

**JSS Academy of Higher Education & Research**

( Deemed to be University )

Re-Accredited "A+" Grade by NAAC

Sri Shivarathreeshwara Nagara Mysuru - 570015, Karnataka

Faculty of Biomedical Science

# Regulation & Syllabus

B.Sc. CARDIAC CARE TECHNOLOGY  
2023

**BSc**



# REGULATIONS AND CURRICULUM

B.Sc. Cardiac Care technology

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Sri Shivarathreeshwara Nagara, Mysuru - 570015, Karnataka



**REGULATIONS**  
**B.Sc. Cardiac Care 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)

**2. 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.

### 3. Duration of the course

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

### 4. Medium of instruction

The medium of instruction and examination shall be in English.

### 5. 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.

### 6. 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.

### 7. 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
Total Credits	20								

**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
Total Credits	20								

**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	Basics of medical disorder	45	3	15	1	90	3	150	7
Core - 8	Patient care & Basic Nursing	45	3	15	1	90	3	150	7
Core - 9	Introduction to Cardiology	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
Total Credits	25								

**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	Basic Cardiac Evaluation, Non Invasive Cardiology	45	3	15	1	90	3	150	7
Core - 11	Clinical Cardiology & Cardiac Pharmacology	45	3	15	1	90	3	150	7
Core - 12	Invasive Cardiology	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	Cardiac Evaluation and Therapies Part I	45	3	15	1	90	3	150	7
Core - 14	Cardiac Evaluation and Therapies Part II	45	3	15	1	90	3	150	7
Core - 15	Cardiac Evaluation and Therapies 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	Non Invasive Cardiac care technology	45	3	15	1	90	3	150	7
Core - 17	Invasive cardiac care technology-Applied	45	3	15	1	90	3	150	7
Core - 18	Basic Intensive Care	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
Fifth Semester	
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
Sixth Semester	
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, Emergency Medicine Technology, Anaesthesia and OT Technology, Cardiac Care Technology	VI	Emergency medicine

## 8. 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.

## 9. 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	Basics of medical disorder	40	60	-	100	15	35	-	50
Core - 8	Patient care & Basic Nursing	40	60	-	100	15	35	-	50
Core - 9	Introduction to Cardiology	40	60	-	100	15	35	-	50
Skill Enhancement-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	Basic Cardiac Evaluation, Non Invasive Cardiology	40	60	-	100	15	35	-	50
Core - 11	Clinical Cardiology & Cardiac Pharmacology	40	60	-	100	15	35	-	50
Core - 12	Cardiac Invasive Cardiology	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	Cardiac Evaluation and Therapies Part I	40	60	-	100	15	35	-	50
Core - 14	Cardiac Evaluation and Therapies Part II	40	60	-	100	15	35	-	50
Core - 15	Cardiac Evaluation and Therapies 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	Non Invasive Cardiac care technology	40	60	-	100	15	35	-	50
Core - 17	Invasive cardiac care technology- Applied	40	60	-	100	15	35	-	50
Core - 18	Basic Intensive Care	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

- Short Essay: 04 questions out of 06 = 04x05=20
- Short Answer: 10 questions = 10x03=30
- 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

### **10. 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.

### **11. 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.

### **12. Grading of performances**

- 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.

- 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:

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

- 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, ....

### **13. 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

### **14. 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.

### **15. 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.

### **16. 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.

### **17. 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.

### **18. 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.

### **19. 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. Cardiac Care Technology**

### **Program outcomes**

At the end the program the cardiac care technology student should be able to

PO1: Demonstrate comprehensive knowledge and skills in basic sciences to assist the cardiac care team.

PO2: Demonstrate the acquisition of comprehensive knowledge and skills related to electrical properties of heart

PO3: Demonstrate the capability to use advanced life support equipment.

PO4: Demonstrate the capability to use the various investigative and therapeutic approaches of cardiac patients.

PO5: Communicate effectively with patients, peers, and doctors.

PO6: Ability to develop a strong ethical basis in dealing with human life.

PO7: Ability to evaluate the patient with proper history and documenting the same.

PO8: Analyze and evaluate a problem in a multidisciplinary team approach.

PO9: 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 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> 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****30hrs**

- Demonstration of parts of microscope and its uses
- Demonstration of skeleton and joint
- Demonstration of deltoid and gluteus maximus, Cubital fossa
- 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
- Demonstration of location and parts of lungs, histology of trachea and lungs
- Demonstration of location of stomach, small and large intestines. Location and features of pancreas, liver and gall bladder
- Demonstration of location and features of kidney, ureter, urinary bladder and urethra. Histology of urinary system except urethra
- Demonstration of location of male and female reproductive organs
- Demonstration of brain and spinal cord
- Histology of cornea and retina

**Practical Examination : 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 . - 15 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. AryaPubliction.
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 related to Biomedical importance of macromolecules and micromolecules

CO 3: Demonstrate acquisition of comprehensive knowledge of the enzymes

CO 4: Demonstrate acquisition of comprehensive knowledge and skills related to 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-1English**

**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

- Find the section of the dictionary with first letter of your word.
- Read the guide words.
- Scan down the page for your word.
- 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

##### 1. 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.

##### 2. 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

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

### Unit V

#### The study of Various forms of Composition

- a) Paragraph  
Exercises for students on short paragraph topics.
- b) Essay  
How to Write an Essay  
The writing of an essay has three stages :
  1. Essay writing
  2. Close reading
  3. Research
- c) Letter  
Mechanics of writing formal and business letters. Exercises on writing letters for students.
- d) Summary  
Writing reports: project report, magazine article and reporting in newspaper on sporting events.
- e) Practice In Writing  
Exercises and assignments on report writing for students

## **Unit VI**

### **Verbal Communication**

- Discussions And Summarization Tips on taking minutes of a meetingWhy 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.

c) **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.

d) **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.

- Quotation Marks
- Periods
- Question Marks
- Commas
- Capitalization and Paragraphs
- 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 ಶುಶ್ರೂಷಣೆಗೆ 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 )**

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

**Unit: II General Perspective of Yoga** **(3 hours)**

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

**Unit: III Introduction to Yoga practises** **(10 hours)**

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

**REFERENCE:**

1. Lal Basant Kumar: Contemporary Indian Philosophy, Motilal Banarsidas Publishers Pvt. Ltd, Delhi, 2013
3. Dasgupta S. N: History of Indian Philosophy, Motilal Banarsidas, Delhi, 2012
4. Singh S. P: History of Yoga, PHISPC, Centre for Studies in Civilization Ist, 2010
5. Singh S. P & Yogi Mukesh: Foundation of Yoga, Standard Publication, New Delhi, 2010
6. G.C pande, Histroy of science, philosophy, and culture of Indian Civilization Vol.VII part 10 Centre for Studies in Civilisations.
7. 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)**

- 1.1 Hands stretch breathing , Hand In & out breathing.
- 1.2 Sukshma Vyayama: All Joints Rotation: Fingers, Wrist, Elbows, Shoulder rotation, Neck Flexion/ Extension, Neck rotation, knee movements & ankle joint movements
- 1.3 Hip rotation, extension and all possible movements.
- 1.4 Stretching: Forward, Backward & Sideward bending & Situps.

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

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

### **Reference:**

- Asana by Swami Kuvalyananda Kaivalyadhama, Lonavla.
- Asana, Pranayama, Bandha, Mudra by Swami Satyananda Saraswati Bihar School of Yoga.
- Light on Yoga, by B.K.S Iyengar, Harper Collins Publishers.
- 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. Atherosclerosis-definition, risk factors, pathogenesis, morphology and complications
2. Ischemic heart disease: Myocardial infarction- definition, pathogenesis, morphology and complications
3. Hypertension- Benign and malignant hypertension: pathogenesis, pathology and complications
4. Heart failure-Right and left heart failure: causes, pathophysiology and morphology
5. Rheumatic heart disease and infectious endocarditis- definition, etiopathogenesis, morphology and complications
6. Congenital heart disease- Types and atrial septal defect; aneurysms- types and morphology; cardiomyopathies in brief

### **UNIT V**

**10 hrs**

1. Atelectasis - types, Adult respiratory distress syndrome - causes, pathogenesis and morphology; pulmonary edema- classification, causes and morphology
2. Chronic obstructive pulmonary disease- Chronic bronchitis, emphysema, asthma, bronchiectasis: Definition, etiopathogenesis and morphology
3. Restrictive pulmonary diseases- Definition, categories, pathogenesis and morphology
4. Pneumoconiosis-types, asbestosis, coal workers pneumoconiosis - etiopathogenesis and morphology
5. Pulmonary embolism, infarction, pulmonary hypertension-Definition, etiopathogenesis and morphology
6. Pneumonia-Classification of pneumonias; Lobar pneumonia and bronchopneumonia - etiology, pathology and complications
7. Pericardial and pleural effusions- causes and microscopy
8. Clinical manifestations of renal diseases.

**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, glassware's for hematology, pipettes and equipment's 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
12. 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- benedict's test, ketone bodies- Rothera's test, bile pigments- Fouchet method, bile salt- hays method, blood- benzidine test, urobilinogen and porphobilinogen- Ehrlich aldehyde and Schwartz test, Bence jones protein, microscopy.
13. Blood grouping and Rh typing
14. Charts
15. Specimens
  - Atherosclerosis
  - Pneumonia
  - Tuberculosis
  - Infarct - lung
  - Contracted kidney
  - Hydronephrosis
  - Left ventricular hypertrophy
  - Bronchiectasis

**Practical Examination: 35 marks.**

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

**Recommended Books Recent Editions.**

1. Basic Pathology Robbins Saunders, an imprint of Elsevier Inc., Philadelphia, USA.
2. Text book of Pathology Harsha Mmohan Jaypee Brothers, New Delhi.
3. Practical Pathology P. Chakraborty, Gargi Chakarborty 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 staining techniques, 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 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 -
2. Advantages (1 Mark), Disadvantages (1 Mark) Examples (1 Mark )  
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. Butcher, 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. Cardiac Care Technology**  
**III Semester**

**Core-7- Basics of Medical Disorders**

**Course outcome:**

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

CO1: Demonstrate the acquisition of comprehensive knowledge about common medical disorders

CO2: Demonstrate the acquisition of comprehensive knowledge about therapeutic options of common medical disorders

CO3: Demonstrate the capability of analysing the basic investigations

CO4: Demonstrate the capability of effective communication in eliciting the history.

**Theory:**

**Unit I**

**Cardiac and Respiratory diseases**

**10 hours**

1. Cardi vascular diseases
  - Hypertension, Ischemic heart diseases, Myocardial Infarction, arrhythmias
  - Heart failure, shock - types, causes
2. Respiratory diseases
  - Pneumonia, tuberculosis,
  - Chronic obstructive pulmonary disease, asthma
  - Pleural effusion, pneumothorax
  - Interstitial lung disease

**Unit II**

**Neurological, Renal, GI and infectious diseases**

**10 hours**

3. Neurological diseases
  - Polio myelitis, Gullian Barre Syndrome, Myasthenia Gravis, epilepsy / seizure disorder, cerebro vascular accident / stroke
4. Renal Diseases
  - Acute kidney injury
  - Chronic Kidney Disease
5. Gastro intestinal and Liver Diseases
  - Gastritis / APD, peptic ulcer
  - Acute gastroenteritis
  - Hepatitis, Hepatic failure, alcoholic liver disease
6. Infectious diseases: Dengue, malaria, leptospirosis

**Unit III**

**Blood, fluid, electrolyte and acid base abnormalities**

**10 hours**

7. Blood loss and Anemia, thrombocytopenia
8. Fluid Electrolyte imbalance and corrective methods
9. Acid Base abnormalities and corrective methods

## **Unit IV**

### **Pulmonary Oedema, Sepsis and MODS**

**hours05**

10. Pulmonary Oedema, Acute Lung Injury and Acute Respiratory Distress Syndrome
11. Sepsis, multi-organ failure, Multi-organ dysfunction syndrome

## **Unit V**

### **Health problems in Specific conditions and Toxicology**

**10 hours**

12. Health problems in specific conditions
  - Pregnancy - antenatal care, disorders in pregnancy
  - Children and new born
  - Obesity
  - Diabetes mellitus
  - HIV infections and AIDS
  - Elderly subjects and disability
  - Brief mention about endocrine disorders
13. Poisoning and drug over dosing
  - Classification of poisons
  - Principles of treatment of poisoning and Primary care
  - Poisons and drug over dosing requiring ventilation
14. Miscellaneous
  - Drowning
  - Hanging

### **Practical**

- History Taking and clinical examination, monitoring of patient.
- Therapeutic options for various diseases and conditions

### **Practical Examination: 35 marks**

1. Spotters Drugs, Instruments and devices
2. X rays, Basic Blood investigation reports
3. Case Discussion
4. Demonstration of Procedures

### **Reference Books:**

1. Davidson's Principles and Practice of Medicine - Elsevier Publications
2. Harrison's Principle of Internal Med

**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**

3. 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**

4. 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

**5. 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**

**6. 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

**7. 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**

**8. 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

**9. 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 Cardiology**

**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 cardiovascular anatomy and physiology

CO 2: Demonstrate the acquisition of comprehensive knowledge and skills related to electrical activity of the heart

CO 3: Demonstrate the acquisition of comprehensive knowledge and skills related to echocardiography

CO 4: Demonstrate the acquisition of comprehensive knowledge about the cathlab organization, equipment's and radiation safety measures

CO 5: Demonstrate the capability to identify the basic coronary angiographic views

**THEORY:**

**UNIT I - APPLIED ANATOMY AND PHYSIOLOGY**

**CARDIAC ANATOMY**

**6 Hours**

- Gross anatomy, Structure and Position of the heart
- Internal anatomy of the heart
- Chest topography and Surface anatomy of the heart
- Chamber, Great vessels and valves
- Pericardium
- Circulation - Systemic, Pulmonary, Coronary and Fetal

**CARDIAC PHYSIOLOGY**

**5 Hours**

- Hemodynamics
- Conduction System of the Heart
- Cardiac action potential
- Cardiac Cycle
- Heart Sounds
- Primary Principle of Circulation
- Arterial Blood Pressure
- Cardiac Output - Factors That Affect Stroke Volume
- Factors That Affect Heart Rate

**UNIT II: BASICS OF ELECTROCARDIOGRAPHY**

**6 Hours**

- Introduction to ECG
- Lead positioning and ECG recording
- Leads - limb leads, augmented leads and precordial leads
- Rhythm
- Electrical axis and axis deviation
- Calculation of heart rate
- Waves - P, QRS, T, U

- Osborne wave, Delta wave and Epsilon wave.
- Intervals & Segments
- Understanding the Normal ECG
- ECG reporting

### **UNIT III : BASICS OF ECHOCARDIOGRAPHY**

#### **Part 1: ULTRASOUND**

**4 Hours**

- Ultrasound waves
- Transducers, Piezoelectric Crystal
- Types of Transducers, Beam Shape and Focusing, Resolution
- Ultrasound imaging modalities: M-Mode, Two-Dimensional Echocardiography
- Image Production, Instrument Settings and Imaging Artifacts

#### **Part 2: DOPPLER**

**6 hours**

- Principles of Doppler
- Doppler Velocity Data
- Doppler Equation Spectral Analysis Continuous-Wave Doppler Ultrasound
- Pulsed Doppler Ultrasound Doppler Velocity Instrument Controls
- Doppler Velocity Data Artifacts
- Color Doppler Flow Imaging
- Color Doppler Instrument Controls
- Color Doppler Imaging Artifacts
- Tissue Doppler
- Doppler Measurement

### **PART 3: NORMAL ANATOMY AND FLOW PATTERNS ON TRANSTHORACIC ECHOCARDIOGRAPHY**

**6 hours**

#### **BASIC IMAGING PRINCIPLES**

- Tomographic Imaging
- Nomenclature of Standard Views
- Image Orientation
- Examination Technique Technical Quality Echocardiographic Image Interpretation

#### **TRANSTHORACIC TOMOGRAPHIC VIEWS**

- Parasternal Window - Long-Axis views, RV Inflow and Outflow view and Short-Axis Views
- Apical Window - Four-Chamber View, Two-Chamber View, Three-Chamber View
- Subcostal Window
- Suprasternal Notch Window
- Other Acoustic Windows

#### **M-MODE RECORDINGS**

- Aortic Valve and Left Atrium
- Mitral Valve Left Ventricle
- Other M-Mode Recordings

#### **UNIT IV: BASICS OF CARDIAC CATHETERIZATION**

**12 hours**

1. Introduction and purposes of the Cath-Lab.
2. Organization of cath lab services
3. Radiation safety and protocols.
4. Management of patients in the Cath – Lab
5. Coronary angiographic views
6. Prerequisites of cath lab procedures: CBC, RFT, Serology, ECG, Echo and Pre-procedure check lists
7. Maintaining sterility, PPE - Personnel protective equipment.
8. Introduction to Hardware used in the Cardiac cathlab
9. Contrast media

#### **PRACTICALS:**

1. Demonstration of Normal ECG, waves, segments and intervals
2. Demonstration of cathlab biomedical equipments, PPEs, radiation safety, equipments, catheters and guidewires
3. Demonstration of coronary angiographic views

#### **PRACTICAL EXAMINATION: 35 MARKS:**

1. Spotters 20 Marks
2. Viva 15 Marks

#### **REFERENCE BOOKS (LATEST EDITION)**

1. Braunwald's Text book of Cardiology
2. Text book of Electrocardiography – Goldberger's
3. IAE Text book of Echocardiography
4. Comprehensive Text book of Echocardiography-Navin C Nanda
5. The Interventional Cardiac Catheterization –Morton J Kern
6. A Text of Cardiac Catheterization & Interventions - W. Grossman &Baim's



### 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 – Basic Cardiac Evaluation-Non Invasive Cardiology**

**Course Outcomes:**

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge and skills to counsel patients before cardiac investigative procedures.

CO 2: Demonstrate the capability to perform various cardiac investigative procedures with its endpoints.

CO 3: Demonstrate the capability to analyse and evaluate ECHO findings

CO 4: Demonstrate the acquisition of comprehensive knowledge and skills about variations in cardiac rhythm.

CO 5: Demonstrate the capability to maintain patient's registries.

**Theory:**

**UNIT I: ECHOCARDIOGRAPHY**

**25 Hours**

**Left ventricular systolic function assessment**

- Qualitative Evaluation of Systolic Function
- Quantitative Evaluation of Systolic Function
- Linear Dimensions - Left Ventricular Geometry and Mass
- 2D Ventricular Volumes
- Limitations and Alternate Approaches
- Endocardial Definition, Geometric Assumptions, Accuracy and Reproducibility
- Doppler evaluation of left ventricular systolic function
- Limitations

**Left ventricular diastolic function assessment**

- Anatomic parameters - Left Ventricular Changes, Left Atrial Volume and Function
- Doppler evaluation of LV filling
- Tissue Doppler myocardial imaging
- Left atrial filling
- Other approaches-
- Isovolumic Relaxation Time, Rate of Left Ventricular Relaxation ( $-dP/dt$ ) and LV and LA Myocardial Mechanics
- Clinical Classification of diastolic dysfunction

**Right ventricular systolic function assessment**

- RV Anatomy
- Linear measurements, Fractional area change, TAPSE
- Tissue Doppler imaging and Tricuspid regurgitation index
- Reference values

**Right ventricular diastolic function**

- Right Ventricular Filling
- Doppler Data Recording
- Physiologic Factors That Affect RV Filling Right Atrial Filling

### **Echocardiography in pulmonary artery hypertension**

- Definition
- 2D Echo in PAH
- Doppler Echocardiographic Assessment of PAH
- Stress Echocardiography in PAH

### **Echocardiography in coronary artery disease**

- Myocardial ischemia and infarction
- Detection of Ischemia
- Role in Acute Coronary Syndromes
- Mechanical Complications of Myocardial Infarction
- Role of Echocardiography in Chronic Ischemic Cardiomyopathy

## **UNIT II: STRESS TEST**

**14 Hours**

### **Treadmill test -**

- Indications, Contraindications, Protocol, Procedure, Complications, Interpretation
- Artefacts in TMT

### **Pharmacological stress test - Dobutamine stress test**

- Indications for stress echocardiography and appropriate usage criteria
- Fundamental principles of stress echocardiography
- Setting up a stress echocardiography laboratory
- Performance of pharmacological stress echocardiography
- Patient preparation
- Imaging during pharmacological stress echocardiography
- End-points for pharmacological stress echocardiography Post-procedure observation
- Interpretation of stress echocardiography
- Factors affecting diagnostic accuracy of stress echocardiography
- Assessment of myocardial viability

## **UNIT III: OTHER CARDIAC NON-INVASIVE TESTS**

**6 Hours**

- Holter monitoring, Loop recorder, ABPM, Tilt table test, Ankle-brachial index

### **PRACTICALS:**

1. Recording ECG, Basics of Interpretation of ECG
2. Basic ECHO evaluation
3. Preparation for a treadmill test
4. Preparation for 24-hour Holter monitoring
5. Preparation for ABPM

**PRACTICAL EXAMINATION 35 MARKS:**

- Recording of ECG with its interpretation
- Preparation of the patient for ECHO/ABPM/Treadmill test

**REFERENCE BOOKS:**

1. Echocardiography : Feigenbaum's Echocardiography Eighth edition
2. Textbook of Clinical Echocardiography Textbook by Catherine Otto 7th Edition
3. Manual of Echocardiography, Second edition , Navin C Nanda Textbook of Echocardiography by IAE
4. Electrocardiography : Clinical Electrocardiography: A Simplified Approach, 8th Edition Leo Schamroth
5. An Introduction To Electrocardiography 8Ed (Adapted Edition) Marriott's Practical Electrocardiography: Galen S. Wagner MD, David G. Strauss MD PhD
6. Congenital heart disease : Park's Pediatric Cardiology for Practitioners Sixth Edition Clinical Diagnosis of Congenital Heart Disease by M Satpathy, BR Mishra
7. Cardiac catheterization : The Cardiac Catheterization Handbook by Morton J kern's 7th edition
8. Grossman & Baim's Cardiac Catheterization, Angiography, and Intervention clinical cardiology: Netter's Cardiology , Authors : George Stouffer & Marschall S. Runge & Cam Patterson & Joseph S. Rossi 3rd Edition



**IV Semester**  
**Core 11: Clinical Cardiology and Cardiac Pharmacology**

**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 coronary syndromes

CO 2: Demonstrate capability to perform and interpret various cardiac arrhythmia with ECG.

CO 3: Demonstrate the acquisition of comprehensive knowledge about the various pathological conditions of heart.

CO 4: Demonstrate the ability of proper history taking by the patient.

CO 5: Perform the bed-side physical examination of patients related to cardiac diseases

CO6: Demonstrate the capability to work in a team

**SYLLABUS:**

**UNIT I - HEART DISEASES AND RELATED DISORDERS** **15 Hours**

1. Acute coronary syndromes-Clinical presentation, evaluation and management
2. Stable ischemic heart disease risk factors for IHD, Atherosclerosis, Clinical presentation, evaluation and management
3. Shock state- Types, diagnosis and management, Cardiogenic shock
4. Hypertension -Diagnosis, complications and management
5. Heart failure-Classification, diagnosis and management

**UNIT II: ELECTROCARDIOGRAPHY** **10 Hours**

1. Chamber enlargement - LAE, RAE
2. Chamber hypertrophy - RVH, LVH, ECG in Athletes
3. Ventricular conduction blocks - LBBB, RBBB, Fascicular blocks
4. Myocardial ischemia and infarction - ST elevation and Q wave syndrome, Non-ST-Segment Elevation and Non-Q Wave MI Syndromes
5. Optimum recording of 12 leads ECG
6. Technical artefacts in ECG and Troubleshooting of the artefacts

**UNIT III - CARDIAC PHARMACOLOGY** **10 Hours**

1. Antiplatelet drugs
2. Anticoagulant drugs
3. Statins
4. Antihypertensive drugs
5. Intravenous fluids
6. Diuretics
7. Nitrates
8. Anti-ischemic drugs
9. Thrombolytic drugs

#### **UNIT IV - CLINICAL CARDIOLOGY**

**10 Hours**

1. Approach to Patient, history and physical examination
2. Pathophysiological signs and symptoms in cardiac diseases
3. Arterial Pulses
4. Blood pressure
5. Cardiac examination-Auscultation of heart sounds and murmurs

#### **PRACTICALS**

1. History taking, General physical examination, Basic systemic examination
2. Recording Blood pressure
3. Recording 12 lead ECG, learning trouble-shooting of artefacts
4. Demonstration of ECGs in myocardial infarction and ischemia

#### **Practical Examination: 35marks**

1. History taking
2. Recording of BP, ECG with evaluation.

#### **REFERENCE BOOKS:**

1. Echocardiography : Feigenbaum's Echocardiography Eighth edition
2. Textbook of Clinical Echocardiography Textbook by Catherine Otto 7th Edition
3. Manual of Echocardiography, Second edition , Navin C Nanda Textbook of Echocardiography by IAE
4. Electrocardiography : Clinical Electrocardiography: A Simplified Approach, 8th Edition Leo Schamroth
5. An Introduction To Electrocardiography 8Ed (Adapted Edition) Marriott's Practical Electrocardiography: Galen S. Wagner MD, David G. Strauss MD PhD
6. Congenital heart disease : Park's Pediatric Cardiology for Practitioners Sixth Edition Clinical Diagnosis of Congenital Heart Disease by M Satpathy, BR Mishra
7. Cardiac catheterization : The Cardiac Catheterization Handbook by Morton J kern's 7th edition
8. Grossman & Baim's Cardiac Catheterization, Angiography, and Intervention clinical cardiology: Netter's Cardiology , Authors : George Stouffer & Marschall S. Runge & Cam Patterson & Joseph S. Rossi 3rd Edition

**IV Semester**  
**Core-12- Invasive Cardiology**

**Course Outcomes:**

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge of basic monitoring techniques in Cathlab.

CO 2: Demonstrate the acquisition of comprehensive knowledge and skills related to Cardiac ICU and Cathlab.

CO 3: Demonstrate the capability of relevant awareness of radiation safety and ETO techniques

CO 4: Demonstrate the acquisition of comprehensive knowledge and skills related to coronary angiography.

CO 5: Demonstrate the acquisition of comprehensive knowledge about coronary therapeutic procedures.

CO6: Demonstrate the acquisition of comprehensive knowledge and skills related to ventriculography and peripheral artery procedures.

**Theory:**

**Unit I**

**5 Hours**

Vascular access - arterial in femoral, radial and ulnar, venous in femoral.

Monitoring of a patient with cardiac disease

1. Cardiac Rhythm and rate.
2. Trans-cutaneous oxygen monitors and Pulse oximeters.
3. Invasive hemodynamic monitoring
4. Multi-parameter monitoring
5. ACT monitoring

**Unit II**

**20 hours**

**Indications and contraindications for angiographic studies Coronary angiogram**

- Approach
- Seldinger technique
- Catheters for coronary angiography
- Views for coronary angiography
- Evaluation of a coronary lesion
- Reporting of coronary angiography

Guide wires and catheters Percutaneous Transluminal coronary angioplasty (PTCA)-

Indications, contraindications, procedure, Hardware Coronary Stents Optimising the results of PTCA Management of intra-coronary thrombus Management of coronary perforation

**Unit III COMPLICATIONS IN CATH-LAB**

**10 Hours**

- Management of hypotension
- Management of vasovagal attack
- Complications of cardiac catheterization Complications of contrast and management
- Contrast-induced nephropathy prevention and management

#### **Unit IV - CATHLAB PROCEDURES**

**10 Hours**

- Left and Right heart catheterization- Indications, Hardware and Procedure
- Diagnosis of peripheral artery diseases-Peripheral angiography and angioplasty
- Diagnosis of aortic diseases
- Renal Angiography and angioplasty- Indications, Hardware, procedure

#### **Practicals**

1. Demonstration of Coronary angiographic views
2. Demonstration of cathlab hardware and biomedical equipment used for various procedures

#### **Practical Examinations: 35marks**

1. Discussion about the Coronary angiographic views
2. Demonstration of equipment of cathlab.

#### **REFERENCE BOOKS**

1. Echocardiography : Feigenbaum's Echocardiography Eighth edition
2. Textbook of Clinical Echocardiography Textbook by Catherine Otto 7th Edition
3. Manual of Echocardiography, Second edition , Navin C Nanda Textbook of Echocardiography by IAE
4. Electrocardiography : Clinical Electrocardiography: A Simplified Approach, 8th Edition Leo Schamroth
5. An Introduction To Electrocardiography 8Ed (Adapted Edition) Marriott's Practical Electrocardiography: Galen S. Wagner MD, David G. Strauss MD PhD
6. Congenital heart disease : Park's Pediatric Cardiology for Practitioners Sixth Edition Clinical Diagnosis of Congenital Heart Disease by M Satpathy, BR Mishra
7. Cardiac catheterization : The Cardiac Catheterization Handbook by Morton J kern's 7th edition
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**IV Semester**  
**Skill Enhancement-2**  
**Biostatistics and Research Methodology**

**Learning Objectives**

- To have a basic knowledge of Biostatistics and its applications in medicine
- To know various types of data presentation and data summarization in medical field
- To have overview of data analysis and sampling techniques
- To understand various study designs in medical field
- 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:**

- To know about the fundamental rights and duties of the Constitution.
- 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- Cardiac Evaluation and Therapies Part I**

**Course Outcomes**

At the end of the course student should be able to

CO 1: Able to demonstrate the all echocardiographic views

CO 2: Demonstrate the acquisition of comprehensive knowledge and skills related to cardiac chambers and transvalvular gradients.

CO3: Demonstrate the capability to diagnose the life threatening conduction abnormalities in ECG

CO4: Demonstrate the skills required to use crash carts and manage cardiac arrhythmias.

CO5: Demonstrate the capability to perform and interpret TMT findings.

CO6: Demonstrate the acquisition of comprehensive knowledge about the drugs used in cardiac diseases

CO 5: Demonstrate capability in identifying valvular and pericardial heart disorders by echocardiography.

CO 6: Demonstrate the capability to work in a team.

**Theory:**

**UNIT I: ELECTROCARDIOGRAPHY**

**10 Hours**

- Sinus rhythm, Sinus arrhythmias, Sinus pauses & arrest
- AV conduction abnormality and blocks
- Tachyarrhythmias - Narrow and wide complex, Regular and irregular rhythms
- ECG in Pericardial diseases

**UNIT II: CLINICAL CARDIOLOGY**

**10 Hours**

- Clinical presentation and management of arrhythmias
- Valvular Heart diseases - Clinical presentation, diagnosis and management
- Pericardial Diseases and Cardiac Tamponade- Causes, Clinical Presentation and Management
- Acute rheumatic fever
- Infective endocarditis

**UNIT III: ECHO IN PERICARDIAL AND VALVULAR HEART DISEASES**

**20 Hours**

- Echocardiography in Pericardial Diseases and Cardiac tamponade
- Echocardiography in Rheumatic and other valvular heart diseases
- Mitral stenosis
- Mitral Regurgitation
- Aortic Stenosis
- Aortic Regurgitation
- Pulmonary Stenosis
- Pulmonary Regurgitation
- Tricuspid Stenosis
- Tricuspid Regurgitation

#### **UNIT IV: CARDIAC PHARMACOLOGY**

**5 Hours**

1. Anti-arrhythmic drugs
2. Digoxin
3. Inotropic and vasopressor agents
4. Atropine
5. GP 2B 3A receptors blocking agents

#### **PRACTICALS:**

1. Demonstration of ECGs for arrhythmias
2. Echo studies of Valvular and Pericardial heart disease

#### **Practical Examinations: 35marks**

Discussion about the ECG and ECHO

#### **REFERENCE BOOKS:**

1. Echocardiography : Feigenbaum's Echocardiography Eighth edition
2. Textbook of Clinical Echocardiography Textbook by Catherine Otto 7th Edition
3. Manual of Echocardiography, Second edition , Navin C Nanda Textbook of Echocardiography by IAE
4. Electrocardiography : Clinical Electrocardiography: A Simplified Approach, 8th Edition Leo Schamroth
5. An Introduction To Electrocardiography 8Ed (Adapted Edition) Marriott's Practical Electrocardiography: Galen S. Wagner MD, David G. Strauss MD PhD
6. Congenital heart disease : Park's Pediatric Cardiology for Practitioners Sixth Edition Clinical Diagnosis of Congenital Heart Disease by M Satpathy, BR Mishra
7. Cardiac catheterization : The Cardiac Catheterization Handbook by Morton J kern's 7th edition
8. Grossman & Baim's Cardiac Catheterization, Angiography, and Intervention clinical cardiology: Netter's Cardiology , Authors : George Stouffer & Marschall S. Runge & Cam Patterson & Joseph S. Rossi 3rd Edition

**V Semester**  
**Core-14- Cardiac Evaluation and Therapies Part II**

**Course Outcomes:**

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge about segmental approach to pediatric echocardiography

CO 2: Demonstrate the acquisition of comprehensive knowledge about fetal circulation and embryologic basis of Congenital heart diseases.

CO 3: Demonstrate the acquisition of comprehensive knowledge about acyanotic congenital cardiac conditions.

CO 4: Demonstrate the acquisition of comprehensive knowledge about echocardiographic identification and management of cardiomyopathies and intracardiac masses.

CO5: Demonstrate the acquisition of comprehensive knowledge and skills related to Echocardiography in pediatric cardiac patients.

CO 6: Ability to Document pediatric cases and follow ups..

**Theory:**

**UNIT I: Cardiac Embryology**

**5 Hours**

- Fetal circulation
- Heart tube formation
- Atria and Ventricular Development
- IAS & IVS formation
- Aortic arch formation

**UNIT II: Pediatric Echocardiography**

**15 Hours**

- Cardiac positions : Dextrocardia, Levocardia, Mesocardia
- Situs solitus and Inversus
- A systematic approach to Pediatric Echocardiography
- Acyanotic Congenital Heart Diseases - PFO, ASD, VSD, PDA, CoA, AVSD, PAPVC

**UNIT III: Cardiomyopathy, Myocarditis and Intracardiac masses**

**15 Hours**

- Hypertrophic Cardiomyopathy - Obstructive and non-obstructive
- Dilated Cardiomyopathy
- Restrictive Cardiomyopathy
- Takotsubo cardiomyopathy
- Arrhythmogenic Right ventricular dysplasia
- LV Non-Compaction
- Myocarditis
- Intracardiac masses

**UNIT IV: CARDIO-VASCULAR RELATED DISORDERS**

**10 Hours**

- Diabetes
- Dyslipidaemia
- Pulmonary embolism

- Anaemia
- Renal Failure
- Bleeding Diathesis

#### **PRACTICALS:**

- Demonstration of Pediatric Echocardiography-Segmental approach
- ECHO studies of acyanotic congenital heart diseases, Cardiomyopathies, Intracardiac masses

#### **Practical Examinations**

**35marks**

- Demonstration of Pediatric Echocardiographic segmental approach
- Analyses of ECHO findings of Acyanotic congenital heart diseases, cardiomyopathies and intracardiac masses.

#### **REFERENCE BOOKS**

1. Echocardiography : Feigenbaum's Echocardiography Eighth edition
2. Textbook of Clinical Echocardiography Textbook by Catherine Otto 7th Edition
3. Manual of Echocardiography, Second edition , Navin C Nanda Textbook of Echocardiography by IAE
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6. Congenital heart disease : Park's Pediatric Cardiology for Practitioners Sixth Edition Clinical Diagnosis of Congenital Heart Disease by M Satpathy, BR Mishra
7. Cardiac catheterization : The Cardiac Catheterization Handbook by Morton J kern's 7th edition
8. Grossman & Baim's Cardiac Catheterization, Angiography, and Intervention clinical cardiology: Netter's Cardiology , Authors : George Stouffer & Marschall S. Runge & Cam Patterson & Joseph S. Rossi 3rd Edition

**V Semester**  
**Core-15- Cardiac Evaluation and Therapies**  
**Part III**

**Course Outcome**

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge about diagnostic and therapeutic invasive procedures

CO 2: Demonstrate the acquisition of comprehensive knowledge about hardware options and types available for invasive congenital and valvular heart disease.

CO 3: Demonstrate the acquisition of comprehensive knowledge about monitoring and data handling in cathlab.

CO 4: Ability to provide post procedure care.

CO 5: Demonstrate the capability to evaluate the various treatment and diagnostic approaches.

**SYLLABUS:**

**UNIT I: Valvular diagnostic and invasive procedures** **10 hours**

- Diagnosis of mitral stenosis, regurgitation and mixed
- Indications, Contraindications, procedure and post-procedure care - Mitral valvoplasty  
Pulmonary and aortic valvuloplasty

**UNIT II: Congenital heart disease-Diagnostic procedures and device closures 10 Hours**

- Diagnosis of shunts ASD, VSD, PDA Closure - Indications, Contraindications, procedure and post-procedure care Evaluation of pulmonary hypertension

**UNIT III: CATHLAB PROCEDURES** **15 Hours**

- Pericardiocentesis
- Management of retrieval of dislodged foreign materials in the vessels
- Diagnosis of pericardial constriction
- Myocardial biopsy
- Percutaneous Transluminal septal myocardial ablation
- Carotid and cerebral angiography, Diagnostic catheters and Procedure
- Studies of the abdominal aorta, mesenteric, iliac and other, Diagnostic catheters for abdominal vessels

**UNIT IV** **10 Hours**

- Documentation in Non-Invasive (ECG, ECHO, TMT)
- Documentation in Invasive cardiology( Diagnostic and Invasive procedures
- Care of the patient undergoing vascular procedures
- Data management in the cath lab
- Patient education about invasive procedures, consent processes and preparation
- Monitoring physiological variables during cath lab procedures
- Post-procedure patient care and protocols
- Reporting of the cath procedures

## **PRACTICALS: DEMONSTRATION OF CATH PROCEDURE**

### **Practical Examinations: 35marks**

1. Discussion on Cath Procedure

### **REFERENCE BOOK**

1. Echocardiography : Feigenbaum's Echocardiography Eighth edition
2. Textbook of Clinical Echocardiography Textbook by Catherine Otto 7th Edition
3. Manual of Echocardiography, Second edition , Navin C Nanda Textbook of Echocardiography by IAE
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## **V Semester**

### **Elective-1- Autonomic function test**

#### **Objective:**

- To learn about the basics of Autonomic function test

#### **Principles of AFT**

#### **Different test of Autonomic function test**

#### **Indications for Autonomic function 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 - Non-Invasive Cardiac Care Technology**

**Course Outcomes**

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge of contrast echocardiography

CO 2: Demonstrate the acquisition of comprehensive knowledge about TEE

CO 3: Demonstrate the capability to analyse the abnormal pediatric echoes.

CO 4: Demonstrate the acquisition of comprehensive knowledge about cyanotic congenital heart diseases.

CO 5: Demonstrate the acquisition of comprehensive knowledge and skills of prosthetic valves.

CO 6: Demonstrate the capability to record and interpret various echocardiographic views.

**Theory**

**UNIT I: ELECTROCARDIOGRAPHY**

**10 Hours**

- Review of ECG in Ischemic heart diseases
- Electrolyte abnormalities and metabolic factors
- Drug effects
- Pre-excitation patterns and WPW syndrome
- ECG in Pacemakers

**UNIT II: ECHOCARDIOGRAPHY**

**15 Hours**

1. Contrast Echocardiography
2. Strain and strain rate
3. Trans-Esophageal Echocardiography
4. Basics of 3D Echocardiography
5. Echocardiographic assessment of Prosthetic valves
6. Echo evaluation for CRT

**UNIT III**

**20 Hours**

**CYANOTIC CONGENITAL HEART DISEASES**

- TAPVC
- DTGA
- CCTGA
- TOF
- DORV
- Ebstein's Anomaly
- Truncus Arteriosus
- HLHS
- Other CHDS

**PRACTICALS:** Demonstration of various cyanotic congenital heart diseases, Contrast Echo, TEE and Strain rate imaging

**Practical Examinations: 35marks**

1. Demonstration of cyanotic congenital heart diseases.
2. Demonstration of Contrast ECHO, TEE, Strain rate imaging.

**REFERENCE BOOKS:**

1. Echocardiography : Feigenbaum's Echocardiography Eighth edition
2. Textbook of Clinical Echocardiography Textbook by Catherine Otto 7th Edition
3. Manual of Echocardiography, Second edition , Navin C Nanda Textbook of Echocardiography by IAE
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**VI Semester**  
**Core -17- Invasive Cardiac Care Technology-Applied**

**Course Outcomes:**

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge and skills about pacemaker.

CO 2: Demonstrate the acquisition of comprehensive knowledge and skills related to ICD, CRT implantation.

CO 3: Demonstrate the acquisition of comprehensive knowledge about CPR.

CO 4: Demonstrate the acquisition of comprehensive knowledge of IABP and nuclear cardiology.

CO 5: Demonstrate the capability to provide post procedure care following implanted devices.

CO 6: Demonstrate the acquisition of comprehensive knowledge about advanced invasive procedures.

**SYLLABUS**

**Temporary pacemaker implantation**

**5 HOURS**

**Permanent pacemaker**

**8 HOURS**

- Cardiac pacing indications
- Cardiac anatomy and its importance in pacing
- Cardiac pacing physiology
- Cardiac pacing temporary
- Cardiac pacing permanent
- Programming of pacemakers Common problems associated with pacemakers
- External cardiac pacing
- Implantable cardioverter defibrillator (ICD) – Indications, Hardware, Implantation procedure, Complications, Follow up and programming 2 Hours
- Cardiac resynchronization Therapy(CRT)- Indications, Evaluation for CRT, Hardware, Procedure and its complications, Post CRT follow up 2 Hours

**UNIT II**

**12 HOURS**

- Intra-aortic balloon pump
- Fractional flow reserve
- Rotational atherectomy
- Intravascular ultrasound
- Optical coherence tomography

**UNIT III**

**10 HOURS**

1. Basics of Nuclear Cardiology
  - Principles of nuclear cardiology
  - Tracers used in nuclear cardiology
  - Imaging techniques in nuclear cardiology
  - Indications of nuclear diagnostic procedures in cardiology

## UNIT IV

6 Hours

1. Cardiopulmonary resuscitation
2. Cardiac rehabilitation
3. Case studies
  - Cases of Acute myocardial infarction with complications
  - Case of Pulmonary embolism
  - Cases of Valvular heart diseases
  - Case of Infective Endocarditis

### PRACTICALS :

- Study of various cath diagnostic and invasive procedures

### Practical Examinations : 35marks

Demonstrate the various cath diagnostic and invasive procedures.

### REFERENCE BOOKS:

1. Echocardiography : Feigenbaum's Echocardiography Eighth edition
2. Textbook of Clinical Echocardiography Textbook by Catherine Otto 7th Edition
3. Manual of Echocardiography, Second edition , Navin C Nanda Textbook of Echocardiography by IAE
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**VI Semester**  
**Core-18 – Basic Intensive Care**

**Course outcomes:**

At the end of the course student should be able to

CO1: To demonstrate the acquisition of knowledge about care and monitoring of the patients at Intensive care unit

CO2: To demonstrate the acquisition of knowledge about infection control in ICU

CO3: To demonstrate the acquisition of knowledge about patient care in various systemic diseases and trauma in ICU

CO4: To demonstrate the skills of history taking and monitoring of the patient in ICU

CO5: To demonstrate of efficacy of working in multidisciplinary team

**Unit I**

**General ICU Care and Monitoring**

**10 hours**

1. General care and transport of ICU patient - eye, skin, bladder care, position, airways, drains, catheters. Transport of critically ill patient to and out of ICU, transport of patient with drains, airway, inotropes, mechanical ventilator.
2. Monitoring in critical care: vital signs, drains, ECG, fluid intake & output, invasive hemodynamic and central venous pressure monitoring

**Unit II**

**Infection Control and Nutrition in ICU**

**07 hours**

1. Infection control in ICU: prevention of cross infection, personal protection, antibiotics and policy.
2. Nutrition and Fluid balance - total parenteral nutrition, nasogastric tube, gastric tube, jejunostomy tube care and feeding, IV Fluids.

**Unit III**

**Systemic Diseases and Care in ICU**

**10 hours**

1. Cardiac care in ICU: hypertension, hypotension, arrhythmias, cardiac arrest,
2. ACLS
3. Respiratory care in ICU: airway care, tracheostomy care, endotracheal intubation, mechanical ventilation, care of ventilated patient, complications and weaning.
4. Renal failure: types, etiology, complications, corrective measures
5. Hepatic failure: types, etiology, complications, corrective measures

**Unit IV**

**Head Injury and Trauma care in ICU**

**08 hours**

1. Head injury and Trauma Care: Glasgow coma scale, care of head injury patient, poly trauma patient
2. Blood and blood products transfusion: Transfusion reactions & complications, Massive transfusion

## **Unit V**

### **Acid base disorders, neonatal ventilation, imaging in ICU**

**10 hours**

1. Acid-base & electrolyte balance and their correction, fluid, electrolyte, nutrition balance and management.
2. Neonatal mechanical ventilation: intubation and problems inherent to the neonate, basic principles of neonatal ventilation, modes, initiation and maintenance.
3. Miscellaneous: X-rays, ultrasound, chest and limb physical therapy in ICU

#### **Practical:**

1. Monitoring of Patients
2. Operating devices, ventilator and monitor settings for different clinical conditions
3. Drugs used in Intensive Care
4. Trouble shooting and maintenance of monitors, equipments and ventilators

#### **Practical exam : 35 marks**

1. Identification and use of devices and equipment's used for monitoring and care in ICUs
2. Demonstration of patient care procedures
3. Identifications of drugs used in ICU and its effects / precautions / complications.

#### **Recommended Books**

1. Introduction to Critical Care Nursing - Mary Lou Sole
2. Critical Care Notes: Clinical Pocket Guide - Janice Jones

#### **Reference Books**

1. AACN Essentials of Critical Care Nursing - American Association of Critical Care Nursing
2. Textbook of Critical Care: Expert Consult - Jean-Louis Vincent The ICU Book - Paul L. Marin

**VI Semester**  
**Elective-2 Coronary Angiography**

**Objective:** To learn about the basics of coronary angiography.

**Introduction to coronary angiogram** **4 hours**

1. History of coronary angiography
2. Instrumentation in coronary angiography
3. Indications for coronary angiography
4. Contraindications for coronary angiography

**Procedure** **6 hours**

1. Approach
2. Seldingers technique
3. Catheters for coronary angiography
4. Views for coronary angiography
5. Evaluation of a coronary lesion
6. Reporting of coronary angiography

**Decision making on management** **12 hours**

1. Revascularization PTCA or CABG

**Planning review of protocol Post procedure care** **8 hours**

1. Drugs
2. Groin care (femoral approach)
3. Wrist care (radial approach)

**Complications and management Practical assessment**

1. Spotters
2. Video Clips
3. Demonstration of common disorders

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

**Learning objective:**

1. To know about the various quality concepts
2. 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.



