



**JSS Academy of Higher Education & Research**

( Deemed to be University )

Re-Accredited "A+" Grade by NAAC

Sri Shivarathreeswara Nagara Mysuru - 570015, Karnataka

Faculty of Biomedical Science

# Regulation & Syllabus

B.Sc. RENAL DIALYSIS TECHNOLOGY  
2023

**BSc**



# REGULATIONS AND CURRICULUM

## B.Sc. Renal Dialysis Technology

2023



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Sri Shivarathreeshwara Nagara, Mysuru - 570015, Karnataka



**REGULATIONS**  
**B.Sc. Renal Dialysis Technology**

**1. Courses offered in Allied Health Sciences:**

- a. Bachelor of Science in Medical Laboratory Technology [B.Sc. (MLT)]
- b. Bachelor of Science in Anesthesia & Operation Theatre Technology [B.Sc.(AOTT)]
- c. Bachelor of Science in Renal Dialysis Technology [B.Sc. (RDT)]
- d. Bachelor of Science in Respiratory Care Technology [B.Sc. (RCT)]
- e. Bachelor of Science in Medical Imaging Technology [B.Sc. (MIT)]
- f. Bachelor of Science in Cardiac Care Technology [B.Sc. (CCT)]
- g. Bachelor of Science in Perfusion Technology [B.Sc. (PT)]
- h. Bachelor of Science in Emergency Medicine Technology [B.Sc. (EMT)]
- i. Bachelor of Science in Physician Assistant in CTVS [B.Sc. (PA)]
- j. Bachelor of Science in Optometry [B.Sc. (optometry)]
- k. Bachelor of Science in Forensic Science [B.Sc. (FS)]
- l. Bachelor of Science (Honors) in Genetics & Genomics [B.Sc. (G & G)]
- m. Bachelors of Occupational therapy (BOT)

**1. Eligibility for admission**

A candidate seeking admission to the Bachelor of Science Degree in Allied Health Sciences [a) to m) above], shall have studied English as one of the principal subjects and shall have passed (except for B.Sc. Imaging Technology):

- a) Two year Pre-University examination or equivalent as recognized by JSS AHER, Mysore (JSSAHER) with Physics, Chemistry and Biology as principal subjects of study.  
OR
- b) Pre-degree course from a recognized University considered as equivalent by JSSAHER, (two years after ten years of schooling) with Physics, Chemistry and Biology as principal subjects of study.  
OR
- c) Any equivalent examination recognized by the JSSAHER for the above purpose, with Physics, Chemistry and Biology as principal subjects of study.  
OR
- d) Vocational higher secondary education course conducted by Vocational Higher Secondary Education, Government of Kerala with five subjects including Physics, Chemistry, Biology and English in addition to vocational subjects conducted, considered equivalent to 'plus - two' [10+2] examinations of Government of Karnataka Pre University Course.  
OR
- e) Two years diploma from a recognized Government Board in a subject for which the candidate desires to enroll in the respective Allied Health Sciences course and shall have passed 'plus two' [10+2] with Physics, Chemistry and Biology, as principal subject  
OR
- f) Three years diploma from a recognized Government Board in a subject for which the candidate desires to enroll in the respective Allied Health Sciences course, with Physics, Chemistry and Biology as principal subjects during the tenure of the course.  
OR
- g) Senior secondary course with Physics, Chemistry and Biology as principal subject of study equivalent to class XII, of open school education system of the central government and state

government approved institutions.

- h) In case of B.Sc. Imaging Technology the candidate shall have passed Pre- University or equivalent examination with Physics, Chemistry, Biology and Mathematics, as principal subjects of study.

## **2. Duration of the course**

Duration shall be for a period of Six semesters (three years) followed by 12 months (one year) of internship.

## **3. Medium of instruction**

The medium of instruction and examination shall be in English.

## **4. Attendance**

Candidates should have attended at least 75% of the total number of classes conducted in an academic year, from the date of commencement of the term to the last working day, as notified by the University, in each of the subjects prescribed for that year (theory and practical's/ clinicals separately) to be eligible to appear for the University examinations. Candidates lacking prescribed percentage of attendance in any subject shall not be eligible to appear for the University examination in that subject in that semester. However, students will have to put up 75% attendance in the additional classes conducted by the department to appear for supplementary examination.

## **5. Internal assessment (IA)**

There shall be a minimum of two Internal assessment examinations in theory and practical of each core subject spread over evenly in each semester. The average marks of the two IA examinations shall be submitted to the University at least 15 days before the commencement of the University examination. The University shall have access to the records of IA examinations. Candidates have to secure 40% marks in the **IA theory and practical separately** in each subject to become eligible to appear for the University examination. The marks of the IA examinations must be displayed on the notice board of the respective departments within a fortnight from the date of IA examination. If a candidate is absent for any of the IA examinations due to genuine and satisfactory reasons, such a candidate may be given a re-examination, within a fortnight.

## **6. Subject and hours of in for theory and practical's**

The number of hours of teaching theory and practical, course wise in each semester are shown in table I, II, III, IV, V and VI.

There are three compulsory core subjects in each semester. Language, Allied and Skill enhancement subjects are mandatory for all courses. Candidates shall select one elective subject each in fifth and sixth semester from the list mentioned in the table VII.

**Table I: Distribution of teaching hours in first year subjects.**

Category	Subjects	Theory hours	Credits	Tutorials hours	Credits	Practical hours	Credits	Total hours	Total credits
Core - 1	Anatomy	45	3	15	1	30	1	90	5
Core - 2	Physiology	45	3	15	1	30	1	90	5
Core - 3	Basic Biochemistry	45	3	15	1	30	1	90	5
Ability Enhancement -1	English	30	2	-	-	-	-	30	2
Ability Enhancement - 2	Kannada	30	2	-	-	-	-	30	2
Value added course 1	Yoga	15	1	-	-	15	-	30	1
<b>Total Credits</b>	<b>20</b>								

**Table II: Distribution of teaching hours in Second Semester subjects**

Category	Subjects	Theory hours	Credits	Tutorials hours	Credits	Practical hours	Credits	Total hours	Total credits
Core - 4	Pathology including applied aspects	45	3	15	1	30	1	90	5
Core - 5	Microbiology including applied aspects	45	3	15	1	30	1	90	5
Core - 6	Pharmacology	45	3	15	1	30	1	90	5
Value added course 2	Health care	30	2	-	-	-	-	30	2
Allied - 1	Psychology	30	2	-	-	-	-	30	2
Skill Enhancement-1	Soft skills	15	1	-	-	-	-	15	1
<b>Total Credits</b>	<b>20</b>								

**Table III: Distribution of teaching hours in Third Semester subjects**

Category	Subjects	Theory hours	Credits	Tutorials hours	Credits	Modality Posting + Practicals	Credits	Total hours	Total Credits
Core - 7	Introduction to RDT	45	3	15	1	90	3	150	7
Core - 8	Patient care and basic nursing	45	3	15	1	90	3	150	7
Core - 9	Introduction to Nephrology	45	3	15	1	90	3	150	7
Skill Enhancement-2	Computer application	30	2	-	-	-	-	30	2
Value added course-3	Environment Science and Health	30	2	-	-	-	-	30	2
<b>Total Credits</b>	<b>25</b>								

**Table IV: Distribution of teaching hours in Fourth Semester subjects**

Category	Subjects	Theory hours	Credits	Tutorials hours	Credits	Modality Posting + Practicals	Credits	Total hours	Total Credits
Core - 10	Introduction to Clinical Nephrology	45	3	15	1	90	3	150	7
Core - 11	Introduction to Clinical Nephrology - II	45	3	15	1	90	3	150	7
Core - 12	Acute and Chronic Kidney Diseases and Nutrition	45	3	15	1	90	3	150	7
Skill Enhancement-3	Biostatistics and Research methodology	30	2	-	-	-	-	30	2
Value added course -4	Constitution of India	30	2	-	-	-	-	30	2
Total Credits	25								

**Table V: Distribution of teaching hours in Fifth Semester subjects**

Category	Subjects	Theory hours	Credits	Tutorials hours	Credits	Modality Posting + Practicals	Credits	Total hours	Total Credits
Core - 13	Hemodialysis Part I	45	3	15	1	90	3	150	7
Core - 14	Hemodialysis Part II	45	3	15	1	90	3	150	7
Core - 15	Hemodialysis Part III	45	3	15	1	90	3	150	7
Elective 1		30	2	-	-	-	-	30	2
Allied - 2	Medical Ethics	30	2	-	-	-	-	30	2
Total Credits	25								

**Table VI: Distribution of teaching hours in Sixth Semester subjects**

Category	Subjects	Theory hours	Credits	Tutorials hours	Credits	Modality Posting + Practicals	Credits	Total hours	Total Credits
Core - 16	Peritoneal Dialysis	45	3	15	1	90	3	150	7
Core - 17	Dialysis in Special situations	45	3	15	1	90	3	150	7

Core - 18	Recent advances in Dialysis technology	45	3	15	1	90	3	150	7
Elective-2		30	2	-	-	-	-	30	2
Allied-3	Hospital Management	30	2	-	-	-	-	30	2
Total Credits	25								

**Table VII: Elective Subjects**

Elective Subjects	Offering Departments
<b>Fifth Semester</b>	
Immunotechniques in diagnosis of diseases	Pathology and Microbiology
Dental Radiography	Radio diagnosis
Pulmonary Function Testing	Pulmonary Medicine
Telemedicine	Dermatology (Dr Kantharaj)
Hands on training in Continuous ambulatory peritoneal dialysis	Nephrology
Echocardiography (Cardiology)	Cardiology
Echocardiography (CTVS)	Cardio Thoracic Vascular Surgery
Difficult airway intubation	Anesthesiology
Accident Investigation	Forensic Medicine
Forensic Psychology	Forensic Medicine
<b>Sixth Semester</b>	
Molecular Techniques	Biochemistry
Digital Subtraction Angiography	Radio diagnosis
Polysomnography	Pulmonary Medicine
Practice Management	Health system management studies
Renal Transplant	Nephrology
Coronary angiography	Cardiology
Intra Aortic Balloon pump	Cardio Thoracic Vascular Surgery
Ventilator management	Anesthesiology
DNA Typing	Forensic Medicine
Introduction to biometry	Forensic Medicine

### Extension Activity

The following extension activities shall be provided for the ability enhancement of the candidates, to provide better health care services. The certificate shall be provided by the offering departments. The Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS) shall be as per the American Heart Association guidelines and certification.

Extension Activity	Courses	Semester	Offering departments
Phlebotomy	All courses	III	Anaesthesiology
Basic life support *(compulsory on payment basis)	All courses	IV	Emergency medicine

Small Project/data Analysis/Industrial visit	All courses	V	Concerned departments of the Course
Advanced cardiac life support *(Compulsory on payment basis for Said Courses)	Respiratory Care Technology, Emergence Medicine Technology, Anaesthesia and OT Technology, Cardiac Care Technology	VI	Emergency medicine

## 7. End Semester Examination

- University examinations (UE): The University shall conduct examination for the core subjects at the end of each semester. The candidates, who satisfy the requirement of attendance and internal assessment, shall be eligible to appear for the University examination. The head of the institution shall verify the same before forwarding the applications to the University within stipulated time along with the prescribed fee.
- Non-University Examinations (NUE): Examination for Languages, Allied subjects, Skill enhancement, value added courses and Elective subjects shall be conducted by the college and the marks obtained shall be submitted to the University along with the IA marks of the core subjects at least 15 days before the commencement of the University examination. The marks of non-core subjects shall be incorporated in the marks card issued by the University.
- The candidate must have passed all the previous subjects (Core/Language/Skill enhancement/Value based/Allied/Elective) from first to fifth semester to appear for the sixth semester University examination.

## 8. Scheme of Examination:

Distribution of subjects and marks for each semester theory and practical examinations are shown in the Table - VIII, IX, X, XI, XII and XIII.

**Table VIII: Distribution of Subjects and marks for First Semester theory and practical examination**

Category	Subjects	Theory				Practical			
		IA	UE	NUE	Total	IA	UE	NUE	Total
Core - 1	Anatomy	40	60	-	100	15	35	-	50
Core - 2	Physiology	40	60	-	100	15	35	-	50
Core - 3	Basic Biochemistry	40	60	-	100	15	35	-	50
Ability Enhancement -1	English		-	50	50	-	-	-	-
Ability Enhancement - 2	Kannada	-	-	50	50	-	-	-	-
Value added course 1	Yoga	-	-	50	50	-	-	-	-

**Table IX: Distribution of Subjects and marks for Second Semester theory and practical examination**

Category	Subjects	Theory				Practical			
		IA	UE	NUE	Total	IA	UE	NUE	Total
Core - 4	Pathology including applied aspects	40	60	-	100	15	35	-	50
Core - 5	Microbiology including applied aspects	40	60	-	100	15	35	-	50
Core - 6	Pharmacology	40	60	-	100	15	35	-	50
Value added course 2	Health care	-	-	50	50	-	-	-	-
Allied - 1	Psychology	-	-	50	50	-	-	-	-
Skill Enhancement-1	Soft skills			50	50				

**Table X: Distribution of Subjects and marks for Third Semester theory and practical examination**

Category	Subjects	Theory				Practical			
		IA	UE	NUE	Total	IA	UE	NUE	Total
Core - 7	Introduction to RDT	40	60	-	100	15	35	-	50
Core - 8	Patient care and basic nursing	40	60	-	100	15	35	-	50
Core - 9	Introduction to Nephrology	40	60	-	100	15	35	-	50
Skill Enhance ment-2	Computer application	-	-	50	50	-	-	-	-
Value added course-3	Environment Science and Health	-	-	50	50	-	-	-	-

**Table XI: Distribution of Subjects and marks for Fourth Semester theory and practical examination**

Category	Subjects	Theory				Practical			
		IA	UE	NUE	Total	IA	UE	NUE	Total
Core - 10	Introduction to Clinical Nephrology	40	60	-	100	15	35	-	50
Core - 11	Introduction to Clinical Nephrology - II	40	60	-	100	15	35	-	50
Core - 12	Acute and Chronic Kidney Diseases and Nutrition	40	60	-	100	15	35	-	50
Skill Enhancement-3	Biostatistics and Research methodology	-	-	50	50	-	-	-	-
Value added course -4	Constitution of India	-	-	50	50	-	-	-	-

**Table XII: Distribution of Subjects and marks for Fifth Semester theory and practical examination**

Category	Subjects	Theory				Practical			
		IA	UE	NUE	Total	IA	UE	NUE	Total
Core - 13	Hemodialysis Part I	40	60	-	100	15	35	-	50
Core - 14	Hemodialysis Part II	40	60	-	100	15	35	-	50
Core - 15	Hemodialysis Part III	40	60	-	100	15	35	-	50
Elective 1		-	-	50	50	-	-	-	-
Allied-5	Medical Ethics	-	-	50	50	-	-	-	-

**Table XIII: Distribution of Subjects and marks for Sixth Semester theory and practical examination**

Category	Subjects	Theory				Practical			
		IA	UE	NUE	Total	IA	UE	NUE	Total
Core - 16	Peritoneal Dialysis	40	60	-	100	15	35	-	50
Core - 17	Dialysis in Special situations	40	60	-	100	15	35	-	50
Core - 18	Recent advances in Dialysis technology	40	60	-	100	15	35	-	50
Elective 2		-	-	50	50	-	-	-	-
Allied-6	Hospital Management	-	-	50	50	-	-	-	-

Question paper pattern for end semester University theory examinations(60 marks): Duration-2hours

- I. Short Essay: 04 questions out of 06 = 04x05=20
  - II. Short Answer: 10 questions = 10x03=30
  - III. Very Short Answer: 05 questions = 05x02=10
- Total = 60 Marks

**Question paper pattern for end semester Non-University theory examinations(50 marks)**

MCQs 50 marks/Written theory assessment for 50 marks/Theory & practical assessment for 50 marks

## 9. Examiners

- Appointment of Examiners

Examiners shall be appointed by the University to conduct the end semester University examinations, from the panel of examiners approved by the Board of Studies. For Practical examinations, there shall be two internal/One Internal & one External examiners. Theory paper shall be valued by both the examiners.

- Qualification and Experience of Examiners

For question paper setting and external examiner: Post graduation in the respective field with five years of teaching experience.

For Internal examiners: Post graduation in the respective field with three years of teaching experience.

## 10. Criteria for pass

Core Subjects: Candidates are declared to have passed in a subject, if they secure 40% of marks in university examination and internal assessment added together. Theory & practical shall be considered as separate subjects. If a candidate passes in practical examination but fails in theory

paper, such candidate is exempted from reappearing for practical but shall have to appear in the subsequent examination for the theory paper in which the candidate has failed or vice versa. The minimum prescribed marks to pass in Language papers, allied papers, skill enhancement value based papers and elective papers shall be 35% of the maximum marks prescribed for a subject.

## 11. Grading of performances

### a. Letter grades and grade points allocations

Based on the performances, each student shall be awarded a final letter grade at the end of the semester for each course. The letter grades and their corresponding grade points are given in Table - XIV.

**Table - XIV: Letter grades and grade points equivalent to percentage of marks and performances**

Percentage of Marks obtained	Letter Grade	Grade Point	Performance
90.00 - 100	O	10	Outstanding
80.00 - 89.99	A	9	Excellent
70.00 - 79.99	B	8	Good
60.00 - 69.99	C	7	Fair
50.00 - 59.99	D	6	Satisfactory
40.00 - 49.99	E	5	Average
Less than 40	F	0	Fail
Absent	AB	0	Fail

A candidate who remains absent for any end semester examination shall be assigned a letter grade of AB and a corresponding grade point of zero. He/she should reappear for the said evaluation/examination in due course.

### b. The Semester Grade Point Average (SGPA)

The performance of a student in a semester is indicated by a number called 'Semester Grade Point Average' (SGPA). The SGPA is the weighted average of the grade points obtained in all the courses by the student during the semester. For example, if a student takes five courses (Theory/Practical) in a semester with credits C<sub>1</sub>, C<sub>2</sub>, C<sub>3</sub>, C<sub>4</sub> and C<sub>5</sub> and the student's grade points in these courses are G<sub>1</sub>, G<sub>2</sub>, G<sub>3</sub>, G<sub>4</sub> and G<sub>5</sub>, respectively, and then students' SGPA is equal to:

$$\text{SGPA} = \frac{C_1G_1 + C_2G_2 + C_3G_3 + C_4G_4 + C_5G_5}{C_1 + C_2 + C_3 + C_4 + C_5}$$

The SGPA is calculated to two decimal points. It should be noted that, the SGPA for any semester shall take into consideration the F and ABS grade awarded in that semester. For example, if a learner has a F or ABS grade in course 4, the SGPA shall then be computed as:

$$\text{SGPA} = \frac{C_1G_1 + C_2G_2 + C_3G_3 + C_4 \text{ ZERO} + C_5G_5}{C_1 + C_2 + C_3 + C_4 + C_5}$$

### c. Cumulative Grade Point Average (CGPA)

The CGPA is calculated with the SGPA of all the VI semesters to two decimal points and is indicated in final grade report card/final transcript showing the grades of all VI semesters and their courses. The CGPA shall reflect the failed status in case of F grade(s), till the course(s) is/

are passed. When the course(s) is/are passed by obtaining a pass grade on subsequent examination(s) the CGPA shall only reflect the new grade and not the fail grades earned earlier. The CGPA is calculated as:

$$\text{CGPA} = \frac{C_1S_1 + C_2S_2 + C_3S_3 + C_4S_4 + C_5S_5 + C_6S_6}{C_1 + C_2 + C_3 + C_4 + C_5 + C_6}$$

where  $C_1, C_2, C_3, \dots$  is the total number of credits for semester I, II, III, .... and  $S_1, S_2, S_3, \dots$  is the SGPA of semester I, II, III, ....

## 12. Declaration of class

The class shall be awarded on the basis of CGPA as follows:

First Class with Distinction	= CGPA of 7.50 and above
First Class	= CGPA of 6.00 to 7.49
Second Class	= CGPA of 5.00 to 5.99
Pass Class	= CGPA of 4.00 to 4.99

## 13. Carry over

A candidate who fails in core/language/skill enhancement/value based/allied/elective subjects of first semester to Fifth semester shall be permitted to carryover those subjects upto fifth semester. However, the candidate must have passed all the previous subjects (core/language/skill enhancement/value based/ allied/elective) to appear for the sixth semester University examination.

## 14. Internship

Twelve months (one year) internship shall be mandatory after successful completion of sixth semester examination. The 'Internship Completion Certificate' shall be issued by the college and copy of same is submitted to the University.

## 15. Award of Ranks/Medals

Ranks and Medals shall be awarded on the basis of final CGPA. However, candidates who fail in one or more subject during the course shall not be eligible for award of ranks.

## 16. Award of degree

A candidate who has passed in all the subjects (core/language/allied/skill enhancement/value based/elective papers) of all the semesters and has successfully completed the internship shall be eligible for award of degree.

## 17. Revaluation and Re-totaling of answer papers

There is no provision for revaluation of the answer papers in any examination. However, the candidates can apply for re-totaling by paying prescribed fee.

## 18. Maximum duration for completion of course

A candidate shall complete the course within six years from date of admission, failing which candidate shall re-register for the course.

## **B.Sc. Renal Dialysis Technology**

### **Program outcomes**

#### **At the end the program the Renal Dialysis technology student should be able to**

PO1: Demonstrate comprehensive knowledge and skills in basic sciences for dialysis technique

PO2: Demonstrate the comprehensive knowledge about the common renal diseases, its manifestation and relevant investigations.

PO3: Demonstrate the comprehensive knowledge and skills related to various forms of renal replacement therapies including dialysis

PO4: Demonstrate the comprehensive knowledge and skills related to various forms of dialysis, CRRT, Plasmapheresis, Hemoperfusion etc.

PO5: Demonstrate the comprehensive knowledge and skills related to hemodialysis equipment and alternate dialysis procedures including handling, maintenance, dialysis unit policies, infection control and quality control standards

PO6: Demonstrate the capability to assess the patients' conditions and recognition of complications.

PO7: Communicate effectively with patients, peers, and doctors and responding effectively to the needs of the patients undergoing dialysis treatment.

PO8: Ability to develop a strong ethical basis in dealing with human life.

PO9: Ability to evaluate the patient with proper history and documenting the same.

PO10: Analyze and evaluate a problem in a multidisciplinary team approach.

PO11: Life-long learner in equipping with higher technical skills and competencies.

**I Semester  
Core-1 Anatomy**

**Course Outcome:**

At the end of the course, students should know

CO1: Demonstrate the acquisition of comprehensive knowledge of basic tissues of the body.

CO2: Demonstrate the acquisition of comprehensive knowledge of gross anatomy of muscles, joints and organ system of human body

CO3: Demonstrate the acquisition of analysing the applied aspects concerned to human body.

CO4: Demonstrate the skill of identification of viscera of organ systems of human body

CO5: Demonstrate the skill of identification of microscopic structure of basic tissues and organs and correlate with their functions

CO6: Demonstrate the acquisition of comprehensive knowledge regarding the general embryology with congenital anomalies

**Theory:**

**Unit I**

**03hrs**

Organization of the human body

Introduction to the human body

Definition and subdivisions of anatomy

Anatomical position and terminology

**Cell** – Definition of a cell, shapes and sizes of cells

Parts of a cell – cell membrane, cytoplasm, cell organelles

**Cell division** – definition and main events in different stages of mitosis and meiosis

Tissues – Tissues of the body

Characteristics, functions and locations of different types of tissues

Epithelial tissue – definition, classification with examples

Glands – classification with examples

Connective tissue and Nervous tissue

**Unit II**

**Locomotion and Support**

**06hrs**

**Locomotion and support**

Cartilage – structure, types with examples

**Skeletal system**

Classification, structure, functions and ossification

Name, location and features of bones of the body.

**Joints** – Definition, types of joints with examples

Name, location, type, bones forming, movements possible in the synovial joints of the body.

**Muscular system**

Muscular tissue – skeletal muscle - gross anatomy and histology

Cardiac and smooth muscle – histology

Muscles of upper limb, lower limb, thorax, abdomen and head and neck

**Unit III**

**Maintenance of the Human Body**

**12hrs**

**Cardio-vascular system**

Types and structure of blood vessels, capillaries

Heart – location, coverings, external and internal features of heart

### **Blood supply of heart**

Systemic arteries and veins – major arteries and veins of the body

### **Lymphatic system**

Lymphoid organs – structure and functions

### **Respiratory system**

Organs of respiration, location, features of nasal cavity, pharynx, larynx, trachea, bronchi, lungs and pleura

### **Digestive system**

Organs of digestive system, location, features of oral cavity, Tongue, pharynx, oesophagus, stomach, intestine and accessory organs of digestion – salivary glands, liver and pancreas.

## **Unit IV**

### **Excretory system and reproductive system**

**12hrs**

Organs of urinary system, location and features of kidneys, ureter, urinary bladder and urethra  
Male and female reproductive organs. Location, features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory ducts, prostate gland, penis and spermatic cord  
Location and features of uterus, its supports, uterine tube, ovary and mammary gland

**Embryology I - IV week** – gametogenesis, structure of sperm, growth of the ovarian follicles, events of 1st, 2nd and 3rd weeks of development, folding of embryo, derivatives of germ layers, placenta

## **Unit V**

### **Control Systems of the Body**

**12hrs**

#### **Nervous system**

Introduction, coverings and blood supply of brain and spinal cord  
Spinal cord – location, external features and internal structure of spinal cord  
Brain – subdivisions, location, external features and internal structure of medulla oblongata, pons and midbrain, cerebellum and cerebrum.  
Thalamus and hypothalamus  
Basal ganglia  
Ventricles – location, formation and circulation of CSF  
Cranial nerves

#### **Sense organs**

Location and features of olfaction, eye, ear and skin

#### **Endocrine system**

Name of the endocrine glands, location and features, histology of pituitary gland, thyroid gland, parathyroid, suprarenal gland, pancreas, testis and ovary. Hormones secreted by each gland.

### **Practical**

1. Demonstration of parts of microscope and its uses
2. Demonstration of skeleton and joint
3. Demonstration of deltoid and gluteus maximus, Cubital fossa
4. Demonstration of heart and its blood supply, demonstration of major arteries of upper limb and lower limb, histology of cardiac muscle and histology of vessels

5. Demonstration of location and parts of lungs, histology of trachea and lungs
6. Demonstration of location of stomach, small and large intestines. Location and features of pancreas, liver and gall bladder
7. Demonstration of location and features of kidney, ureter, urinary bladder and urethra. Histology of urinary system except urethra
8. Demonstration of location of male and female reproductive organs
9. Demonstration of brain and spinal cord
10. Histology of cornea and retina

#### **Practical Examination Pattern**

**35 Marks**

1. Gross Anatomy- Discussion of any one specimen
2. Discussion of specimens of Cardiovascular system, Respiratory System, Gastrointestinal system, Urinary system, Reproductive system
3. Spotters - Cardiovascular system, Respiratory System, Gastrointestinal system, Urinary system, Reproductive system
4. Histology discussion of any one demonstrated slide

#### **Recommended Books Recent Editions:**

1. Ross and Wilson: Anatomy and Physiology in Health and illness
2. Understanding Human Anatomy and Physiology, William Davis (p) MC Graw Hill
3. Essentials of Human Embryology. Bhatnagar, Orient Blackswan Pvt. Ltd.
4. Anatomy for B.Sc Nursing by Renu Chauhan. Arichal publishing company 2012
5. Hand book of Anatomy BD Chaurasia
6. Basics in Human Anatomy for B.Sc. Paramedical Courses 1<sup>st</sup> edition 2008 Jaypee Publishers

#### **Reference books:**

1. B D Chaurasia: Regional Anatomy. Vol I, II, III 6<sup>th</sup> edition

**I Semester  
Core- 2 Physiology**

**Course Outcome**

**At the end of the course, students should know**

CO1: Demonstrate the acquisition of comprehensive knowledge in the basic physiological concepts of general physiology.

CO2: Demonstrate the acquisition of comprehensive knowledge of circulation in human body.

CO3. Demonstrate the acquisition of comprehensive knowledge of all organ system of the body

CO4. Perform and analyse the investigation of blood.

**Contents**

**Theory Unit -I**

**General physiology and Blood**

**General Physiology**

**(2 Hrs)**

- Homeostasis with body fluid compartments
- Cell membrane, types of transport across cell membrane
- Membrane potential-RMP & AP

**Blood**

**(7 Hrs)**

- Composition and function of blood: Haemopoiesis
- Haemoglobin : types & functions: RBC structure & function ,destruction. Anaemia & Jaundice
- WBC: types & functions. Immunity: definition & classification
- Platelets: structure & function. Haemostasis :steps in brief ,anticoagulant eg
- Blood groups: types, incompatibility, blood transfusion.
- Lymph: composition and functions

**Unit -II**

**Digestive system & Respiratory system**

**Digestive System**

**(3Hrs)**

- Organization and functions of digestive system
- Saliva: composition & functions
- Mastication and deglutition
- Functions of stomach
- Gastric juice: composition & functions
- Types of gastric motility
- Liver: functions, bile juices: composition & function, functions of gall bladder
- Pancreatic juice: composition & functions
- Small intestine: succus entericus, types of motilities
- Large intestine: functions

**Respiratory system**

**(4 Hrs)**

- Functions of respiratory system. Mechanism of breathing {inspiration and expiration}
- Surfactant: composition and function. Lung volumes and capacities
- Pulmonary ventilation, alveolar ventilation, dead space
- Transport of oxygen and carbon di oxide {only difference}
- Hypoxia: definition, types, dyspnea, apnea, hyperventilation

### **Unit -III**

#### **Cardiovascular and Endocrine system**

##### **Cardiovascular system**

**(4Hrs)**

- List the properties of cardiac muscle
- Origin spread of cardiac impulse
- ECG: Definition, normal ECG, diagram in lead II
- Cardiac cycle: definition, normal duration, phases
- Heart sounds types, normal characteristics
- Blood pressure: Definition, components, normal values, factors affecting it

Name different regional circulation, effect of exercise on CVS (brief)

##### **Endocrine System**

**(7 Hrs)**

Name the different endocrine glands, hormones secreted by them

HORMONE: Structure, Function, name the disorders involved with that hormone{hypo and hyper secretion}

### **Unit -IV**

#### **Excretory system and Reproductive system**

##### **Excretory System**

**(4Hrs)**

- Types of nephrons and its differences, JG Apparatus
- GFR: definition , normal values , factors affecting
- Tubular functions: absorption and secretion in different segment
- Micturition process
- Skin and body temperature

##### **Reproductive system**

**(3Hrs)**

- Puberty in male and female
- Spermatogenesis, semen composition& analysis
- Functions of Testosterone
- Functions of Estrogen
- Functions of Progesterone.
- Menstrual cycle: uterine and ovarian cycle (brief only)
- Contraception both in men and women: types

### **Unit -V**

#### **Muscle nerve physiology, Nervous system and Special senses**

##### **Muscle nerve physiology**

**(2Hrs)**

- Classification of neurons and nerve fiber. List of properties of nerve fibers

##### **Neuroglia: types**

- Types of muscle, steps of neuromuscular transmission ,E-C coupling ,muscle contraction

##### **Nervous system**

**(5Hrs)**

- Synapse: types, list properties, list functions
- Receptor: structure, type, sensation carried by it , list the properties
- Reflex: reflex arc, classification, functions
- Ascending tract: list them and its function

- Descending tract: list them and its function
- Cerebral cortex: different lobes and its functions
- functions of basal ganglia, thalamus, hypothalamus
- functions of cerebellum
- CSF: composition and function

### **Special senses**

**(4Hrs)**

- Olfaction: tract, types of smell, odorant, receptor, name the applied aspect
- Gustation: pathway, types of tastes, taste buds, name the applied aspect
- Vision: rods, cones, differences, dark & light adaptation, visual pathway & name the applied aspect, errors of refraction & its correction, colour blindness, cataract
- Audition: functions of external ear, middle ear & inner ear, content of middle ear & inner ear, Organ of Corti, hearing pathway, name the applied aspect

### **Practicals**

**(30 Hrs)**

1. Haemoglobinometry.
2. Haemocytometry
3. Total leucocyte count.
4. Total Red blood cell count.
5. Determination of blood groups.
6. Differential WBC count.
7. Determination of clotting time, bleeding time.
8. Erythrocyte sedimentation rate (ESR). Determination of packed cell Volume, Calculation of Blood indices: CI, MCH, MCV, MCHC.
9. Blood pressure recording.
10. Spirometry, Artificial Respiration

### **Practical Examination**

**35 Marks**

1. Estimation of Hemoglobin.
2. Determination of Blood Groups.
3. Determination of Bleeding and Clotting time.
4. Spotters-Haemocytometer, (Identification of cells) Differential Count, Sphygmomanometer, Spirometer . - 10 marks

### **Recommended Books Recent Editions**

1. A.K.Jain, Human Physiology and Biochemistry for Physical Therapy and Occupational Therapy, 1st Ed. Arya Publication.
2. Dr. Venkatesh.D and Dr. Sudhakar H.S. Basic of Medical Physiology, 3rd Ed., Wolter-Kluwer Publication.
3. Chaudhari (Sujith K) Concise Medical Physiology 6th Ed. New Central Book.

### **Reference Books**

1. A.K.Jain, Text book of Physiology for Medical Students, 8th Ed. Arya Publication.
2. Guyton (Arthur) Text Book of Physiology. 13rd Ed. Prism Publishers.
3. Ganong (William F) Review of Medical Physiology. 27th Ed. Appleton.

**I Semester  
Core- 3- Basic Biochemistry**

**Course outcome:**

At the end of the course, students should know

CO1: Demonstrate acquisition of comprehensive knowledge of cellular structure with its functions

CO 2: Demonstrate acquisition of comprehensive knowledge and skills of Biomedical importance of macromolecules and micromolecules

CO 3: Demonstrate acquisition of comprehensive knowledge of the enzymes

CO 4: Demonstrate acquisition of comprehensive knowledge of biochemical components of blood, urine and body fluids.

CO 5: Demonstrate acquisition of comprehensive knowledge of biochemical importance of nutrition

CO 6: Demonstrate acquisition of comprehensive knowledge of quality control and biomedical waste management in medical laboratory.

**Unit I**

**12hrs**

**Chemistry of Cell & Chemistry of Carbohydrates, Proteins, Lipids & Nucleotides-**

Cell- Structure & Function of Cell Membrane, Subcellular Organelles, and their Functions.

Carbohydrates- Definition, Classification & Biological importance of carbohydrates, Derivatives of Monosaccharides. Proteins- Definition & Classification of amino acids. Definition & Classification of Proteins based composition, conformation, and function. Functions Plasma proteins, Biologically important peptides and their functions, and Immunoglobulins -structure and functions Lipids- Definition, Classification, Biological importance, and Functions of Lipids. Structure and functions of Cholesterol, types and functions of Lipoproteins. Fatty acids -definition and Classification Nucleotides- Structure and Functions of DNA & RNA. Biologically important nucleotides and their functions.

**Unit II**

**06 hrs**

**Enzymes & Acid base balance**

Enzymes- Definition and Classification. Factors affecting enzyme activity. Coenzymes and Cofactors. Enzyme inhibition – types and their importance.

Acids, Bases & Body Buffers -Definition with examples, and regulation of pH in brief.

**Unit III**

**12hrs**

**Vitamins & Minerals**

Vitamins-Classification, Sources, RDA, Functions (in brief), deficiency manifestations and hypervitaminosis of fat-soluble vitamins A, D, E and K.

Sources, RDA, Functions (in brief), deficiency manifestations of water-soluble vitamins – Thiamine. Riboflavin, Niacin, Pyridoxine, Biotin, Pantothenic acid, Folic acid, cobalamin and Ascorbic acid. Minerals-Classification.

Calcium, Phosphorus, Iron, copper Iodine, zinc, calcium, phosphorous, sodium, potassium & chloride -Sources, RDA, Functions (in Brief), deficiency manifestations.

**Unit IV**

**05hrs**

**Nutrition, Blood chemistry & Urine Chemistry**

Nutrition- Nutrients, Calorific value of food, BMR and factors affecting BMR, respiratory quotient and its applications, biological value of proteins, nitrogen balance, Protein energy malnutrition.

Blood chemistry- Biochemical components & their reference ranges in normal & diseased states- glucose, urea ,creatinine , electrolytes, total proteins and albumin.

## **Unit V**

**10hrs**

### **Clinical Biochemistry**

Specimen Collection - Blood, Urine and Body fluids. Preanalytical, analytical and postanalytical errors

Clinical Biochemistry- Parameters to diagnose Diabetes & Cardiovascular diseases.

Diagnostic enzymology, Assessment of arterial Blood gas status and electrolyte balance, Point of Care Testing. Renal Function tests(in brief), Liver function tests(in brief), Biomedical Waste Management.

### **Practicals**

- General Reactions of Carbohydrates.
- Identification of carbohydrates
- Color reactions of Proteins.
- Reactions of Non-Protein nitrogenous substances.
- Demonstration of pH meter, Colorimeter, and spectrophotometer.
- Demonstration of Chromatography and Electrophoresis.

### **Practical Examination (35marks)**

- Identification carbohydrates or NPN substances - 10 Marks
- Color reactions of Proteins - 15 Marks
- Spotters - 10 Marks

### **Recommended books Recent edition.**

- Textbook of Biochemistry - D.M.Vasudevan
- Biochemistry - Pankaja Naik
- Clinical Biochemistry - Principles and Practice - Praful. B. Godkar
- Textbook of Biochemistry - Chatterjea and Shinde
- Textbook of Clinical Chemistry - Norbert W Teitz

### **Reference Books Recent Edition**

- Harpers Biochemistry
- Clinical Biochemistry-Michael L. Bishop
- Textbook of Biochemistry-Rafi M.D
- Lippincott's Illustrated review of Biochemistry
- Practical Clinical Biochemistry-Harold Varley

## I Semester Language-1 English

### Unit I

#### Introduction

- a) Study Techniques - Reading Comprehension  
Exercises on reading passages and answering questions based on the passage.
- b) Organization of Effective Note Taking  
Why good note-taking is important  
Effective note-taking is an important practice to master at university. You have a lot of new knowledge and you need to develop reliable mechanisms for recording and retrieving it when necessary. But note-taking is also a learning process in itself, helping you to process and understand the information you receive.
- c) Use of the Dictionary  
Tips on how to use the dictionary
  1. Choose the right dictionary.
  2. Read the introduction.
  3. Learn the abbreviations.
  4. Learn the guide to pronunciation.
  5. Looking Up a Word
    - a) Find the section of the dictionary with first letter of your word.
    - b) Read the guide words.
    - c) Scan down the page for your word.
    - d) Read the definition.
  6. Online dictionaries
  7. Research various facts.
  8. Thesaurus  
It is a dictionary of synonyms and antonyms, such as the online Thesaurus.com.  
Enlargement of Vocabulary  
Roots : A to G  
Effective Diction  
Foreign Expressions - meaning and pronunciation

### Unit II

#### Applied Grammar

- a. Correct Usage  
The Eight Parts of Speech
  1. Noun
  2. Pronoun
  3. Adjective
  4. Verb
  5. Adverb
  6. Preposition
  7. Conjunction
  8. Interjection
- b. The Structure of Sentences  
What is a sentence?  
What are clauses?  
What are phrases?  
Types of sentences:

1. Simple sentences
2. Compound sentences
3. Complex sentences
- c. The Structure of Paragraphs

1. What is a Paragraph?

Paragraphs are comprised of sentences, but not random sentences. A paragraph is a group of sentences organized around a central topic.

2. The Secrets to Good Paragraph Writing: Four Essential Elements

The four elements essential to good paragraph writing are: unity, order, coherence, and completeness.

3. Paragraph Structure

A paragraph consists of 3 main structures :

1. Claim
2. Evidence
3. Analysis

- d. Enlargements of Vocabulary Roots: H to M

### Unit III

#### Written Composition

- a) Precise writing and Summarizing

1. Definition of precise:

A precise or summary is an encapsulation of someone's writing or ideas. Technically it should be one - third the length of the actual passage given.

2. Definition of summary:

Summaries may not always follow a direct line through what they're summarizing - if you want to summarize someone else's ideas in a few sentences, it might make more sense if you begin with their conclusion, and work back to the arguments they use to develop that conclusion.

Guidelines to follow while writing a summary are:

1. Divide...and conquer.
2. Read.
3. Reread.
4. One sentence at a time.
5. Write a thesis statement.
6. Check for accuracy.
7. Revise.

- b) Writing of a Bibliography

- I. What is a bibliography?

A bibliography is an alphabetical list of all materials consulted in the preparation of your assignment.

- II. What is an annotated bibliography?

An annotated bibliography is an alphabetical list of books or articles for which you have added explanatory or critical notes.

- III. Why you must do a bibliography?

- a) To acknowledge and give credit to sources of words, ideas, diagrams, illustrations and quotations borrowed, or any materials summarized or paraphrased.
- b) To show that you are respectfully borrowing other people's ideas, not stealing them, i.e. to prove that you are not plagiarizing.

#### IV. What must be included in a bibliography?

- Author
- Title
- Place of publication
- Publisher
- Date of publication
- Page number(s) (for articles from magazines, journals, periodicals, newspapers, encyclopedias, or in anthologies)

#### V. Writing a bibliography in MLA style

- Standard Format for a Book: Author. Title: Subtitle. City or Town: Publisher, Year of Publication. If a book has no author or editor stated, begin with the title. If the city or town is not commonly known, add the abbreviation for the State or Province.
- Standard Format for a Magazine, Periodical, Journal, or Newspaper Article: Author. "Title: Subtitle of Article." Title of Magazine, Journal, or Newspaper Day, Month, Year of Publication: Page Number(s).

c) Enlargement of Vocabulary Roots - N to S

### Unit IV

#### Reading and Comprehension

1. Review of selected materials and express oneself in one's words Seminar for students on powerpoint presentation and book review.
2. Enlargement of Vocabulary Roots - T to Z

### Unit V

#### The study of Various forms of Composition

##### 1. Paragraph

Exercises for students on short paragraph topics.

##### 2. Essay

How to Write an Essay

The writing of an essay has three stages :

- Essay writing
- Close reading
- Research

##### 3. Letter

- Mechanics of writing formal and business letters. Exercises on writing letters for students.

##### 4. Summary

- Writing reports: project report, magazine article and reporting in newspapers on sporting events.

##### 5. Practice In Writing

- Exercises and assignments on report writing for students

### Unit VI

#### Verbal Communication

a) Discussions And Summarization Tips on taking minutes of a meeting Why Meeting Minutes Matter Meeting minutes are important. They capture the essential information of a meeting -

decisions and assigned actions. The following instructions will help you take useful and concise meeting minutes.

### **Before the Meeting**

If you are recording the minutes, make sure you aren't a major participant in the meeting. You can't perform both tasks well.

Create a template for recording your meeting minutes and make sure you leave some blank space to record your notes.

Decide how you want to record your notes. If you aren't comfortable relying on your pen and notepad, try using a tape recorder or, if you're a fast typist, take a laptop to the meeting.

### **During the Meeting**

As people enter the room, check off their names on your attendee list. Ask the meeting lead to introduce you to meeting attendees you aren't familiar with. This will be helpful later when you are recording assigned tasks or decisions.

### **After the Meeting**

Review the notes and add additional comments, or clarify what you didn't understand right after the meeting.

#### **a. Debates**

Group Discussions:

##### **1. Do's in a group discussion:**

- Be confident. Introduce yourself with warm smile and get into topic soon
- Have eye contact with all group members
- Learn to listen
- Be polite
- Be a good team player. Move with all group members and help them when needed.

##### **2. Don'ts in a group discussion:**

- Don't be harsh when you are interrupted
- Don't interrupt the other person
- Don't try to push your ideas on others
- Don't argue. Everyone is free to express their idea

##### **3. Do's in a group discussion:**

- Be confident. Introduce yourself with warm smile and get into topic soon
- Have eye contact with all group members
- Learn to listen
- Be polite
- Be a good team player. Move with all group members and help them when needed.

##### **4. Don'ts in a group discussion:**

- Don't be harsh when you are interrupted
- Don't interrupt the other person
- Don't try to push your ideas on others
- Don't argue. Everyone is free to express their ideas.

#### **b. Oral Reports**

An oral report is a presentation, usually done for a student's teacher and classmates, though it can also be done for a larger segment of the school community, for parents, or for a more open

group, depending on the circumstances. For example, at a science fair, a student might present a report on his or her project periodically for the class, for other visitors who pass by, and for judges.

### c. Use in Teaching Writing of dialogues

Originating from dialogues, the Greek word for conversation, the term dialogue refers to a verbal conversation between two or more people.

When writing dialogues, it is important to adhere to specific grammar rules. The following points need to be remembered while writing dialogues for role play.

1. Quotation Marks
2. Periods
3. Question Marks
4. Commas
5. Capitalization and Paragraphs
6. How Dialogue Enhances Writing

Dialogue reveals information about the speaker(s) within a written work. Dialogue also enhances the story line and plot.

#### a) Exposes Character Traits

Through indirect characterization, dialogue reveals details about a character by what they say, how they say it, and perhaps what they choose not to say.

#### b) Unveils Mood/Emotions

A character's word choice, description of tone, and choice of language reveal the inner state of the character without directly "telling" the audience. Showing instead of telling creates a deeper understanding of the character through the eyes of the reader or audience.

#### c) Reveals Motivation/Influences

Dialogue can illuminate a character's internal motivation or desires.

#### d) Establishes Relationships

Seeing how a character addresses and responds to other characters shows the type of relationships that they form and where their relationships currently stand. Dialogue can demonstrate how relationships change throughout the course of the story. It can show how a character changes or responds to various situations.

Exercises for students on preparing a dialogue exchange between two people

1. On the street (with a vegetable vendor)
2. At college with a lecturer (regarding admissions)
3. In a bank with the manager (for opening a bank account)
4. Telephone conversation with a hotel receptionist (make room reservations)
5. Telephone conversation (taking an appointment with the dentist/doctor)

**I Semester  
Language 2- Kannada**

ಕನ್ನಡ : ಒಂದು

ಪಠ್ಯಕ್ರಮದ ರೂಪರೇಖೆ

ಸ್ಥಾನ  
ಸಮಯ  
ಪಠ್ಯಕ್ರಮದ ವಿವರಣೆ

- : ಬಿ.ಎಸ್.ಸಿ. (ಅಲ್ಟಿಮ್ ಹೆಲ್ತ್ ಸೈನ್ಸ್ ಕೋರ್ಸ್) ಮೊದಲವರ್ಷ
- : 30 ಘಂಟೆಗಳು (ಮೂವತ್ತು ಘಂಟೆಗಳು)
- : ವಿದ್ಯಾರ್ಥಿ/ ವಿದ್ಯಾರ್ಥಿನಿಯರು ದಿನನಿತ್ಯ ಸಂಪರ್ಕಿಸಬಹುದಾದ ಜನಸಾಮಾನ್ಯರೊಡನೆ ಶುಶ್ರೂಷೆಗೆ ಸಂಬಂಧಿಸಿದಂತೆ ಕನ್ನಡದಲ್ಲಿ ಸಂಭಾಷಣೆ ಮಾಡಲು ಹಾಗೂ ತಿಳುವಳಿಕೆ ನೀಡಲು ಸಹಕಾರವಾಗುವಂತೆ ಪಠ್ಯಕ್ರಮದ ಮಾದರಿಯನ್ನು ಅಳವಡಿಸುವುದು.
- : ದಿನಬಳಕೆಯ ವ್ಯವಹಾರದಲ್ಲಿ ಶುಶ್ರೂಷೆಗೆ ಸಂಬಂಧಪಟ್ಟಂತೆ ಕನ್ನಡ ಭಾಷೆಗೆ ಅಳವಡಿಕೆ.
- : ಕನ್ನಡೇತರರಿಗೆ ಕನ್ನಡ ಭಾಷೆಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.

ಉದ್ದೇಶ

ಪಠ್ಯಕ್ರಮದ ವಿವರಣೆ

ಘಟಕಒಂದು (ಆರು ಘಂಟೆಗಳು)

ಚಟುವಟಿಕೆ

ಘಟಕಎರಡು (ಆರು ಘಂಟೆಗಳು)

ಚಟುವಟಿಕೆ

ಘಟಕಮೂರು (ಆರು ಘಂಟೆಗಳು)

ಚಟುವಟಿಕೆ

ಘಟಕ ನಾಲ್ಕು (ಆರು ಘಂಟೆಗಳು)

ಚಟುವಟಿಕೆ

ಘಟಕ ಐದು (ಆರು ಘಂಟೆಗಳು)

- : ಅಕ್ಷರಮಾಲೆ, ಸ್ವರಗಳು, ವ್ಯಂಜನಗಳು, ಕಾಗುಣಿತ, ಬರವಣಿಗೆ, ಅಭ್ಯಾಸ.
- : 1. ಕನ್ನಡ ವರ್ಣಮಾಲೆಯ ಅಕ್ಷರಗಳನ್ನು ಬರೆಯಿರಿ.
- : ಪದಪರಿಚಯ, ಪದಪುಂಜ, ದಿನಬಳಕೆಯ ಪದಗಳು, ಸಂಬಂಧಗಳು, ನಾಮಪದ, ಸರ್ವನಾಮ, ಅಂಕಿಗಳ ಪರಿಚಯ, ಪ್ರಶ್ನಾರ್ಥಕ ಪದಗಳು.
- : 1. ನಿಮಗೆ ತಿಳಿದಿರುವ ವಿವಿಧ ರೋಗಗಳ ಹೆಸರುಗಳನ್ನು ಪಟ್ಟಿಮಾಡಿ.
- : 2. ನಿಮಗೆ ತಿಳಿದಿರುವ ತಿಂಡಿ - ತಿನಿಸುಗಳ ಹೆಸರುಗಳನ್ನು ಪಟ್ಟಿಮಾಡಿ.
- : ಲಿಂಗ, ವಚನ, ಅವ್ಯಯ, ತಿಂಡಿ - ತಿನಿಸುಗಳ ಪರಿಚಯ, ದೇಹದ ಅಂಗಗಳ ಪರಿಚಯ, ವಿವಿಧ ಬಗೆಯ ರೋಗಗಳ ಪರಿಚಯ.
- : ರೋಗಿಯ ವಿವರ ತಿಳಿಯಲು ಆಸ್ಪತ್ರೆಯಲ್ಲಿ ಬಳಸಲಾಗುವ ನಮೂನೆಯ ಮಾದರಿಯನ್ನು ರಚಿಸಿ.
- : ಶುಶ್ರೂಷಣಾ ಪದಗಳು, ಆಸ್ಪತ್ರೆಯಲ್ಲಿ ಬಳಸುವ ವಿವಿಧ ನಮೂನೆಗಳ ಪರಿಚಯ, ನಮೂನೆಗಳ ರಚನೆ.
- : ಶುಶ್ರೂಕರು ಮತ್ತು ರೋಗಿಯ ನಡುವಿನ ಸಂಭಾಷಣೆಯ ಮಾದರಿಯನ್ನು ತಯಾರಿಸಿ.
- : ಶುಶ್ರೂಕರ ಹಾಗೂ ರೋಗಿಗಳ ನಡುವೆ ನಡೆಯುವ ಸಂಭಾಷಣೆಗೆ ಬೇಕಾದ ವಾಕ್ಯಗಳ ಪರಿಚಯ.

ಅಧ್ಯಯನಕ್ಕೆ ಶಿಫಾರಸ್ಸು ಮಾಡಲಾಗಿರುವ ಗ್ರಂಥಗಳು

1. ಕನ್ನಡ ವ್ಯಾಕರಣ (8,9 ಮತ್ತು 10ನೇ ತರಗತಿಗಳಿಗೆ ಕರ್ನಾಟಕ ಸರ್ಕಾರ, ಪಠ್ಯಪುಸ್ತಕಗಳ ಇಲಾಖೆ)
2. ವ್ಯವಹಾರಿಕಕನ್ನಡ : ಎಚ್ಚಿಕ್ಕಿ
3. ಪತ್ರಲೇಖನ : ಕನ್ನಡಸಾಹಿತ್ಯಪರಿಷತ್ತು
4. ಲೇಖನಕಲೆ : ಎನ್ ಪ್ರಹ್ಲಾದರಾವ್
5. ಆರೋಗ್ಯ ಮತ್ತು ಇತರೆ ಪ್ರಬಂಧಗಳು : ಡಾ|| ಪಿ.ಎಸ್ ಶಂಕರ್
6. ವೈದ್ಯ ಪದಗಳ ಹುಟ್ಟುರಚನೆ : ಡಾ|| ಡಿ.ಎಸ್.ಶಿವಪ್ಪ

ಕನ್ನಡ: ಎರಡು

ಪಠ್ಯಕ್ರಮದರೂಪರೇಖೆ

ಸ್ಥಾನ

ಸಮಯ

ಉದ್ದೇಶ

- : ಬಿ.ಎಸ್.ಸಿ.(ಅಲ್ಟಿಮ್ ಹೆಲ್ತ್ ಸೈನ್ಸ್ ಕೋರ್ಸ್) ಮೊದಲ ವರ್ಷ
- : 30 ಘಂಟೆಗಳು (ಮೂವತ್ತು ಘಂಟೆಗಳು)
- : ಜನರ ಆರೋಗ್ಯದ ಬಗ್ಗೆ ಸಮುದಾಯಕ್ಕೆ ತಿಳುವಳಿಕೆ ಕೊಡುವುದು.

## Value Added Course

### Yoga

#### Learning Objectives

1. To define Yoga and understand the history of yoga
2. To understand general concept and practice of yoga.

#### Syllabus

#### Yoga theory- 15 hours

##### Unit I: History & Origin of Yoga

(2 hours )

- Introduction to Yoga
- Introduction to Yoga education & its importance.
- Evolution of Yoga- Concept about yoga origin, Pre-vedic & Vedic period
- Modern view about yoga.

##### Unit: II General Perspective of Yoga

(3 hours)

- Definitions of Yoga, Objectives of Yoga, Importance of yoga and Misconceptions about Yoga,
- Principles of Yoga,
- Brief Introduction of schools of Yoga.
- Yogic Lifestyle.

##### Unit: III Introduction to Yoga practises

(10 hours)

- Standing & Sitting Series of Asanas
- Supine & Prone Series of Asanas.
- Relaxation technique & its importance.
- Pranayama & its importance

#### REFERENCE:

1. Lal Basant Kumar: Contemporary Indian Philosophy, Motilal Banarsidas Publishers Pvt. Ltd, Delhi, 2013
2. Dasgupta S. N: History of Indian Philosophy, Motilal Banarsidas, Delhi, 2012
3. Singh S. P: History of Yoga, PHISPC, Centre for Studies in Civilization Ist, 2010
4. Singh S. P & Yogi Mukesh: Foundation of Yoga, Standard Publication, New Delhi, 2010
5. G.C pande, Histroy of science, philosophy, and culture of Indian Civilization Vol.VII part 10 Centre for Studies in Civilisations.
6. Asana, Pranayama, Bandha, Mudra by Swami Satyananda Saraswati Bihar School of Yoga.

## Yoga practical- 15 hours

All Yogic sessions will be started with brief theory of technique of yogic practices, name of the practice, precautionary measures to be taken before, during and after practice of yoga & its benefits. This will enhance the students to learn different techniques of yoga.

### Unit I: Breathing Practices & Sukshma Vyayama (Loosening exercise)

1. Hands stretch breathing , Hand In & out breathing.
2. Sukshma Vyayama: *All Joints Rotation*: Fingers, Wrist, Elbows, Shoulder rotation, Neck Flexion/ Extension, Neck rotation, knee movements & ankle joint movements
3. Hip rotation, extension and all possible movements.
4. Stretching: Forward, Backward & Sideward bending & Situps.

### Unit II: Asanas, Pranayama & Relaxation technique.

1. Suryanamaskara (12 Series of asana)
2. **Standing Series**: Ardha Chakrasana , Ardhakati Chakrasana, Trikonasana, Vrikshasana, Tadasana;
3. **Sitting Series**: Vajrasana, paschimotanasana Ustrasana, Vakrasana,; **Prone Series**: Bhujangasana, Shalabhasana ;**Supine series**: Uttitapadasana & setubhandasana,
4. **Pranayama & Relaxation technique**: Suryabedana, Chandrabedana, Anuloma Viloma; Relaxation technique- Quick relaxation technique.

### Reference

1. Asana by Swami Kuvalyananda Kaivalyadhama, Lonavla.
2. Asana, Pranayama, Bandha, Mudra by Swami Satyananda Saraswati Bihar School of Yoga.
3. Light on Yoga, by B.K.S Iyengar, Harper Collins Publishers.
4. Surya Namaskar by Saraswati, Swami Satyananda, Bihar School of Yoga.

**II Semester**  
**Core 4-General Pathology including Applied aspects**

**Course outcome:**

At the end of the course student should be able to

CO1: Demonstrate the acquisition of comprehensive knowledge of cell pathology and repair

CO2: Demonstrate the acquisition of comprehensive knowledge of pathogenesis, morphology and complications of organ systems diseases of the body.

CO3: Perform and analyse basic hematology techniques.

CO4: Acquisition of Knowledge of workflow and to perform basic investigations in Transfusion medicine and clinical pathology.

**Unit I**

**10 hrs**

**General pathology-Introduction- & scope of pathology**

1. Cell injury and Cellular adaptations- Normal cell, Cell injury- types, etiology, morphology, Cell death-autolysis, necrosis, apoptosis, Cellular adaptations- atrophy, hypertrophy, hyperplasia, metaplasia.
2. Inflammation-Introduction, acute inflammation-vascular events, cellular events, chemical mediators, chronic inflammation- general features, granulomatous inflammation, tuberculosis.
3. Healing and repair- Definition, different phases of healing, factors influencing wound healing, fracture healing.
4. Haemodynamic disorders- Edema, hyperemia, congestion, hemorrhage, embolism, thrombosis, infarction.
5. Neoplasia- definition, nomenclature, features of benign and malignant tumors, spread of tumors, dysplasia, carcinoma in situ, precancerous lesions.
6. Environmental and nutritional pathology-smoking, obesity and vitamin deficiencies.

**Unit- II**

**10 hrs**

**Haematological Disorders**

**5 hrs**

1. Introduction and hematopoiesis
2. Anemia-introduction and classification (morphological and etiological).
3. Iron deficiency anemia: distribution of body iron, iron absorption, causes of iron deficiency, lab findings, megaloblastic anemia: causes, lab findings.
4. Hemolytic anemias: definition. Causes, classification and lab findings.
5. WBC disorders- quantitative disorders, leukemia-introduction, Pancytopenia.
6. Bleeding disorders- Introduction, physiology of hemostasis. Classification, causes of inherited and acquired bleeding disorders, thrombocytopenia, DIC, laboratory findings.

**Basic Hematological Techniques**

**5 hrs**

1. Characteristics of good technician, Blood collection- methods (capillary blood, venipuncture, arterial puncture) complications, patient after care.
2. Anticoagulants, transport of the specimen, preservation, effects of storage, separation of serum and plasma, universal precautions.
3. Complete hemogram- CBC, peripheral smear, BT, CT, PT, APTT, ESR,

4. Automation in hematology-principles of autoanalysers -3 part, 5 part and six part analysers and coagulometer-interpretation of autoanalyser results.
5. Disposal of the waste in the laboratory.

### **Unit- III**

**5 hrs**

#### **Transfusion Medicine**

1. Selection of donor, blood grouping, Rh typing, cross matching, and storage.
2. Transfusion transmitted diseases, transfusion reactions, components- types, indications.

#### **Clinical Pathology**

1. Examination of cerebrospinal fluid-physical examination, chemical examination, microscopic examination.
2. Examination of body fluids (pleural, pericardial and peritoneal), physical examination, chemical examination, microscopic examination.
3. Sputum examination

### **UNIT IV**

**10 hrs**

1. Congenital and cystic diseases of kidney
2. Introduction and clinical manifestations of glomerular diseases
3. Pathogenesis of glomerular diseases -brief
4. Nephritic syndrome - Acute post infectious glomerulonephritis, Rapidly progressive glomerulonephritis
5. Nephrotic syndrome - Membranous glomerulonephritis, Minimal change disease, Focal segmental glomerulosclerosis, Membranoproliferative glomerulonephritis
6. IgA nephropathy and chronic glomerulonephritis
7. Glomerular lesions in systemic diseases - diabetes, amyloidosis, systemic lupus erythematosus

### **UNIT V**

**10 hrs**

1. Vascular diseases - benign hypertension, malignant hypertension, renal artery stenosis, thrombotic microangiopathy
2. Tubulo-interstitial diseases
  - Acute tubular injury
  - Pyelonephritis - acute and chronic
  - Tubulointerstitial nephritis due to drugs and toxins, others
3. Obstructive uropathy in brief
4. Urolithiasis and lower urinary tract infections
5. Pathology of peritoneum: peritonitis, dialysis induced changes

### **Practicals**

**30 hrs**

1. Laboratory organization- Reception of specimen, dispatch of reports, records keeping. Laboratory safety guidelines.
2. SI units and conventional units in hospital laboratory.
3. Basic requirements for hematology laboratory, glasswares for hematology, pipettes and equipments for haematology lab and anticoagulant vials.
4. Blood collection- methods (capillary blood, venipuncture, arterial puncture) complications,

patient after care.

5. Determination of haemoglobin.
6. Determination of ESR and PCV.
7. RBC count and TLC by hemocytometer.
8. Differential leukocyte count and Absolute eosinophil count
9. Interpretation of autoanalyser results- complete blood count and erythrocyte Indices- MCV, MCH, MCHC.
10. Reticulocyte staining and count .
11. Introduction to clinical pathology and Urinalysis- collection. Preservatives, physical, chemical examination and microscopy Physical examination; volume, color, odor, appearance, specific gravity and ph, Chemical examination; strip method- protein- heat and acetic acid test, sulfosalicylic acid method, reducing sugar- benedicts test, ketone bodies- rothas test, bile pigments- fouchet method, bile salt- hays method, blood- benzidine test, urobilinogen and porphobilinogen- ehrlich aldehyde and schwartz test, bence jones protein, microscopy.
12. Blood grouping and Rh typing
13. Histopathology: fixatives and preservation of tissues, processing, hematoxylin and eosin staining, special stains-PAS, MTS and Jones methanamine silver, direct immunofluorescence staining

**14. Charts:**

- Nephritic syndrome
- Nephrotic syndrome
- Pyelonephritis
- Lower urinary tract infection
- Acute renal failure
- Chronic renal failure
- Diabetic nephropathy
- Peritoneal fluid analysis

**15. Specimens:**

- Small contracted kidney
- Cystic diseases
- Pyelonephritis
- Hydronephrosis

**Practical Examination**

**35 marks**

1. Spotters
2. Haemoglobin estimation and blood grouping
3. Charts + Specimens
4. Urinalysis

**Recommended Books**

1. Basic Pathology Robbins Saunders, Elsevier Inc., Philadelphia, USA.
2. Text book of Pathology Harsha Mohan Jaypee Brothers, New Delhi.
3. Practical Pathology P. Chakraborty, Gargi Chakraborty New Central bookagency, Kolkata.
4. Text book of Haematology Dr Tejinder Singh Arya Publications, Sirmour (H P)

5. Text book of Medical Laboratory Technology Praful Godkar Bhalani Publications house, Mumbai.
6. Textbook of Medical Laboratory Technology Ramanik Sood.
7. Practical Haematology Sir John Dacie Churchill Livingstone, London.
8. Todd and Sanford, Clinical Diagnosis and Management by Laboratory
9. Methods John Bernard Henry, All India Traveller Bookseller.
10. Histopathology Techniques, Culling.
11. Histopathology Techniques Bancroft.
12. Diagnostic Cytopathology Koss.
13. Diagnostic Cytopathology Winfred Grey.
14. Hand book of Medical Laboratory Technology, CMC Vellore.
15. Basic Haematological Techniques Manipal.

**II Semester**  
**Core 5- Microbiology including Applied aspects**

**Course outcome**

At the end of the course student should be able to

CO1: Demonstrate the acquisition of knowledge of morphology of bacteria, viruses, parasites and fungal pathogens causing human infections

CO2: Demonstrate capability to practice appropriate sterilization and disinfection techniques used in microbiology

CO3: Demonstrate the acquisition of knowledge of immunity, immunization schedule and role of Immunoprophylaxis.

CO4: Demonstrate the acquisition of knowledge about infection control and practices in laboratory.

CO5: Demonstrate capability to explain the concepts and principles of compound microscope and its applications

CO6: Demonstrate the acquisition of knowledge and skill of diagnostic test of infectious diseases

CO7: Demonstrate the acquisition of knowledge about antibiotic sensitivity testing and their role in drug resistance in bacteria.

**Unit - I**

**10 hours**

**General Microbiology**

- Introduction to Medical microbiology and Classification of microorganisms
- Morphology and Physiology of bacteria
- Sterilization and Disinfection practices followed in a tertiary care centre including CSSD and recent advances.
- Culture methods
- Infection
- Specimen collection and laboratory diagnosis of infectious diseases

**Immunology**

- Antigen
- Antibodies
- Immunity
- Vaccines and immunization schedule, Immunoprophylaxis

**Unit – II**

**8 hours**

**Systemic bacteriology**

- Staphylococcus, *Streptococcus pyogenes* and Pneumococcus
- Overview of Clostridia and *C. tetani*
- *M. tuberculosis*
- Enterobacteriaceae - Klebsiella, *E. coli*, Proteus
- Non-fermenters - Pseudomonas and Acinetobacter

**Unit – III**

**8 hours**

**Parasitology**

- Introduction to parasitology and lab diagnosis of parasitic infections

- Protozoa - *Entamoeba histolytica*, Giardia, trichomonas, Malaria, Hook worm and Round worm

#### **Unit – IV**

**9 hours**

##### **Mycology**

- Introduction to mycology and lab diagnosis of fungal infections
- Yeasts - Candida and Cryptococcus
- Moulds – Aspergillus, Zygomycetes

##### **Virology**

- General properties of viruses and laboratory diagnosis of viral infections
- Blood borne viral infections - Hepatitis B and C viruses, HIV

#### **Unit – V**

**10 hours**

##### **Applied microbiology**

- Hospital acquired infections - Causative agents, transmission methods, investigation, prevention and control of hospital Acquired infections.
- SSI, VAP, CAUTI, CLABSI
- Overview of opportunistic infections – Definition, predisposing factors and etiological agents
- Standard and universal precautions
- Biomedical waste management

##### **Practicals**

**30 hours**

- Compound microscope and demonstration of the parts.
- Demonstration of sterilization equipment's - hot air oven, autoclave- principle, mechanism of action, preparation of the materials and quality control
- Disinfection practices in a tertiary care centre - Disinfection of OT, Wards, OPD, dialysis units and laboratories
- Testing of water, air and environmental surveillance
- Demonstration of commonly used culture media with and without growth- Nutrient agar, blood agar, chocolate agar, Mac Conkey medium, Lowenstein-Jensen media, AST plate and Robertson cooked meat broth
- Classification of Stains and Procedure and interpretation of Grams staining

##### **Practical examination pattern**

**35 marks**

Spotters, Culture media, Equipments, Slides

Discussion:

1.Gram stain

2.Ziehl- Neelsen stain

##### **Reference Books**

1. Ananthanarayan & Panikar's Textbook of Microbiology – Latest Edition University Press.
2. Parasitology (protozoology and helminthology Parasitology) by K D Chatterjee
3. Textbook of Practical Microbiology for MLT by C P Baveja, Arya publications
4. Textbook for laboratory technicians by RamnikSood. Jaypee publishers
5. Textbook of parasitology by Paniker. 7th edition

**II Semester**  
**Core - 6 - Pharmacology**

**Course outcome:**

At the end of the course student should be able to

CO1: Demonstrate the acquisition of comprehensive knowledge of basics of pharmacology

CO2: Demonstrate the acquisition of comprehensive knowledge about the pharmacokinetics and pharmacodynamics of drugs

CO3: Demonstrate the capability of enlisting the drugs used on various organ system of the body including hormones and chemotherapy

CO4: Demonstrate the capability of enlisting the drugs used on emergency conditions

CO5: Demonstrate the capability of enlisting the uses of various devices and instruments used in hospital setting.

CO6: Demonstrate the skills of identifying the devices, instruments, drugs and dosage forms

**UNIT I- General Pharmacology, ANS, PNS.**

**9 Hrs**

Sources of Drugs

Route of drug administration

Pharmacokinetics (Absorption, Metabolism, Distribution, Excretion)

Pharmacodynamics (Mechanisms of action)

Adverse drug reactions

ANS : Adrenergic drugs -Adrenaline,

Anti adrenergic-alpha and beta blockers

Cholinergic drugs-Acetyl choline

Anti cholinergic agents-Atropine

**Unit II- PNS, CVS, Renal system**

**9 hrs**

Skeletal muscle relaxants-

Local anaesthetics-lignocaine, LA + vasoconstrictor

CVS-ionotropic agents -Digoxin,

Antianginal drugs-GTN,

Antihypertensives-

Management of different types of shock and Plasma expanders

Renal system-Diuretics Antidiuretics-Vasopressin

**Unit III- CNS, Blood**

**9 hrs**

CNS-general Anaesthetics

Sedative hypnotics-

Antiepileptics

Opioid analgesics-

NSAIDS-

Respiratory system-treatment of cough And Bronchial asthma

Blood-Hematinics, Anticoagulants -Warfarin, Heparin

Thrombolytics & Antiplatelet drugs-streptokinase, / aspirin,

**Unit IV- GIT, Chemotherapy**

**9 hrs**

GIT-drugs used in peptic ulcer-

Antiemetics -Metaclopramide, Domperidone, Ondansetron

Purgatives & Laxatives

Drugs used in Diarrhoea- ORS, Super ORS, Antimotility drugs (loperamide, diphenoxylate)

Chemotherapy-general considerations MOA, Resistance, Prophylaxis

### **Unit V- Chemotherapy, Hormones**

**9 hrs**

Anti-bacterial, anti-fungal, anti-viral, anti-protozoal, anti-helminthic

Cancer chemotherapy (names, common Adverse effects, general principles in the treatment of cancer )

Hormones-Thyroid and antithyroid drugs, Insulin, glucagon, antidiabetic drugs, corticosteroids, oestrogen, progesterone, oxytocin

### **Practicals**

**30 hrs**

Dosage forms

Solid Dosage forms

Liquid Dosage forms

Gaseous Dosage forms

Oral route

Parenteral routes

Novel routes

Fixed dose combination- Amoxycillin+clavulanic acid-cotrimoxazole, Lignocaine+ Adrenaline

Drug stations-Adrenaline, dopamine, Dobutamine)

Drug stations-Corticosteroids (hydrocortisone, prednisolone, inhalational steroids) Drug stations-common antibiotics (Amoxycillin, Ciprofloxacin, Azithromycin, Metronidazole, Cephalosporins)

Drug stations-Insulin preparations

Instrument & devices (Nasogastric tube, laryngoscope, Different Catheters, Nebulizers, Inhalers, Rotahalers)

### **Practical examination**

**35 marks**

#### **1. Dosage Forms**

Capsules, Tablets, Syrup, Iv, Im, Sc, Ia, Intra Articular -

Advantages (1 Mark), Disadvantages (1 Mark) Examples (1 Mark)

#### **2. Mention the name of the Device/Instruments and uses: Inhalers, Rota halers, Space halers, Drip sets, Vaso fix, Ryle's tube, Urinary catheter, Endotracheal tube, Hand gloves**

#### **3. 10 Spotters**

### **Recommended Books**

1. K.D. Tripathi, Essentials of Medical Pharmacology, V. Edition, M/s. Jaypee Brothers, Post Box, 7193, G-16, Emca House, 23/23, Bansari Road, Daryaganj, New Delhi.
2. Padmaja Udaykumar -Pharmacology for Allied Sciences
3. R. S. Satoskar, S.D. Bhandarkar, S. S. Ainapure, Pharmacology and Pharmacotherapeutics, 18th Edition, Single Volume, M/s Popular Prakashan, 350, Madan Mohan Marg, Tardeo, Bombay - 400 034.

## **II Semester Allied - 1 Health Care**

### **Learning Objectives**

1. To define Health and understand various concepts of Health
2. To understand concept of disease and its causation.
3. To know the Health care delivery system in India
4. To understand epidemiology of common infectious diseases of India.
5. To know various National Health Programmes of India
6. To have overview of First Aid and Bio-Medical Waste management Principles and guidelines

### **Content**

#### **Unit I**

##### **1a. Concepts of Health**

Definition of health; evolution in concepts of public health; public health events-sanitary awakening, germ theory of disease, rise of public health in various countries, changing concepts of health- biomedical concept, ecological concept, psycho-social concept and holistic concept.

##### **1b. Dimensions of Health**

Physical dimension, mental dimension, Social dimension etc;

##### **1c. Determinants of Health**

The factors which determine human health like social, economic, cultural, nutritional factors, etc. will be discussed. Common health problems in India - Communicable diseases, Non communicable diseases, MCH problems, Nutritional problems, Environmental sanitation, Glance over National Health profile.

#### **Unit II**

##### **2a. Concept of disease and causation.**

Germ theory of disease, Epidemiological triad, Natural History of disease, concept of prevention. Definition of Epidemiology.

##### **2b. Epidemiology of common infectious diseases**

Brief epidemiology of Tuberculosis, Malaria, Dengue, HIV, Leprosy

#### **Unit III**

##### **3a. Evolution of health care delivery systems**

History of health care delivery services; Genesis of primary health care; National health policy; SDGs.

##### **3b. Levels of health care**

Primary health care, secondary health care, tertiary health care.

Primary health care-principles of primary health care, elements of primary health care.

#### **Unit IV**

##### **4a. Primary health care: Delivery of services**

Introduction; Structure of health care delivery system; Delivery of primary health care services at village level; Village health guide, ASHA, ICDS: Subcentre: Primary health centre.

Primary Health care- current status in India- Status of health care infrastructure; Health

team concept.

**4b. Secondary and tertiary health care: Delivery of services**

Community Health centre; First referral unit; District hospital.

**Unit V**

**5a. National Health Programmes- Communicable diseases**

Introduction; National Vector Borne Disease Control Programme; National Leprosy Eradication Programme; National Tuberculosis Elimination Programme; National AIDS Control Programme; Universal Immunization Programme; National Rural Health Mission.

**5b. National Health Programmes- Non-communicable diseases**

National Programme for Control of Blindness; National Programme for control of Diabetes, Cardiovascular diseases, Cancer and Stroke (NPCDCS); National Mental Health Programme. Nutritional programmes.

**5c. National Health Programmes – Maternal and Child Health**

Reproductive and Child Health Programme; Integrated Management of Neonatal and Childhood Illnesses; National Nutritional Anemia Prophylaxis Programme

**Unit VI**

**6a. First aid**

Basic terminologies; general guidelines; first aid in specific situations; Wound, bleeding, fracture, choking, burns, epistaxis, strains and sprain, animal bites (classification, causes and first aid), Cardio-pulmonary resuscitation

**6b. Biomedical Waste (BMW) Management**

Sources of Bio-medical waste, principles of bio-medical waste management, step in management of BMW.

**Recommended Books Recent Editions.**

1. Park K. Park's Textbook of Preventive and Social Medicine. 26<sup>th</sup> ed. Jabalpur: Banarsidas Bhanot Publishers, 2015. p.135-141
2. Suryakantha. Textbook of Community Medicine with recent advances. 6<sup>th</sup> edition
3. Bhalwar R editor. Textbook of Public Health and Community Medicine. 2nd Pune, Department of Community medicine AFMC; 2012
4. Essentials of Community Medicine for Allied Health Sciences, JSS University Publications, 2015

## II Semester Allied -2- Psychology

**DESCRIPTION:** This course is designed to enable the students to develop understanding about basic concepts of psychology and its application in personal and professional life. It further provides students opportunity to recognize the significance and application of counselling skills.

**Objectives:** On completion of the course, the students will be able to

1. Identify the importance of psychology in individual and professional life.
2. Understand biological basis of human behaviour
3. Understand mental health and hygiene
4. Understand personality and gain experience in personality assessment
5. Understand stress and learn coping strategies
6. Learn suicide prevention and counselling skills

### Unit -I

- Meaning of Psychology
- Scope of Psychology- Scope, branches and methods of psychology
- Relationship with other subjects
- Applied psychology to solve everyday issues

### Unit -II

- **Personality** Introduction: Meaning, definition, Classification, measurement and evaluation of personality

### Unit -III

#### Biological basis of behavior –Introduction

- Body mind relationship
- Genetics and behaviour
- Inheritance of behaviour
- Brain and behaviour.
- Psychology and sensation – sensory process normal and abnormal.

### Unit-IV

#### Mental health and mental hygiene

- Concept of mental health and mental hygiene
- Characteristic of mentally healthy person
- Warning signs of poor mental health
- Promotive and preventive mental health strategies and services
- Defense mechanism and its implication
- Frustration and conflict – types of conflicts and measurements to overcome

### Unit-V

- **Intelligence** – Meaning of intelligence – Effect of heredity and environment in intelligence, classification, Introduction to measurement of intelligence tests – Mental deficiencies

- **Learning** – Definition of learning, types of learning, Factors influencing learning – Learning process, Habit formation
- **Memory**-meaning and nature of memory, factors influencing memory, methods to improve memory, forgetting

#### **Unit VI:**

##### **Stress**

- Hans Selye Model of stress. Lazarus and Folkman model of stress.
- Sources of stress. Stress, disease and health.
- Coping strategies and styles- emotion focused and problem focused
- Relaxation techniques

#### **Unit VII:**

##### **Counselling**

- Counselling-meaning and definition.
- Micro skills of counselling
- Psychotherapy- meaning and definition.
- Relaxation-types.
- Suicide and suicide prevention

#### **Recommended Books Recent Editions.**

1. C.P. Khokhar (2003) Text book of Stress Coping and Management Shalab Publishing House.
2. S.M.Kosslyn and R.S.Rosenberg (2006) Psychology in Context. Pearson Education Inc.
3. C.R. Carson, J.N. Bitcher, S.Mineka and J.M. Hooley (2007), Abnormal Psychology 13th, Pearson Education, Inc.
4. D.A. Barlow and V.M. Durand (2004) Abnormal Psychology Wadsworth, Thompson Learning, 3rd edition USA.
5. R.J . Gerrig & P.G. Zimbardo (2006) Psychology and life, Pearson Education, Inc.
6. Pestonjee, D.M. (1999). Stress & Coping, The Indian Experience 2nd edn. New Delhi, Sage India Publications.

## **Skill Enhancement Course**

### **Soft Skills**

#### **Learning objectives**

- To give each student a realistic perspective of work and work expectations
- To help formulate problem solving skills, to guide students in making appropriate and responsible decisions
- To create a desire to fulfill individual goals, and to educate students about unproductive thinking, self-defeating emotional impulses, and self- defeating behaviors

#### **Unit I**

Definition of soft skills, Soft skills and Hard Skills, Advantage of Soft Skills, Real life scenarios, Measurement of soft skills.

Self Discovery, Definition of Self, Identification of Strengths and weakness of self, Setting goals, Personal beliefs, values and ethics.

#### **Unit II**

Mindsets: Types of Mindsets, Developing a learning and Growth mindset, Developing a positive outlook towards life, Increasing emotional and Spiritual intelligence. People skills, Types of people - passive, assertive and aggressive people, Developing assertive personality, dealing with aggressive and submissive people.

#### **Unit III**

Communication Skills: Definition of Communication, Verbal and Nonverbal communication, Telephone and internet communication, Common mistakes in communication.

Interpersonal skills: Listening skills, Understanding body language, polite communication and people friendly attitude.

#### **Unit IV**

Time management: Importance of punctuality, Efficient time handling, Avoiding leakage of time and procrastination

Stress Management: Definition of Stress, Positive and negative stress. Handling major projects through effective delegation.

#### **Unit V**

Organizational behavior: Definition of an organization, Understanding the rules and regulations of an organization, Creating an ideal working Environment.

Professional attitude-Definition and developing an effective professional attitude.

Leadership Skills: Developing a positive attitude, Presentation and public speaking skills, effective handling of the team and sub ordinates. Recognizing and encouraging talents in Sub ordinates.

#### **Recommended books**

1. Barun Mitra (2016), Personality Development and Soft Skills, 2<sup>nd</sup> edition, Oxford University Press
2. Alex K (2014), Soft Skills Paperback, S Chand & Company
3. Peggy Klaus (2008) The Hard Truth About Soft Skills: Workplace Lessons Smart People Wish They'd Learned Sooner 1<sup>st</sup> edition, HarperBusiness.
4. Sanjay Kumar, Pushp Lata (2018) Communication Skills Paperback 1<sup>st</sup> edition, Oxford University Press

5. John Hayes (1994), Interpersonal Skills: Goal Directed Behavior at Work, Routledge.
6. Gurdeep Singh Gujral (2013) Leadership Qualities for Effective Leaders, VIJ Books (India) Pty Ltd.

**BSc. Renal Dialysis Technology**  
**III Semester**  
**Core-7- Introduction to RDT**

**Course Outcome**

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

CO 1: Demonstrate the acquisition of comprehensive knowledge about the basics of renal system

CO 2: Demonstrate the acquisition of comprehensive knowledge about common investigations in renal disease with its interpretation.

CO 3: Demonstrate the skills to take proper history of patients with common renal diseases.

CO4: Demonstrate the acquisition of comprehensive knowledge about the common renal diseases.

**THEORY:**

**Unit I-** Applied Anatomy- Basic anatomy of urinary system- structural anatomy of kidney, bladder, ureter, urethra,  
Blood supply of kidney,  
Anatomy of vascular systems of limbs and neck.

**Unit II-** Applied Physiology

Physiological values – urea, creatinine, electrolytes, calcium, phosphorous, magnesium, glucose

Physiology of renal circulation, autoregulation

GFR and mechanism of urine formation

**Unit III-** Clinical presentation of renal disease & history taking.

**Unit IV-** Investigations in Nephrology- Urine examination, hemogram, serology, biochemical tests, radio-imaging in nephrology, renal biopsy- indications, prerequisites, complications), Investigations required before starting of dialysis.

**Practicals:**

- Case discussion - Nephrotic syndrome, nephritic syndrome, Acute renal failure, chronic renal failure
- Spotters: Normal values of various renal function tests

**Practical Examination**

**35Marks**

- Spotters
- Case Discussion

**Recommended Books Recent edition**

1. Dialysis therapy- Nissenson & Fine
2. Handbook of dialysis- Daugirdas ,Blake & Todd
3. Principles and practice of dialysis- Heinrich
4. Primer to kidney disease
5. CKD, Dialysis and transplant- A companion to Brenner & Rectors- The Kidney
6. Comprehensive Clinical nephrology -John Feehaly
7. Handbook of nutrition and kidney- Lippincott Williams & Wilkins

**III Semester**  
**Core-8-Patient care and Basic Nursing**

**Course outcome**

At the end of the course, student should be able to

CO1: Demonstrate the acquisition of comprehensive knowledge about universal precautions, Administrations of Medication and patient transports

CO2: Demonstrate the acquisition of comprehensive knowledge about bed side care and monitoring of patient.

CO3: Demonstrate the acquisition of comprehensive knowledge and skills related to firstaid Management

CO4: Demonstrate the capability of effective communication with the team members and patient.

**Theory**

**Unit I**

**Introduction, Communication and Documentation**

**06 hours**

1. Introduction to Patient Care:

- Principles of patient care
- Types of patients (gender, age, diseases, severity of illness, triage)

2. Communication & Documentation:

- Communication with doctors, colleagues and other staffs.
- Non-verbal communication, Inter-personnel relationships.
- patient contact techniques, communication with patients and their relatives

**Unit II**

**Universal Precautions and Infection Control**

**10 hours**

1. Universal Precautions and Infection Control:

- Hand washing and hygiene.
- Injuries and Personal protection, Insulation and safety procedures.
- Aseptic techniques, sterilization and disinfection.
- Disinfection and Sterilization of devices and equipment
- Central sterilization and supply department
- Biomedical Medical waste management

**Unit III**

**Medication Administration and Transport of patient**

**10 hours**

1. Medication Administration:

- Oral / Parenteral route
- Parenteral medication administration: Intra venous, intra muscular, sub- cutaneous, intra dermal routes, Intra venous Infusion
- Aerosol medication administration, Oxygen therapy
- Intravenous fluids,
- Blood and blood component transfusion

2. Position and Transport of patient:

- Patient position, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfort measures, bed making, rest and sleep.
- Lifting and transporting patients: lifting patients up in the bed, transferring from bed to wheel chair, transferring from bed to stretcher.

## **Unit IV**

### **Bedside care and monitoring – 10 hours**

#### **1. Bedside care:**

- Methods of giving nourishment: feeding, tube feeding, drips, transfusion.
- Recording of pulse, blood pressure, respiration, saturation and temperature.
- Bed side management: giving and taking bed pan, urine container.
- Care of immobile/bed ridden patients, bed sore and aspiration prevention

#### **2. Monitoring of Patient:**

- Pulse, ECG (Cardiac Monitor), Oxygen Saturation, Blood Pressure,
- Respiration
- Multi parameter monitors, Capnography and End Tidal CO<sub>2</sub> (ETCO<sub>2</sub>)
- Monitoring ventilator parameters: Respiratory Rate, Volumes, Pressures, Compliance, Resistance

## **Unit V**

### **Wound care and first aid**

**09 hours**

#### **1. Dressing and wound care:**

- Bandaging: basic turns, bandaging extremities, triangular bandages and their application.
- Suture materials and suturing techniques
- Splinting
- Basic care of patient with burns

#### **2. First Aid and Basic Life Support (BLS)**

### **Practical:**

#### **1. Demonstration of Patient care Procedures:**

- Positioning of patient, transport of the patient, Dressing and Bandaging, Care of inter costal drain tube, Insertion of naso-gastric tube and feeding
- Phlebotomy and obtaining blood samples, Arterial Blood sampling for ABG
- Injections: intra muscular, intra venous, sub cutaneous, intra dermal
- Insertion of intra venous catheter and infusion of medications, blood transfusion
- Recording of ECG and monitoring of patient
- Oxygen therapy: oxygen cannula, masks. Aerosol therapy: nebulization, inhalers
- Suctioning and care of artificial airway
- Insertion of urinary bladder catheter

#### **2. Uses, principles, advantages and disadvantages of instruments and Devices inpatient care**

#### **3. First aid and Basic Life Support (BLS)**

**Practical Examinations****(35marks)**

Spotters, Drugs, Instruments and devices - identification and usage, demonstration of patient care procedures.

**Reference Books:**

1. Principles and Practice of Nursing - Sr Nancy
2. Introduction to Critical Care Nursing - Mary Lou Sole
3. First Aid - Redcross Society Guidelines
4. Basic Life Support (BLS) - American Heart Association guideline

**III Semester**  
**Core -9- Introduction to Nephrology**

**Course Outcomes:**

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge about various abnormalities in urine.

CO 2: Demonstrate the acquisition of comprehensive knowledge about the common investigation in renal diseases with its interpretation

CO 3: Demonstrate the acquisition of comprehensive knowledge about the pathophysiology of renal diseases.

CO 4: Demonstrate the Skills to take the proper history of patients with renal diseases.

**Theory:**

Unit I: Asymptomatic urinary abnormalities-

- Hematuria- causes,
- Pyuria- causes, features and management
- Crystals and casts etc
- Urine analysis

Unit II: Hematuria- types, features and management

Unit III: Proteinuria- Causes, types, measurement and management

Unit IV: Classification of renal diseases

**PRACTICALS:**

- History taking
- General physical examination (Demonstration of pulse, BP, Temperature, Pallor, Icterus, Edema)
- Case discussion - Nephrotic syndrome, nephritic syndrome, Acute renal failure, chronic renal failure

**Practical Examination**

**35marks**

1. Case presentation
2. Case discussion- Nephrotic syndrome, nephritic syndrome, Acute renal failure, chronic renal failure

**REFERENCE BOOKS:**

1. Primer to kidney disease
2. Comprehensive Clinical nephrology -John Feehaly

### III Semester Skill Enhancement-1 Computer Application

#### Learning Objectives

1. To know various aspects of basic components of computer
2. To learn the modes of application of basic utility of the computer

#### Content

**Introduction to Computer & Operating System: Introduction to computers** – Definition, Characteristics, Generation, Applications, Classifications, Hardware, Software, Computer Arithmetic & Number System, Decimal, Binary, Octal & Hexadecimal System.

**Arithmetic Operations on Binary Numbers.** ASCII, EBCDIC, BCD codes, Fixed point & floating point representation of numbers.

**Computer Organization & Architecture** – Memory hierarchy, Primary Memory - memory unit, SRAM, DRAM, SDRAM, RDRAM, Flash memory. Secondary storage devices include Magnetic Disk, Floppy Disks, Optical Disks, Magnetic Drum

#### Input Devices, Output Devices.

**Softwares** – Introductory ideas of System Software, Application Software, Operating Systems, Translators, Interpreters, Compilers, Assemblers, and Generation of Languages.

**Operating System** : Definition, Introductory ideas of single user and multi-user operating system, Time sharing, multitasking, multiprogramming, Batch Processing, on-line processing, spooling.

**Introduction to Windows** – Windows basics, Windows Accessories, Miscellaneous Windows features, Web Features & Browsers.

**Networks:** Different types of networks and their application

**Internet and Intranet:** Similarities in Internet and Intranet, Differences in Internet and Intranet, Effective Internet use.

**Computer Viruses:** Types of computer viruses, Use of Antivirus software

**Application of Computer:** General and Health industry

**Software:** Different types based on applications. Download open-source softwares. Convert one file format into another (Pdf to Word, Word to pdf, etc.). Ways to protect the documents

### MS Office: (Theory & Practicals)

#### Word Processing

- Introduction to Microsoft Word
- Font options in Microsoft Word
- Paragraph Formatting in Microsoft Word
- Heading Styles in Microsoft Word
- Editing Options in the Home Tab

- Clipboard & Format Painter Options in Microsoft Word
- Page Insert Options in Microsoft Word
- Inserting Tables in Microsoft Word
- Insert Pictures in Microsoft Word
- Shapes, Icons & 3d Models in Microsoft Word
- SmartArt Options in Microsoft Word
- Inserting Charts in Microsoft Word
- Text Box & Drop Cap Options in Microsoft Word
- Hyperlink in Microsoft Word
- Header, Footer & Page Number Options in Microsoft Word
- Equations & Symbols in Microsoft Word
- Water Mark, Page Color & Page Border Options in Microsoft Word
- Page Setup Options in Microsoft Word -
- Table of Contents & Table of Figures in Microsoft Word
- Endnote & Footnote Options in Microsoft Word
- Mailings Tab Options in Microsoft Word

### **Microsoft PowerPoint**

- Introduction to Microsoft PowerPoint Interface
- Font & Slide Options in Microsoft PowerPoint
- Paragraph Formatting in Microsoft PowerPoint
- Drawing Tools in Microsoft PowerPoint
- Editing Options in the Home Tab
- Inserting Tables in Microsoft PowerPoint -
- Inserting Pictures in Microsoft PowerPoint
- Screenshot Option in Microsoft PowerPoint
- Inserting Photo Albums in Microsoft PowerPoint
- Inserting Icons in Microsoft PowerPoint
- Inserting 3D Models in Microsoft PowerPoint
- Inserting Smart Arts in Microsoft PowerPoint
- Inserting Charts in Microsoft PowerPoint
- Inserting Videos in Microsoft PowerPoint
- Design Tab Options in Microsoft PowerPoint
- Transitions Tab Options in Microsoft PowerPoint
- Animations Tab Options in Microsoft PowerPoint
- Slide Show Tab Options in Microsoft PowerPoint
- View Tab Options in Microsoft PowerPoint
- Built-in Presentation Templates in Microsoft PowerPoint

### **Microsoft Excel**

- Introduction to Microsoft Excel Interface
- Basic Math Functions
- AutoSum Functions

- Sum IF Function & Remove Duplicates Option
- Sum IF & Sum IFs, Count IF & Count IFs Functions
- Sub Total Function
- Arrays & Sum Product Functions
- Other Math Functions
- Absolute & Relative References
- Formatting Techniques in Excel
- Excel Data Types
- Go to & Replace Options
- Auto Fill Options
- Copy, Paste & Paste Special Options
- Conditional Formatting
- Sort & Filter
- Excel Operators
- Equations Solving in Excel
- Errors in Excel Sheet
- Logical Function IF
- Logical Function IF Error
- Logical Function (IF, Nested IF, OR)
- Logical Function AND
- VLOOKUP Function
- VLOOKUP with Data Validation
- Nested VLOOKUP
- HLOOKUP Function
- Selecting the Chart
- Charts in Excel
- Tables in Excel
- Inserting Comments
- Inserting Hyperlink
- Text Functions
- Date, Time & Reference Functions
- Text to Columns Tool
- Data Consolidation
- Goal Seek Option
- Data Table Option

**III Semester**  
**Allied-3- Environment Science and Health**

**Learning Objectives**

1. To know various Environmental factors which affect Health
2. To learn the modes of disease transmission and various control measures

**Unit I**

**1. a. Introduction to Environment and Health and Water**

Ecological definition of Health, Population perspective of relations, Health & environment perspective of relations, Environmental factors, Environmental Sanitation, Need to study environmental health, Predominant reasons for ill-health in India

**1.b.Water**

Safe and wholesome water, requirements, uses, sources; sanitary well; Hand pump; water Pollution; Purification of water; large scale & small scale; slow sand filters; rapid sand filters; Purification of Water on a small scale; Household purification, Disinfection of wells; water quality criteria & standards.

**Unit II**

**Air, Light, Noise, Radiation**

**2 a.Air**

Composition, Indices of Thermal Comfort, Air pollutants, Air Pollution - Health Effects, Environmental Effects, Green-house effect, Social & Economic Effects, Monitoring, Prevention & Control.

**2. b. Light, Noise, Radiation**

Natural and Artificial light; Properties, sources, noise pollution and its control, types, sources, biological effects and protection.

**Unit III**

**Waste and Excreta Disposal**

**3 a. Disposal of Wastes**

Solid Wastes, Health hazards, Methods of Disposal; Dumping, Controlled tipping/ sanitary landfill, Incineration, Composting.

**3 b. Excreta Disposal**

Public health importance, Health hazards, sanitation barrier, Methods of excreta disposal, unsewered areas and sewerage areas, sewage, Modern Sewage Treatment.

**Unit IV**

**Housing and Health and Medical Entomology**

**4 a. Housing and Health**

Human Settlement, Social goals of housing, Criteria for Healthful Housing by Expert Committee of the WHO, Housing standards- Environmental Hygiene Committee, Rural Housing Standards, Overcrowding, Indicators of Housing.

**4 b. Medical Entomology**

Classification of Arthropods, Routes of Disease transmission, Control measures.

**Unit V**

**Insecticides and Rodents**

**5 a. Insecticides**

Types, mechanism of action, dosage and application for control of insects.

#### **5 b. Rodents**

Rodents and its importance in disease, along with anti-rodent measures.

#### **Reference Books (latest edition)**

1. Park K. Park's Textbook of Preventive and Social Medicine. 26<sup>th</sup> ed. Jabalpur: Banarsidas Bhanot Publishers; 2015. p.135-141
2. Suryakantha. Textbook of Community Medicine with recent advances. 4th edition.
3. Bhalwar R. Textbook of Public Health and Community Medicine. 2nd edition. Pune: Department of Community Medicine AFMC, 2012
4. Essentials of Community Medicine for Allied Health Sciences, JSS University Publications, 2015.

**IV Semester**  
**Core -10 – Introduction to Clinical Nephrology**

**Course Outcomes**

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge about various symptoms in nephrology.

CO 2: Demonstrate the acquisition of comprehensive knowledge about cystic and inherited diseases of kidney

CO 3: Demonstrate the acquisition of comprehensive knowledge about electrolyte imbalances like sodium and potassium disorders

CO 4: Demonstrate the acquisition of comprehensive knowledge about nephrotic syndrome with its presentation and management

CO 5. Demonstrate the acquisition of comprehensive knowledge and skills related to dietary modifications in renal disease.

CO6: Demonstrate Priming of dialysis apparatus and/or Reuse of dialyser.

**SYLLABUS:**

**Unit I**

Fluid & Electrolytes disorders:

1. Disorders of water imbalance:  
Mechanisms of edema, causes and its management.
2. Disorders of Sodium & Potassium- Etiology, clinical presentation and management

**Unit II:**

1. Cystic diseases of kidney
2. Inherited diseases of kidney

**Unit III:**

1. Diet in AKI, CKD, Dialysis, food to be avoided in CKD

**Unit IV:**

1. Nephrotic syndrome – definition, clinical features, causes, primary & secondary, complications, management.

**Unit V**

1. Nephritic syndrome definition, clinical features, causes, primary& secondary, complications, management.

**Practicals:**

1. Priming of dialysis apparatus or Demonstration of dialyzer reuse
2. Charts / spotters: nephrotic syndrome, nephritic, AKI, CKD, BP apparatus, stethoscope, pulse oximeter, cardiac monitor, thermometer

**Practical Examination**

**35marks**

1. Spotters/Charts
2. Priming of dialysis apparatus
3. Demonstration of dialyser reuse.

**Recommended books recent edition:**

1. Dialysis therapy – Nissenson & Fine
2. Handbook of dialysis – Daugirdas, Blake & Todd
3. Principles and practice of dialysis – Heinrich
4. Primer to kidney disease
5. CKD, Dialysis and transplant – A companion to Brenner & rectors – The kidney
6. Comprehensive Clinical Nephrology – John Feehaly
7. Handbook of nutrition and kidney- Lippincott Williams & Wilkins

**IV Semester**  
**Core 11: Introduction to Clinical Nephrology - II**

**Course Outcomes**

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge about electrolyte imbalances like calcium, magnesium and phosphorous.

CO 2: Demonstrate the acquisition of comprehensive knowledge about Urinary tract infections

CO 3: Demonstrate the acquisition of comprehensive knowledge about Renal stones

CO 4. Demonstrate the acquisition of comprehensive knowledge about regulation of blood pressure with its pharmacology.

CO5: Demonstrate the acquisition of comprehensive knowledge about Rapidly progressive renal failure with its management.

CO6: Demonstrate the skills related to history taking and perform general physical examination of a patient.

**Theory:**

**Unit I** **10 hours**

1. Disorders of Calcium, Phosphorus & Magnesium- Causes, Clinical presentation and Management.
2. Acid base disorders: Basics of ABG
3. Metabolic acidosis & alkalosis: pathophysiology, etiology, clinical features and management

**Unit II** **10 hours**

1. Urinary tract infections: Definition, types of UTI, risk factors, diagnosis, treatment

**Unit III** **10 hours**

1. Renal stone diseases, composition of kidney stones, risk factors for recurrent stones, clinical presentation, prevention of recurrent stones & treatment

**Unit IV** **10 hours**

1. Hypertension – Normal BP control, definition, evaluation, primary & secondary HTN, complications, antihypertensive drugs

**Unit V** **5 hours**

1. RPRF & RPGN- definition, clinical features, causes and management

**Practicals:**

1. Priming of dialysis apparatus or Demonstration of dialyzer reuse
2. History taking
3. General physical examination (Demonstration of pulse, BP, Temperature, Pallor, Icterus, Edema)
4. Case discussion - Nephrotic syndrome, nephritic syndrome, Acute renal failure, chronic renal failure
5. Charts/spotters: nephrotic syndrome, nephritic, AKI, CKD, BP apparatus, stethoscope, pulse oximeter, cardiac monitor, thermometer

**Practical Examination**

**35marks**

1. Cases presentation with General physical examination
2. Case discussion
3. Charts/spotters

**Recommended books recent edition**

1. Dialysis therapy – Nissenson & Fine
2. Handbook of dialysis – Daugirdas, Blake & Todd
3. Principles and practice of dialysis – Heinrich
4. Primer to kidney disease
5. CKD, Dialysis and transplant – A companion to Brenner & Rector's – The kidney
6. Comprehensive Clinical Nephrology – John Feehally
7. Handbook of nutrition and kidney- Lippincott Williams & Wilkins

**IV Semester**  
**Core-12- Acute and Chronic Kidney Diseases and Nutrition**

**Course Outcomes:**

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge about acute and chronic renal diseases

CO 2: Demonstrate the acquisition of comprehensive knowledge about renal failure

CO 3: Demonstrate the acquisition of comprehensive knowledge about dietary management in renal disorder and ESRD patients

CO 4: Demonstrate the skills related to history taking and examination of renal disease patients.

**Theory:**

**Unit I:**

AKI- Definition, classification, etiology, strategies of reducing risk of AKI, complications, non dialysis management of AKI, dialytic therapy for AKI, Dialysis in ICU setting

**Unit II:**

Chronic kidney disease – definition, staging, GFR calculation, causes for CKD, steps to retard progression of CKD, complications of CKD (cardiovascular, hematologic, mineral bone disorders, dermatologic, neuropsychiatric...), evaluation of CKD, management and RRT options.

**Unit III:**

Sources and types of proteins, fats, carbohydrates and planning balanced diet

**Unit IV:**

Nutritional requirements of healthy adults, RDA, effects of renal failure on nutrient metabolism, lipid abnormalities, trace elements and vitamins

**Practicals:**

1. Priming of dialysis apparatus or Demonstration of dialyzer reuse
2. Charts / spotters: nephrotic syndrome, nephritic, AKI, CKD, BP apparatus, stethoscope, pulse oximeter, cardiac monitor, thermometer
3. History taking
4. General physical examination (Demonstration of pulse, BP, Temperature, Pallor, Icterus, Edema)
5. Case discussion - Nephrotic syndrome, nephritic syndrome, Acute renal failure, chronic renal failure

**Practical Examination**

**35marks**

1. Cases presentation with General physical examination
2. Case discussion
3. Charts/spotters

**Recommended books recent edition:**

1. Dialysis therapy – Nissenson & Fine
2. Handbook of dialysis – Daugirdas, Blake & Todd
3. Principles and practice of dialysis – Heinrich

4. Primer to kidney disease
5. CKD, Dialysis and transplant – A companion to Brenner & rectors – The kidney
6. Comprehensive Clinical Nephrology – John Feehaly
7. Handbook of nutrition and kidney- Lippincott Williams & Wilkins

**IV Semester**  
**Skill Enhancement-2**  
**Biostatistics and Research Methodology**

**Learning Objectives**

1. To have a basic knowledge of Biostatistics and its applications in medicine
2. To know various types of data presentation and data summarization in medical field
3. To have overview of data analysis and sampling techniques
4. To understand various study designs in medical field
5. To know applications of various study designs in Medical Research

**Biostatistics**

**Unit I**

Introduction and Presentation of data

Meaning , Branches of Statistics, Uses of statistics in medicine, Basic concepts, Scales of measurement, Collection of data, Presentation of data; Tabulation, Frequency Distribution, Diagrammatic and Graphical Representation of Data.

**Unit II**

Measures of central tendency and Measures of variation

Arithmetic Mean (Mean), Median, Mode, Partition values, Range, Interquartile range , Mean Deviation, Standard Deviation, Coefficient of Variation.

**Unit III**

Probability and standard distributions

Definition of some terms commonly encountered in probability, Probability distributions, Binomial distribution, Normal distribution, Divergence from normality; Skewness and kurtosis

**Unit IV**

Census and Sampling Methods

Census and sample survey, Common terms used in sampling theory, Non-probability (Non-random) Sampling Methods; Convenience sampling, Quota sampling, Snowball sampling, Judgmental sampling or Purposive sampling, Volunteer sampling, Probability (Random) Sampling methods; Simple random sampling, Systematic Sampling, Stratified Sampling, Cluster sampling, Multi-stage sampling, Sampling error, Non-sampling error.

**Unit V**

Inferential Statistics

Parameter and statistic, Estimation of parameters; Point estimation, Interval Estimation, Testing of hypothesis; Null and alternative hypotheses, Type-I and Type-II Errors.

## **Research Methodology**

### **Unit I**

Introduction to research methodology

Types of research; Quantitative vs. Qualitative, Conceptual vs. Empirical

### **Unit II**

Study Designs-Observational Studies

Epidemiological study designs; Uses of Epidemiology, Observational studies, Descriptive studies; Case reports, Case series, Analytical studies; Case control studies, Cohort studies, Cross sectional

### **Unit III**

Experimental Studies

Experimental studies (Interventional studies); Randomized control Trials (Clinical trials), Field trials, Community trials and Randomized Trials, Application of study Designs in Medical Research

### **Recommended Books Recent Editions.**

1. K.R.Sundaram, S.N.Dwivedi and V Sreenivas (2010), Medical Statistics, Principles and Methods, BI Publications Pvt Ltd, New Delhi
2. NSN Rao and NS Murthy (2008), Applied Statistics in Health Sciences, Second Edition, Jaypee Brothers Medical Publishers (P) Ltd.
3. J.V.Dixit and L.B.Suryavanshi (1996), Principles and practice of Biostatistics, First Edition, M/S Banarsidas Bhanot Publishers.
4. Getu Degu and Fasil Tessema (2005), Biostatistics, Ethiopia Public Health Training Initiative.
5. Essentials of Community Medicine for Allied Health Sciences, JSS University Publications, 20.
6. Park K. Park's Textbook of Preventive and Social Medicine. 26<sup>th</sup> ed. Jabalpur: Banarsidas Bhanot Publishers, 2015. p.135-141.
7. Suryakantha. Textbook of Community Medicine with recent Advances. 4th edition.
8. Bhalwar R. Textbook of Public Health and Community Medicine. 2nd Edition. Pune, Department of Community Medicine AFMC, 2012.
9. Leon Gordis. Epidemiology 4th Edition - Elsevier Saunders Publication.

**IV Semester**  
**Allied-4**  
**Constitution of India**

**Learning Objective:**

1. To know about the fundamental rights and duties of the Constitution.
2. To know about the sustainable development and special rights of the backward class and tribes.

**Content:**

**Unit - I**

Meaning of the term 'Constitution'. Making of the Indian Constitution 1946-1950.

**Unit - II**

The democratic institutions created by the constitution, Bicameral system of Legislature at the Centre and in the States.

**Unit - III**

Fundamental rights and duties their content and significance.

**Unit - IV**

Directive principles of States, policies the need to balance fundamental rights with directive principles.

**Unit - V**

Special rights created in the Constitution for dalits, backwards, women and children and the religious and linguistic minorities.

**Unit - VI**

Doctrine of Separation of Powers, legislative, executive and judicial and their functioning in India.

**Unit - VII**

The Election Commission and State Public Service commissions.

**Unit - VIII**

Method of amending the Constitution.

**Unit - IX**

Enforcing rights through writs.

**Unit - X**

Constitution and sustainable development in India.

**Recommended Books Recent Editions.**

1. J.C. Johari. The Constitution of India. A Politico-Legal Study. Sterling Publication, Pvt. Ltd. New Delhi.
2. J.N. Pandey. Constitution Law of India, Allahbad, Central Law Agency, 1998.
3. Granville Austin. The Indian Constitution. Corner Stone of a Nation-Oxford, New Delhi, 200

**V Semester**  
**Core-13- Hemodialysis Part I**

**Course Outcomes**

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge about basic principles of hemodialysis

CO 2: Demonstrate the acquisition of comprehensive knowledge and skills related to dialysis apparatus with dialyzers.

CO 3: Demonstrate the acquisition of comprehensive knowledge about basics of vascular access for hemodialysis

CO 4: Demonstrate the acquisition of comprehensive knowledge about hemodialysis including indications, withdrawal, RRT options and home hemodialysis

**Theory:**

**Unit I**

Treatment options of RRT, decision to start dialysis and withdrawal of dialysis, pre-dialysis patient education, choosing the RRT option, home hemodialysis

**Unit II**

Basics of hemodialysis and urea kinetic modelling. Mechanisms of solute transport, dialyzer clearance, Kt/V, Urea reduction ratio, adequacy in hemodialysis

**Unit III**

Vascular access for hemodialysis/various catheters (type, design, location of insertion and methods used, complications of CVC, maintenance of dialysis catheters)

Arterio-venous access AVF/AVG (Presurgical evaluation, advantages, complications and their management, cannulation techniques, measuring access flow, general measures to reduce infection)

**Unit IV**

HD apparatus/ Blood circuit, Dialysate circuit, monitors and alarms

Dialyzers- types/structure/membrane/clearance/High flux and low flux

**Unit V**

Product water and hemodialysis solution preparations/ contaminants in raw water, water and dialysis solution quality standards, dialysis solution composition, preparation of RO water and distribution

**Practicals**

1. Demonstrate priming of dialysis apparatus
2. Demonstrate reuse of dialyzers
3. Spotters- HD catheters, Dialyzers, AV needle, dialysis machine, PD set, Permcath, dialysis solutions, chemicals used in hemodialysis

**Practical Examinations**

**35marks**

1. Demonstrate priming of dialysis apparatus
2. Demonstrate reuse of dialyzers
3. Spotters

**Recommended books recent edition:**

1. Dialysis therapy – Nissenson & Fine
2. Handbook of dialysis – Daugirdas, Blake & Todd
3. Principles and practice of dialysis – Heinrich
4. Primer to kidney disease
5. CKD, Dialysis and transplant – A companion to Brenner & rectors – The kidney
6. Comprehensive Clinical Nephrology – John Feehaly
7. Handbook of nutrition and kidney- Lippincott Williams & Wilkins

**V Semester**  
**Core-14- Hemodialysis Part II**

**Course Outcomes:**

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge about handling and disinfection of dialysis machine

CO2: Demonstrate the acquisition of comprehensive knowledge about Dialyser handling, use, reuse and disinfection

CO3: Demonstrate the acquisition of comprehensive knowledge and skills related to functioning, infection surveillance and maintenance of dialysis water and its preparation

CO4: Demonstrate the acquisition of comprehensive knowledge about acute and chronic hemodialysis.

CO5: Demonstrate the acquisition of comprehensive knowledge about complication during hemodialysis

CO6: Demonstrate the acquisition of comprehensive knowledge about various anticoagulants used in hemodialysis, CRRT and various regimes for anticoagulation.

CO7: Demonstrate the skills related to assisting in insertion of central line, PD Catheter and renal biopsy.

**Theory:**

**Unit I**

Disinfection of HD machines and maintenance of RO plant- Chemicals used and technique of disinfection, advantages

**Unit II**

Dialyzer reuse- definition, methods, advantages and disadvantages of reuse

**Unit III**

Hemodialysis for acute renal failure- indications, vascular access, HD prescription, common problems encountered, dialysis for critically ill patients

**Unit IV**

Chronic hemodialysis- indications, residual renal function, clearance targets and adequacy, chronic HD prescription, dry weight, complications, access recirculation and dialysis disequilibrium

**Unit V**

Anticoagulation- factors influencing clotting of extracorporeal circuit, signs of circuit clotting, drugs used in anticoagulation, various protocols, monitoring of anticoagulation and regional anticoagulation

**Practicals:**

1. Setting up dialysis machine for dialysis
2. AVF/AVG Cannulation
3. Packing and sterilization of dialysis trays
4. Preparation of concentrates
5. First assistant in central line insertions, PD catheter insertion and renal biopsy

6. Priming of dialysis apparatus
7. Reuse of dialyser

**Practical Examinations**

**35marks**

1. Setting up dialysis machine for dialysis
2. AVF/AVG Cannulation
3. Packing and sterilization of dialysis trays
4. Preparation of concentrates
5. First assistant in central line insertions, PD catheter insertion and renal biopsy
6. Priming of dialysis apparatus
7. Reuse of dialyser

**Recommended books recent edition:**

1. Dialysis therapy – Nissenson & Fine
2. Handbook of dialysis – Daugirdas, Blake & Todd
3. Principles and practice of dialysis – Heinrich
4. Primer to kidney disease
5. CKD, Dialysis and transplant – A companion to Brenner & rectors – The kidney
6. Comprehensive Clinical Nephrology – John Feehaly
7. Handbook of nutrition and kidney- Lippincott Williams & Wilkins

**V Semester**  
**Core-15- Hemodialysis Part III**

**Course Outcome**

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge of complications of hemodialysis with its management/

CO 2: Demonstrate the acquisition of comprehensive knowledge about renal anemia with its management.

CO 3: Demonstrate the acquisition of comprehensive knowledge and skills about various CRRT modalities with its indications and advantages.

CO 4: Demonstrate the acquisition of comprehensive knowledge about CRRT dosing, replacement fluids and anticoagulation techniques in CRRT.

CO 5: Demonstrate the acquisition of comprehensive knowledge about SLED

CO 6: Demonstrate the acquisition of comprehensive knowledge about plasmapheresis.

**Theory**

**Unit I**

Complications of HD – Hypotension (causes and management), headaches, chest pains, back pain, leg cramps, dialyzer reactions, itching, nausea, dialysis disequilibrium (etiology and management), seizures, cardiac arrhythmias, air embolism.

**Unit II**

Renal anemia and its management – etiology, symptoms, treatment, indications for ESA and target Hb levels, dosing of erythropoietin and its side effects

**Unit III**

Hemofiltration/Hemodiafiltration/SCUF

**Unit IV**

SLED/SLED-f: advantages of SLED, protocols, anticoagulation

CRRT- machines and tubing's, schematic descriptions of circuit, advantages and disadvantages, indications of CRRT, anticoagulation, replacement fluids (dose, Pre Vs Post filter)

**Unit V**

Plasmapheresis- rationale, methods of plasma separation, indications, common renal diseases for which used, protocols, complications, anticoagulation for PP.

**Practicals:**

1. Setting up dialysis machine for dialysis
2. AVF/AVG Cannulation
3. Packing and sterilization of dialysis trays
4. Preparation of concentrates
5. First assistant in central line insertions, PD catheter insertion and renal biopsy
6. Priming of dialysis apparatus
7. Reuse of dialyser

**Practical Examinations**

**35marks**

1. Setting up dialysis machine for dialysis

2. AVF/AVG Cannulation
3. Packing and sterilization of dialysis trays
4. Preparation of concentrates
5. First assistant in central line insertions, PD catheter insertion and renal biopsy
6. Priming of dialysis apparatus
7. Reuse of dialyser

**Recommended books recent edition**

1. Dialysis therapy – Nissenson & Fine
2. Handbook of dialysis – Daugirdas, Blake & Todd
3. Principles and practice of dialysis – Heinrich
4. Primer to kidney disease
5. CKD, Dialysis and transplant – A companion to Brenner & rectors – The kidney
6. Comprehensive Clinical Nephrology – John Feehaly
7. Handbook of nutrition and kidney- Lippincott Williams & Wilkins

**V Semester**  
**Elective-1- Hands on training in Continuous ambulatory**  
**peritoneal dialysis**

**Objective:**

To learn about the basics of Continuous ambulatory peritoneal dialysis

**Content:**

1. Setting up Acute PD- catheter insertion, connections , performing and monitoring of PD
2. Setting up CAPD, performing and monitoring of CAPD, seeing CAPD catheter insertion.
3. Technical aspects of APD machine and performing and monitoring of APD
4. Introduction to PD solutions
5. Performing PET test

**V Semester**  
**Allied - 5 - Medical Ethics**

**Learning Objectives:**

1. To know about the basics and importance of ethics in the profession

**Content:**

**General Considerations of Medical Ethics**

1. Medical Ethics - Introduction
2. Three Core Contents in Medical Ethics - Best Interest, Autonomy, Unrights
3. Doctors, Patient & Profession

**Special Considerations of Medical Ethics**

1. Consent
2. Confidentiality
3. Genetics
4. Reproductive Medicine
5. Mental Health
6. End of life and Organ Transplantation
7. Research & Clinical Trials

**Recommended Books Recent Editions.**

1. Medical Ethics & Law, The Core Curriculum
2. Author - Tony Hope Atla
3. Reference book No. 16715 Center Library

**VI Semester**  
**Core 16 - Peritoneal Dialysis**

**Course Outcomes**

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge about basics of Peritoneum.

CO 2: Demonstrate the acquisition of comprehensive knowledge and skills related to Peritoneal dialysis including apparatus and solutions.

CO 3: Demonstrate the acquisition of comprehensive knowledge about ambulatory peritoneal dialysis with its complications.

**Theory**

**Unit I**

Functional anatomy of peritoneum, models of peritoneal transport, physiology of peritoneal transport, PET test, peritoneal clearance and clearance targets

**Unit II**

Apparatus for PD, Peritoneal dialysis solutions, PD catheter designs and placement, catheter break-in procedures, complications of PD catheters (leak, outflow failure, catheter related infections and hernias)

**Unit III**

Common APD and CAPD prescriptions, advantages of cyclers, Hybrid forms of PD, How to improve peritoneal Kt/V, Nutrition in CAPD

**Unit IV**

Causes of fluid overload in CAPD, Ultrafiltration failure, preserving residual renal functions, Peritonitis and exit site infections- potential routes of infections, diagnosis, common organisms, drugs used and drug delivery methods.

**Unit V**

Mechanical complications (hernias, abdominal wall edema, hydrothorax), metabolic complications (glucotoxicity, lipid abnormalities, electrolyte abnormalities, protein loss)

**Practicals:**

1. Setting up dialysis machine for dialysis
2. AVF/AVG Cannulation
3. Packing and sterilization of dialysis trays
4. Preparation of concentrates
5. First assistant in central line insertions, PD catheter insertion and renal biopsy
6. Performance of PD exchanges
7. Setting up of APD machine
8. Priming of dialysis apparatus
9. Reuse of dialyser

**Practical Examinations**

**35marks**

1. Setting up dialysis machine for dialysis
2. AVF/AVG Cannulation
3. Packing and sterilization of dialysis trays

4. Preparation of concentrates
5. First assistant in central line insertions, PD catheter insertion and renal biopsy
6. Performance of PD exchanges
7. Setting up of APD machine
8. Priming of dialysis apparatus
9. Reuse of dialyser

**Recommended books recent edition:**

1. Dialysis therapy – Nissenson & Fine
2. Handbook of dialysis – Daugirdas, Blake & Todd
3. Principles and practice of dialysis – Heinrich
4. Primer to kidney disease
5. CKD, Dialysis and transplant – A companion to Brenner & rectors – The kidney
6. Comprehensive Clinical Nephrology – John Feehaly
7. Handbook of nutrition and kidney- Lippincott Williams & Wilkins

**VI Semester**  
**Core -17- Dialysis in Special situations**

**Course Outcomes:**

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge and skills related to HD/HP in cases of poisoning.

CO 2: Demonstrate the acquisition of comprehensive knowledge and skills about choice of dialysis modalities in children with their vascular access.

CO 3: Demonstrate the acquisition of comprehensive knowledge and skills related to AKI and dialysis in pregnancy.

CO 4: Demonstrate the acquisition of comprehensive knowledge and skills related to dialysis in patients with HIV/HBsAg/HCV infections.

CO 5: Demonstrate the acquisition of comprehensive knowledge and skills related to universal precautions and infection control practices in dialysis unit.

CO 6: Demonstrate the acquisition of comprehensive knowledge about dialysis in patients with congestive heart failure.

**Theory**

**Unit I**

Use of Hemoperfusion and dialysis for poisoning case- common indications for HP/HD, drugs which can be removed (acetaminophen, salicylates, digoxin, barbiturates, toxic alcohols, lithium, anticonvulsants)

**Unit II**

Dialysis in children- choice between PD/HD, Problems with vascular access, HD prescription in children, Nutrition and growth-related issues

**Unit III**

Dialysis in Pregnancy- causes for AKI in pregnancy, dialysis regimen during pregnancy, Indications for dialysis in pregnancy

**Unit IV**

Dialysis in HIV/HBsAg/HCV positive patients – Guidelines, Infection control practices in HD units, Dedicated machines, Vaccinations for dialysis patients

**Unit V**

Dialysis in patients with congestive cardiac failure- special precautions

**Practicals**

1. Starting / termination of dialysis
2. AV cannulation
3. Initiating dialysis through central lines
4. Packing of dialysis trays
5. Preparations of concentrates for dialysis purpose
6. CPR demonstration
7. Performing isolated ultrafiltration

**Practical Examinations****35marks**

1. Starting / termination of dialysis
2. AV cannulation
3. Initiating dialysis through central lines
4. Packing of dialysis trays
5. Preparations of concentrates for dialysis purpose
6. CPR demonstration
7. Performing isolated ultrafiltration

**Recommended books recent edition:**

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2. Handbook of dialysis – Daugirdas, Blake & Todd
3. Principles and practice of dialysis – Heinrich
4. Primer to kidney disease
5. CKD, Dialysis and transplant – A companion to Brenner & rectors – The kidney
6. Comprehensive Clinical Nephrology – John Feehaly
7. Handbook of nutrition and kidney- Lippincott Williams & Wilkins

**VI Semester**  
**Core-18 – Recent advances in Dialysis technology**

**Course outcomes:**

At the end of the course student should be able to

CO1: Demonstrate the acquisition of knowledge about various extracorporeal therapies used in advanced liver disease

CO2: Demonstrate the acquisition of knowledge and skills about nocturnal hemodialysis

CO3: Demonstrate the acquisition of knowledge and skills about newer PD solutions.

CO4: Demonstrate the acquisition of knowledge about home hemodialysis

CO5: Demonstrate the capability of usefulness of telemedicine in dialysis.

**Theory**

**Unit I**

Extracorporeal therapies in advanced Liver diseases- MARS dialysis and other related procedures

**Unit II- Recent advances in Hemodialysis**

Nocturnal dialysis/ Daily dialysis- advantages

Online Dialysis

**Unit III**

Newer Peritoneal dialysis solutions- advantages and disadvantages

**Unit IV**

Home hemodialysis, Telemedicine in Dialysis

**Unit V- Special problems in dialysis patients**

Psychology and rehabilitation, Diabetes, Hypertension, Infections, Bone diseases

**Practicals:**

1. Starting / termination of dialysis
2. AV cannulation
3. Initiating dialysis through central lines
4. Packing of dialysis trays
5. Preparations of concentrates for dialysis purpose
6. CPR demonstration
7. Performing isolated ultrafiltration

**Practical examinations**

**35 marks**

1. Starting / termination of dialysis
2. AV cannulation
3. Initiating dialysis through central lines
4. Packing of dialysis trays
5. Preparations of concentrates for dialysis purpose
6. CPR demonstration
7. Performing isolated ultrafiltration

**Recommended books recent edition:**

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2. Handbook of dialysis – Daugirdas, Blake & Todd
3. Principles and practice of dialysis – Heinrich
4. Primer to kidney disease
5. CKD, Dialysis and transplant – A companion to Brenner & rectors – The kidney
6. Comprehensive Clinical Nephrology – John Feehaly
7. Handbook of nutrition and kidney- Lippincott Williams & Wilkins

**VI Semester**  
**Elective-2 Renal Transplantation**

**Objective:** To learn about the basics of renal transplantation.

1. Options for patient with ESRD, basics in transplant immunology, donor selection, recipient evaluation
2. Science of deceased donor and living donor renal transplant- ischemia times and its impact on kidney function, brief introduction to immunosuppression used in transplant.
3. Problems encountered in transplant recipient- rejection, infection, drug toxicity, dyslipidemias, diabetes, cosmetic changes, impaired graft function.
4. Monitoring of patient on the waiting list for transplant.
5. Watching transplant inside the operation theatre

**Books recommended**

1. Dialysis therapy- Nissenson & Fine
2. Handbook of dialysis- Daugirdas, Blake & Todd
3. Principles and practice of dialysis- Heinrich
4. Primer to kidney disease
5. CKD, Dialysis and transplant- A companion to Brenner & Rectors- The Kidney
6. Comprehensive Clinical nephrology -John Feehaly
7. Handbook of nutrition and kidney- Lippincott Williams & Wilkins
8. Handbook of kidney transplantation- Gabriel Danovitch

**VI Semester**  
**Allied - 6 - Hospital Management**

**Learning objective**

- To know about the various quality concepts
- To learn about the Hospital information system, inventory control, equipment operations management and biomedical waste management.

**Content**

1. Quality Concepts: Definition of Quality, Dimensions of Quality, Basic concepts of Total Quality Management, Quality Awards. Accreditations for hospitals: Understanding the process of getting started on the road to accreditation, National and International Accreditation bodies, overview of standards- ISO (9000 & 14000 environmental standards), NABH, NABL, JCI, JACHO.
2. Hospital Information System: Hospital Information System Management and software applications in registration, billing, investigations, reporting, ward management and bed distribution, medical records management, materials management and inventory control, pharmacy management, dietary services, management, information processing. Security and ethical challenges.
3. Inventory Control: Concept, various costs of inventory, Inventory techniques-ABC, SDE / VED Analysis, EOQ models. Storage: Importance and functions of storage. Location and layout of stores. Management of receipts and issue of materials from stores, Warehousing costs, Stock verification.
4. Equipment Operations management: Hospital equipment repair and maintenance, types of maintenance, job orders, equipment maintenance log books, AMCS, outsourcing of maintenance services, quality and reliability, concept of failure, equipment history and documents, replacement policy, calibration tests, spare parts stocking techniques and policies
5. Biomedical Waste Management: Meaning, Categories of Biomedical Wastes, Colour code practices, Segregation, Treatment of biomedical waste - Incineration and its importance. Standards for waste autoclaving, Microwaving. Packaging, Transportation & Disposal of Biomedical wastes.