies and Poliomyelitis. Hospital infection Causative agents, transmission methods, investigation, prevention and control Hospital infection. Principles and practice Biomedical waste management.

Transactional modes

Video-based teaching, Collaborative teaching, Case based teaching, Question Answer.

REFERENCE BOOKS:

1. Ananthanarayana & Panikar Medical Microbiology- University Press
2. Robert Cruickshank- Medical Microbiology- The Practice of Medical Microbiology
3. Chatterjee- Parasitology- Interpretation to Clinical Medicine
4. Rippon- Medical Mycology
5. Emmons- Medical Mycology
6. Basic Laboratory methods in Parasitology, J P Bros, New Delhi
7. Basic Laboratory procedures in clinical bacteriology, J P Bros, New Delhi
8. Medical Parasitology- Ajit Damle
9. Introduction to medical microbiology- Ananthanarayana- Orient Longman Pvt. Ltd

Semester 4th**Course Title: Renal Dialysis Technology I****Course Code: BVD401**

L	T	P	Cr.
4	0	0	4

Total Hours: 60**Learning Outcomes:**

- 1 We will be able to identify the pathological processes related to renal disorders.
- 2 Will be able to demonstrate competency in handling patients with Renal disorders.
- 3 Will be able to express support in diagnosing and treatment of Kidney disease patients with care
4. Evaluate Respiratory Acidosis, Respiratory Alkalosis Disorders Of Sodium Disorders Of Potassium
5. Analyse Acid – Base, fluids and Electrolyte Disorders

Course Contents**Unit- I****15 Hours**

Basic Renal Disorders:

Glomerular Diseases– causes, types & pathology

Definition, etiology, pathophysiology of each type, medical and surgical management Post Infectious Glomerulonephritis Acute Renal Failure

Definition, etiology, pathophysiology of each type, medical and surgical management Chronic Renal Failure – Chronic Kidney Disease (CKD)

Definition, etiology, pathophysiology of each type, medical and surgical management

Unit- II

15 Hours

Acid – Base, fluids and Electrolyte Disorders:Metabolic Acidosis, Metabolic Alkalosis & Respiratory Acidosis, Respiratory Alkalosis Disorders Of Sodium Disorders Of Potassium Metabolism Disorders Of Calcium And Phosphorus Homeostasis Edema and The Clinical Use Of Diuretics

Unit- III

15 Hours

The Kidney in Systemic diseases : Renal function in Congestive heart failure Renal function in Liver diseases Renal involvement in Systemic vasculitis Renal manifestations in SLE and other Rheumatic disorders

Unit- IV

15 Hours

Diabetic Nephropathy: Epidemiology Pathogenesis Diagnosis Management Prevention

Renal Biopsy: Indications Contraindication Procedure Pre and Post biopsy Care

Transactional modes

Video-based teaching, Collaborative teaching, Case based teaching, Question Answer

Suggested Readings

1. *Basic Pathology - Robbins, 9th Edition, Saunders, 2012.*

2. *Primer on Kidney diseases - Greenberg, 5th Edition, Elsevier Health Sciences, 2009.*

1. *Textbook of Pathology – Harsh Mohan, 7th Edition, Jaypee Brothers Medical Publishers, 2014.*

2. *Kidney Diseases in Primary Care – K.Mandal and Stanley, 3rd Edition, Dorrance Publishing Co, 2008.*

3. *Davidson’s Principle and Practice of Medicine – Brain R Walker, 22nd Edition, Churchill Livingston, 2014.*

4. *ABC of Kidney Diseases – David Goldsmith, 22nd Edition, BMJ books, 2011.*

Course Title: Renal Dialysis Technology II

Course Code: BVD402

L	T	P	Cr.
4	0	0	4

Total Hours: 60

Learning Outcomes:

- 1 We will be able to identify the pathological processes related to renal disorders.
- 2 Will be able to demonstrate the competency in handling patients with Renal disorders.
- 3 Will be able to express support in diagnosing and treatment of Kidney disease patients with care
- 4 Evaluate Obstructive Renal Disorders
- 5 Analyse Drugs and The Kidney

Course Contents

Unit- I

15 Hours

The Kidney in Systemic disease :

- Amyloidosis
- Hyperoxaluria
- HemolyticUremic Syndrome / Thrombotic Thrombocytopenic Purpura
- Hereditary Renal disorders
- Kidney Disorders in Pregnancy

Unit- II

15 Hours

Obstructive Renal Disorders :

- Obstructive Uropathy
- VesicoUreteric Reflux and Reflux Nephropathy
- Nephrolithiasis

Unit- III

15 Hours

Infectious Diseases :

- Renal diseases associated with HIV infection
- Urinary Tract Infection (UTI)

Unit- IV

15 Hours

Drugs and The Kidney :

- Analgesics and The Kidney
- Principles of Drug therapy in Kidney failure

Renal Hypertension :

- Pathogenesis
- Essential HTN

- Renovascular HTN
- Therapy of HTN

Transactional modes

Video-based teaching, Collaborative teaching, Case based teaching, Question Answer

Suggested Readings:

1. *Basic Pathology - Robbins, 9th Edition, Saunders, 2012.*
2. *Primer on Kidney diseases - Greenberg, 5th Edition, Elsevier Health Sciences, 2009.*
1. *Textbook of Pathology – Harsh Mohan, 7th Edition, Jaypee Brothers Medical Publishers, 2014.*
2. *Kidney Diseases in Primary Care – K.Mandal and Stanley, 3rd Edition, Dorrance Publishing Co, 2008.*
3. *Davidson’s Principle and Practice of Medicine – Brain R Walker, 22nd Edition, Churchill Livingston, 2014.*
4. *ABC of Kidney Diseases – David Goldsmith, 22nd Edition, BMJ books, 2011*

Course Title: : Renal Dialysis Technology I(Practical)

Course Code: BVD403

L	T	P	Cr.
3	0	0	3

Total Hours: 45

Learning Outcomes:

- 1 Will be able to identify the pathological processes in relation to Renal sciences.
- 2 Will be able to demonstrate the competency in handling patients with Renal disorders.
- 3 Will be able to express support in diagnosing and treatment of Kidney disease patients with care
- 4 . Acute Renal Failure and Chronic Renal Failure – Chronic Kidney Disease (CKD)
5. Analyse Acid – Base, fluids and Electrolyte Disorders

List of Practical/Experiments

Specimens and Charts / Case Discussions :

1. Glomerular Diseases
2. Post Infectious Glomerulonephritis

3. Acute Renal Failure
4. Chronic Renal Failure – Chronic Kidney Disease (CKD)
5. Acid – Base, fluids and Electrolyte Disorders
6. Renal function in Congestive heart failure
7. Renal function in Liver diseases
8. Renal involvement in Systemic vasculitis
9. Renal manifestations in SLE and other Rheumatic disorders
10. Diabetic Nephropathy
11. Renal Biopsy

Urine Analysis :

1. Physical Examination
2. Chemical Examination
3. Microscopic Examination

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question Answer

Suggested Readings

Textbook of Pathology – Harsh Mohan, 7th Edition, Jaypee Brothers Medical Publishers, 2014.

2. Kidney Diseases in Primary Care – K.Mandal and Stanley, 3rd Edition, Dorrance Publishing Co, 2008.

3. Davidson’s Principle and Practice of Medicine – Brain R Walker, 22nd Edition, Churchill Livingstone, 2014.

4. ABC of Kidney Diseases – David Goldsmith, 22nd Edition, BMJ books, 2011

Course Title: : Renal Dialysis Technology II(Practical)

Course Code: BVD404

L	T	P	Cr.
3	0	0	3

Hours 45

Learning Outcomes: After Completion of this course, the learner will be able to:

1. Understand the principles of hemodialysis, including diffusion, convection, and ultrafiltration.
2. Describe the components and functioning of a hemodialysis machine.
3. Explain identify the pathological processes in relation to Renal sciences
4. Understand the different types of dialyzers and their characteristics.
5. express support in diagnosing and treatment of Kidney disease patients with care

List of Practical's/ Experiment

1 Charts / Spotters / Specimens :

1. Amyloidosis
2. Hyperoxaluria
3. HUS / TTP
4. Hereditary Renal disorders
5. Kidney disorders in Pregnancy
6. Obstructive Uropathy
7. VUR and Reflux Nephropathy
8. Nephrolithiasis
9. Renal diseases associated with HIV infection
10. Urinary Tract Infection (UTI)
11. Drugs and The Kidney
12. Renal Hypertension

**Course Title: ENVIRONMENTAL SCIENCE AND
COMMUNITY MEDICINE**

Course Code: BVD405

L	T	P	Cr.
3	0	0	3

Hours 45

Learning Outcomes: After Completion of this course, the learner will be able to:

1. Understand the principles of peritoneal dialysis, including osmosis, diffusion, and ultrafiltration.
2. Describe the different types of peritoneal dialysis (Continuous Ambulatory Peritoneal Dialysis (CAPD), Automated Peritoneal Dialysis (APD), Continuous Cycling Peritoneal Dialysis (CCPD)).
3. Explain the indications, contraindications, and complications of peritoneal dialysis.
4. Familiarity with peritoneal dialysis solutions, additives, and cyclers.
5. Understand the role of peritoneal dialysis in renal replacement therapy

Course Contents

Unit- I

11 Hours

Natural Resources: Introduction, Multi-disciplinary nature of environmental studies, Earth Resources and Man, Renewable And Non-Renewable Resources, Water Resources, Mineral Resources: Food Resources: Effects of modern agriculture, Fertilizer/ pesticide problems, Waterlogging, and salinity, Energy Resources. Ecosystems: Concept of an Ecosystem, Structure And Functions of an Ecosystem, Producers, Consumers and Decomposers, Cycles in The Ecosystem Pollution: Definition, Causes, Effects and Control Measures of Air Pollution, Water Pollution.

Unit- I

11 Hours

Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards, Solid Waste Management role of Individuals in Pollution Prevention. Social Issues Human, Population and Environment: From Unsustainable To Sustainable Development, Urban Problems Related To Energy, Water Conservation, Rain Water Harvesting, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust.

Unit- I

11 Hours

Concept of health & disease: Concept of health, Definition of health, Philosophy of health Dimension of health - Concept of well being, Spectrum of health, Responsibility of health -Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation –Natural history of disease – Iceberg phenomenon-concept of control- concept of prevention-Modes of Intervention, Changing pattern of disease.

Unit- I

12 Hours

Epidemiology: Definition & Explanation, Aims, Epidemiologic approach, Basic measurement in epidemiology & tools of measurement – of Mortality , Epidemiologic methods – Descriptive epidemiology – Analytical epidemiology -Cohort study – Experimental epidemiology – RCT Association & Causation Uses of epidemiology (Criteria for judging causality) – Infection disease epidemiology Definitions Dynamic of disease transmission & Mode of Transmission – Disinfection – Definitions Types Agents used Recommended disinfection procedures – Investigation of an epidemic.

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question Answer

Suggested Readings

**Course Title: BIOSSTATISTICS & RESEARCH
METHODOLOGY**

Course Code: BVD406

L	T	P	Cr.
2	0	0	4

Hours 60

Learning Outcomes: After Completion of this course, the learner will be able to:

1. Understand Importance of statistics in behavioural sciences.
2. Recognize Measures of central tendency
3. Diagnose and manage medical disorders using evidence-based guidelines.
4. Understand the Measures of variability – Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance
5. Research Meaning- Scope and Objectives –.Research Methods vs. Methodology. Types of research.

Course Contents

Unit- I

15 Hours

INTRODUCTION What is statistics – Importance of statistics in behavioral sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioral sciences. Measurements – Scales of measurements – Nominal, Ordinal, Interval and Ratio scales. Cumulative frequency curve – Drawing inference from graph. Measures of central tendency – Need – types: Mean, Median, Mode – Working out these measures with illustrations.

Unit- I

15 Hours

Measures of variability – Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation. Normal distribution – General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve. Variants from the normal distribution – skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.

UNIT III

15 Hours

RESEARCH METHODS:

Research Meaning- Scope and Objectives –.Research methods vs. Methodology. Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical, concept of applied and basic research process, criteria of good research. Defining and formulating the research problem, selecting the problem, necessity of defining the problem, importance of literature review in defining a problem, literature review-primary and secondary sources, reviews, monograph, patents,

research databases, web as a source, searching the web, critical literature review, identifying gap areas from literature and research database, development of working hypothesis

UNIT-IV

15 Hours

DATA COLLECTION AND SAMPLING:

Data collection – Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram. Accepts of method validation, observation and collection of data, methods of data collection, sampling methods, data processing and analysis strategies and tools, data analysis with statically package (Sigma STAT, SPSS for student t-test, ANOVA, etc.), hypothesis testing. Correlation – historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis. Tests of significance- need for – significance of the mean – sampling error – the significance of differences between means – interpretation of probability levels – small samples – large samples.

Transactional modes

Video-based teaching, Collaborative teaching, Case based teaching, Question Answer

Course Title: HEALTH CARE

Course Code: BVD407

L	T	P	Cr.
3	0	0	3

Total Hours: 45

Learning Outcomes:

1. Understand Importance of Health, Determinants of Health, Health Indicators of India.
2. Recognize Health Team, Concept, National Health Policy, National Health Programmes
3. Bandages and their application. Nursing Position, Bed making, prone, lateral, dorsal, dorsal re-cumbent, Fowler's positions.
4. Understand the Simple aseptic technique, sterilization and disinfection
5. Observation of stools, urine. Observation of sputum, Understand the use and care of catheters

Course Contents

UNIT-I

12 Hours

Introduction to Health

Definition of Health, Determinants of Health, Health Indicators of India, Health Team, Concept, National Health Policy, National Health Programmes (Briefly Objectives and scope), Population of India and Family welfare program in India, Introduction to Nursing, What is Nursing? Nursing principles, Inter-Personnel relationships, Bandaging: Basic, turns;

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UNIT-II

12 Hours

Bandaging

extremities; Triangular Bandages and their application. Nursing Position, Bed making, prone, lateral, dorsal, dorsal re-cumbent, Fowler's positions, comfort measures, Aids and rest and sleep. Lifting And Transporting Patients: Lifting patients up in the bed. Transferring from bed to wheel chair. Transferring from bed to stretcher. Bed Side Management: Giving and taking Bed pan

UNIT-III

11 Hours

Urinal : Observation of stools, urine. Observation of sputum, Understand the use and care of catheters, enema giving. Methods of Giving Nourishment: Feeding, Tube feeding, drips, transfusion, Care of Rubber Goods, Recording of body temperature, respiration and pulse,

UNIT-IV

10 Hours

Simple aseptic technique, sterilization and disinfection. Surgical Dressing: Observation of dressing procedures First Aid Syllabus as for Certificate Course of Red Cross Society of St. John's Ambulance Brigade. of reuse

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question Answer

Suggested Readings

- Chaurasia, B. D. (2004). *Human anatomy* (p. 53). CBS Publisher.
- Netter, F. H. (1990). *Atlas of Human Anatomy*/Frank H. Netter. East Hanover, New Jersey, 592.
- Agur, A. M., & Dalley, A. F. (2009). *Grant's atlas of anatomy*. Lippincott Williams & Wilkins.
- Ashalatha, P. R., & Deepa, G. (2012). *Textbook of Anatomy & Physiology for Nurses*. JP Medical Ltd.

Course Title: BASIC NUTRITION

Course Code: BVD408

L	T	P	Cr.
3	0	0	3

Total Hours: 60

Learning Outcomes:

1. Understand Importance of Nutritional anthropometric measurements
2. Recognize Diet during special needs- Pregnancy and lactation
3. management in underweight, Dietary management in obesity.
4. Understand Nutritional biochemical assessment
5. Observation of management in cardiovascular diseases

Course Contents

UNIT 1	12 Hours
- NUTRITIONAL ASSESSMENT	
<input type="checkbox"/> Nutritional anthropometric measurements	
<input type="checkbox"/> Nutritional biochemical assessment	
<input type="checkbox"/> Clinical signs & symptoms	
<input type="checkbox"/> Dietary assessment	
UNIT2	12 Hours
- NUTRITION THROUGH LIFE CYCLE	
<input type="checkbox"/> Diet during infancy	
<input type="checkbox"/> Diet during preschool	
<input type="checkbox"/> Diet during school	
<input type="checkbox"/> Diet during adolescence	
<input type="checkbox"/> Diet during adulthood	
<input type="checkbox"/> Diet during geriatrics	
<input type="checkbox"/> Diet during special needs- Pregnancy and lactation	
UNIT 3	11 Hours
- THERAPEUTIC NUTRITION 1	
<input type="checkbox"/> Dietary management in underweight,	
<input type="checkbox"/> Dietary management in obesity,	
<input type="checkbox"/> Dietary management in diabetes,	
<input type="checkbox"/> Dietary management in hypertension.	
UNIT 4	10 Hours
- THERAPEUTIC NUTRITION 2	
<input type="checkbox"/> Dietary management in cardiovascular diseases	
<input type="checkbox"/> Dietary management in renal diseases	
<input type="checkbox"/> Dietary management in cancer	

Transactional modes

Video-based teaching, Collaborative teaching, Case based teaching, Question Answer

Suggested Readings

- *Bushberg, J. T., & Boone, J. M. (2011).The essential physics of medical imaging. Lippincott Williams & Wilkins.*
- *Chesney DN, Chesney MO, Ball JL, Price TA. Chesneys’ radiographic imaging. Oxford: Blackwell Science; 1995.*
- *Curry TS. Christensen’s physics of Diagnostic Radiology. Media, Pa: Williams & Wilkins; 1990.*

Semester 5th

Course Title: Applied Anatomy & Physiology related to Dialysis Technology

Course Code: BVD501

L	T	P	Cr.
4	0	0	4

Total Hours: 60

Learning Outcomes:

1. Understand Importance of Basic Anatomy of Urinary System
2. Recognize Brief Anatomy of Peritoneum Including Concept of Abdominal Hernias
3. management Physiology Mechanism of Urine Formation.
4. Understand Nutritional biochemical assessment
5. Observation of Haemostasis - Coagulation Cascade, Coagulation Factors, AutoRegulation, Bt, Ct, Pt, Ptt, Thrombin Time Acid Base Balance.

Course Contents

UNIT-I

15 Hours

Anatomy

Basic Anatomy of Urinary System – Structural Anatomy of Kidney, Bladder, Ureter, Urethra, Prostate, Histology of Kidney, Blood Supply of Kidney, Development of Kidney In Brief Anatomy of Peritoneum Including Concept of Abdominal Hernias

UNIT-II

15 Hours

Anatomy of Vasculat System Upper Limb Vessels-Course, Distribution, Branches, Origin & Abnormalities, Neck Vessels - Course, Distribution, Branches, Origin & Abnormalities Femoral Vessels - Course, Distribution,

Branches, Origin & Abnormalities

UNIT-III

15 Hours

Physiology

Mechanism of Urine Formation, Glomerular Filtration Rate (gfr), Clearance Studies Physiological Values - Urea, Creatinine, Electrolytes, Calcium, Phosphorous, Uric Acid, Magnesium, Glucose Urinary Indices - Urea, Creatinine, Electrolytes, Calcium, Magnesium, Physiology of Renal Circulation, Factors Contributing & Modifying Renal Circulation, Autoregulation Hormones Produced by Kidney & Physiologic Alterations In Pregnancy

UNIT-IV

15 Hours

Haemostasis - Coagulation Cascade, Coagulation Factors, Auto Regulation, Bt, Ct, Pt, Ptt, Thrombin Time Acid Base Balance - Basic Principles & Common Abnormalities Like Hypokalemia, Hyponatremia, Hyperkalemia, Hyponatremia, Hypocalcemia, Hypercalcemia, Ph, Etc. Basic Nutrition In Renal Diseases

Transactional modes

Video based teaching, Collaborative teaching, Case based teaching, Question Answer

Suggested Readings

- *Bhargava, S. K. (2001). Text Book of Radiology for Residents and Technicians. CBS Publishers & Distributors.*
- *Singh, H. (2016). Textbook of Radiology Physics. JP Medical Ltd.*
- *Seeram, E. (2015). Computed Tomography-EBook: Physical Principles, Clinical Applications, and Quality Control. Elsevier Health Sciences.*
- *Bushong, S. C., & Facmp, S. F. (2020). Radiologic Science for Technologists EBook: Physics, Biology, and Protection. Mosby.*
- *Curry, T. S., Dowdey, J. E., & Murry, R. C. (1990). Christensen's physics of diagnostic radiology. Lippincott Williams & Wilkins.*

Course Title: Research Methodology and Biostatistics

Course Code: BVD-504

L	T	P	Cr.
3	1	0	4

Total Hours: 60

Learning Outcomes:

This course is focus on the research methodology & biostatistics after learning this course students are able to understand the introduction and measurement of statistics, variability, data, central tendency & central technique.

Course Content

UNIT-I

12 Hours

Introduction Meaning, definition, characteristics of statistics Importance of the study of statistics Branches of statistics Statistics and health science including nursing Parameters and estimates Descriptive and inferential statistics Variables and their types Measurement scales

UNIT-II

12 Hours

Tabulation of Data Raw data, the array, frequency distribution Basic principles of graphical representation Types of diagrams - histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, Normal probability curve

UNIT-III

12 Hours

Measure of Central Tendency Introduction: Uses, applications and practical approach Definition and calculation of mean - ungrouped and grouped data Meaning, interpretation and calculation of median ungrouped and grouped data Meaning and calculation of mode Comparison of the mean, and mode Guidelines for the use of various measures of central tendency

UNIT-IV

12 Hours

Measure of Variability Introduction: Uses, applications and practical approach The range, the average deviation or mean deviation The variance and standard deviation Calculation of variance and standard deviation for ungrouped and grouped data Properties and uses of variance and Standard deviation

UNIT-V

12 Hours

Sampling Techniques Introduction: Uses, applications and practical approach Criteria for good samples Application of sampling in Community Sampling methods, sampling and non-sampling errors Sampling variation and tests of significance

Course Title: Hospital Management and Medical Ethics

Course Code: BVD-505

L	T	P	Cr.
3	1	0	4

Total Hours: 60

Learning Outcomes:

This course is focus on the principles of medical ethics & hospital management after learning this course students are able to understand introduction to hospital staffing, legal & medical issues, handling of patients, department safety & infection control & anesthesia.

Course Content

UNIT-I

12 Hours

Introduction to hospital staffing- Hospital staffing, administration, PACS, HIS, RIS, DICOM. Medical records and documentation.

UNIT-II

12 Hours

Legal & medical issues- Legal and Ethical issues towards patient rights, patient responsibility, legal concerns, History taking, patient monitoring, inform consent, mal-practice, patient privacy issues. Professional ethics and Code of conduct of radiographer. Medical legal issues (MLC)

UNIT-III

12 Hours

Handling of patients Seriously ill and traumatized patients, visually impaired, hearing and speech impaired patients, mentally impaired patients/ psychologically issues, infectious patients, critical/trauma patients, pregnant patient, patient with implant. Handling of patient with life threading diseases like HIV, STD, HBsAG, etc.

UNIT-IV

12 Hours

Departmental Safety & Infection Control Safety and hazards from material and electricity etc. Biomedical waste management and control. Infection control Skin care, donning of gowns, gloves, face masks, head caps, shoe covers. Vitals signs- Vital signs. How to measure vital signs. Body mechanics and transferring & shifting of patient Draw sheet lift, use of slide boards, wheelchair to couch, couch to wheelchair, couch to table, three men lift and four men lift Orthodox & Austrian method etc. First aid- Artificial respiration, hemostasis, first aid techniques, ABCD management.

UNIT-V

12 Hours

Anesthesia- Local anesthesia and general anesthesia, uses in hospital, Facilities regarding general Anesthesia in different department of hospital. Management of adverse

Course Title: Hemodialysis II (Practical)

Course Code: BVD-511

L	T	P	Cr.
0	0	2	1

Learning Outcomes: After Completion of this course, the learner will be able to:

1. Understand the principles of hemodialysis, including diffusion, convection, and ultrafiltration.
2. Describe the components and functioning of a hemodialysis machine.
3. Explain the indications, contraindications, and complications of hemodialysis.
4. Understand the different types of dialyzers and their characteristics.
5. Familiarity with hemodialysis access options (AV fistula, graft, catheter).

List of Practical's/ Experiment

1. Setting up dialysis machine for dialysis
2. AVF/ AVG cannulation
3. Packing and sterilisation of dialysis trays
4. Preparation of concentrates
5. Initiation and maintenance of hemodialysis
6. Initiation and maintenance of CRRT
7. Priming of CRRT
8. Complication and troubleshooting of CRRT
9. Priming of dialysis apparatus
10. Troubleshooting in hemodialysis machine
11. Demonstrate priming of dialysis apparatus
12. Demonstrate reuse of dialyzers
13. Spotters- HD catheters, dialyzers, AV needle, tubings, dialysis machine, PD set, perm catheters, dialysis solutions, chemicals used in hemodialysis.

Course Title: Dialysis in Special Situations (Practical)

Course Code: BVD-512

L	T	P	Cr.
0	0	2	1

Learning Outcomes: After Completion of this course, the learner will be able to:

1. Understand unique considerations for pediatric dialysis patients.
2. Manage fluid and electrolyte imbalances in pediatric patients.
3. Develop individualized dialysis plans for pediatric patients.
4. Recognize and manage complications specific to pediatric dialysis.
5. Familiarity with pediatric dialysis access options.

List of Practical's/ Experiment

1. Starting / Termination of in special situation dialysis
2. AV cannulation in special situation
3. Initiating dialysis through central lines
4. Sterilization in HIV, HCV, HBsAg dialysis and universal precautions
5. Preparation of concentrate for dialysis purpose
6. Performing Hemoperfusion
7. Renal Transplantation patient, monitoring
8. Assisting minor procedures like central line insertions, renal biopsies
9. Performing isolated ultrafiltration 10. Priming and dialyser reuse

Course Title: Dialysis in Special Situations (Practical)

Course Code: BVD-513

L	T	P	Cr.
0	0	2	1

Learning Outcomes: After Completion of this course, the learner will be able to:

1. New dialysis membranes and materials (e.g., high-flux, biocompatible).
2. Advanced water treatment systems for dialysis.
3. Online hemodiafiltration (HDF) and its benefits.
4. Convective therapies (e.g., hemofiltration, hemodiafiltration).

5. New dialysis machines and their features (e.g., touchscreen, remote monitoring).

List of Practical's/ Experiment

1. Starting / Termination of MARS
2. AV cannulation in MARS, Home dialysis, Nocturnal dialysis
3. Initiating online dialysis through central lines
4. sterilization in home dialysis
5. Preparation of concentrates for dialysis purpose.
6. Assisting minor procedures like central line insertions, renal biopsies
7. Performing isolated ultrafiltration 8. Priming of MARS

Semester 6th

Course Title: Training/Internship report

L	T	P	Cr
0	0	0	20

Course Code: BVD-601

Learning Outcomes: After successful completion of this course, the students will be able to:

1. Prepare and maintain operation theatre as well as patients before surgery.
2. Maintain a sterile field and theatre equipment and follow infection control policies.
3. Manage hazardous waste and follow biomedical waste disposal protocols.
4. Demonstrate skills and knowledge to assist anesthetist in handling emergencies.

Course Contents

Students have to carry out a training report (on any topic related to dialysis) under the supervision of a faculty. The training report has to be prepared on the basis of the training work carried out. The assessment is done on the basis of the work done and the presentation and viva.