



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. PERFUSION TECHNOLOGY
2023

BSc

REGULATIONS AND CURRICULUM

B.Sc. Perfusion Technology

2023



JSS Academy of Higher Education & Research
Deemed to be University
Re-Accredited "A+" Grade by NAAC
Sri Shivarathreeshwara Nagara, Mysuru - 570015, Karnataka

REGULATIONS
B.Sc. Perfusion 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. (P A)]
- 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 Perfusion Technology	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	Components of Blood	45	3	15	1	90	3	150	7
Core - 11	Investigations and Monitoring of Patient posted for Cardiac Surgery	45	3	15	1	90	3	150	7
Core - 12	Pharmacology of Drugs Used in Cardiac Surgery	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	Conduct of Cardiopulmonary Bypass	45	3	15	1	90	3	150	7
Core - 14	Medical disorders	45	3	15	1	90	3	150	7
Core - 15	CPB and Its Effects on Organ Systems	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	Unique Situations in CPB	45	3	15	1	90	3	150	7

Core - 17	Advances in Cardiac Surgery and Perfusion Techniques	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 lifesupport *(Compulsory on payment basis for Said Courses)	Respiratory Care Technology, Emergence 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 Perfusion Technology	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	Components of Blood	40	60	-	100	15	35	-	50
Core - 11	Investigations and Monitoring of Patient posted for Cardiac Surgery	40	60	-	100	15	35	-	50
Core - 12	Pharmacology of Drugs Used in Cardiac Surgery	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	Conduct of Cardiopulmonary Bypass	40	60	-	100	15	35	-	50
Core - 14	Medical disorders	40	60	-	100	15	35	-	50
Core - 15	CPB and Its Effects on Organ Systems	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	Unique Situations in CPB	40	60	-	100	15	35	-	50
Core - 17	Advances in Cardiac Surgery and Perfusion Techniques	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

1. Short Essay: 04 questions out of 06	= 04x05=20
2. Short Answer: 10 questions	= 10x03=30
3. 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

a. Letter grades and grade points allocations

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

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

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

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

b. The Semester Grade Point Average (SGPA)

The performance of a student in a semester is indicated by a number called 'Semester Grade Point Average' (SGPA). The SGPA is the weighted average of the grade points obtained in all the courses by the student during the semester. For example, if a student takes five courses (Theory/Practical) in a semester with credits C1, C2, C3, C4 and C5 and the student's grade points in these courses are G1, G2, G3, G4 and G5, respectively, and then students' SGPA is equal to:

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

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

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

c. Cumulative Grade Point Average (CGPA)

The CGPA is calculated with the SGPA of all the VI semesters to two decimal points and is indicated in final grade report card/final transcript showing the grades of all VI semesters and their courses. The CGPA shall reflect the failed status in case of F grade(s), till the course(s) is/are passed. When the course(s) is/are passed by obtaining a pass grade on subsequent examination(s) the CGPA shall only reflect the new grade and not the fail grades earned earlier. The CGPA is calculated as:

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

where C1, C2, C3,.... is the total number of credits for semester I,II,III,.... and S1, S2, S3,.... 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. Perfusion Technology

Program outcomes

At the end the program the perfusion technology student should be able to

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

PO2: Demonstrate the capability to monitor the patient's blood flow and other vital signs during open-heart surgery and are responsible for administering intravenous fluids, blood products and anesthetic drugs.

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

PO4: Demonstrate the capability to analyze various blood parameters and other parameters to identify appropriate mechanical, pharmacological and thermal manipulation to maintain tissue viability.

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

1.Cardio-vascular system

- Types and structure of blood vessels, capillaries
- Heart – location, coverings, external and internal features of heart, Blood supply of heart
- Systemic arteries and veins – major arteries and veins of the body

Lymphatic system

- Lymphoid organs – structure and functions

Respiratory system

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

Digestive system

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

Unit IV

Excretory system and reproductive system

12hrs

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

Embryology I - IV week

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

Unit V

Control Systems of the Body

12hrs

1.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

2.Sense organs

- Location and features of olfaction, eye, ear and skin

3.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

- 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 Pattern

35 Marks

- Gross Anatomy- Discussion of any one specimen Discussion of specimens of Cardiovascular system, Respiratory System, Gastrointestinal system, Urinary system, Reproductive system
- Spotters - Cardiovascular system, Respiratory System, Gastrointestinal system, Urinary system, Reproductive system
- 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 1st edition 2008 Jaypee Publishers

Reference books:

1. B D Chaurasia: Regional Anatomy. Vol I, II, III 6th 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 (4 Hrs)

- 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 (3 Hrs)

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

Unit -V

Muscle nerve physiology, Nervous system and Special senses

Muscle nerve physiology**(2Hrs)**

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

Neuroglia: types

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

Nervous system**(5Hrs)**

- Synapse: types, list properties, list functions
- Receptor: structure, type, sensation carried by it , list the properties
- Reflex: reflex arc, classification, functions
- Ascending tract: list them and its function
- Descending tract: list them and its function
- Cerebral cortex: different lobes and its functions
- functions of basal ganglia, thalamus, hypothalamus
- functions of cerebellum
- CSF: composition and function

Special senses**(4Hrs)**

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

Practicals**(30 Hrs)**

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

Practical Examination**35 Marks**

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

Recommended Books Recent Editions

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

Reference Books

1. A.K.Jain, Text book of Physiology for Medical Students, 8th Ed. Arya Publiction.
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 of biochemical components of blood, urine and body fluids.

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

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

Unit I

12hrs

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

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

Unit II

06 hrs

Enzymes & Acid base balance

- Enzymes- Definition and Classification. Factors affecting enzyme activity. Coenzymes and Cofactors. Enzyme inhibition – types and their importance.
- Acids, Bases & Body Buffers -Definition with examples, and regulation of pH in brief.

Unit III

12hrs

Vitamins & Minerals

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

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

Unit IV

05hrs

Nutrition, Blood chemistry & Urine Chemistry

- Nutrition- Nutrients, Calorific value of food, BMR and factors affecting BMR, respiratory quotient and its applications, biological value of proteins, nitrogen balance, Protein energy malnutrition.
- Blood chemistry- Biochemical components & their reference ranges in normal & diseased states- glucose, urea ,creatinine , electrolytes, total proteins and albumin.

Unit V

10hrs

Clinical Biochemistry-

- Specimen Collection - Blood, Urine and Body fluids. Preanalytical, analytical and postanalytical errors
- Clinical Biochemistry- Parameters to diagnose Diabetes & Cardiovascular diseases.
- Diagnostic enzymology, Assessment of arterial Blood gas status and electrolyte balance, Point of Care Testing. Renal Function tests(in brief), Liver function tests(in brief), Biomedical Waste Management.

Practicals

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

Practical Examination

(35marks)

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

Recommended books Recent edition.

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

Reference Books Recent Edition

1. Harpers Biochemistry
2. Clinical Biochemistry-Michael L. Bishop
3. Textbook of Biochemistry-Rafi M.D

4. Lippincott's Illustrated review of Biochemistry
5. Practical Clinical Biochemistry-Harold Varley

I Semester
Language-1 English

Unit I

Introduction

a. Study Techniques - Reading Comprehension

Exercises on reading passages and answering questions based on the passage.

b. Organization of Effective Note Taking Why good note-taking is important

Effective note-taking is an important practice to master at university. You have a lot of new knowledge and you need to develop reliable mechanisms for recording and retrieving it when necessary. But note-taking is also a learning process in itself, helping you to process and understand the information you receive.

c. Use of the Dictionary

Tips on how to use the dictionary

1. Choose the right dictionary.

2. Read the introduction.

3. Learn the abbreviations.

4. Learn the guide to pronunciation.

5. Looking Up a Word

- 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

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

4. Paragraph Structure

A paragraph consists of 3 main structures :

- Claim
- Evidence
- 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

1. What is a bibliography?

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

2. 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.

3. Why you must do a bibliography?

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

4. 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).

3. Enlargement of Vocabulary Roots - N to S

Unit IV

Reading and Comprehension

- Review of selected materials and express oneself in one's words Seminar for students on powerpoint presentation and book review.
- 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 newspapers 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 meeting Why Meeting Minutes Matter
- Meeting minutes are important. They capture the essential information of a meeting - decisions and assigned actions. The following instructions will help you take useful and concise meeting minutes.

Before the Meeting

- If you are recording the minutes, make sure you aren't a major participant in the meeting. You can't perform both tasks well.
- Create a template for recording your meeting minutes and make sure you leave some blank space to record your notes.
- Decide how you want to record your notes. If you aren't comfortable relying on your pen and notepad, try using a tape recorder or, if you're a fast typist, take a laptop to the meeting.

During the Meeting

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

After the Meeting

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

a. Debates

b. 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.

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

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

1. 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.

2. 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.

3. Reveals Motivation/Influences

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

4. 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

- On the street (with a vegetable vendor)
- At college with a lecturer (regarding admissions)
- In a bank with the manager (for opening a bank account)
- Telephone conversation with a hotel receptionist (make room reservations)
- 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

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

Syllabus
Yoga theory- 15 hours

Unit I: History & Origin of Yoga **(2 hours)**

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

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

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

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

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

REFERENCE:

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

Yoga practical- 15 hours

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

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

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

Unit II: Asanas, Pranayama & Relaxation technique.

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

Reference:

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

II Semester
Core 4-General Pathology including Applied aspects

Course outcome

At the end of the course student should be able to

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

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

CO3: Perform and analyse basic hematology techniques.

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

Unit I

10 hrs

General pathology-Introduction- & scope of pathology

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

Unit- II

10 hrs

Haematological Disorders

5 hrs

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

Basic Hematological Techniques

5 hrs

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

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

Unit- III

5 hrs

Transfusion Medicine

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

Clinical Pathology

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

UNIT IV

10 hrs

- Atherosclerosis-definition, risk factors, pathogenesis, morphology and complications
- Ischemic heart disease: Myocardial infarction- definition, pathogenesis, morphology and complications
- Hypertension- Benign and malignant hypertension: pathogenesis, pathology and complications
- Heart failure-Right and left heart failure: causes, pathophysiology and morphology
- Rheumatic heart disease and infectious endocarditis- definition, etiopathogenesis, morphology and complications
- Congenital heart disease- Types and atrial septal defect; aneurysms- types and morphology; cardiomyopathies in brief

UNIT V

10 hrs

- Atelectasis - types, Adult respiratory distress syndrome - causes, pathogenesis and morphology; pulmonary edema- classification, causes and morphology
- Chronic obstructive pulmonary disease- Chronic bronchitis, emphysema, asthma, bronchiectasis: Definition, etiopathogenesis and morphology
- Restrictive pulmonary diseases- Definition, categories, pathogenesis and morphology
- Pneumoconiosis-types, asbestosis, coal workers pneumoconiosis - etiopathogenesis and morphology
- Pulmonary embolism, infarction, pulmonary hypertension-Definition, etiopathogenesis and morphology
- Pneumonia-Classification of pneumonias; Lobar pneumonia and bronchopneumonia - etiology, pathology and complications
- Pericardial and pleural effusions- causes and microscopy
- 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 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.
12. Blood grouping and Rh typing
13. Charts
14. 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 book agency, 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 technique, 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:

- Gram stain
- 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. Text book of Practical Microbiology for MLT by C P Baveja, Arya publications
4. Textbook for laboratory technicians by RamnikSood. Jaypee publishers
5. Textbook of parasitology by Paniker. 7th edition

II Semester
Core - 6 - Pharmacology

Course outcome

At the end of the course student should be able to

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

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

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

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

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

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

UNIT I- General Pharmacology, ANS, PNS.

9 Hrs

- Sources of Drugs
- Route of drug administration
- Pharmacokinetics (Absorption, Metabolism, Distribution, Excretion)
- Pharmacodynamics (Mechanisms of action)
- Adverse drug reactions
- ANS : Adrenergic drugs -Adrenaline,
- Anti adrenergic-alpha and beta blockers
- Cholinergic drugs-Acetyl choline
- Anti cholinergic agents-Atropine

Unit II- PNS, CVS, Renal system

9 hrs

- Skeletal muscle relaxants-
- Local anaesthetics-lignocaine, LA + vasoconstrictor
- CVS-ionotropic agents -Digoxin,
- Antianginal drugs-GTN,
- Antihypertensives-
- Management of different types of shock and Plasma expanders
- Renal system-Diuretics Antidiuretics-Vasopressin

Unit III- CNS, Blood

9 hrs

- CNS-general Anaesthetics
- Sedative hypnotics-
- Antiepileptics
- Opioid analgesics-
- NSAIDS-
- Respiratory system-treatment of cough And Bronchial asthma
- Blood-Hematinics, Anticoagulants -Warfarin, Heparin

- Thrombolytics & Antiplatelet drugs-streptokinase,/ aspirin,

Unit IV- GIT, Chemotherapy

9 hrs

- GIT-drugs used in peptic ulcer-
- Antiemetics -Metaclopramide, Domperidone, Ondansetron
- Purgatives & Laxatives
- Drugs used in Diarrhoea- ORS, Super ORS, Antimotility drugs (loperamide, diphenoxylate)
- Chemotherapy-general considerations MOA, Resistance, Prophylaxis

Unit V- Chemotherapy, Hormones

9 hrs

- Anti-bacterial, anti-fungal, anti-viral, anti-protozoal, anti-helminthic
- Cancer chemotherapy (names, common Adverse effects, general principles in the treatment of cancer)
- Hormones-Thyroid and antithyroid drugs, Insulin, glucagon, antidiabetic drugs, corticosteroids, oestrogen, progesterone, oxytocin

Practicals

30 hrs

- Dosage forms
- Solid Dosage forms
- Liquid Dosage forms
- Gaseous Dosage forms
- Oral route
- Parenteral routes
- Novel routes
- Fixed dose combination-Amoxycillin+clavulanic acid-cotrimoxazole, Lignocaine+ Adrenaline
- Drug stations-Adrenaline, dopamine, Dobutamine)
- Drug stations-Corticosteroids (hydrocortisone, prednisolone, inhalational steroids) Drug stations-common antibiotics (Amoxycillin, Ciprofloxacin, Azithromycin, Metronidazole, Cephalosporins)
- Drug stations-Insulin preparations
- Instrument & devices (Nasogastric tube, laryngoscope, Different Catheters, Nebulizers, Inhalers, Rotahalers)

Practical examination

35 marks

1. Dosage Forms
Capsules, Tablets, Syrup, Iv, Im, Sc, Ia , Intra Articular -
Advantages (1 Mark), Disadvantages (1 Mark) Examples (1 Mark)
2. Mention the name of the Device/Instruments and uses : Inhalers, Rota halers, Space halers, Drip sets, Vaso fix, Ryle's tube, Urinary catheter, Endotracheal tube, Hand gloves
3. 10 Spotters

Recommended Books

1. K.D. Tripathi, Essentials of Medical Pharmacology, V. Edition, M/s. Jaypee Brothers, Post

Box, 7193, G-16, Emca House, 23/23, Bansari Road, Daryaganj, New Delhi.

2. Padmaja Udaykumar -Pharmacology for Allied Sciences
3. R. S. Satoskar, S.D. Bhandarkar, S. S. Ainapure, Pharmacology and Pharmacotherapeutics, 18th Edition, Single Volume, M/s Popular Prakashan, 350, Madan Mohan Marg, Tardeo, Bombay - 400 034.

II Semester

Allied - 1 Health Care

Learning Objectives

- To define Health and understand various concepts of Health
- To understand concept of disease and its causation.
- To know the Health care delivery system in India
- To understand epidemiology of common infectious diseases of India.
- To know various National Health Programmes of India
- 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. 26th ed. Jabalpur: Banarsidas Bhanot Publishers, 2015. p.135-141
2. Suryakantha. Textbook of Community Medicine with recent advances. 6th edition
3. Bhalwar R editor. Textbook of Public Health and Community Medicine. 2nd Pune, Department of Community medicine AFMC; 2012
4. Essentials of Community Medicine for Allied Health Sciences, JSS University Publications, 2015

II Semester

Allied -2- Psychology

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

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

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

Unit -I

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

Unit -II

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

Unit -III

Biological basis of behavior –Introduction

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

Unit-IV

Mental health and mental hygiene

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

Unit-V

- Intelligence – Meaning of intelligence – Effect of heredity and environment in intelligence, classification, Introduction to measurement of intelligence tests – Mental deficiencies
- Learning – Definition of learning, types of learning, Factors influencing learning – Learning process, Habit formation
- Memory-meaning and nature of memory, factors influencing memory, methods to improve memory, forgetting

Unit VI:

Stress

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

Unit VII:

Counselling

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

Recommended Books Recent Editions.

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

Skill Enhancement Course

Soft Skills

Learning objectives

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

Unit I

- Definition of soft skills, Soft skills and Hard Skills, Advantage of Soft Skills,
- Real life scenarios, Measurement of soft skills.
- Self Discovery, Definition of Self, Identification of Strengths and weakness of self, Setting goals, Personal beliefs, values and ethics.

Unit II

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

Unit III

- Communication Skills: Definition of Communication, Verbal and Nonverbal communication, Telephone and internet communication, Common mistakes in communication.
- Interpersonal skills: Listening skills, Understanding body language, polite communication and people friendly attitude.

Unit IV

- Time management: Importance of punctuality, Efficient time handling,
- Avoiding leakage of time and procrastination
- Stress Management: Definition of Stress, Positive and negative stress. Handling major projects through effective delegation.

Unit V

- Organizational behavior: Definition of an organization, Understanding the rules and regulations of an organization, Creating an ideal working Environment.
- Professional attitude-Definition and developing an effective professional attitude.
- Leadership Skills: Developing a positive attitude, Presentation and public speaking skills, effective handling of the team and sub ordinates. Recognizing and encouraging talents in Sub ordinates.

Recommended books

1. Barun Mitra (2016), Personality Development and Soft Skills, 2nd 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 1st edition, HarperBusiness.
4. Sanjay Kumar, Pushp Lata (2018) Communication Skills Paperback 1st 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. Perfusion 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 CO₂ (ETCO₂)
- 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 in patient 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 Perfusion Technology

Course Outcome:

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

Demonstrate the acquisition of comprehensive knowledge

CO 1: about the Principles of gas exchange and heat exchange.

CO 2: about the Cardiac cycle, Pressure-volume loops.

CO 3: about Humoral control of Heart.

CO 4: about anatomy and physiology of coronary circulation

CO 5: about history and evolution of Cardiopulmonary Bypass

CO 6: about the evolution of individual CPB components.

CO7: Demonstrate the skills to identify components and utility of components of CPB circuit

THEORY:

- Basic Principles of Extracorporeal circulation. Normal physiological circulation in adults, role of arteries, arterioles, capillaries and veins in circulation.
- Hagen-Poiseuille equation, Windkessel effect.
- Cardiac output and factors affecting it. Cardiac Index. Measuring Cardiac Output and Cardiac Index.
- Determinants, regulation and measurement of arterial blood pressure.
- Determinants, regulation and measurement of venous pressure.
- Capillary Oncotic pressure.
- Basic Principles of Extracorporeal gas exchange. Functional anatomy of respiratory tract. Determinants, characteristics and measurement of Pulmonary blood flow. Gas exchange at lungs and tissue level.
- Respiratory membrane, Diffusion capacity and factors affecting it.
- Partial pressure of oxygen, carbon dioxide and other gases at various tissue levels.
- History of Cardiopulmonary Bypass, Cross circulation, Controlled Cross circulation, Role of Hypothermia in Cardiac surgery, Role of Fibrillatory cardiac surgery, Role of Dr John Gibbon and various other pioneers in cardiac surgical field.
- Azygous flow principle.
- History and evolution of oxygenators: Bubble, disc and membrane oxygenators.
- History and evolution of various filters used in CPB.

- History and evolution of pumps.
- History and evolution of various tubings used.
- Location, size, anatomic features of right and left atria and its appendages.
- Location, size, anatomic features of Right and Left Ventricle.
- Valve location, structure and functions of each valve.
- Blood supply of Heart in brief: Coronary arteries and venous drainage
- Sympathetic and parasympathetic supply to the heart
- Mediastinum and its divisions
- Major Arteries and their branches
- Major veins and their tributaries
- Concepts of coronal, sagittal and oblique sections
- Cross sectional Anatomy of Heart.
- Cardiac cycle with emphasis on systole, diastole events and relation to ECG.
- Pressure volume loops related to cardiac function.

PRACTICALS:

- The student should be able to identify the various components of the CPB circuit and be able to describe the history and evolution, demonstrate the utility and location of the various components in the circuit.
- Describe the components of the cardiovascular system including the surface anatomy, features, blood supply to the heart and blood supply to various parts of the body.

Practical Examination: 35Marks

- Spotters
- Discussion on CPB
- Discussion about the cardiovascular system.

REFERENCE BOOKS:

1. Cardiopulmonary Bypass and Mechanical Support. Principles and Practise. Glenn P Gravlee et al. Fourth Edition. Wolter Kluwers
2. Guyton and Hall Textbook of Medical Physiology. John E Hall et al. 14th Edition. Elsevier.
3. Textbook of Physiology for Medical Students. 1st Edition. Harminder Singh. Elsevier.
4. Manual of Practical Physiology for MBBS. 6th Edition. AK Jain. Arya Publications.
5. The Gross Physiology of Cardiovascular system. 2nd Edition. Robert M Anderson. Available online at <http://cardiac-output.info/>.
6. Essentials of Medical Physiology. 6th edition. K Sembulingam, Prema Sembulingam. Jaypee Publishers.

III Semester

Skill Enhancement-1 Computer Application

Learning Objectives

- To know various aspects of basic components of computer
- 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

- To know various Environmental factors which affect Health
- 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. 26th 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 – Components of blood

Course Outcomes:

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge about various components of Blood and blood substitutes

CO 2: Demonstrate ability to confirm proper cross matching of the blood before transfusing to the patient.

CO 3: Demonstrate the capability to understand blood transfusion, identify the adverse effects of blood transfusion and prevention of it

CO 4: Demonstrate the ability to comprehend Blood-borne infections and its prevention

CO 5: Ability to manage Post exposure prophylaxis.

Theory:

- Various Blood grouping systems, important blood groups like ABO, Rh systems, Bombay blood group. Importance of grouping and cross matching.
- Managing patients with acute blood loss with blood products and other temporary measures.
- Importance of whole blood versus individual component therapy.
- Storage of blood, duration of preservation of blood products, preservatives that are commonly used for product storage.
- Uses, dose, complications of Packed Red Cells.
- Uses, dose, complications of Platelet Rich Plasma
- Uses, dose, complications of Fresh frozen plasma
- Uses, dose, complications of cryoprecipitate.
- Uses, dose, complications of individual component clotting factor therapy such as clotting factors II, VII, VIII, Fibrinogen etc
- Blood substitutes- uses, types, indications, contraindications and side effects
- Massive blood transfusion- Definition, uses, complications, prevention and its management.
- Complications of Blood transfusions- Identification, mitigation and management.
- Blood borne infections such as HIV, Hepatitis B, Hepatitis C etc. Its prevention, precautions to prevent spread and Post exposure Prophylaxis.

PRACTICALS:

- Should be able to discuss blood component therapy in detail, demonstrate checking of blood components before transfusion and discuss identification and management of blood transfusion reaction.
- Describe the uses, side effects and complications of individual blood component transfusions.

Practical Examination

35marks

- Discussion on blood component therapy
- Demonstration of the steps of blood transfusion with management of hazards

REFERENCE BOOKS:

1. Guyton and Hall Textbook of Medical Physiology. John E Hall et al. 14th Edition. Elsevier.
2. Textbook of Physiology for Medical Students. 1st Edition. Harminder Singh. Elsevier.
3. Manual of Practical Physiology for MBBS. 6th Edition. AK Jain. Arya Publications.
4. Manual of Transfusion Medicine. 1st edition. Ramadas Nayak. Jaypee Publications.
5. Blood transfusion in Clinical Practice. Manorama Singh. Paras Publications.

IV Semester

Core 11: Investigations and Monitoring of Patient posted for Cardiac Surgery

Course Outcomes:

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge about various organ systems in the body.

CO 2: Demonstrate capability to analyze the investigations conducted on a patient posted for Cardiac Surgery along with their normal values.

CO 3: Demonstrate the acquisition of comprehensive knowledge about the various monitoring modalities used in cardiac surgical patients.

CO 4: Demonstrate capability of analytical skills of the monitoring procedures and tests used intraoperatively during cardiac surgery.

CO 5. Perform the bed-side investigations of patients related to cardiac surgery.

SYLLABUS:

- Normal Physiological functioning, functional anatomy and role of Renal system in the body. Anatomy and functioning of nephron, Juxtaglomerular apparatus, tubes, loop of henle and collecting ducts. Renal circulation and urine formation.
- Normal Physiological functioning, functional anatomy and role of Nervous system in the body. Sympathetic and parasympathetic nervous system and its functioning. Role of spinal cord. Blood supply of the brain and spinal cord.
- Normal Physiological functioning, functional anatomy and role of gastrointestinal system in the body. Role of liver, structure of hepatic lobules and portal triad. Blood supply of the GIT.
- Normal Physiological functioning, functional anatomy and role of endocrine system in the body including pancreas, pituitary gland, suprarenal glands, thyroid and parathyroid glands, etc.
- Normal Physiological functioning, functional anatomy and role of musculoskeletal system.
- Laboratory tests done to assess the functioning of each of these organ systems and their normal values. Basic knowledge regarding causes for derangement in normal lab values of each of these organ systems.
- Various monitoring techniques used in cardiac surgery including electrocardiogram, echocardiogram, coronary angiography, pulse oximetry, end tidal CO₂, CVP, NIBP and invasive arterial, CNS monitoring in cardiac surgery, urine output monitoring, tests for coagulation, temperature management, etc...
- Students should be able to record an ECG and attach various monitors to the patient for cardiac surgery.
- Working principle of each component of CPB machine.

PRACTICALS:

- Students should be able to describe the various tests to assess various organ systems along with their normal values. Students should be able to read basics of Chest x-ray, ECG, Echocardiogram reports, detect abnormalities in blood tests and how to prevent and treat them.
- Demonstrate working principle of each component of CPB machine.
- Conducting and interpreting the various monitoring modalities used in the perioperative

period for monitoring the patient.

Practical Examination

35marks

- Spotters
- Analysis of the diagnostic tests
- Demonstration of the working principle of CPB machine

REFERENCE BOOKS:

1. Guyton and Hall Textbook of Medical Physiology. John E Hall et al. 14th Edition. Elsevier.
2. Textbook of Physiology for Medical Students. 1st Edition. Harminder Singh. Elsevier.
3. Manual of Practical Physiology for MBBS. 6th Edition. AK Jain. Arya Publications.
4. Clinical Laboratory Tests: Values and Implications. 3rd edition. Springerhouse Publications.
5. ECG made easy. 7th edition. John R Hampton. Churchill Livingstone publication.
6. Chest X-ray made easy. 2nd edition. D Kartikeyan et al. Jaypee.

IV Semester
Core-12- Pharmacology of Drugs used in Cardiac Surgery

Course Outcomes:

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge of basics of Pharmacology.

CO 2: Demonstrate the capability of relevant implications of intravenous fluids and anesthetic drugs.

CO 3: Demonstrate the capability of relevant implications of anticoagulants

CO 4: Demonstrate the capability to evaluate electrolyte disorders and its management.

CO 5: Demonstrate the acquisition of comprehensive knowledge and skills related to drugs involved in cardiovascular diseases.

Theory:

- Basic knowledge regarding pharmacokinetics, pharmacodynamics. Routes of drug administration, Absorption of drugs, distribution of drugs, concept of half-life of drugs, metabolism and excretion of drugs. Types of drug receptors, location and concept of agonists, partial agonist and antagonists.
- Types, uses, dosage, side effects and contraindications of various intravenous fluids including both colloids and crystalloids
- Types, uses, dosage, side effects and contraindications of inhalational anesthetic drugs including concept of minimum alveolar concentration (MAC) and factors affecting MAC.
- Types, uses, dosage, side effects and contraindications of intravenous anesthetic drugs such as Barbiturates, propofol, etomidate and benzodiazepines.
- Types, uses, dosage, side effects and contraindications of all analgesic drugs including opioid drugs and non-opioid drugs such as NSAIDs.
- Types, uses, dosage, side effects and contraindications of skeletal muscle relaxants including depolarising and non-depolarising drugs.
- Pharmacology, mechanism of action, dose, half-life, side effects, contraindications for heparin.
- Heparin resistance and its management. Alternate drugs used in cases of known heparin resistance.
- Pharmacology, mechanism of action, dose, half-life, side effects, contraindications for protamine.
- Hypokalemia- causes, symptoms, investigations and management.
- Hyperkalemia- causes, symptoms, investigations and management.
- Hyponatremia- causes, symptoms, investigations and management.
- Hypernatremia- causes, symptoms, investigations and management.
- Magnesium and Calcium disorders.
- Pharmacology of adrenergic drugs including types of adrenergic receptors, location of these receptors, drugs acting on various adrenergic receptors including agonists and antagonists. Dosage, indications, contraindications and side effects of commonly used adrenergic drugs.
- Pharmacology of vasodilator drugs such as nitroglycerine and sodium nitroprusside.
- Classification, uses, dose, mechanism of action, side effects of antiarrhythmics drugs.

- Classification, uses, dose, mechanism of action, side effects of diuretics.
- Classification, uses, dose, side effects of steroids. Role of steroids in cardiac surgery.
- Pharmacology of other miscellaneous drugs used in cardiac surgery.

PRACTICALS:

- Recognize the class, uses, side effects, mechanism of action and contraindications for the above-mentioned drugs.
- Ability to recognize the class of drugs and uses and to be able to load the drugs in a neatly labelled syringe under aseptic precautions.

Practical Examinations: 35marks

Spotters

Discussion about the drugs

REFERENCE BOOKS:

1. The pharmacological Basis of Therapeutics. Goodman and Gillman. Lawrence Brunton. 14th Edition. Mc Graw Hill Publications.
2. Clinical Pharmacology and Therapeutics for students and Practitioners. 3rd Edition. Rataboli PV. CBSPD.
3. Essentials of Medical Pharmacology. 8th Edition. K D Tripathi. Jaypee Publications.
4. Short textbook of Anaesthesia. 6th Edition. Ajay Yadav. Jaypee Publications.
5. Drugs for the Heart. 6th Edition. Lionel Opie et al. Elsevier Saunders.

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. 26th 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.

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- Conduct of Cardiopulmonary Bypass

Course Outcomes

At the end of the course student should be able to

CO 1: Able to demonstrate the ability to manage temperature in cardiac and vascular surgical patients

CO 2: Demonstrate the acquisition of comprehensive knowledge of the various materials used in CPB

CO 3: Assist in setting up the cardiopulmonary bypass circuit.

CO 4: Demonstrate the acquisition of comprehensive knowledge about the blood conservation strategies used in cardiac surgery

CO 5: Demonstrate capability in assessing the adequacy of perfusion on CPB

CO 6: Demonstrate the acquisition of knowledge of various monitoring used during CPB

Theory:

- Prebypass, On bypass and Coming-off bypass checklist.
- Measuring temperature, sites for measuring temperature in cardiac surgery.
- Physiology of hypothermia, types of hypothermia, Role of hypothermia in cardiac surgery, Acid-base management, alpha stat and pH stat ABG management and its importance on CPB, Temperature management on CPB, Uses of hypothermia in cardiac surgery and non-cardiac surgery.
- Chart review, selection of proper equipment for CPB, assembly, priming, setting occlusion and verifying accuracy of pump flow.
- Calculating priming volume, circulating hematocrit, degree of hemodilution.
- Managing pump flow and gas flow on CPB.
- Monitoring adequacy of perfusion on CPB.
- Neurological monitoring during CPB.
- Coagulation management during CPB.
- Equipment monitoring during CPB.
- Various safety devices used in CPB machine.
- Blood conservation strategies used in cardiac surgery including cell savers, preoperative, intraoperative and postoperative measures used for blood conservation during cardiac surgery.
- Detailed analysis of ABG during CPB. Detecting ABG abnormalities and management of the same.
- Arterial cannulas- types, indications, contraindications and complications
- Venous Cannulas - types, indications, contraindications and complications
- Cardioplegia cannulas - types, indications, contraindications and complications
- Cannulas used in minimal access cardiac surgery and robotic cardiac surgery.
- The sizes available, blood flow and complications.
- Connecting tubes and connectors

- Cardioplegia delivery system – setting up and control of temperature, mixing of cardioplegia.
- Vents – uses, sites of venting, advantages and disadvantages
- Suckers – uses, sites, advantages and disadvantages
- Assist in assembling the CPB pump under the supervision of clinical perfusionist.
- Setting proper occlusion, de-airing the circuit, strictly following the checklists before going on bypass and before coming off bypass.
- Cardiopulmonary bypass without cardiac arrest.
- Hypothermic circulatory arrest, antegrade and retrograde cerebral perfusion.
- Left heart bypass, selective organ perfusion and cold renal perfusion.
- Deep Hypothermic circulatory arrest.
- Role of CPB and perfusionist in non-cardiac surgery.
- Role of perfusionist in off pump cardiac surgery.

PRACTICALS:

- Discussion in detail about the above-mentioned topics.

Practical Examinations: 35marks

- Discussion about the apparatus and procedures

REFERENCE BOOKS:

1. Cardiopulmonary Bypass and Mechanical Support. Principles and Practise. Glenn P Gravlee et al. Fourth Edition. Wolter Kluwers.
2. Cardiopulmonary Bypass. 1st Edition. Sumit Ghosh et al. Cambridge University Press.
3. On Bypass- Advanced Perfusion Techniques. Linda B Mongero et al. Humana Press.
4. Essentials of Cardiac Anaesthesia. 5th Edition. Kaplan. Saunders Elsevier.

V Semester
Core-14- Medical Disorders

Course Outcomes:

At the end of the course student should be able to

Demonstrate the acquisition of comprehensive knowledge about

CO 1: Ischaemic Heart Disease and its management.

CO 2: Congenital Heart Diseases and its management.

CO 3: Valvular Heart Diseases and its management.

CO 4: Vascular Diseases and its management.

CO 5: Take relevant history in patients posted for surgery.

CO 6: Communicate effectively about the therapy to the patients.

CO 7: Performs assessment of patient and plan the perioperative management of these patients along with team members.

Theory:

- Pathophysiology, causes, symptomatology, investigations and detailed management of **Myocardial Ischaemia and Infarction.**

Angina- types, pathology, symptoms, management.

Congenital heart diseases

- Definition, classification, symptomatology, causes, complications, prevention, investigations and treatment options for Atrial septal defects.
- Definition, classification, symptomatology, causes, complications, prevention, investigations and treatment options for Ventricular septal defects.
- Definition, classification, symptomatology, causes, complications, prevention, investigations and treatment options for Tetralogy of Fallot.
- Definition, classification, symptomatology, causes, complications, prevention, investigations and treatment options for Transposition of Great Arteries.
- Definition, classification, symptomatology, causes, complications, prevention, investigations and treatment options for Total and partial Anomalous Pulmonary Venous Connection.
- Definition, classification, symptomatology, causes, complications, prevention, investigations and treatment options in Coarctation of Aorta.

Valvular heart diseases

- Causes, grading of severity, symptoms, pathophysiology, investigations and management of Mitral stenosis.
- Causes, grading of severity, symptoms, pathophysiology, investigations and management of mitral regurgitation.
- Causes, grading of severity, symptoms, pathophysiology, investigations and management of aortic stenosis.
- Causes, grading of severity, symptoms, pathophysiology, investigations and management of aortic regurgitation.
- Causes, grading of severity, symptoms, pathophysiology, investigations and management of tricuspid stenosis and regurgitation.
- Causes, grading of severity, symptoms, pathophysiology, investigations and management of pulmonary stenosis and regurgitation.

- Causes, pathology, symptomatology, investigations and management of left ventricular, right ventricular and biventricular failure.

Vascular diseases

- Causes, pathophysiology, symptomatology, investigations and management of Aneurysms.
- Causes, pathophysiology, symptomatology, investigations and management of Dissection of Aorta.
- Causes, pathophysiology, symptomatology, investigations and management of peripheral vascular diseases
- History taking- detailed history taking as required for the case along with planning the treatment options with anaesthesiologist and surgeon.

PRACTICALS:

- History taking in general and specifically related to each organ system. Student should be able to take a proper history and help in proper intraoperative management of the patient based on the underlying disease condition.

Practical Examinations: 35marks

1. History taking
2. Discussion on the intraoperative management

REFERENCE BOOKS

1. Harrison's Principles of Internal Medicine. 20th Edition. Jameson et al. McGraw Hill
2. Ghai Essential Pediatrics. 9th Edition. Vinod K Paul et al. CBS Publishers.
3. Davidson's Principles and Practice of Internal Medicine. 24th Edition. Elsevier.
4. Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine. 10 Edition. Elsevier.
5. Hutchison's Clinical Methods: An Integrated Approach to Clinical Practice. 24th Edition. Elsevier.

V Semester
Core-15- CPB and Its Effects on Organ Systems

Course Outcome

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge of effects of CPB on all the organ systems and organ protection during CPB.

CO 2: Demonstrate the acquisition of comprehensive knowledge about anticoagulants therapy of CPB

CO 3: Demonstrate the acquisition of comprehensive knowledge about complications related to CPB, their prevention and management.

CO 4: Ability to assess the adequacy of CPB.

CO 5: Demonstrate the acquisition of comprehensive knowledge of filtration techniques used in cardiac surgery.

CO 6: Demonstrate ability to assess anticoagulation on CPB and take steps to prevent complications.

SYLLABUS:

- Effect of cardiopulmonary bypass on all the organ systems in the body
- Cerebral physiology on CPB including cerebral blood flow, determinants of cerebral blood flow, autoregulation, cerebral perfusion pressure. Prevention of complications including neurological monitoring such as NIRS, BIS/EEG, Jugular bulb venous oxygen saturation, etc and management of CPB related neurological morbidity.
- Effect of CPB on blood components such as RBCs, WBCs platelets and coagulation factors. CPB related factors leading to intra and post-operative causes of bleeding. Prevention of CPB related effects on blood components.
- Effect of CPB on renal system- Perioperative assessment, risk factors, prevention and management of renal injury during Cardiopulmonary bypass. Various ultra-filtration techniques used in CPB- advantages, physiological effects and disadvantages of each.
- Effect of CPB on Respiratory system- acute lung injury related to CPB, its prevention and management
- Effect of CPB on splanchnic visceral organ systems including the liver and effect of altered liver function on metabolism during bypass. Gastrointestinal complications during cardiac surgery- prevention and management.
- Glucose metabolism, insulin resistance and management of blood sugars on CPB.
- Effect of CPB on various endocrine organs such as pituitary, thyroid, parathyroid, adrenal gland and pancreas.
- Myocardial protection during cardiopulmonary bypass. History of cardioplegia, dose, routes, types, contents of cardioplegia, temperature, duration of action and complications. Prevention of myocardial dysfunction post cardiac surgery.
- Management of anticoagulation on cardiopulmonary bypass, including the role of heparin, alternatives to heparin, tests to assess the action of heparin including Activated Clotting Time, heparin assays, thromboelastogram, etc. Details about ACT, its shortcomings and also that of TEG.
- Various complications related to CPB run on various organ systems and steps commonly taken to mitigate the same in detail.
- Prevention and management of intraoperative and post-operative bleeding by various

pharmacologic and non-pharmacologic measures.

- Various measures used to define adequacy of perfusion, advantages and pitfalls of each.

PRACTICALS:

- Discuss the various complications of CPB on various organs and ways to mitigate them.

Practical Examinations

35marks

1. Discussion on complications of CPB
2. Case history

REFERENCE BOOKS.

1. Cardiopulmonary Bypass and Mechanical Support. Principles and Practise. Glenn P Gravlee et al. Fourth Edition. Wolter Kluwers.
2. Cardiopulmonary Bypass. 1st Edition. Sumit Ghosh et al. Cambridge University Press.
3. On Bypass- Advanced Perfusion Techniques. Linda B Mongero et al. Humana Press.
4. Essentials of Cardiac Anaesthesia. 5th Edition. Kaplan. Saunders Elsevier.

V Semester
Elective-1- Echocardiography

Objective:

- To learn about the basics of principles, practice and applications of echocardiography.

Content:

Introduction to echocardiography.

- Principles of echocardiography 4 hours
- Ultrasound Its application to obtain echocardiograms
- Principles of two dimensional echo and its applications
- Principles of M - mode and its application
- Principles of colour Doppler and spectral Doppler and their applications

Practice of Echocardiography

12 hours

- ECHO views
- ECHO windows
- Obtaining Left ventricular images
- Obtaining Doppler data Echocardiographic measurements

Other methods of imaging Indications for echocardiography

10 hours

- Assessment of anatomy
- Assessment of etiology
- Assessment of pathology
- Assessment of physiology
- Assessment of follow up of cardiac diseases

Technical pit falls of echocardiography

4 hours

- Echo windows
- Suboptimal use of technology of ultrasound
- Artefacts in echocardiography
- Echocardiography in special situations

Practical assessment

- a) Spotters
- b) Video Clips
- c) Demonstration of common disorders

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 - Unique Situations in CPB

Course Outcomes

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge of managing complications during CPB

CO 2: Demonstrate the acquisition of comprehensive knowledge of CPB in patients with renal failure.

CO 3: Demonstrate the acquisition of comprehensive knowledge of CPB in patients with Liver failure

CO 4: Demonstrate the acquisition of comprehensive knowledge about CPB in Infants, Children and Pregnant patients

CO 5: Assess the patient and plan care following CPB in various conditions

CO 6: Demonstrate the acquisition of comprehensive knowledge about Non-cardiac surgical applications of CPB.

CO 7: Demonstrate the capability to manage the assigned task in a team during CPB.

Theory

- **Managing intraoperative** on-CPB complications such as air in the circuit, venous airlock, unusual hemolysis during CPB and inadequate drainage. Methods to identify these complications and ways to identify them and manage them as necessary.
- Managing CPB in patients with acute renal failure and chronic renal failure for cardiac surgery including filtration techniques on CPB.
- Managing CPB in patients with altered hepatic function and in patients with cirrhosis.
- Fetal circulation, changes in circulation after birth, managing infants and children with congenital heart defects for cardiac surgery.
- Managing CPB in cyanotic patients posted for cardiac surgery.
- Managing pregnant patients posted for cardiac surgery.
- Brief introduction regarding intrauterine cardiac surgeries.
- Managing hemodynamics and oxygenation in patients posted for non-cardiac surgery.
- Systemic-pulmonary shunts in pediatric cardiac surgeries- role, causes, effects on cardiopulmonary bypass and management.
- Indications, use, complications of Octopus in cardiac surgery.
- Indications, use, complications of Starfish in cardiac surgery.
- Indications, use, complications of intracoronary shunts.

PRACTICALS:

- Discuss in detail management of patients with the above-mentioned pathologies posted for cardiac surgery.

Practical Examinations

35marks

1. Assessment of the management protocol of various conditions in cardiac surgery

REFERENCE BOOKS:

1. Cardiopulmonary Bypass and Mechanical Support. Principles and Practise. Glenn P Gravlee et al. Fourth Edition. Wolter Kluwers.
2. Cardiopulmonary Bypass. 1st Edition. Sumit Ghosh et al. Cambridge University Press.
3. On Bypass- Advanced Perfusion Techniques. Linda B Mongero et al. Humana Press.
4. Essentials of Cardiac Anaesthesia. 5th Edition. Kaplan. Saunders Elsevier.
5. Anaesthesia for Cardiac Surgery. 4th Edition. James DiNardo. Blackwell Publishing.

VI Semester
Core -17- Advances in Cardiac Surgery and Perfusion Techniques

Course Outcomes:

At the end of the course student should be able to

CO 1: Demonstrate the acquisition of comprehensive knowledge of IABP in Cardiac surgery and other patient setups.

CO 2: Demonstrate the acquisition of comprehensive knowledge of ECMO and its application

CO 3: Demonstrate the acquisition of comprehensive knowledge of VADs and its uses.

CO 4: Demonstrate the acquisition of comprehensive knowledge of DHCA and TCA.

CO 5: Demonstrate the acquisition of comprehensive knowledge of management of patient posted for Minimally Invasive Cardiac Surgery.

CO 6: Demonstrate the acquisition of comprehensive knowledge about recent advances in perfusion technology field.

SYLLABUS

- Intra-aortic Balloon Pump Counter pulsation- History, uses, indications, contraindications, complications and its management. Role of IABP in Non-cardiac surgery.
- ECMO- Types, uses, indications and contraindications, complications and its management, long term management of patients on ECMO. ECMO in non-cardiac setup applications and management.
- Ventricular Assist Devices- Types, indications and management of patients posted for VAD insertion.
- Deep Hypothermic Circulatory Arrest, Retrograde and Antegrade cerebral perfusion- techniques, indications, uses, advantages, complications.
- Management of patients posted for minimally invasive cardiac surgery.
- Management of patients posted for cardiac transplantation.
- Management of patients posted for Heart-lung transplant.
- Role of perfusionist in other organ transplants.

PRACTICALS:

- IABP management- Insertion and removal of IABP. Discuss management of patients with IABP.
- Discuss management of patients mentioned above.

Practical Examinations: 35marks

1. Demonstrate the insertion and removal of IABP
2. Discussion on the management of patients with IABP

REFERENCE BOOKS:

1. Cardiopulmonary Bypass and Mechanical Support. Principles and Practise. Glenn P Gravlee et al. Fourth Edition. Wolter Kluwers.
2. Essentials of Cardiac Anaesthesia. 5th Edition. Kaplan. Saunders Elsevier.
3. Extracorporeal Life Support for Adults. Gregory Schmidt. Humana Press. Clinical Application of Intra-Aortic Balloon Pump. Third Revised Edition. Hooshang Bolooki. Wiley-Blackwell Publishers.

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 pattern

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**

- a) History of coronary angiography
- b) Instrumentation in coronary angiography
- c) Indications for coronary angiography
- d) Contraindications for coronary angiography

Procedure **6 hours**

- a) Approach
- b) Seldingers technique
- c) Catheters for coronary angiography
- d) Views for coronary angiography
- e) Evaluation of a coronary lesion
- f) Reporting of coronary angiography

Decision making on management **12 hours**

- a) Revascularization PTCA or CABG

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

- a) Drugs
- b) Groin care (femoral approach)
- c) Wrist care (radial approach)

Complications and management

Practical assessment:

- a) Spotters
- b) Video Clips
- c) Demonstration of common disorders

VI Semester
Allied - 6 - Hospital Management

Learning objective:

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

Content:

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