



YENEPOYA

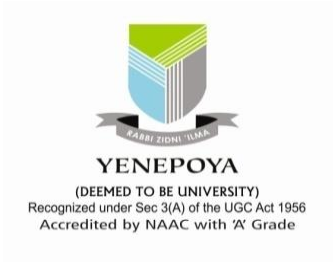
(DEEMED TO BE UNIVERSITY)
Recognized under Sec 3(A) of the UGC Act 1956
Accredited by NAAC with 'A' Grade

YENEPOYA MEDICAL COLLEGE

Deralakatte, Mangaluru, Karnataka - 575018

REGULATIONS AND CURRICULUM GOVERNING

B.Sc. ANAESTHESIA IN OT TECHNOLOGY



**Office of the Registrar
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Ref: No. Y/REG/ACA/Notification/2021

08.03.2021

NOTIFICATION

Sub: Addendum to the B.Sc. Anaesthesia in OT Technology Program regulations 2015-16 based on the revisions approved by the Academic Council and Board of Management meetings: Regarding

With reference to the subject cited above the University is pleased to consolidate the various revisions approved by the Academic Council and Board of Management for implementation effective from the academic year indicated in the respective revisions.

REGISTRAR



Office of the Registrar
University Road,
Deralakatte
Mangalore - 575018
Ph: 0824-2204667/68/69/71
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No.YU/REG/ACA/Academic Council-18/2014

18.10.2014

NOTIFICATION

Sub: Starting of B.Sc. course in Anaesthesia & O.T. Technology from the Academic year 2015-16 under the Faculty of Allied Health & Basic Sciences

Ref: 18th meeting of the Academic Council held on 08.10.2014 (Agenda-16)

The Academic Council at its meeting held on 08.10.2014 (vide Agenda - 16) and subsequently the Board of Management have approved the proposal to start 3 year + 6 months internship B.Sc. course (Anaesthesia and O.T. Technology) as proposed by the Board of Studies concerned and recommended by the Faculty of Allied Health & Basic Sciences. The Regulations/Syllabus recommended by the Faculty of Allied Health & Basic Sciences has also been approved by the Academic Council.

The course shall start from the academic year 2015-16 under the Department of Anaesthesia.


REGISTRAR

Copy to:

1. The Principal, YMC
2. Dean, Faculty of Allied Health & Basic Sciences
3. HoD, Anaesthesia
4. Controller of Examinations
5. Academic Section - to write to Govt. of Karnataka & UGC in the matter

Preamble: Health care sector has become one of the largest employment generation sectors in India and abroad. Rapidly changing and expanding horizon of the health care sector demands formal training programs in all its allied areas. Advanced complex instrumentation & equipment require technologists not only to operate but also to care & maintain these instruments and equipment. These technologists should possess a strong scientific foundation to be able to perform these tasks at a much higher level than the traditionally trained technicians of the past used to perform. The students who are trained in the technological aspects of medical care with a good scientific foundation will be in a position to competently and efficiently assist the Physician or Surgeon. With these goals Yenepoya(deemed to be) University, under Faculty of Allied Health Care started Bachelor of Science in Medical Technology in 2015 with an annual scheme of examination. Ministry of Human Resource Development (HRD), Govt. of India, has initiated the process for developing New Education Policy (NEP) in our country to bring out reforms in Indian education system. In accordance with this, to match our education system with the international educational pattern we are introducing Credit based semester system from academic year 2020- 21 onwards.

Objective:To produce skilled technologist with a strong scientific foundation who has knowledge, confidence, values and skills to perform and assist diagnostic and therapeutic services in his specialty

REGULATIONS

1. Name of the course:

BSc. Anaesthesia and Operation Theatre Technology.

2. Eligibility for admission:

A candidate seeking admission to the Bachelor of Science Degree in Anaesthesia & O.T. Technology shall have studied English as one of the principal subjects during the tenure of the course and shall have passed:

a) Two year Pre-University examination or equivalent as recognized by Yenepoya University, with Physics, Chemistry and Biology as principal subjects of study.

OR

b) Pre-degree course from a recognized university considered as equivalent by Yenepoya University, (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 Yenepoya University 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, with five subjects including Physics, Chemistry, Biology and English in addition to vocational subjects conducted, is considered equivalent to 'plus-two' [10+2] examinations of Government of Karnataka Pre-University Course.

OR

e) Candidates with two years diploma from a recognized Government Board in Anaesthesia or O.T. Technology or Combined course of Anaesthesia & O.T. Technology shall have passed 'plus-two' [10+2] with Physics, Chemistry and Biology, as principal subjects. OR candidates with 3 years diploma from a recognized Government Board in Anaesthesia or O.T. Technology or Anaesthesia & O.T. Technology should have studied Physics, Chemistry and Biology as principal subjects during the tenure of the course.

3. Duration of the course:

Duration shall be for a period of three years followed by six months of internship.

4. Medium of instruction:

The medium of instruction and examinations 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, separately theory and practical, to be eligible to appear for the university examinations. Candidates lacking in prescribed percentage of attendance in any subject, either in theory or practical, in the first appearance, will not be eligible to appear for the university examination in that subject, unless they put in the required attendance, to

appear in the subsequent examinations.

6. Internal assessment(IA):

There shall be a minimum of three periodical tests in theory and practical of each subject spread over evenly in an academic year. The average marks of the best two tests will be calculated and after reducing the marks suitably as specified under IA in table IV, V & VI, taken as IA in that subject. The marks of IA shall be communicated to the university at least 15 days before the commencement of the university examination. The university shall have access to the records of such periodical tests. Candidates have to secure 35% marks in the IA in each subject to become eligible to appear in the university examination. The marks of the internal assessment must be displayed on the notice board of the respective colleges within a fortnight from the date the test is held. If a candidate is absent for any of the tests due to genuine and satisfactory reasons, such a candidate may be given a re-test, within a fortnight of the test.

7. Subject and hours of teaching for theory and practical:

The number of hours of teaching theory and practical, subject wise in first year, second year and third year are shown in table I, table II and table III. Main and subsidiary subjects are common in first year for all the courses in Allied Health Sciences.

Table: Distribution of teaching hours in first year subjects.

S/No	Subject	Theory No. of hours	Practical No. of hours	Total no. of hours
A	Mains subjects			
1	Human anatomy	70	20	90
2	Physiology	70	20	90
3	Biochemistry-I	70	20	90
4	Pathology-I	70	20	90
5	Microbiology-I	70	20	90
	Total	350	100	450
B	Subsidiary subjects			
1	English	25		
2	Kannada	25		
3	Health-care	40		

a) **Note:** a) The classes in main and subsidiary subjects are to be held from Monday to Thursday. On Fridays and Saturdays students shall work in Anaesthesiology Department and operation theatre of the hospital.

b) Hospital Posting: 470 hours

Friday : 8.30 am – 12.30 pm and 2pm – 4.30pm

Saturday : 8.30 a.m. to 12.30 p.m. & 1.30 p.m. to 4.30 p.m.

TABLE II: Distribution of subjects and number of hours of teaching in second year.

Sl. No.	Subject	Theory No. of Hours	Practical No. of Hours	Clinical posting	Total No. of Hours
A	Main Subjects				
1	Section A: Applied pathology Section B: Applied microbiology	30 30	30 30	--	120
2	Introduction to Anaesthesia a related work & operation theatre technology	80	100	650	830
3	Pharmacology	50	--	--	50
4	Medicine relevant to operation theatre technology	50	--	--	50
	Total	240	160	650	1050
B	Subsidiary subjects				
1	Sociology	20			
2	Constitution of India	10			
3	Environmental Science & Health	10			

Table III: Distribution of Teaching Hours in Third Year Subjects.

Sl. No.	Subjects	Theory No. of Hours	Practical No. of Hours	Clinical posting	Total No. of Hours
A	Main Subjects				
1	Anaesthesia Management - Clinical & applied	50	50	250	350
2	Operation theatre technology - Clinical & Applied	50	50	250	350
3	Advanced Anaesthesia management	50	150	250	350
	Total	150	150	750	1050
B	Subsidiary subjects				
1	Ethics	20			
2	Research and Biostatistics	10			
3	Computer application	10			

8. Schedule of Examination:

- a) The University shall conduct three annual examinations, one at the end of each year, as notified by the university. A candidate who satisfies the requirement of attendance, internal assessment and conduct as stipulated by the university shall be eligible to appear for the university examination. Certificate to that effect shall be produced from the Head of the Institution along with the application for examination and the prescribed fee. Supplementary examination shall be conducted by the university between 4-6 months from the date of the annual examinations.

b) Examination for subsidiary subjects shall be conducted by respective college and the results and marks obtained shall be submitted to the University along with the IA marks of main subjects.

9. Scheme of Examination:

Distribution of subjects and marks for first year, second year & third year theory and practical examinations are shown in the Table-IV, V & VI.

Table IV: Distribution of Subjects and marks for First Year theory Examination

		Written Paper		IA Theory	Total
		Duration	Marks	Marks	Marks
A	Main Subjects				
1	Basic Anatomy (Including Histology)	3 hours	80	20	100
2	Physiology	3 hours	80	20	100
3	Biochemistry-I	3 hours	80	20	100
4	Pathology-I	3 hours	80	20	100
5	Microbiology-I	3 hours	80	20	100
B	Subsidiary Subjects				
1	English	3 hours	80	20	100
2	Kannada	3 hours	80	20	100
3	Health Care	3 hours	80	20	100

Note:

- a) The university examination for first year shall consist of only theory examination and there shall be no university practical examination.
- b) IA=Internal Assessment
- c) Main subjects shall have University examination.
- d) Examination for subsidiary subjects shall be conducted by respective college.

TABLE V: Distribution of subjects and marks for Second year examination.

Paper	Subjects	Theory				Practical			Grand Total
		Theory	Viva Voce	IA	Sub Total	Practicals	IA	Sub Total	
A	Main Subjects								
1	Section A: Applied pathology Section B: Applied microbiology	50	30	20	150	40	10	50	200
2	Introduction to Anaesthesia & operation theatre technology	100	30	20	150	40	10	50	200
3	Pharmacology	80	--	20	100	No practical			100
4	Medicine relevant to operation theatre technology	80	--	20	100	No practical			100
B	Subsidiary Subjects	Duration	Marks	IA Theory Marks	Total Marks				
1	Sociology	3 hours	80	20	100				
2	Constitution of India	3 hours	80	20	100				
3	Environmental Science &	3 hours	80	20	100				

	Health				
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Note: Examination for subsidiary subjects shall be conducted by respective college.

TABLE VI: Distribution of subjects and marks for Third year examination.

Paper	Subjects	Theory				Practical			Grand Total
		Theory	Viva Voce	IA	Sub Total	Practicals	IA	Sub Total	
A	Main Subjects								
1	Clinical Anaesthesia and O.T. Technology	100	30	20	150	120 (40+40+40)	30 (10+10+10)	150	600
2	Applied Anaesthesia and O.T. Technology	100	30	20	150				
3	Advanced Anaesthesia Management	100	30	20	150				
B	Subsidiary Subjects	Duration		Marks		IA	Total Marks		
1	Ethics	3 hours		80		20	100		
2	Research & Biostatistics	3 hours		80		20	100		
3	Computer application	3 hours		80		20	100		

Note:

- Practical- One common practical for all the three papers with equal weightage of marks i.e. 40 practical marks and 10 IA mark each paper.
- Examination for subsidiary subjects shall be conducted by respective college.

10. Question Paper pattern:

For 100 marks question paper

Type of Questions	No of Questions	Marks For Each Questions	Total
Essay type	3(2x10)	10	20
Short essay type	12(10x5)	05	50
Short answer type	12(10x3)	03	30

For 80 marks question paper

Type of Questions	No of Questions	Marks For Each Questions	Total
Long Essay	3(2x10)	10	20
Short Essay	8(6x5)	05	30
Short Answers	12(10x3)	03	30

For 50 marks question paper

Type of Questions	No of Questions	Marks For Each Questions	Total
Long Essay	3(2x10)	10	20
Short Essay	5(3x5)	5	15
Short Answers	7(5x3)	3	15

11. Practical Examination.

- a) There shall be no University practical examination in the first year.
 b) Practical Examination (2nd Year):
 i) There will be a combined practical examination for Applied Pathology & Applied Microbiology (20 marks each).

Pathology

S/No	Tests	Marks
1	Interpretation of hematology chart	05
2	Interpretation of urine chart	05
3	Estimation of hemoglobin	05
4	Estimation of bleeding time & clotting time	05
	Total	20

Microbiology

S/No	Tests	Marks
1	Dry heat/Moist heat: Temperature recording charts interpretation	05
2	Dry heat/Moist heat: Color change indicators interpretation	05
3	Air sampling culture plates interpretation of colony forming units based on air flow rate and sampling time	05
4	Interpretation of sterility of hemodialysis water/distilled water/deionized water, based on growth of colonies in BHI Agar to be reported as XCFU/u	05
	Total	20

- ii) There shall be no University practical examination in Applied Pharmacology and Medicine Relevant to Anaesthesia and O.T. Technology.
 c) Practical Examination (3rd Year)
 One common practical for all the three papers with equal weightage of marks i.e. 40 marks for each paper.

12. Board of Examiners:

Practical examination will be conducted by two examiners out of which one will be external examiner recognized by the university.

13. Criteria for pass:

- a) Main 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 all be considered to be separate subjects. If a candidate passes in practical examination but fails in one or more theory papers, 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.
 b) Subsidiary Subjects: The minimum prescribed marks for a pass in subsidiary subject shall be 35% of the maximum marks prescribed for a subject. The marks obtained in the subsidiary subjects shall be communicated to the university before the commencement of the university examination.

14. Declaration of class:

- a) A candidate who passes all the main subjects in the first attempt, securing 75% marks or more (aggregate), shall be declared to have passed the examination with **Distinction**.
- b) A candidate who passes all the main subjects in the first attempt, securing 60% marks or more, but less than 75% (aggregate), shall be declared to have passed the examination with **First Class**.
- c) A candidate who passes all the main subjects in the first attempt, securing 50% marks or more, but less than 60% (aggregate), shall be declared to have passed the examination with **Second Class**.
- d) A candidate who passes all the main subjects in the first attempt, securing 40% marks or more, but less than 50% (aggregate), shall be declared to have passed the examination with **Pass Class**.
- e) A candidate passing university examination in more than one attempt shall be placed in **Pass class** irrespective of the percentage of marks secured.
- f) Marks obtained in the subsidiary subjects shall have no bearing on the class declaration.

15. Carryover

A candidate who fails in main subjects and/or subsidiary subjects of first year and/or second year shall be permitted to carry over those subjects up to final year. However, the candidate must pass the carry over subjects before appearing for third year university examination.

16. Internship

Six months internship shall be mandatory after successful completion of third year examination. The respective departments shall issue 'Internship Completion Certificate'

17. Award of degree

A candidate who has passed in all the main and subsidiary subjects of first, second and third year and has successfully completed the internship shall be eligible for award of degree.

18. Maximum duration for completion of course

A candidate shall complete the course within six years from date of admission, failing which re-registrations shall be mandatory.

SYLLABUS

MAINSUBJECTS

FirstYearB.Sc.Anaesthesia and Operation TheatreTechnology

ANATOMY

No.ofTheoryclasses:70hours

No.ofPracticalclasses:20hours

1.Introduction:Humanbodyasawhole a)

Theory:

Definitionofanatomyanditsdivisions.

Termsoflocation,positionsandplanes.

Cellanditsorganelles.

Epithelium:definition,classification,describewitexamples,function.

Glands:classification,describerous&mucousglandswithexamples.

Basictissues:classificationwithexamples

b) Practical:

Histologyoftypesofepithelium.

Histologyofserous,mucous&mixedsalivarygland.

2.Locomotionandsupport a)

Theory:

Cartilage:typeswithexample&histology.

Bone:classification, namesofbonecells,partsof longbone,microscopy ofcompact bone,namesofallbones,vertebral column, inter-vertebral disc,fontanelles offetal skull.

Joints:classificationofjointswithexamples,synovialjoint(indetailforradiology).

Muscularsystem:classificationofmuscular tissue&histology,namesofmusclesofthe body.

b) Practical:

Histologyofthe3typesofcartilage.

Demoofallbonesshowingparts,radiographsofnormalbones&joints.

Histologyofcompactbone(TS&LS).

Demonstrationofallmusclesofthebody.

Histologyofskeletal,smooth&cardiacmuscle(TS&LS).

3.Cardiovascularsystem

a) Theory:

Heart:size,location,chambers,exterior&interior,bloodsupplyofheart.

Systemic &pulmonary circulation, branches ofaorta,common carotid artery, subclavianartery,axillaryartery,brachialartery,superficialpalmararch, femoralartery, internaliliac artery,peripheralpulse,inferiorvenacava,portalvein, porto-systemic anastomosis,greatsaphenousvein,Duralvenoussinus.

Lymphaticsystem:cisternachyli&thoracicduct,histologyoflymphaticissues,names ofregionallymphatics,axillaryandinguinallymphnodesinbrief.

b) Practical:

Demonstration of heart and vessels in the body.
Histology of large artery, medium sized artery & vein, large vein.
Histology of lymph node, spleen, tonsil & thymus.
Normal chest radiograph showing heart shadows.
Normal angiograms.

4. Gastro-intestinal system

a) Theory:

Parts of GIT, oral cavity, lip, tongue (with histology), tonsil, dentition, pharynx, salivary glands, Waldeyer's ring, esophagus, stomach, small and large intestine, liver, gall bladder, pancreas, radiographs of abdomen.

b) Practical:

Demonstration of parts of gastrointestinal system.
Normal radiographs of gastrointestinal system.
Histology of gastrointestinal system.

5. Respiratory system

a) Theory:

Parts of RS, nose, nasal cavity, larynx, trachea, lungs, Broncho-pulmonary segments, histology of trachea, lung and pleura, names of paranasal sinuses.

b) Practical:

Demonstration of parts of respiratory system.
Normal radiographs of chest.
Histology of lung and trachea.

6. Peritoneum

a) Theory:

Description in brief.

b) Practical:

Demonstration of reflections.

7. Urinary system

a) Theory:

Kidney, ureter, urinary bladder, male and female urethra.
Histology of kidney, ureter and urinary bladder.

b) Practical:

Demonstration of parts of urinary system. Histology of kidney, ureter, urinary bladder. Radiographs of abdomen- IVP, retrograde cystogram.

8.Reproductivesystem

a) Theory:

Partsofmalereproductive system,testis,vasdeferens,epididymis,prostate(gross& histology).

Partsof femalereproductivesystem,uterus,fallopiantubes,ovary(gross&histology).
Mammarygland:gross.

b) Practical:

Demonstrationofsectionofmaleandfemalepelviswithorgansinsitu.

Histologyoftestis,vasdeferens,epididymis,prostate,uterus,fallopiantube,ovary.

Radiographsofpelvis,hystero-salpingogram.

9. Endocrine glands

a) Theory:

Endocrine glands: pituitary gland, thyroid gland, parathyroid gland, suprarenal gland (gross & histology).

b) Practical:

Demonstration of the glands.

Histology of pituitary, thyroid, parathyroid, suprarenal glands.

10. Nervous system

a) Theory:

Neuron, classification of nervous system, cerebrum, cerebellum, midbrain, pons, medulla oblongata, spinal cord with spinal nerve (gross & histology), meninges, ventricles & cerebrospinal fluid, names of basal nuclei, blood supply of brain, cranial nerves. Sympathetic trunk & names of parasympathetic ganglia.

b) Practical:

Histology of peripheral nerve & optic nerve.

Demonstration of all plexuses and nerves in the body.

Demonstration of all parts of brain.

Histology of cerebrum, cerebellum, spinal cord.

11. Sensory organs:

a) Theory:

Skin: histology, appendages of skin.

Eye: parts of eye & lacrimal apparatus. Extra-ocular muscles & nerve supply. Part of ear: external, middle and inner ear and contents.

b) Practical:

Histology of thin and thick skin.

Demonstration and histology of eyeball.

Histology of cornea & retina.

12. Embryology:

a) Theory:

Spermatogenesis & oogenesis.

Ovulation, fertilization.

Fetal circulation.

Placenta.

b) Practical:

Demonstration of models.

REFERENCEBOOKS

1. Chourasia: A Textbook of Anatomy
2. T.S. Ranganathan: A Textbook of Human Anatomy
3. Fattana: Human anatomy (Description and applied) Saunders's & CP Prisma Publishers, Bangalore-1991
4. Bhatnagar: Essentials of Human Embryology. Revised Edition Orient Blackswan Pvt. Ltd.

PHYSIOLOGY

No. of Theory classes: 70 hours

No. of Practical classes: 20 hours

Theory

1. Blood

Introduction: composition and function of blood.

Red blood cells: erythropoiesis, stages of differentiation, function, count, physiological variation.

Structure, function, concentration, physiological variation, methods of estimation of haemoglobin.

White blood cells: production, function, lifespan, count, differential count.

Platelets: origin, normal count, morphology functions.

Plasma proteins: production, concentration, types, functions, albumin, globulin, fibrinogen, prothrombin.

Haemostasis: definition, normal haemostasis, clotting factors, mechanism of clotting, disorders of clotting factors.

Blood bank:

Blood groups: ABO system, Rh system.

Blood grouping & typing, cross matching.

Rh system: Rh factor, Rh incompatibility.

Blood transfusion: indication, universal donor and recipient concept.

Selection criteria of a blood donor, transfusion reactions.

Anticoagulants: classification, examples and uses.

Anaemias: morphological and aetiological classification, effects of anaemia on body.

Blood indices: colour index, MCH, MCV, MCHC.

Erythrocyte sedimentation rate (ESR) and packed cell volume, normal values, definition, determination.

Blood volume: normal value, determination of blood volume and regulation of blood volume.

Body fluid: pH, normal value, regulation and variation.

Lymph: lymphoid tissue formation, circulation, composition and function of lymph.

2. Cardiovascular system

Heart: physiological anatomy, nerve supply.

Properties of cardiac muscle, cardiac cycle: systole, diastole. Intra-ventricular pressure curves.

Cardiac output (only definition).

Heart sounds, normal heart sounds, areas of auscultation.

Blood pressure: definition, normal value, clinical measurement of blood pressure.

Physiological variations, regulation of heart rate, cardiac shock, hypotension, hypertension.

Pulse: jugular, radial pulse, tripler response.

Heart sounds: normal heart sounds, causes, characteristics and significance, heart rate.

Electrocardiogram(ECG)significance.

3. Digestive System

Physiological anatomy of gastrointestinal tract, functions of digestive system.

Salivary glands: structure and functions, deglutition: stages and regulation.

Stomach: structure and functions.

Gastric secretion: composition, function, regulation of gastric juice secretion.

Pancreas: structure, function, composition, regulation of pancreatic juice.

Function of liver. Bile secretion, composition, function, regulation of bile secretion, bilirubin metabolism, types of bilirubin, Van den Berg reaction, jaundice: types, significance.

Function of gall bladder.

Small intestine: functions, digestion, absorption, movements.

Large intestine: functions, digestion and absorption of carbohydrates, proteins, fats, lipids, defecation

4. Respiratory system

Functions of respiratory system, physiological anatomy of respiratory system, respiratory tract, respiratory muscles.

Respiratory organs: lungs, alveoli, respiratory membrane, stages of respiration. Mechanism of normal and rigorous respiration, forces opposing and favoring expansion of the lungs.

Intrapulmonary pleural pressure, surface tension, recoil tendency of the wall.

Transportation of respiratory gases: transportation of oxygen: direction, pressure gradient, forms of transportation, oxygenation of Hb. Quantity of oxygen transported. Lung volumes and capacities

Regulation of respiration: mechanisms of regulation, nervous and chemical regulation, respiratory centre, Hering-Breuer reflexes.

Applied physiology and respiration: hypoxia, cyanosis, asphyxia, dyspnea, dysbarism, artificial respiration, apnoea.

5. Endocrine System

Definition, classification of endocrine glands & their hormones, properties of hormones. Thyroid gland and hormone: physiological anatomy, hormones secreted, physiological function, regulation of secretion, disorders: hypo and hypersecretion of hormone.

Adrenal cortex: physiological anatomy of adrenal gland, adrenal cortex, cortical hormones, functions and regulation.

Adrenal medulla: hormones, regulation and secretion. Functions of adrenaline and noradrenaline.

Pituitary hormones: anterior and posterior pituitary hormones, secretion, function.

Hormones of pancreas.

Insulin: secretion, regulation, function and action.

Diabetes mellitus: regulation of blood glucose level.

Parathyroid gland: function, action, regulation of secretion of parathyroid hormone.

Calcitonin: function and action.

6. Special senses

Vision: structure of eye, function of different parts.

Structure of retina.

Hearing: structure and function of ear, mechanism of hearing.

Tastebuds: functions.

Smell: physiology, receptors.

7. Nervous system

Function of nervous system, neuron: structure, classification and properties.

Neuroglia, nerve fiber, classification, conduction of impulses continuous and saltatory.

Velocity of impulse transmission and factors affecting.

Synapse: structure, types, properties.

Receptors: definition, classification, properties.

Reflex action: unconditioned properties of reflex action. Babinski's sign.

Spinal cord nerve tracts. Ascending tracts, descending tracts.

- **Pyramidal tracts**

Extrapyramidal tracts, functions of medulla, pons, hypothalamic disorders.

Cerebral cortex lobes and functions, sensory cortex, motor cortex, cerebellum, functions of cerebellum. Basal ganglion: functions. EEG.

Cerebrospinal fluid (CSF): formation, circulation, properties, composition and functions.

Lumbar puncture.

- **Autonomic Nervous System:**

Sympathetic and parasympathetic distribution and functions and comparison of functions.

8. Excretory System

Function of kidneys, nephron, vasarecta, cortical and juxtamedullary nephrons, comparison, juxtaglomerular apparatus: structure and function. Renal circulation peculiarities.

Mechanism of urine formation: ultrafiltration criteria for filtration GFR, plasma fraction, GFR, factors affecting GFR. Determination of GFR selective reabsorption—sites of reabsorption, substance reabsorbed, mechanisms of reabsorption of glucose, urea, H^+ , Cl^- , amino acid etc. TMG, tubular load, renal threshold % of reabsorption of different substances, selective secretion.

Properties and composition of normal urine, urine output. Abnormal constituents in urine, mechanism of urine concentration. Counter-current mechanisms: micturition, innervation of bladder, cystourethrogram.

Diuretics: water, diuretics, osmotic diuretics, artificial kidney, renal function tests: plasma clearance, actions of ADH, aldosterone and PTH on kidneys.

Renal function tests.

9. Reproductive system

Function of reproductive system, puberty.

Male reproductive system: functions of testes, spermatogenesis: site, stages, factors influencing, semen. Endocrine functions of testes.

Androgens: testosterone structure and functions.

Female reproductive system: ovulation, menstrual cycle: physiological changes during pregnancy, pregnancy test.

Lactation: composition of milk, factors controlling lactation.

10. Musclenervephysiology

Classification of muscle, structure of skeletal muscle, sarcomere contractile proteins, Neuromuscular junction. Transmission across neuromuscular junction. Excitation contraction coupling. Mechanism of muscle contraction muscle tone, fatigue, rigormortis.

11. Skin

Structure and function, body temperature measurement, physiological variation, regulation of body temperature by physical chemical and nervous mechanisms. Role of hypothalamus, hypothermia and fever.

Practicals

Hemoglobinometry.
White blood cell count.
Red blood cell count.
Determination of blood groups.
Leishman's staining and differential WBC count.
Determination of packed cell volume.
Erythrocyte sedimentation rate (ESR).
Calculation of blood indices.
Determination of clotting time, bleeding time.
Blood pressure recording.
Auscultation for heart sounds.
Artificial respiration.
Determination of vital capacity.

REFERENCE BOOKS

1. Guyton (Arthur): Text Book of Physiology. Latest Ed. Prism publishers.
2. Chatterjee CC: Human Physiology Latest Ed. Vol-1, Medical Allied Agency.
3. Choudhari Sujith K: Concise Medical Physiology Latest Ed. New Central Book.
4. Ganong William F: Review of Medical Physiology. Latest Ed. Tata McGraw Hill.

BIOCHEMISTRY

No.Theoryclasses:70hours

No.ofPracticalclasses:20hours

Theory:

1.Specimencollection:

Pre-analyticalvariables.
Collectionofblood.
CollectionofCSF&otherfluids.
Urinecollection.
Useofpreservatives.
Anticoagulants.

2.Introductiontolaboratoryapparatus

Pipettes:differenttypes(graduated,volumetric,Pasteur,automaticetc.).
Calibrationofglasspipettes.
Burettes,beakers,petridishes,depressionplates.
Flasks:differenttypes(volumetric,roundbottomed,ErleMeyerconicaetc.).
Funnels:differenttypes(conical,Buchneretc.).
Bottles:reagentbottles–graduatedandcommon,washbottles–differenttypespecimen bottles

3.Measuringcylinders,porcelain dishes

Tubes:testtubes,centrifugetubes,testtubedrainigrack.
Tripodstand,wiregauze,bunsenburner.
Cuvettes,significanceofcuvettesincolorimeter,cuvettesforvisibleandUVrange.Cuvette holderracks: bottle,testtube,pipette,dessicator,stopwatch,timers,scissors.
Dispensers:reagentandsample.
Maintenanceoflabglasswareandapparatus.
Glassandplasticwareinlaboratory.
Useofglass:significance ofborosilicate glass,careandcleaning ofglassware,different cleaningsolutionsofglass.
Careandcleaningofplasticware,differentcleaningsolution.

4.Instruments(Theoryanddemonstration)Diagramstobedrawn

Use,careandmaintenanceof:waterbath,oven&incubators,waterdistillationplant,water de ionisers,refrigerators,coldbox,deep freezers,refluxcondenser,centrifuge,balances, colorimeter,spectrophotometer,pHmeterandelectrodes.
Centrifuges: definition, principles, Svedberg unit,centrifugal force,centrifugal field,RPM, conversion ofGtoRPMandviceversa,differenttypesofcentrifuges.
Manualbalances:singlepan,doublepan,triplebalance,directreadoutelectricalbalances. Guideline tobe followedandprecautions tobetakenwhileweighing. Weighingdifferent typesofchemicals,liquids,hygroscopiccompoundsetc.
Colorimeter, spectrophotometer, pH meter, electrodes, salt bridgesolution: principles, parts,types,guidelinestobe followedandprecautionstobetakenwhileusing.

5. Safety of measurements

6. Conventional and SI units

7. Atomic structure

Dalton's theory, properties of electrons, protons, neutrons, and nucleus, Rutherford's model of atomic structure, Bohr's model of atomic structure, orbital and orbital quantum numbers, Heisenberg's uncertainty principle. Electronic configuration, Aufbau principle, Pauli's exclusion principle, etc.

Valency and bonds: different types of strong and weak bonds in detail with examples.

Theory & Practicals for all the following under this section: molecular weight, equivalent weight of elements and compounds, normality, molarity. Preparation of molar solutions (mole/litre solution) eg: 1 M NaCl, 0.15 M NaCl, 1 M NaOH, 0.1 M HCl, 0.1 M H₂SO₄ etc. Preparation of normal solutions. eg, 1 N Na₂CO₃, 0.1 N Oxalic acid, 0.1 N HCl, 0.1 N H₂SO₄, 0.66 N H₂SO₄ etc., percent solutions. Preparation of different solutions: v/v w/v (solids, liquids and acids). Conversion of a percent solution into a molar solution.

8. Dilutions

Diluting solutions: e.g. preparation of 0.1 N NaCl from 1 N NaCl & from 2 N NaCl etc, preparing working standard from stock standard, body fluid dilutions, reagent dilution techniques, calculating the dilution of a solution, body fluid reagent etc, saturated and supersaturated solutions. Technique for preparation of standard solutions eg: glucose, urea, etc, significance of volumetric flask in preparing standard solutions. Volumetric flasks of different sizes, preparation of standard solutions of deliquescent compounds (CaCl₂, potassium carbonate, sodium hydroxide etc). Preparation of standards using conventional and SI units acids, bases, salts and indicators.

9. Acids and Bases

Definition, physical and chemical properties with examples. Arrhenius concept of acids and bases, Lowry-Bronsted theory of acids and bases. Classification of acids and bases. Differences between bases and alkali, acidity and basicity, monoprotic and polyprotic acids and bases. Concept of acid-base reaction, hydrogen ion concentration, ionisation of water, buffer, pH value of a solution.

Preparation of buffer solutions using pH meter. Salts: definition, classification, water of crystallization, definition and different types, deliquescent and hygroscopic salts.

10. Acid-base indicators: (Theory and Practicals)

Theory

Definition, concept, mechanism of dissociation of an indicator, colour change of an indicator in acidic and basic conditions, use of standard buffer solution and indicators for pH determinations, preparation and its application, list of commonly used indicators and their pH range, suitable pH indicators used in different titrations, universal indicators.

Practicals

Titration of a simple acid and base (preparation of standard solution of oxalic acid and using this solution finding out the normality of a sodium hydroxide solution. Acid to be

titrated using this base. Calculation of normality of an acid or a base after titration, measurement of hydrogen ion concentration.

11. Quality control

Accuracy, precision. Specificity, sensitivity, limits of error allowable in laboratory, percentage error.
Normal values and Interpretations.

12. Special Investigations

Serum electrophoresis, immunoglobulins, drugs: digitoxin, theophylline, regulation of acid base status, Henderson HasselBach equations, buffers of the fluid, pH regulation, disturbance in acid base balance, anion gap, metabolic acidosis, metabolic alkalosis, respiratory acidosis, respiratory alkalosis, basic principles and estimation of blood gases and pH, basic principles and estimation of electrolytes, water balance, sodium regulation, bicarbonate buffers, nutrition, nutritional support with special emphasis on parental nutrition, calorific value, nitrogen balance, respiratory quotient, basal metabolic rate, dietary fibers, nutritional importance of lipids, carbohydrates and proteins, vitamins.

PRACTICALS

Analysis of normal urine.
Composition of urine.
Procedure for routine screening.
Urinary screening for inborn errors of metabolism.
Common renal disease.
Urinary calculus.
Urine examination for detection of abnormal constituents.
Interpretation and diagnosis through charts.
Liver function tests.
Lipid profile.
Renal function test.
Cardiac markers.
Blood gases and electrolytes.
Estimation of blood sugar, blood urea and electrolytes.
Demonstration of strips, demonstration of glucometer.

REFERENCEBOOKS

1. Varley: Clinical chemistry
2. Kaplan: Clinical chemistry
3. Vasudevan DM, Sreekumari, S: Textbook of Biochemistry for Medical students, Latest Ed
4. Das, Debajyoti: Biochemistry, Latest ED, Academic Publishers, Calcutta-1992
5. Rajagopal: Practical Biochemistry for Medical students-, Orient Longman PVT Ltd.

PATHOLOGY

No.Theoryclasses:70hours

No.ofPracticalclasses:20hours

Theory

1.Histopathology

Introductiontohistopathology.
Receivingofspecimeninthelaboratory.
Grossingtechniques.
Mountingtechniques:variousmountants.
Maintenanceofrecordsandfilingoftheslides.
Use&careofmicroscope.
Variousfixatives,modeofaction,preparationandindication.
Sectioncutting.
Tissueprocessingforroutineparaffinsections.
Decalcificationoftissues.
Stainingoftissues:H&EStaining. Bio-
medicalwastemanagement.

2.ClinicalPathology

Introductiontoclinicalpathology.
Collection,transport,preservation,andprocessingofvariousclinicalspecimens.
Urine Examination: collection andpreservation of urine, physical, chemical,
microscopicexamination.
Examinationofbodyfluids.
Examinationofcerebrospinalfluid(CSF).
Sputumexamination.
Examinationoffeces.

3.Hematology

Introductiontohematology.
Normalconstituentsofblood,theirstructureandfunction.
Collectionofbloodsamples.
Anticoagulantsusedinhematology.

Instruments and glassware used in hematology, preparation and use of glassware.
Laboratory safety guidelines.
SI units and conventional units in hospital laboratory. Hb,
PCV.
ESR.
Normal haemostasis.
Bleeding time, clotting time, prothrombin time, activated partial thromboplastin time.

4. Blood Bank

Introduction.
Blood grouping and Rhtypes.
Cross matching.

PRACTICALS

Urine Examination: physical, chemical, microscopic.
Blood grouping Rhtyping.
Hb estimation, packed cell volume (PCV), erythrocyte sedimentation rate (ESR).
Bleeding time, clotting time.
Histopathology: section cutting and H&E staining.

REFERENCE BOOKS

1. Bancroft: Histopathology techniques
2. Todd & Sanford: Clinical Diagnosis by laboratory method
3. Ramani Sood: Laboratory Technology (Methods and interpretation) 4th Ed. J.P. Bros, New Delhi-1996.
4. Sachdev K.N.: Clinical Pathology and Bacteriology 8th Ed, J.P. Bros, New Delhi-1991.
5. Krishna: Textbook of Pathology, Orient Longman Pvt Ltd. New Delhi-1991.

MICROBIOLOGY

No.Theoryclasses:70hours

No.ofPracticalclasses:20hours

Theory

- 1.Morphology** **4hours**
Classificationofmicroorganisms,size,shapeandstructureofbacteria. Useofmicroscopein thestudyofbacteria.
- 2.Growthandnutrition** **3hours**
Nutrition, growth and multiplications of bacteria, use of culture media in diagnostic bacteriology.
- 3.Culturemedia**
Useofculturemediaindiagnosticbacteriology,anti-microbialsensitivitytest. **1hour**
- 4.SterilizationandDisinfection** **4hours**
Principlesanduseofequipment'sofsterilizationnamelyhotairoven,autoclaveandserum inspissator,pasteurization,antisepticanddisinfectants.
- 5.Immunology** **6hours**
Immunity, vaccines, types of vaccine and immunization schedule, principles and interpretation of common serological tests namely Widal, VDRL, ASLO, CRP, RF & ELISA. Rapid tests for HIV and HBsAg (excluding technical details).
- 6.SystematicBacteriology** **20hours**
Morphology, cultivation, diseases caused, laboratory diagnosis including specimen collection of the following bacteria (excluding classification, antigenic structure and pathogenicity), Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococci, C. diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, Sech coli, Klebsiella, Proteus, Vibrio cholerae, Pseudomonas & Spirochetes.
- 7.Parasitology** **10hours**
Morphology, lifecycle, laboratory diagnosis of following parasites: E. histolytica, Plasmodium, tapeworms, Intestinal nematodes.
- 8.Mycology** **4hours**
Morphology, diseases caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes, opportunistic fungi
- 9.Virology** **10hours**
General properties of viruses, diseases caused lab diagnosis and prevention of following

viruses, Herpes, Hepatitis, HIV, Rabies and Poliomyelitis.

10. Hospital infection

4 hours

Causative agents, transmission methods, investigation, prevention and control of hospital infection.

11. Principles and practice Biomedical waste management

4 hours

Practical

20 hours

Compound microscope.

Demonstration of sterilization equipment's: hot air oven, autoclave, bacterial filters. Demonstration of commonly used culture media, nutrient broth, nutrient agar, blood agar, chocolate agar, Macconkey medium, LJ media, Robertson cooked meat media,

Potassium tellurite media with growth, Mac with LF & NLF, NA with staph.

Antibiotic susceptibility test.

Demonstration of common serological tests: Widal, VDRL, ELISA.

Gram staining.

Acid fast staining.

Stool exam for helminth ova & cysts.

Visit to hospital for demonstration of biomedical waste management.

Anaerobic culture methods.

REFERENCE BOOKS

1. Anathanarayana & Panikar: Medical Microbiology – Latest Edition University Press.
2. Robert Cruickshank: Medical Microbiology – The Practice of Medical Microbiology.
3. Basic Laboratory methods in Parasitology: 1st Ed, JP Bros, New Delhi.
4. Basic laboratory procedures in clinical bacteriology, 1st Ed, JP Brothers, New Delhi.
5. Ajit Damle: Medical Parasitology.

SUBSIDIARY SUBJECTS

First Year B.Sc. Anaesthesia and Operation Theatre Technology

ENGLISH

Teaching Hours: 20

1. Course Description

This course is designed to help the student acquire a good command and comprehension of the English language through individual papers and conferences.

2. Behavioral Objectives

The student at the end of training shall be able to:

- a) Read and comprehend English language.
- b) Speak and write grammatically correct English.
- c) Appreciate the value of English literature in personal and professional life.

3. Contents

Unit-I: Introduction:

- a) Study techniques.
- b) Organization of effective note taking and logical processes of analysis and synthesis. c) Use of the dictionary.
- d) Enlargement of vocabulary.
- e) Effective diction.

Unit-II: Applied Grammar:

- a) Correct usage.
- b) The structure of sentences. c) The structure of paragraphs. d) Enlargement of vocabulary.

Unit-III: Written Composition:

- a) Precise writing and summarizing. b) Writing of bibliography.
- c) Enlargement of vocabulary.

Unit-IV: Reading and Comprehension:

- a) Review of selected materials and expression of self in one's words. b) Enlargement of vocabulary.

Unit-V:TheStudyofthevariousformsofcomposition:

- a) Paragraph.
- b) Essay.
- c) Letter.
- d) Summary.
- e) Practiceinwriting.

Unit-VI:Verbalcommunication:

- a) Discussionsandsummarization.
- b) Debates.
- c) Oralreports.
- d) Useinteaching.

REFERENCE

1. English Grammar: Collins, Birmingham University, International Language Data Base,Rupa &Co.1993.
2. WrenandMartin:GrammarandComposition,1989,Chand&Co,Delhi.
3. SpokenEnglish:V.ShasikumarandPVDhanija.Pub.By:TataMcgrawHill,New Delhi
4. WritersBasicBookself-Series:WritersDigestseries.

HEALTHCARE

TeachingHours:40

1. IntroductiontoHealth

- a) Definitionofhealth,determinantsofhealth,healthindicatorsofIndia,healthteam concept.
- b) Nationalhealthpolicy
- c) Nationalhealthprogrammes(Brieflyobjectivesandscope)
- d) PopulationofIndiaandfamilywelfareprogrammeinIndia

2. IntroductiontoNursing

- a) Whatisnursing?Nursingprinciples,inter-personnelrelationships.
- b) Bandaging: basic turns, bandaging extremities, triangular bandages and their application.
- c) Nursing position, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfortmeasures,bedmaking,restandsleep.
- d) Liftingandtransportingpatients:liftingpatientsupinthebed,transferringfrombed towheelchair,transferringfrombedtostretcher.
- e) Bedsidemanagement:givingandtakingbedpan,urinal. f) Observationofstools,urine,sputum
- g) Useandcareofcatheters,enemagiving.
- h) Methodsofgivingnourishment:feeding,tubefeeding,drips,transfusion. i) Careofrubbergoods.
- j) Recordingofbodytemperature,respirationandpulse.
- k) Simpleaseptictechniques,sterilizationanddisinfection. l) Surgicaldressing:observationofdressingprocedures.

3. FirstAid:

Syllabus as for Certificate Course of Red Cross Society of St. John's Ambulance Brigade.

REFERENCEBOOKS:

- 1.PreventiveandSocialMedicinebyJ.Park

MAINSUBJECTS

SecondYearB.Sc.Anaesthesia and OperationTheatre Technology

AppliedPharmacology

(Generalconceptsaboutpharmacodynamicandpharmacokineticprinciplesinvolvedin drugactivity).

THEORY

1. Autonomicnervessystem.

- a)Anatomy& functionalorganization.
- b)ListofdrugsactingonANSincludingdose,routeofadministration,indications, contraindicationsandadverseeffects.

2. Cardiovasculardrugs.

Modeofaction,sideeffectsandtherapeuticusesofthefollowingdrugs:

- a)Antihypertensives:
 - i. Betaadrenergicantagonists.
 - ii.Alphaadrenergicantagonists. iii.
 - Peripheralvasodilators.
 - iv. Calciumchannelblockers.
- b)Antiarrhythmicdrugs.
- c) Cardiacglycosides.
- d)Sympatheticandnon-sympatheticinotropicagents.
- e)Coronaryvasodilators.
- f) Antianginalandanti-failureagents.
- g)Lipidlowering&antiatheroscleroticdrugs.
- h)Drugsusedinhemostasis:anticoagulantsthrombolyticsandanti-thrombolytics. l)
- Cardioplegicdrugs:history,principlesandtypesofcardioplegia.
- j) Primarysolutions:history,principles&types.
- k)Drugsusedinthetreatmentofshock.

3. Anaestheticagents.

- a)Definitionofgeneralandlocalanaesthetics.
- b)Classificationofgeneralanaesthetics.
- c) Pharmacokineticsandpharmacodynamicsofinhaledanaestheticagents.
- d)Intravenousgeneralanaestheticagents.
- e)Localanaesthetics:classification,mechanismofaction,durationofactionand methodstoprolongthedurationofaction,preparation,doseandroutes ofadministration

4. Analgesics

- a)Definitionandclassification.
- b)Routesofadministration,dose,frequencyofadministration,sideeffectsand

managementofnon-opioidandopioidanalgesics.

5. Antihistamines and antiemetics

Classification, mechanism of action, adverse effects, preparations, dose and routes and administration.

6. CNS stimulants and depressants

- a) Alcohol.
- b) Sedatives, hypnotics and narcotics.
- c) CNS stimulants.
- d) Neuromuscular blocking agents and muscle relaxants.

7. Pharmacological protection of organs during CPB

8. Inhalational gases and emergency drugs.

9. Pharmacotherapy of respiratory disorders

- a) Introduction: modulators of bronchial smooth muscle tone and pulmonary vascular smooth muscle tone.
- b) Pharmacotherapy of bronchial asthma.
- c) Pharmacotherapy of cough.
- d) Mucokinetic and mucolytic agents.
- e) Use of bland aerosols in respiratory care.

10. Corticosteroids

Classification, mechanism of action, adverse effects and complications, preparation, dose and routes of administration.

11. Diuretics

- a) Renal physiology.
- b) Side effect of diuretics.
- c) Adverse effects.
- d) Preparations, dose and routes of administration.

12. Chemotherapy of infections

- a) Definition.
- b) Classification and mechanism of action of antimicrobial agents.
- c) Combination of antimicrobial agents.
- d) Chemoprophylaxis.
- e) Classification, spectrum of activity, dose, routes of administration and adverse effects of penicillin, cephalosporins, aminoglycosides, tetracyclines, chloramphenicol, antitubercular drugs.

13. Miscellaneous.

- a) IV fluids - various preparations and their usage.
- b) Electrolyte supplements.
- c) Immunosuppressive agents.
- d) New drugs included in perfusion technology.
- e) Drugs used in metabolic and electrolyte imbalance.

PRACTICALS

1. Preparation and prescription of drugs of relevance.
2. Experimental pharmacology directed to show the effects of commonly used drugs of relevance and interpretation of few charts.

RECOMENDED BOOKS.

1. 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-400034.
2. 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.
3. Laurence and Bennet, Clinical Pharmacology, ELBS Edition, 9th Edition.

Applied Pathology

THEORY

1. Cardiovascular system

- a) Atherosclerosis: definition, risk factors, briefly pathogenesis & morphology, clinical significance and prevention.
- b) Hypertension: definition, types and briefly pathogenesis and effects of hypertension. c) Aneurysms: definition, classification, pathology and complications.
- d) Pathophysiology of heart failure.
- e) Cardiac hypertrophy: causes, pathophysiology & progression to heart failure.
- f) Ischemic heart diseases: definition, types, pathophysiology, pathology & complications of various types of IHD.
- g) Valvular heart diseases: causes, pathology & complication. Complications of artificial valves.
- h) Cardiomyopathy: definition, types, causes and significance. i) Pericardial effusion: causes, effects and diagnosis.
- j) Congenital heart diseases: basic defect and effects of important types of congenital heart diseases.

2. Hematology

- a) Anaemia: definition, morphological types and diagnosis of anaemia, brief concept about haemolytic anaemia and polycythaemia.
- b) Leukocytoid disorders: leukaemia, leukocytosis, agranulocytosis etc.
- c) Bleeding disorders: definition, classification, causes & effects of important types of bleeding disorders, various laboratory tests used to diagnose bleeding disorders.

3. Respiratory system

- a) Chronic obstructive airway diseases: definition and types, causes, pathology and complications of each type of COPD.
- b) Concept about obstructive versus restrictive pulmonary disease.
- c) Pneumoconiosis: definition, types, pathology and effects.
- d) Pulmonary congestion and edema.
- e) Pleural effusion: causes, effects and diagnosis.

4. Renal system

- a) Clinical manifestations of renal diseases, causes, mechanism, effects and laboratory diagnosis of ARF & CRF, glomerulonephritis and pyelonephritis.
- b) End stage renal disease: definition, causes, effects and role of dialysis and renal transplantation in its management.
- c) Brief concept about obstructive uropathy.

PRACTICALS

1. Description & diagnosis of the following gross specimens. a)

Atherosclerosis.

b) Aortic aneurysm.

c) Myocardial infarction.

d) Emphysema

e) Chronic glomerulonephritis. f)

Chronic pyelonephritis.

2. Interpretation & diagnosis of the following charts.

a) Hematology chart: AML, CML, hemophilia, neutrophilia, eosinophilia. b)

Urine Chart: ARF, CRF, acute glomerulonephritis.

3. Estimation of hemoglobin.

4. Estimation of bleeding & clotting time.

Applied Microbiology

THEORY(40hours)

1. Health care associated infections and antimicrobial resistance: infections that patients acquire during the course of receiving treatment for other conditions within a healthcare setting like methicillin resistant *Staphylococcus aureus* infections, infections caused by *Clostridium difficile*, vancomycin resistant enterococci etc, catheter related bloodstream infections, ventilator associated pneumonia, catheter related urinary tract infections, surveillance of emerging resistance and changing flora, the impact and cost attributed to hospital associated infection. (6hours).
2. Disease communicable to healthcare workers in hospital set up and its preventive measures, occupationally acquired infections in healthcare professionals by respiratory route (tuberculosis, varicella-zoster, respiratory syncytial virus etc), blood borne transmission (HIV, hepatitis B, hepatitis C, cytomegalovirus, Ebola virus etc), or of fecal route (salmonella, hepatitis A etc), direct contact (Herpes simplex virus etc), preventive measures to combat the spread of these infections by monitoring and control. (6hours).
3. Microbiological surveillance and sampling, required to determine the frequency of potential bacterial pathogens including *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Moraxella catarrhalis* and also to assess the antimicrobial resistance, sampling: rinse technique, direct surface agar plating technique. (6hours).
4. Importance of sterilization.
 - a) Disinfection of instruments used in patient care: classification, different methods, advantages and disadvantages of the various methods.
 - b) Disinfection of the patient care unit.
 - c) Infection control measures for ICU's. (10hours)
5. Sterilization:
 - a) Rooms: gaseous sterilization, one atmosphere uniform glow discharge plasma (OAUGDP).
 - b) Equipment's: classification of the instruments and appropriate methods of sterilization.
 - c) Central supply department: the four areas and the floor plan for instrument cleaning, high-level disinfecting and sterilizing areas. (8hours).
6. Preparation of materials for autoclaving: packing of different types of materials, loading, holding time and unloading. (4hours).

PRACTICALS(30hours)

1. Principles of autoclaving & quality control of sterilization.
2. Collection of specimens from outpatient units, inpatient units, minor operation theatre and major operation theatre for sterility testing.
3. The various methods employed for sterility testing.
4. Interpretation of results of sterility testing.
5. Disinfection of wards, OT and laboratory.

Medicine Relevant to Operation Theatre Technology

1. Diabetes mellitus.
2. Hypertension.
3. Ischemic heart disease.
4. Obesity.
5. Elderly patient.
6. Pregnancy.
7. Shock.
8. COPD.
9. Chronic renal failure.
10. Chronic liver disease/failure.
11. Anaemia.
12. Pediatric patient, infant/neonate.
13. Epilepsy.
14. CVA.

Introduction to Anaesthesia and Operation Theatre Technology

- 1. Introduction to Anaesthesia and Operation Theatre:**
- 2. Importance of Pre Anaesthetic-Evaluation**
- 3. Pre-medication**
- 4. Drugs and equipments for General Anaesthesia**
- 5. Drugs and equipments for Regional Anaesthesia**
- 6. Drugs and equipments for Spinal Anaesthesia**
- 7. Drugs and equipments for Epidural Anaesthesia**
- 8. Recovery room**
- 9. Post-operative Intensive Care**
- 10. Importance of CSSD Department**
 - a) Cleaning and dusting: methods of cleaning, composition of dust.
 - b) General care and testing of instruments: forceps, haemostatic, needle holders, knife, blade, scissor, use/abuse, care during surgery.
 - c) Disinfectants of instruments and sterilization- definition, methods, cleaning agents, detergents, mechanical washing, ultrasonic cleaner, lubrication, inspection and pitfalls
 - d) thermal, hot air oven, dry heat, autoclaving, steam sterilization water etc, UV treatment.
 - e) Various methods of chemical treatment: formalin, glutaraldehyde
 - f) Instrument setching, care of microsurgical and titanium instruments
 - g) Sterilization of equipments: arthroscope, gastroscope, image lamp, apparatus, suction apparatus, anaesthetic equipments including endotracheal tubes.
 - h) OT Sterilization including laminar airflow.
 - i) Trouble shooting: colored spots and corrosion, staining, dust deposit, recent amendment in EPA with reference to waste disposal.
- 11. Blood Transfusion**
- 12. Patient position during Anaesthesia**
- 13. Monitoring in the operation theatre**
- 14. Instrument planning for various surgical procedure and auxiliary instrumentation.**
- 15. OT techniques, OT environment, control of infections scrubbing, theatre cloths including lead apron and goggles.**
- 16. Duties of nurses: ethics, behavior during surgery, etc.**

SUBSIDIARY SUBJECTS

Second Year B.Sc. Anaesthesia and Operation Theatre Technology

SOCIOLOGY

Teaching Hours: 20

1. Course description

This course will introduce student to the basic concepts of sociology, principles, social processes and social institutions in relation to the individual, family and community. The various social factors affecting the family in rural and urban communities in India will be studied.

2. Introduction

- a) Meaning, definition and scope of sociology.
- b) Its relation to anthropology, psychology, social psychology.
- c) Methods of sociological investigations: case study, social survey, questionnaire, interview and opinion poll methods.
- d) Importance of its study with special reference to healthcare professionals.

3. Social factors in health and disease

- a) Meaning of social factors.
- b) Role of social factors in health and disease.

4. Socialization

- a) Meaning and nature of socialization.
- b) Primary, secondary and anticipatory socialization. c) Agencies of socialization.

5. Social groups

- a) Concepts of social groups, influence of formal and informal groups on health and sickness.
- b) The role of primary groups and secondary groups in the hospital and rehabilitation setup.

6. Family

- a) The family, meaning and definitions.
- b) Functions of types of family.
- c) Changing family patterns.
- d) Influence of family on individual's health, family and nutrition.
- e) The effects of sickness in the family
- f) Psychosomatic diseases and their importance.

7. Community

- a) Rural community: meaning and features.
- b) Health hazards of rural communities.
- c) Health hazards of tribal communities.
- d) Urban community: meaning and features.
- e) Health hazards of urban communities.

8. Culture and health

- a) Concept of culture.
- b) Concept of health. c) Culture and health.
- d) Culture and health disorders.

9. Social change

- a) Meaning of social changes.
- b) Factors of social changes.
- c) Human adaptation and social change.
- d) Social change and stress.
- e) Social change and deviance.
- f) Social change and health programme.
- g) The role of social planning in the improvement of health and rehabilitation.

10. Social problems of disabled

(Consequences of the following social problems in relation to sickness and disability and remedies to prevent these problems):

- a) Population explosion.
- b) Poverty and unemployment. c) Beggary.
- d) Juvenile delinquency.
- e) Prostitution.
- f) Alcoholism.
- g) Problems of women in employment.

11. Social security

- a) Social Security and social legislation in relation to the disabled.

12. Social work

- a) Meaning of social work.
- b) The role of a medical social worker.

Reference books

- 1. Sachdeva & Vidyabhushan, Introduction to the study of sociology.
- 2. Indrani T.K., Textbook of sociology for graduates' nurses and Physiotherapy students, JP Brothers, New Delhi 10.

CONSTITUTION OF INDIA

1. **Unit-I:** Meaning of the term 'Constitution'. Making of the Indian Constitution 1946-1950.
2. **Unit-II:** The democratic institutions created by the constitution, Bicameral system of Legislature at the Centre and in the States.
3. **Unit-III:** Fundamental rights and duties their content and significance.
4. **Unit-IV:** Directive principles of States, policies the need to balance fundamental rights with directive principles.
5. **Unit-V:** Special rights created in the Constitution for Dalits, backwards, women and children and the religious and linguistic minorities.
6. **Unit-VI:** Doctrine of Separation of Powers, legislative, executive and judicial and their functioning in India.
7. **Unit-VII:** The Election Commission and State Public Service commissions.
8. **Unit-VIII:** Method of amending the Constitution.
9. **Unit-IX:** Enforcing rights through writs.
10. **Unit-X:** Constitution and sustainable development in India.

Books:

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, Allahabad, Central Law Agency, 1998.
3. Granville Austin: The Indian Constitution .Corner Stone of a Nation-Oxford, New Delhi, 2000.

ENVIRONMENTALSCIENCEANDHEALTH

Introductiontoenvironmentandhealth

1. Sources,healthhazardsandcontrolofenvironmentalpollution.
2. Theconceptofsafeandwholesomewater, the requirementsofsanitarysourcesof water,understandingthethodsofpurificationofwateronsmallscaleandlarge scale,variousbiologicalstandards,includingWHOGuidelinesforthirdworldcountries, conceptandmethodsof assessingqualityofwater.
3. Domesticrefuse,sullage,humanexcretaandsewage,theireffectsonenvironmentand health,methodsandissuesrelatedtotheir disposal.
4. Awarenessofstandards ofhousingandtheeffectofpoorhousingonhealth.
5. Roleofarthropodsinthecaustionof diseases,modeoftransmissionofarthropods bornediseases,methodsofcontrol.

RecommendedBooks.

1. Text BookofEnvironmentalStudiesforundergraduatecourses ByErachBharucha Reprintedin2006,OrientLongmanPrivateLimited/UniversitiesPressIndiaPvt.Ltd.

MAINSUBJECTS

ThirdYearB.Sc. OperationTheatreTechnology

Paper1:Anaesthesia and OperationTheatreTechnology-Clinical

1. Physicalfacility.
2. Layoutofoperationtheatres.
3. Transition.
4. Peripheralsupportareas.
5. Operatingroom.
6. Specialprocedurerooms.
7. Potentialsourcesofinjurytothecaregiver&patient.
8. Principlesofasepsis& steriletechnologies.
9. Asepsis,surgicalscrub,gowning&gloving
10. Decontamination&disinfections.
11. Sterilizationassembly&packing.
12. Thermalsterilization.
13. Chemicalsterilization.
14. Radiationsterilization.
15. Anaesthesia equipments
16. Fabrication.
17. Classification.
18. Powered surgical instruments.
19. Handling instruments.
20. Anaesthesia Ventilator and Workstation
21. Electrocautery.
22. Laser.
23. Microsurgery.
24. Ultra-sonography.
25. Monitoring Equipment
26. Defibrillator
27. Positioning after anaesthesia
28. Preparation and draping of the patient
29. Generalsurgery.
30. Orthopaedic procedures.
31. E.N.T. Procedures
32. Ophthalmic procedures
33. Urology procedures.
34. Endoscopic procedures.

35. Anaesthesia in M.R.I Room.

Paper2:Anaesthesia and OperationTheatreTechnology-Applied

1. Preoperativepreparationofthepatient.
2. Diagnosticprocedures.
3. Pathologicalexamination.
4. Radiologicalexamination.
5. MRI.
6. Nuclearmedicinstudies.
7. Ultra-sonography.
8. Endoscopy.
9. Anaesthesiatechniques.
10. History of Anaesthesia.
11. Typesofanaesthesia.
12. Choiceofanaesthesia.
13. Generalanaesthesia.
14. Indicationofgeneralanaesthesia.
15. Endotrachealintubation / LMA
16. Maintenance.
17. Monitoring during Anaesthesia.
18. Emergency Anaesthesia.
19. Balancedanaesthesia.
20. Careofanaesthetizedpatient.
21. Local®ionalanaesthesia.
22. Spinalandepiduralanaesthesia.
23. Intravenousanaesthesiaagents.
24. Inhalationanaestheticagents.
25. Anaestheticadjuvantdrugs.
26. Complicationofgeneralanaesthesia.
27. Complicationoflocal/regionalanaesthesia.
28. Bloodtransfusion and complications.
29. Anaesthesiamachine& centralgassupply.
30. Drugs and equipment for difficultintubation.

Paper3:Anaesthesia and OperationTheatreTechnology-Advanced

1. Preparation,nursingrequirement,equipmentsincludinginstruments,sutures,etc.
2. Anaesthesiatechniques,patientpositioning&recovery.
3. Gynecological/obstetricAnaesthesia.
4. Labour Analgesia
5. Anaesthesia for Neuro Surgery.
6. Anaesthesia for Vascular Surgery.
7. Anaesthesia for Plasticandreconstructivesurgery.
8. Anaesthesia for Head and Neck procedures.
- 9.. Anaesthesia for Thoracicsurgery.
10. Anaesthesia for Cardiacsurgery.
11. Anaesthesia for Renal transplant
12. Oxygen therapy in the ICU
13. Weaning from the ventilator.
14. Complications in the ICU.
15. Patient management in the terminally ill.

SUBSIDIARY SUBJECTS

Third B.Sc. Anaesthesia and Operation Theatre Technology

BIostatistics and Research Methodology

Teaching Hours: 20 Hours

1. Course description

Introduction to basic statistical concepts.
Methods of statistical analysis and interpretation of data.
Introduction to research methodology

2. Objectives

Understands statistical terms.
Possesses knowledge and skills in the use of basic statistical and research methodology.

3. Contents

a) Unit-I: Introduction

- i. Meaning, definitions, and types of statistics.
- ii. Statistics as a singular and plural noun
- iii. Branches of statistics.
- iv. Application of statistics in medicine.

b) Unit-II: Presentation of data

- i. Definition and types of data
- ii. Raw data, the array, frequency distribution.
- iii. Basic definitions and principles of tabular presentation
- iv. Basic principles of graphical representation.
- v. Types of diagrams: Bar, pie, line, histograms, pictogram.

c) Unit- III: Measure of central tendency

- i. Need for measures of central tendency.
- ii. Definition and calculation of mean: ungrouped and grouped.
- iii. Meaning, interpretation and calculation of median ungrouped and grouped.
- iv. Meaning and calculation of mode ungrouped and grouped.
- v. Selection of an appropriate measure of central tendency.

d) Unit- IV: Measure of variability

- i. Need for measure of variation.
- ii. Range and mean deviation.
- iii. Variance and standard deviation.
- iv. Calculation of variance and standard deviation ungrouped and grouped.
- v.

Properties and uses of variance and SD.

- e) **Unit-V:Probabilityandstandarddistributions.**
 - i. Meaningofprobabilityandstandarddistributions. ii. Prioriandposterioriprobabilities
 - iii. TheBinominalandPoissondistributions. iv. Thenormaldistribution.
 - v. Divergencefromnormality:skewness,kurtosis.

- f) **Unit-VI:Samplingtechniques**
 - i. Population,sampleandsampling. ii. Methodsandtypesofsampling.
 - iii. Randomandnon-randomsampling
 - iv. Parameterandstatistic.
 - v. Basicconceptsandtermsrelatedtotestsofsignificance.

- g) **Unit-VII:Introductiontoresearchmethodology**
 - i. Definitionandcharacteristicsofresearch. ii. Levelsandtypesofresearch.
 - iii. Experimentalandnon-experimentalstudydesigns.
 - iv. Definitionsofcasereport,caseseries,case-controlandcohortstudies.

RECOMMENDED BOOKS:

- 1) KRSundaram,SNDwivediandVSreenivas(2010):MedicalStatistics,Principlesand Methods,BIPublicationsPvtLtd,NewDelhi,India.
- 2) Alndrayan(2008):BasicMethodsofMedicalResearch,Secondedition,AITBS Publishers,India.
- 3) NSNRaoandNSMurthy(2008):AppliedStatisticsinHealthSciences,FirstEdition, JAYPEEbrothers'medicalpublishers(P)Ltd,India.
- 4) A.Mustafa(2010):ResearchMethodology,Firstedition,AITBSPublishers,India.

BASICS IN COMPUTER APPLICATIONS

1. Introduction to data processing

Features of computers, advantages of using computers, getting data into/ out of computers, role of computers, data processing, application areas of computers involved in data processing, common activities in processing, types of data processing, characteristics of information, hardware and software.

2. Hardware Concepts

Architecture of computers, classification of computers, concept of damage, types of storage devices, characteristics of discs, tapes, terminals, printers, network, applications of networking, concept of PC system care, floppy care, data care.

3. Concept of Software

Classification of software, system software, application of software, operating system, computer system, computer virus, precautions against viruses, dealing with viruses, computers in medical electronics, basic anatomy of computers.

4. Principles of programming

Computer application, principles in scientific research, work processing, medicine, libraries, museum, education, information system.

5. Data processing

Computers in physical therapy: principles in EMG, exercise testing equipment, laser.

ETHICS

1. Introduction

Medical ethics is a systematic effort to work within the ethos of medicine, which has traditionally been service to sick.

2. Objectives

Identify underlying ethical issues and problems in medical practice.

3. Course contents (Syllabus)

a. Introduction to medical ethics

What is ethics, what are values and norms, freedom and personal responsibility?

b. Definition of medical ethics

Major principles of medical ethics.

c. Perspective of medical ethics

The Hippocratic oath, The Declaration of Helsinki, The WHO Declaration of Geneva, International Code of Medical Ethics (1993), Medical Council of India Code of Ethics (2002).

d. Ethics of the individual

Truth and confidentiality, the concept of disease, health and healing, the right to health.

e. The ethics of human life

Prenatal sex determination.

f. The family and society in medical ethics

Euthanasia, cancer and terminal care.

g. Death and dying

Use of life-support systems, the right to die with dignity, suicide – the ethical outlook.

h. Professional Ethics

Contract and confidentiality, malpractice and negligence.

4. Teaching/Learning Experience

a. Increasing the awareness and knowledge of students of the valued dimensions of interactions with the patients, colleagues, relations and public.

b. Fostering the development of skills of analysis, decision making and judgment.

c. Making the students aware of the need to respect the rights of the patient.

d. Duties and responsibilities of the technologists.