



SHRI  
DHARMASTHALA  
MANJUNATHESHWARA  
UNIVERSITY

ORDINANCE GOVERNING  
B.SC. IN ALLIED HEALTH SCIENCES  
**OPERATION THEATRE TECHNOLOGY**  
CURRICULUM 2023-24

**SHRI DHARMASTHALA MANJUNATHESHWARA UNIVERSITY**

(A State Private University established under the Shri Dharmasthala Manjunatheshwara University  
Act No 19 of 2018 of Government of Karnataka and Notification No. ED 261 URC 2018 dated 19th December 2018)

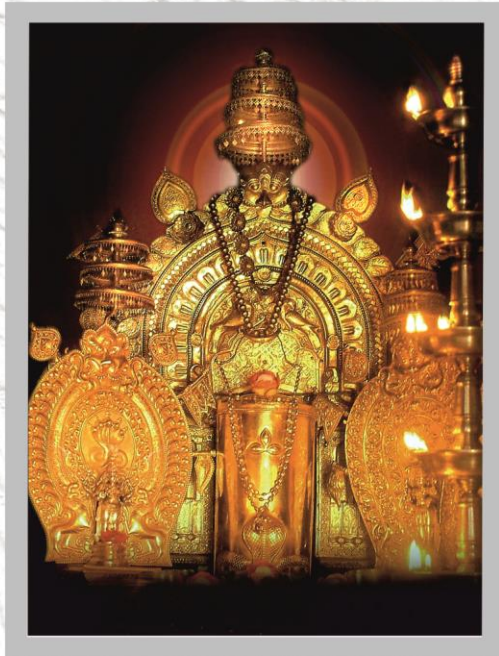
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|| Om Shri Manjunathaya Namaha ||



Shree Kshethra Dharmasthala

**Edition Year : 2023-24**

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**Published by**

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## THE LOGO

Poojya Dr D. Veerendra Heggade, Hon'ble Chancellor of the University, while searching for an appropriate Logo for the University, saw a photograph picked from Temple Architecture showing Wings of a Bird, sculpted in Indian style and wanted it to be incorporated in the logo for the University, as the Wings symbolize 'Spreading of Knowledge beyond Boundaries'. Further it was felt that the Central theme of the logo should be 'Rudra' (The Linga) with wings on each side. In this way, the logo of the University was conceptualized.

Hence:

1. The central part represents **Rudra** who Demolishes Darkness.
2. The Three **horizontal lines on The Linga** stand for Samyak Darshan (Right Belief), Samyak Gyan (Right Knowledge) and Samyak Charitra (Right Conduct).
3. The **Wings** symbolize spreading of Knowledge across the boundaries.
4. Base line "**Truth Liberates**" highlights the Purpose of Education: to liberate oneself unconditionally. It shows that it is not discipline, nor knowledge nor the efforts to freedom that liberate but Truth is what liberates you from all your conditioning and ignorance.

The overall significance of Shri Dharmasthala Manjunatheshwara University's Logo is:

**Darkness of ignorance is destroyed by the flow of knowledge to bring Liberty to everyone, by realizing the truth. And, it should spread globally without the**



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## VISION

Shri Dharmasthala Manjunatheshwara University will set the highest standards of teaching and learning by awakening the intelligence of the students and nurturing the creativity hidden in them by creating an environment where the ancient wisdom blends with modern science, to transform them into whole human beings to face the challenges.

## MISSION

- ▶ To ensure that the journey of education is inspiring, pleasant and enjoyable.
- ▶ Attract the best of teachers and students.
- ▶ Achieve high principles of trust, love and spirituality in the students.
- ▶ Create a collaborative, diverse and exclusive community.
- ▶ Transform the student of today to be a leader of tomorrow and a better human being.
- ▶ Produce passionate teachers.
- ▶ Evolve innovative teaching techniques.
- ▶ Create a peaceful environment.
- ▶ Prepare the student to face the social challenges.
- ▶ Create a University of which the Nation is proud of.
- ▶ Be an effective partner in Nation Building.
- ▶ Create an Eco-friendly University.
- ▶ Create a University based on the principles of beauty, love and justice.

||Om Shanti! Om Shanti! Om Shanti||



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SDMU/ACD/ALLIED/Notfn-321(A1)/370/2023

Date: 26-06-2023

## NOTIFICATION

### Amendment in the Ordinance governing Curricula of Medical Allied Sciences

- Ref:
1. Notification on Ordinance governing Curricula of Medical Allied Sciences - 2019 (SDMU/ACD/DEN/CRM/369A/2019; Dated: 28-08-2019 & SDMU/Notif-123/2020/178 Date: 19.09.2020)
  2. Minutes of the 7<sup>th</sup> Meeting of Academic Council held on 16<sup>th</sup> June 2023 (Letter No: SDMU/AC/M-7/F-28/354/2023 Dated: 19-06-2023)
  3. Minutes of the 9<sup>th</sup> Meeting of Board of Studies (Allied Health Sciences) held on 1<sup>st</sup> April 2023 (Letter dated:19-04-2023)

In exercise of the powers conferred under Statutes 1.4(Powers and functions - Para ix & x) & 1.8(Powers and functions - Para i) of Shri Dharmasthala Manjunatheshwara University, approval of the Academic Council of Shri Dharmasthala Manjunatheshwara University is hereby accorded for the **Amendment of the Ordinance governing Revised Curricula of Medical Allied Sciences** with effect from the date of notification.

1	BSc Medical lab Technology
2	BSc Medical Imaging Technology
3	BSc in Renal Dialysis Technology
4	BSc Optometry
5	BSc Anaesthesia Technology
6	BSc Emergency and Trauma care Technology
7	BSc Operation Theatre Technology

REGISTRAR  
REGISTRAR

Shri Dharmasthala Manjunatheshwara  
University, Dharwad

To: The Principal, SDM College of Medical Sciences & Hospital.

Copy for kind information to:

1. Hon'ble Vice Chancellor - Shri Dharmasthala Manjunatheshwara University.
2. Pro Vice Chancellor (Academics) - Shri Dharmasthala Manjunatheshwara University.
3. Controller of Examinations - Shri Dharmasthala Manjunatheshwara University.
4. Coordinator, Medical Allied Sciences
5. Office of the Registrar
6. University Office for Records File & Website



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## **B. Sc. OPERATION THEATRE TECHNOLOGY COURSE**

### **PREAMBLE**

The B.Sc. Operation Theatre Technology Course is a 4 years (3 + 1 year Internship) degree program aimed at training students in the technological aspects of Operation theatre care with a good scientific foundation. These students will be in a position to competently assist the Anaesthesiologists & the Surgeons, especially in high tech Anaesthesia techniques & surgical theatres. They will be in much demand both within the country and abroad as Anaesthesia Technologists. With advanced training in the latest technologies in OT specialty, these graduates will play an important role in determining the quality of health care provided.

### **OBJECTIVE**

The objective is to impart the basic Operation Theatre knowledge, technical skills and its application in the health care delivery system.

#### **1. Eligibility for admission:**

A candidate seeking admission to the Bachelor of Science Degree Courses in the Allied Health Sciences course, shall have studied English as one of the principle subjects during the tenure of the course.

- a. Two-year Pre-University examination or equivalent as recognized by Pre-University Board or equivalent authority with, Physics, Chemistry and Biology as principal subjects of study.  
OR
- b. Any equivalent examination recognized by the SDM University for the above purpose with Physics, Chemistry and Biology as principal subjects of study.  
OR
- c. Candidates with two years diploma from a recognized Government Board in a subject for which the candidate desires to enrol, in the respective Allied Health Sciences course mentioned shall have passed plus 12 [10+2] with Physics, Chemistry and Biology, as principal subjects.
- d. Lateral entry to second year for allied health science courses for candidates who have passed diploma program from the Government Boards and recognized by SDM University, fulfilling the conditions specified above.



**Note:**

- a. The candidate shall have passed individually in each of the principal subjects.
- b. Candidates who have completed diploma or vocational course through Correspondence shall not be eligible for any of the courses mentioned above.

**2. Intake: 10 seats****3. Duration of the course:**

Duration shall be for a period of four years including 1 Year Internship.

**5. Medium of instruction:**

The medium of instruction and examination shall be in English.

**6. Attendance**

Candidates should **75% attendance in Theory and Practical separately** for each subject to be eligible to appear for the university examinations. **75% attendance in each**

**departmental postings** is a prerequisite to appear for university examination.

Only such candidates are eligible to appear for the university examinations in their first attempt. Special classes conducted for any purpose shall not be considered for the calculation of percentage of attendance for eligibility. A candidate lacking in prescribed percentage of attendance in any subjects either in theory or practical in the first appearance will not be eligible to appear for the University Examination in that subject.

**Internal assessment:** Students must score **50% in theory and 50% practical separately** to be eligible to appear for the university examinations (**average of two IAs**).

The marks of IA shall be communicated to the SDM University at least 15 days before the commencement of the University examination. The University shall have access to the records of such periodical tests.

The marks of the internal assessment must be displayed on the notice board of the college within a fortnight from the date test is held. If a candidate is absent for any one of the tests due to genuine and satisfactory reasons, such a candidate may be given a re-test within a fortnight.

## Distribution of Teaching Hours in First Year Subjects

Sl No.	Subject	Theory	Practical	Total
1	Anatomy	70	20	90
2	Physiology	70	20	90
3	Biochemistry	70	20	90
4	Pathology	70	20	90
5	Microbiology	70	20	90
	<b>Total</b>	<b>350</b>	<b>100</b>	<b>450</b>

## Hospital posting 470 Hours

### Distribution of Teaching Hours in Second Year Subjects

SUBJECT PAPERS	Theory (Th)				Practical (Pr)			Total (Th+Pr)
	UE	Viva (UE)	IA	TOTAL	UE	IA	TOTAL	
Basic and Applied Pharmacology	70	-	30	100	-	-	-	100
Applied Pathology and Microbiology (Section A & Section B)	35 35	-	15 15	100	-	-	-	100
Medicine relevant to O.T. technology	70	10	20	100	40	10	50	150
Operation Theatre Technology – Basics	70	10	20	100	40	10	50	150
<b>Grand Total Marks</b>				<b>400</b>			<b>100</b>	<b>500</b>

## Distribution of Teaching Hours in Third Year Subjects

Sl. No.	Subject	Theory	Practical	Clinical Posting	Total
1	Operation theatre Technology-Clinical	50	50	250	350
2	Operation theatre Technology-Applied	50	50	250	350
3	Operation theatre Technology-Advanced	50	50	250	350
			150	750	1050

### 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 65% 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 60% marks or more, but less than 65% (aggregate), shall be declared to have passed the examination with Second Class.

### I. Pass criteria:

- i. For pass in a subject student has to get **minimum 40% marks** in University Theory paper and 40% marks in university practical exam separately.
- ii. **Where the subject has only Theory component and NO practical component**, student has to get minimum 40% marks in University Theory

paper and 50% marks in Theory total (**Theory marks in UE + IA**) to be declared PASS in university examination.

- iii. **Where the subject has BOTH Theory and Practical component**, A total of 50% marks in Theory (Theory marks in UE + Viva voce + IA) and 50% marks in Practical (Practical marks in UE + IA) separately is required for the candidate to be declared PASS in university examination.
- iv. **If the student fails in either Theory or practical component of a subject paper**, the he/she has to appear for both Theory and Practical exam in the next resit examination. If student fails in resit exam also, then he/she will be promoted to next year based on carry over guidelines.

### III. Carryover criteria:

- i. **1<sup>st</sup> Year** – Student can **carryover 50% of subjects** after university exam (UE) and Resit exam (RE) results to next year. These students can be promoted to 2<sup>nd</sup> year as ATKT (Allowed to keep term) students.
- ii. **2<sup>nd</sup> year** – Student can appear for 1<sup>st</sup> year failed subjects and 2<sup>nd</sup> year subjects together during 2<sup>nd</sup> year university exam (UE) and also 2<sup>nd</sup> year Resit exam.
  - a. If student does not clear all 1<sup>st</sup> year subjects even after 2<sup>nd</sup> year resit exam, then he/she will not be promoted for 3<sup>rd</sup> year. Student has to clear all the 1<sup>st</sup> year subjects to be promoted to 3<sup>rd</sup> year.
  - b. However, if student clears all 1<sup>st</sup> year subjects in university exam or after Resit exam, he/she can carryover 50% of 2<sup>nd</sup> year subjects to next year. These students can be promoted to 3<sup>rd</sup> year as ATKT students.
- iii. **3<sup>rd</sup> year** - Student can appear for 2<sup>nd</sup> year failed subjects ONLY during 3<sup>rd</sup> year university exam. He/she can appear for 3<sup>rd</sup> year subjects in subsequent university conducted exams only after he/she clears all the 2<sup>nd</sup> year subjects. Student has to PASS in all the 3<sup>rd</sup> year subjects to start his/her internship.

d) For pass in a subject student has to get **minimum 40% marks in University Theory paper and 40% marks in university practical exam separately**. A total of **50% marks in Theory (Theory marks in UE + Viva voce + IA) and Practical (Practical marks in UE + IA)** separately is required for the candidate to be declared PASS in university examination.

Where the subject has only Theory component and NO practical component, student has to get minimum 40% marks in University Theory paper and 50% marks in Theory total (Theory marks in UE + IA) to be declared PASS in university examination.

If the student fails in either Theory or practical component of a subject paper, the he/she has to appear for both Theory and Practical exam in the next resit examination. If student fails in resit exam also, then he/she will be not be promoted to next year. Such students will be continuing in the same year and give the university exam after one year.

e) Marks obtained in the subsidiary subjects shall have no bearing on the class declaration.

### **13. Carry over**

A candidate who fails in main subjects and /or first year and/ or second year shall be permitted to attend the classes, practical & posting of next year but the candidate should clear all the subjects in the resit examination. If a candidate unable to pass He/she not be allowed to attend the classes. He/she should join the classes next year after passing in all main subjects.

### **14. 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.

### **15. Maximum duration for completion of course**

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

1 year - B.Sc. Operation Theatre Technology

SUBJECT- ANATOMY

**Theory - 70 hours + Practical - 20 hours: Total teaching hours 90**

Sl. No.	CONTENT	Theory (Hours)	Practical (Hours)
1	Introduction: human body as a whole: Definition of anatomy and its divisions Terms of location, positions and planes Cell and its organelles Epithelium-definition, classification, describe with examples, function Glands- classification, describe serous & mucous glands with examples Basic tissues – classification with examples Practical: Histology of types of epithelium Histology of serous, mucous & mixed salivary glands	6	2
2	Locomotion and support: Cartilage – types with example & histology Bone – Classification, names of bone cells, parts of long bone, microscopy of compact bone, names of all bones, vertebral column, intervertebral disc, fontanelles of foetal skull, Joints – Classification of joints with examples, synovial joint (in detail for radiology) Muscular system: Classification of muscular tissue & histology Names of muscles of the body	6	2
3	Cardiovascular system: Heart-size, location, chambers, exterior & interior Blood supply of heart Systemic & pulmonary circulation Branches of aorta, common carotid artery, subclavian artery, axillary artery, brachial artery, superficial palmar arch, femoral artery, internal iliac artery Peripheral pulses Inferior venacava, portal vein, porto systemic anastomosis Great saphenous vein Dural venous sinuses [Lymphatic system- cisterna chyli & thoracic duct Histology of lymphatic tissues Names of regional lymphatic's, axillary and nguinal lymph nodes in brief]	6	2
4	Gastro-intestinal system: Parts of GIT, Oral cavity lip, tongue (with histology), tonsil, dentition, pharynx, salivary glands, Waldeyer's ring) Oesophagus, stomach, small and large intestine, liver, gall bladder, pancreas Radiographs of abdomen	5	2
	Respiratory system: Parts of RS, nose, nasal cavity, larynx, trachea,		

5	lungs, bronchopulmonary segments Histology of trachea, lung and pleura Names of paranasal air sinuses	4	2
6	Peritoneum: Theory: Description in brief Practical: Demonstration of reflections	4	1
7	Urinary system: Kidney, ureter, urinary bladder, male and female urethra Histology of kidney, ureter and urinary bladder Practical: demonstration of parts of urinary system Histology of kidney, ureter, urinary bladder Radiographs of abdomen-IVP, retrograde cystourethrogram	8	2
8	Reproductive system Parts of male reproductive system, testis, vas deferens, epididymis, prostate (gross & histology) sentinel vesicle Parts of female reproductive system, uterus, fallopian tubes, ovary (gross & histology) Mammary gland -gross	6	2
9	Endocrine glands Names of all endocrine glands in detail on pituitary gland, thyroid gland, parathyroid gland, suprarenal glad - (gross & histology)	6	1
10	Nervous system Neurons, neuroglial cells Classification of NS 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	6	2
11	Sensory organs: Skin: Skin-histology Appendages of skin Eye: Parts of eye & lacrimal apparatus Extra-ocular muscles & nerve supply Ear: parts of ear- external, middle and inner ear and contents	5	1
12	Embryology: Spermatogenesis & oogenesis ,Ovulation, fertilization, Foetal circulation, Placenta	8	1
	Total Teaching Hours -90	70	20

## TEACHING LEARNING ACTIVITIES

The course contents in Anatomy will be covered by

1. Didactic lectures
2. Practicals
3. Demonstration of dissected parts
4. Demonstration of museum specimens
5. Demonstration of charts and models
6. Demonstration of histology slides
7. Demonstration of human skeleton and individual bones
8. Demonstration of embryology models
9. Assignments –Practical record book

## EXAMINATION PATTERN

<b>Section</b>	<b>Maximum</b>	<b>Duration</b>
<b>Theory examination 1 paper</b>	70	3 hours
<b>Internal Assessment- Theory</b>	30	
<b>Total marks -Theory + IA Theory</b>	100	
<b>Grand Total</b>	100	

There shall be no University Practical Examination

Examiner: One internal and external examiner for university examinations



### TEXT BOOKS RECOMMENDED (LATEST EDITIONS)

1. Human Anatomy By B. D. Chaurasia, 8th edition Vol-1, 2, 3, 4
2. B. D. Chaurasia's Hand book of General Anatomy, 6th edition
3. Text book of Anatomy & Physiology for nurses – P. R. Asha Lata & G Deepa ,  
3rd edition
4. Inderbir Singh's Text book of Human Histology with colour atlas and  
1. Practical  
2. Guide, 2016  
3. Principles and Techniques in Histology Microscopy and Photomicrography  
4. 2nd edition, 2018 by D R Singh

### Marks Distribution: Total - 70 marks

- A. **Long essay:** 2 Questions X 10 marks each = 20 marks (answer 2 out of 3 questions)
- B. **Short essay:** 6 Questions X 5 marks each = 30 marks (answer 6 out of 8 questions)
- C. **Short answer:** 10 Questions X 2 marks each = 20 marks (answer all questions)

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## SUBJECT – PHYSIOLOGY

Teaching hours; Theory: 70 Hrs. Practical: 20 Hrs: Total: 90 Hrs

### THEORY:

Sl. No.	CONTENT	Teaching hours
1	<b>General physiology-</b> Homeostasis. Cell- structure, organelles, cell junctions, stem cells, cell aging and death. Transport across cell membrane, body fluids	3 hours
2	<b>Blood-</b> composition and function of blood Red blood cells - Erythropoiesis, stages of differentiation, function, count physiological Variation. Haemoglobin -structure , functions , concentration physiological variation Methods of Estimation of Hb. White blood cells - Production , function, life span, count, differential count, immune response, Humoral and cell mediated Platelets - Origin, normal count, morphology functions. Plasma Proteins - Production, concentration, types, albumin, globulin, Fibrinogen, Prothrombin functions. Haemostasis& Blood coagulation 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 in compatibility.	14 hours

	<p>Anticoagulants - Classification, Examples and uses</p> <p>Anaemias: Classification - morphological and etiological. effects of anemia on body</p> <p>Blood indices – Colour index , MCH, MCV, MCHC</p> <p>Erythrocyte sedimentation Rate (ESR) and Packed cell volume- Normal values, Definition, determination,</p> <p>Blood Volume -Normal value, determination of blood volume and regulation of blood volume</p> <p>Lymph - lymphoid tissue formation, circulation, composition and function of lymph</p>	
3	<p><b>Cardiovascular system-</b></p> <p>Heart - Physiological Anatomy, Nerve supply, conducting tissues of heart</p> <p>Properties of Cardiac muscle, Cardiac cycle-systole, diastole. Intraventricular pressure curves.</p> <p>Cardiac Output - definition, factors affecting</p> <p>Heart sounds- Normal heart sounds Areas of auscultation, cause characteristics and signification. Heart rate.</p> <p>Blood Pressure - Definition, normal value, clinical measurement of blood pressure. Physiological variations, regulation of heart rate, cardiac shock, hypotension, hypertension.</p> <p>Pulse - Jugular, radial pulse, coronary circulation, cerebral circulation</p> <p>Electrocardiogram (ECG) -significance.</p>	6 hours
4	<p><b>Digestive System –</b></p> <p>Physiological anatomy of Gastro intestinal tract, Functions of digestive system</p> <p>Salivary glands -Structure and functions. Deglutition -stages and regulation</p> <p>Stomach - structure and functions secretion - Composition function regulation of gastric juice secretion</p> <p>Pancreas - structure, function, composition, regulation of</p>	6 hours

	<p>pancreatic juice</p> <p>Liver - functions of liver</p> <p>Bile secretion, composition, function regulation of bile secretion.</p> <p>Bilirubin metabolism types of bilirubin, Vandenberg reaction, Jaundice- types, significance.</p> <p>Gall bladder - functions</p> <p>Intestine - small intestine and large intestine Small intestine - Functions- Digestive, absorption, movements.</p> <p>Large intestine - Functions, Defecation.</p>	
5	<p><b>Respiratory system -</b></p> <p>Functions of Respiratory system, Physiological Anatomy of Respiratory system, Respiratory tract, Respiratory Muscles, Respiratory organ-lungs, Alveoli, Respiratory membrane, types of respiration.</p> <p>Mechanism of normal and rigorous respiration. Forces opposing and favouring expansion of the lungs. Intra pulmonary pleural pressure, surface tension, recoil tendency of the wall.</p> <p>Transportation of Oxygen: Direction, pressure gradient, Forms of transportation, Oxygenation of Hb. Quantity of Oxygen transported.</p> <p>Lung volumes and capacities</p> <p>Regulation of respiration- Mechanisms of Regulation, nervous and chemical regulation. Respiratory centre. Hering Breuer, Reflexes.</p> <p>Applied Physiology and Respiration : Hypoxia, Cyanosis, Asphyxia, Dyspnea, Dysbarism, Artificial Respiration, Apnoea.</p>	6 hours
6	<p><b>Endocrine System -</b></p> <p>Definition Classification of Endocrine glands &amp; their Hormones Properties of Hormones.</p>	

	<p>Thyroid gland hormone - Physiological, Anatomy, Hormones secreted, Physiological function, regulation of secretion.</p> <p>Disorders - hypo and hyper secretion of hormone</p> <p>Adrenal gland, Adrenal cortex physiologic anatomy of adrenal gland, Adrenal cortex, cortical hormones - functions and regulation</p> <p>Adrenal medulla - Hormones, regulation and secretion. Functions of Adrenaline and noradrenaline.</p> <p>Pituitary hormones - Anterior and posterior pituitary hormones, secretion, function</p> <p>Pancreas - Hormones of pancreas</p> <p>Insulin - secretion, regulation, function and action Diabetes mellitus - Regulation of blood glucose level Parathyroid gland - function, action, regulation of secretion of parathyroid hormone.</p> <p>Calcitonin - functions and actions.</p>	6 hours
7	<p><b>Special senses-</b></p> <p>Vision - structure of eye. Function of different parts. Structure of retina, visual pathway, visual acuity, accommodation, refractory errors, colour vision</p> <p>Hearing structure and function of middle &amp; inner ear mechanism of hearing,</p> <p>Taste - Taste buds, functions. Smell physiology, Receptors</p>	6 hours
8	<p><b>Nervous system-</b></p> <p>Functions of Nervous system, Neurone structure, classification and properties. Neuroglia, nerve fiber, classification, conduction of impulses, salutatory conduction. Velocity of impulse transmission and factors affecting.</p> <p>Synapse - structure, types, properties.</p> <p>Receptors - Definition, classification, properties.</p> <p>Reflex action - unconditioned properties of reflex action.</p> <p>Babinski's sign. Spinal cord nerve tracts.</p>	8 hours

	<p>Ascending tracts, Dorsal column, spino thalamic pathway          Descending tracts- pyramidal tracts, Extrapyramidal tracts.          Functions of Medulla, pons, Hypothalamic functions, Thalamus - functions.          Cerebral cortex lobes and functions, Sensory cortex, Motor cortex, Cerebellum functions of Cerebellum. Basal ganglia- functions.          Cerebro-Spinal Fluid(CSF): formation, circulation, properties, composition and functions, lumbar puncture.          Autonomic Nervous System: Sympathetic and parasympathetic distribution and functions and comparison of functions.</p>	
9	<p><b>Excretory System-</b>          Excretory organs          Kidneys: Functions of kidneys structural and functional unit nephron, vasa recta, cortical and Juxta medullary nephrons - Comparison, Juxta Glomerular Apparatus -Structure and function.          Renal circulation peculiarities.          Mechanism of Urine formation : Ultrafiltration criteria for filtration GFR,          Factors affecting GFR. Determination of GFR.          Selective reabsorption- sites of reabsorption, substance reabsorbed, mechanisms of reabsorption Glucose, urea, H + Cl, aminoacids 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, Cystometrogram.          Diuretics : Water, Diuretics, osmotic diuretics, Artificial kidney.          PH of body fluids, regulation and acid base balance</p>	6 hours

10	<p><b>Reproductive system-</b>  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,  Ovarian Cycle Physiological changes during pregnancy,  pregnancy test.  Lactation : Composition of milk factors controlling lactation.  Contraception</p>	4 hours
11	<p><b>Muscle physiology-</b>  Classification of muscle, structure of skeletal muscle,  Sarcomere contractile proteins, Neuromuscular junction.  Transmission across Neuromuscular junction. Excitation  contraction coupling. Mechanism of muscle contraction,  fatigue Rigor mortis</p>	3 hours
12	<p><b>Skin -structure and function-</b>  Body temperature measurement, Physiological variation,  Regulation of body Temperature by physical, chemical and  nervous mechanisms. Role of Hypothalamus, Hypothermia and  fever</p>	2 hours

### Demonstration of Practicals:

1. Haemoglobinometry
2. White Blood Cell count
3. Red Blood Cell count
4. Determination of Blood Groups
5. Leishman's staining and Differential WBC count
6. Determination of packed cell Volume
7. Erythrocyte sedimentation rate [ESR]
8. Calculation of Blood indices
9. Determination of Clotting Time, Bleeding Time
10. Blood pressure Recording
11. Auscultation for Heart Sounds
12. Artificial Respiration- demo.
13. Determination of vital capacity- demo

## Internal Assessment

Theory - Average of two exams conducted- 20 marks

Practical's: Record & Lab work\* - 10 marks

\* There shall be no University Practical Examination and internal assessment marks secured in Practical need not be sent to the University.

Examiner: One internal and external examiner for university examinations

### Marks Distribution:

SUBJECT PAPERS	Theory (Th)				Practical (Pr)			Total (Th+Pr)
	UE	Viva (UE)	IA	TOTAL	UE	IA	TOTAL	
Physiology	70	-	30	100	-	-	-	100
Grand total Marks				100				100

**\*There shall be NO University practical examination**

### Scheme of Examination Theory

There shall be one theory paper of three hours duration carrying 70 marks. Distribution of type of questions and marks for Physiology shall be as given under.

TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS	SUB – TOTAL
LONG ESSAY(LE)	3 (To attempt 2)	2x10	20
SHORT ESSAY(SE)	8 (To attempt 6)	6x5	30
SHORT ANSWER (SA)	All are compulsory	10x2	20
TOTAL MARKS			70

### NO UNIVERSITY PRACTICAL EXAMINATION

#### REFERENCE BOOKS

1. Text and Practical Physiology for MLT – Dr. A.K.Jain, Avichal publishing company
2. Text book of Anatomy and Physiology for Nurses – P R Ashalatha
3. Guyton (Arthur) Text Book of Physiology. Latest Ed. Prism publishers
4. Anatomy and Physiology- Ashalata.
5. Physiology for B.Sc- A.K. Jain.



## **SUBJECT: BIOCHEMISTRY - BASICS INSTRUMENTS & REAGENTS**

Sl No. Topic

- 1 Cell: Sub cellular organelles, structure and function. Transport across cell membrane
- 2 Carbohydrate Chemistry: Definition, classification with examples, Composition, sources, functions of Monosaccharides, Disaccharides, Polysaccharides and Glycosaminoglycans.
- 3 Lipid Chemistry: Definition, classification of lipids and Fatty acids. Essential fatty acids- Definition, example, functions, deficiency features & Significance. Functions of Cholesterol, Phospholipids and their importance.
- 4 Amino-acid Chemistry: Definition, Classification based on side chain properties, nutritional requirement, Peptide bonds, biologically important peptides. Protein chemistry: Definition, Classification based on chemical nature and solubility, Functions of proteins Structure and functions of Collagen, Elastin. Plasma proteins and Immunoglobulins – types and functions.
- 5 Nucleotide and Nucleic Acid Chemistry: Nucleosides and Nucleotide composition with examples. Nucleic acid: DNA and RNA - chemistry, types and functions
- 6 Vitamins: Definition, classification according to solubility, Individual vitamins (Water soluble & fat soluble) - Sources, Coenzyme forms, functions, RDA, digestion, absorption and transport, deficiency and toxicity of A, D, C in detail, function and deficiency features of E, K, B-complex vitamins.
- 7 Enzymes: Definition, Classification with examples. Factors effecting enzyme activity, Mechanism of enzyme action in brief. Active site, Coenzyme, Proenzyme and Isoenzyme with examples. Diagnostic enzymology (clinical significance of enzymes and isoenzymes - CK, CK-MB, LDH, AST, ALT, ALP)
- 8 Carbohydrate Metabolism: Digestion and absorption, Pathway and significance of Glycolysis – Aerobic, Anaerobic. Pathway and energetics of Citric acid cycle.

- Gluconeogenesis in brief. Glycogen metabolism – Pathway and glycogen storage disorders. HMP shunt pathway and significance. Regulation of blood glucose level. Diabetes mellitus: Definition, classification, signs and symptoms, diagnosis.
- 9 Lipid Metabolism: Digestion and absorption, Lipolysis, pathway and energetics of  $\beta$ -oxidation of fatty acids. Ketone body metabolism: Ketone body formation (ketogenesis), utilization (ketolysis), ketosis. Lipoproteins - Types and functions. Dyslipidaemia, Atherosclerosis, CAD, fatty liver.
- 10 Amino acid and Protein Metabolism: Digestion and absorption, Catabolism of amino acids - Transamination, deamination, Fate of ammonia, transport of ammonia, Urea cycle. Specialized products formed from amino acids - glycine, arginine, methionine, phenylalanine, tyrosine, tryptophan.
- 11 ATP formation: Fundamentals of Biological oxidative reactions.
- 12 Minerals: Micro and macro minerals, Sources, RDA, Digestion, absorption, transport, excretion, functions, disorders of Individual minerals - Calcium, Phosphorous, Iron in detail; Functions and deficiency features of Copper, Zinc, Selenium, Iodine, Na, K, Cl.
- 13 Nutrition: Calorific values of foodstuffs Respiratory quotient, Basal metabolic rate: Definition, Normal values, Factors affecting BMR. Special dynamic action of food. Balanced Diet: Definition, Components, Recommended dietary allowances. Role of carbohydrates in diet: Digestible carbohydrates and dietary fibres. Role of lipids in diet: Saturated and unsaturated fatty acids, PUFA, Essential fatty acids. Role of proteins in diet: Quality of proteins - Biological value, net protein utilization. Nutritional aspects of proteins- essential and non-essential amino acids. Nitrogen balance. Nutritional disorders – protein Energy Malnutrition.
- 14 Acid base balance: Definitions of acid, base, pH and pKa, Henderson Hasselbalch equation. Buffers - Buffer systems in the ECF/ ICF and urine. Bicarbonate and phosphate buffer systems (pKa value, normal ratio of base/acid in the plasma) Role of kidneys in acid base balance. Acidosis & Alkalosis: Types, causes and biochemical findings.

- 15 Radioactive Isotopes: Definition, clinical applications, biological effects of radiations.
- 16 Solutions: Definition, use, classification, preparation and storage of solutions/reagents.

Molar and Normal solutions of compounds and acids. Preparation of percent solutions: w/w, v/v w/v (solids, liquids and acids). Conversion of a percent solution into a molar solution. Saturated and supersaturated solutions. Standard solutions - Technique for preparation and Storage.

Dilutions- Diluting Normal, Molar and percent solutions.

Part dilutions: Specimen dilutions, Serial dilutions, Reagent dilution, Dilution factors. Stock and working solutions. Preparing working standard from stock standard.

Biophysical chemistry Valency, Molecular weight and Equivalent weight of elements and compounds. Definition of Normality, Molarity, Molality with formula.

- 17 Clinical Biochemistry:

Blood Chemistry - Biochemical components. Normal reference ranges.

Urine chemistry- Biochemical components. Normal reference ranges.

Specimen collection: Collection of blood, CSF, urine & other fluids.

Use of preservatives, Anticoagulants, Method of transport, packing and storing of specimens,

Renal Function Tests - Serum Urea, Creatinine, Clearance tests, plasma and urine osmolarity.

Liver Function Tests - Bilirubin, Total protein, albumin, Enzymes (AST, ALT, ALP, GGT)

Lipid Profile - Total Cholesterol, Triglycerides, LDL, HDL.

Thyroid profile - TSH, T3, T4, fT3, fT4.

Arterial blood gas analysis, Blood gas analyser (Principle & Applications).

Electrolyte analysis, electrolyte analyser (Principle & Applications).

Quality control: The concept of pre analytical, analytical and post analytical errors.

18 Biomedical waste disposal

### **PRACTICAL: 20hours**

1. General Reactions of Carbohydrates
2. General Reactions of Proteins/Amino Acids
3. Analysis of Normal and Abnormal Urine
4. Colorimetry/Spectrophotometry/Autoanalyzer
5. Estimation of Blood glucose by enzymatic method (GOD-POD method)
6. Estimation of Urea
7. Estimation of Creatinine
8. POCT instruments/Devices

**SCHEME OF EXAMINATION** Theory - 100 marks University exam - 70 marks

Internal assessment - 30 marks

No University practical Exam

There shall be one theory paper of three hours duration carrying 70 marks.

### **Marks Distribution:**

<b>SUBJECT PAPERS</b>	<b>Theory (Th)</b>				<b>Practical (Pr)</b>			<b>Total (Th+Pr)</b>
	<b>UE</b>	<b>Viva (UE)</b>	<b>IA</b>	<b>TOTAL</b>	<b>UE</b>	<b>IA</b>	<b>TOTA</b>	
Biochemistry	70	-	30	100	-	-	-	100
Grand total Marks				100				100

**\*There shall be NO University practical examination in Biochemistry**

### **Distribution of type of questions and marks for Biochemistry:**

Biochemistry Theory Paper Course - First year B. Sc Operation Theatre Technology Maximum marks = 70 marks			
Type of Questions	No. of questions	Marks for Each Questions	Total Marks
Long Essay (answer any 3)	3 (2 x 10)	10	20
Short Essay (answer any 6)	8 (6 x 5)	05	30
Short Answer (answer all)	10 (10 x 2)	02	20
	<b>Total</b>		<b>70</b>

### **Internal Assessment:**

Internal Assessment Marks (Theory): 30

Minimum Two IA should be conducted. Candidate should score minimum 50% average IA marks to get eligibility to appear for final university examination.

\*There shall be no university practical examination and hence practical internal assessment marks need not be sent to the university.

### **Text Book References - Latest editions**

1. Vasudevan, Sreekumari -Text book of Biochemistry, Latest Ed
2. Biochemistry –U Sathyanarayana & U Chakrapani
3. Biochemistry - by Pankaja Naik
4. Godkar – Text book of Medical Laboratory Technology
5. Medical Laboratory technology by Ramnik Sood
6. Manipal Manual of Clinical Biochemistry for medical laboratory and M.Sc., students - by Shivananda Nayak B
7. Clinical chemistry - Marshall, William J.; Bangert, Stephen K.

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## **SUBJECT – GENERAL PATHOLOGY**

**Clinical Pathology, Haematology and Blood Banking Teaching hours; Theory: 70 Hrs.**

**Practical: 20 Hrs: Total: 90 Hrs I. General Pathology:**

### **1. Cell injury:**

- a. Definition causes.
- b. Cellular adaptations – Hypertrophy, hyperplasia, atrophy and metaplasia
- c. Types of cell injury – Reversible and irreversible; morphology of reversible injury. d. Necrosis – Definition and patterns of tissue necrosis.
- e. Intracellular accumulations – Lipids, cholesterol, proteins, glycogen and pigments; examples.

### **f. Pathologic calcification – Types and examples.**

### **2. Inflammation:**

- a. Definition and signs of inflammation.
- b. Types – Acute and chronic inflammation.
- c. Acute inflammation – Causes, morphological patterns and outcome.
- d. Chronic inflammation – Causes, morphology and examples.
- e. Regeneration and repair – Mechanism of cutaneous wound healing. f. Factors affecting wound healing.

### **3. Hemodynamic disorders:**

- a. Edema – Definition, pathogenesis and types: Renal, cardiac, pulmonary and cerebral.
- b. Difference between transudate and exudate.
- c. Shock – Definition, types of shock with examples: Hypovolemic, cardiogenic and septic shock, stages of shock: Nonprogressive, progressive and irreversible.

d. Thrombosis – Definition, mechanism of thrombus formation (Virchow's triad) and fate of thrombus.

e. Embolism – Definition and types: Thromboembolism, fat, air and amniotic fluid embolism.

f. Infarction – Definition and examples.

**4. Immune system:** Autoimmune diseases – General features, enumerate systemic and organ specific autoimmune diseases.

a. Systemic lupus erythematosus – Manifestations and diagnosis.

## **5. Neoplasia:**

a. Definition and nomenclature of tumors.

b. Differences between benign and malignant neoplasms.

c. Enumerate modes of carcinogenesis: Genes, physical, chemical and microbial agents of carcinogenesis.

d. Modes of spread of tumors.

e. Clinical aspects of neoplasia.

f. Grading and staging of cancers. g. Laboratory diagnosis of cancer.

## **II. Clinical Pathology- Theory**

Introduction to clinical pathology Collection, transport, preservation and processing of various clinical specimens Urine examination- collection and preservation, Physical, chemical and microscopic examination for abnormal constituents

### **Examination of Body fluids**

### **Examination of Cerebrospinal fluid (CSF) II. Hematology – Theory**

Introduction to hematology

Normal constituents of Blood, their structure and functions

Collection of Blood samples

Various anticoagulants used in Hematology

Hemoglobin estimation, different methods and normal values

Packed cell volume Erythrocyte sedimentation rate Normal Haemostasis Bleeding time. Clotting time, prothrombin time, Activated partial Thromboplastin time

**III. Blood Bank-** Theory Introduction blood banking Blood group system Collection and processing of blood for transfusion Compatibility testing Blood transfusion reactions Practical

1. Urine analysis- Physical, Chemical, Microscopic

2. Blood grouping and Rh typing

3. Hb estimation, packed cell volume (PCV), Erythrocyte Sedimentation rate (ESR)

4. Bleeding time and Clotting time

**Question Paper pattern Maximum Marks= 70 (for first year B.Sc)**

Type of questions	No. of questions	Marks for each question	Total Marks
<b>Essay type</b>	3 (2x10)	10	20
<b>Short Essay Type</b>	8 (6x5)	05	30
<b>Short Answer Type</b>	12(10x2)	02	20
	<b>Total</b>		70



- No Practical Examination

Distribution of Marks for University Theory and Practical Exam					
Theory				Practicals	Grand Total
Theory	Viva Voce	IA	Total	-	
70	-	30	100	-	100

**REFERENCE BOOKS:**

1. Culling Histopathology techniques
2. Bancroft Histopathology techniques
3. Koss- Cytology
4. Winifred Diagnostic cytopathology
5. Orell Cytopathology
6. Todd and Sanford- clinical diagnosis by Laboratory Medicine
7. Dacie and Lewis- Practical Hematology
8. Ramnik SOOD. Lab technology, Methods and interpretation, 4 th edition JP Bros New Delhi, 1996
9. Sathish Guptha , Short text book of Medical laboratory techniques for technicians
10. Sachdev K N. Clinical Pathology and Bacteriology, 8 th edition JP Bros, New Delhi, 1996

## **SUBJECT: GENERAL MICROBIOLOGY**

**Theory: 70 Hrs. + Practical: 20 Hrs: Total teaching hours 90**

**Objective:** This course introduces the principles of Microbiology with emphasis on applied aspects of Microbiology of infectious diseases particularly in the following areas

- Principles & practice of sterilization methods
- Collection and transport of specimens for routine microbiological investigations- Interpretation of commonly done bacteriological and serological investigations
- Control of Hospital infections & Biomedical waste management
- Immunization schedule

### **Theory - 70 hours**

#### **1. Morphology**

**4 hours** Classification

of the microorganisms: size, shape and structure of bacteria. Use of microscope in the study of bacteria

#### **2. Growth and nutrition**

**4 hours** Nutrition,

growth and multiplications of bacteria, use of culture media in diagnostic bacteriology.

#### **3. Sterilisation and Disinfection**

**6 hours** Principles and

use of equipment's of sterilization namely Hot Air oven, Autoclave and serum inspissator. Pasteurization, Anti septic and disinfectants. Antimicrobial sensitivity test

#### **4. Immunology**

**10 hours** Immunity Vaccines,

Types of Vaccine and immunization schedule Principles and interpretation of commonly done serological tests namely Widal, VDRL, ASLO, CRP, RF & ELISA. Rapid tests for HIV and HbsAg (Technical details to be avoided)

## **5. Systematic Bacteriology**

**25 hours** Morphology,

cultivation, diseases caused , laboratory diagnosis including specimen collection of the following bacteria( the classification, antigenic structure and pathogenicity are not to be taught) Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococci, C. diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, E. coli, Klebsiella, Proteus, Vibrio cholerae, Pseudomonas & Spirochetes

## **7. Mycology**

**4 hours** Morphology,

diseases caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes, opportunistic fungi.

## **8. Virology**

**8 hours** General

properties of viruses, diseases caused lab diagnosis and prevention of following viruses, Herpes, Hepatitis, HIV, Rabies and Poliomyelitis.

## **9. Hospital infection Control**

**5 hours**

Causative agents, transmission methods, investigation, prevention and control

## **10. Biomedical waste management- Principles and practice**

**4 hours**

## **PRACTICAL 20 hours**

Compound Microscope Demonstration and sterilization of equipments - Hot Air oven, Autoclave, Bacterial filters. Demonstration of commonly used culture media, Nutrient broth, Nutrient agar, Blood agar, Chocolate agar, Mac conkey 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, VRDL, ELISA. Grams stain Acid Fast staining

Visit to hospital for demonstration of Biomedical waste management. Anaerobic culture methods

## Internal Assessment

Theory - Average of two exams conducted – Marks 20

Practical's: Record & Lab work\* - Marks - 10

*\* There shall be no University Practical Examination and internal assessment*

*marks secured in Practical's need not be sent to the University.*

### Marks Distribution:

SUBJECT PAPERS	Theory (Th)				Practical (Pr)			Total (Th+Pr)
	UE	Viva (UE)	IA	TOTAL	UE	IA	TOTA	
Microbiology	70	-	30	100	-	-	-	100
Grand total Marks				100				100

**\*There shall be No University practical examination**

### Scheme of Examination Theory

There shall be one theory paper of three hours duration carrying 70 marks. Distribution and type of questions and marks for Microbiology shall be as given under

TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS	SUB – TOTAL
LONG ESSAY(LE)	3 ( To attempt 2)	2x10	20
SHORT ESSAY(SE)	8 ( To attempt 6)	6x5	30
SHORT ANSWER (SA)	All are compulsory	10x2	20
TOTAL MARKS			70

### NO PRACTICAL EXAMINATION

## REFERENCE BOOKS

1. Essentials of Medical Microbiology Apurba Shankar Sastry 2nd ed
2. Textbook of Microbiology Ananthnarayan and Paniker's 11 ed
3. Essentials of Medical Microbiology Apurba Shankar Sastry 3rd ed
4. Roberty Cruickshank - Medical Microbiology - The Practice of Medical Microbiology
5. Rippon - Medical Mycology
6. Emmons - Medical mycology
7. Basic laboratory methods in Parasitology, 1st Ed, J P Bros, New Delhi
8. Basic laboratory procedures in clinical bacteriology, 1st Ed, J P Brothers, New Delhi

### FIRST YEAR - Subsidiary subjects

	Subject	Teaching
1	Computer basics	20
2	English and Communication Skills	20
3	Health care	20
4	Basic Science with Skill Development Training	40

## **I. COMPUTER BASICS**

**Teaching Hours: 20**

1. Introduction to Computers
2. Definition: Input. Output & CPU
3. Input and output devices: types
4. Basis of computer system: Switching on & off, what is Bias? And computer generations
5. Keyboard practices
6. Definitions of terms: Desktop & Software
7. Computer systems: Hardware & software definitions
8. Windows operating system (win7, 8, 10 etc): Definition & Why, Calculator - Word pad - Short cuts - Start menu - Media player - Note pad - Win amp – Paint - Control panel
9. Microsoft word: Opening, saving, deleting, typing, print , Page border, spelling, table, grammar, margin, Clip art, BU, word art, Colour text & background, Picture drawing using word
10. Excel: Formulas - Design charts- Format tables
11. PowerPoint: Designing a presentation - Inserting some animation with sound
12. Internet & its applications: Interconnection to HTML, E-mailing – Browsing Chatting

## **II. ENGLISH AND COMMUNICATION SKILLS Teaching Hours: 20**

### **ENGLISH**

1. Functional English – Grammar: Components of a sentence – Verb - Transformation of sentences – Voice - Reported speech - Positive/ negative-Statement/ Interrogative - Subject verb agreement - Common errors – Exercises
2. Vocabulary: Synonyms and antonyms - Idioms and phrases – Similies - Words denoting assemblage
3. Writing skills: Note making – Summarizing - Report writing - Letter writing - Expansion of an idea - Comprehension
4. Reading: What is efficient and fast reading? - What is Awareness of existing reading habits - Tested techniques for improving speed - Improving concentration and comprehension through systematic study

## COMMUNICATION

5. Introduction: Communication process - Elements of communication - Barriers of communication and how to overcome them.
6. Speaking: Importance of speaking efficiently - Voice culture - Preparation of speech - secrets of good delivery - Audience psychology handling - Presentation skills - Conference/Interview technique
7. Listening: Importance of listening - Self-awareness about listening - Action plan execution - Barriers in listening - Good and persuasive listening
8. Nonverbal Communication: Basics of nonverbal communication
9. Memory: What is memory, Brain- mind potential? - Systems for memorizing  
- Summary page  
  
- Building positive mental habits
10. Self-awareness: Self-image - Self talk - Relaxation - Personality development

## III HEALTH CARE

**Teaching Hours: 20**

1. Introduction to Health: Definition of Health, Determinants of Health, Health Indicators of India, Health Team Concept, National Health Policy, National Health, Programmes (Briefly Objectives and scope) Population of India and Family welfare programme in India
2. Introduction to Nursing
  - Nursing principles. Inter-Personnel relationships. Bandaging: Basic turns; Bandaging extremities; Triangular Bandages and their application. Nursing Position, Bed making, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfort measures, Aids and rest and sleep. Lifting and Transporting Patients: Lifting patients up in the bed. Transferring from bed to wheel chair. Transferring from bed to stretcher.
  - Bed Side Management: Giving and taking Bed pan, Urinal : Observation of stools, urine. Observation of sputum, Understand use and care of catheters, enema giving.
  - Methods of Giving Nourishment: Feeding, Tube feeding, drips, transfusion Care of Rubber Goods Recording of body temperature, respiration and pulse, Simple aseptic technique, sterilization and disinfection. Surgical Dressing: Observation of dressing procedures

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

**Reference Books:**

1. Preventive and Social Medicine by J.Park
2. Text Book of P & SM by Park and Park
3. Counseling & Communicate skills for medical and health, Bayne- Orient Longman Pvt. Ltd.

**IV. BASIC SCIENCE WITH SKILL DEVELOPMENT TRAINING AND HOSPITAL PROCEDURE AND RECORDS**

**Teaching Hours: 40**

**1. Basic science with skill development training**

- Medical ethics & the relevant medico legal aspects Responsibilities & duties Ethical behaviour & conduct Medico-legal aspects and its relation to consumer protection act
- Biomedical waste & Its management Cardiopulmonary resuscitation- basic cardiac life support & advanced cardiac life support
- Critical care nephrology - management of renal failure in ICU Basic principles of blood transfusion & fluid therapy Sterilization - material & methods
- Biochemistry, Microbiology, Pathology & other related instrumentation: Basic principles of commonly used instruments, care & maintenance

**2. Infection control**

- The cycle of infection Infectious organisms The reservoir of infection The susceptible host Transmission of disease Practical asepsis Handling linen Disposal of contaminated waste Environmental asepsis Isolation technique
- The isolation patient in radiology dept. Precaution for the comprised patient Surgical asepsis

**3. Medication and their administration (nursing classes)**

- The role of the radiographer Medication information
- The topical route The oral route The parenteral route Preparation of injection The intravenous route Charting



#### **4. Dealing with acute situations (emergency medicine classes)**

- Accident victims: Head injury/ Fractures/ Burns
- Life threatening emergencies: Respiratory arrests, Heart attacks and cardiac arrests, Shocks Other emergencies - Epitaxis, Postural hypotension and vertigo Seizures, Diabetic coma and insulin reaction Asthma

#### **5. CARDIOPULPONARY RESUSCITATION (C.P.R)**

Basics of CPR - How to give CPR Precautions during CPR Basic cardiac life support & advanced cardiac life support

#### **6. HOSPITAL PROCEDURE AND RECORDS**

- General idea about the role, importance and procedures of the following within the hospital set up -
- Medical records
- Medical photography
- Computer networking system
- Laboratory services
- Sample collection and transport
- Biomedical waste disposal

## 1<sup>st</sup> Year BSc OT Technology

### SCHEME OF EXAMINATION

### MARK DISTRIBUTION

SUBJECT PAPERS	Theory (Th)				Practical (Pr)			Total (Th+Pr)
	UE	Viva (UE)	IA	TOTAL	UE	IA	TOTAL	
Anatomy	70	-	30	100	-	-	-	100
Physiology	70	-	30	100	-	-	-	100
Biochemistry	70	-	30	100	-	-	-	100
Microbiology	70	-	30	100	-	-	-	100
Pathology	70	-	30	100	-	-	-	100
Grand total Marks				500				500

**Second Year B.Sc Operation Theatre Technology**  
**SUBJECT: BASIC AND APPLIED PHARMACOLOGY**

**TEACHING HOURS: 50 hours**

**THEORY: Course content**

SI. NO	TOPICS
<b>TOPIC PH 1: GENERAL PHARMACOLOGY</b>	
1	Introduction and sources of drugs, routes of drug administration
2	Pharmacokinetics - Absorption and bioavailability, distribution, biotransformation, excretion
3	Pharmacodynamics - Types and mechanism of drug action
4	Adverse drug reactions
<b>SYSTEMIC PHARMACOLOGY</b>	
<b>TOPIC PH 2: DRUGS ACTING ON ANS</b>	
5	Anatomy and functional organization - Introduction, neurotransmitters and mechanism of action
6	Cholinergic & anticholinergic drugs
7	Adrenergic & antiadrenergic drugs
8	Neuro muscular blocking agents and skeletal muscle relaxants
<b>TOPIC PH 3: DRUGS ACTING ON CNS</b>	
9	Sedative, hypnotics, alcohol
10	General anesthetics, inhalational gases and emergency drugs
11	Local anesthetics
12	Opioid and non-opioid analgesic drugs
13	Non-steroidal anti-inflammatory drugs & antihistaminics
<b>TOPIC PH 4: DRUGS ACTING ON CVS</b>	
14	Anti-hypertensives (beta adrenergic, alpha adrenergic, peripheral vasodilators, calcium channel blockers)
15	Anti-anginal drugs
16	Antiarrhythmic drugs & cardiac glycosides
17	Drugs used in treatment of shock, hypolipidemic drugs

<b>TOPIC PH 5: DRUGS ACTING ON RENAL SYSTEM</b>	
18	Renal physiology, diuretics & antidiuretics
<b>RESPIRATORY SYSTEM</b>	
19	Drugs used in bronchial asthma & cough (mucokinetic and mucolytic agents, use of bland aerosols in respiratory care)
<b>TOPIC PH 6: BLOOD</b>	
20	Drugs used in hemostasis - anticoagulants, thrombolytics and antithrombolytics
<b>TOPIC PH 7: HORMONES AND DRUGS ACTING ON GIT</b>	
21	Corticosteroids and anti-emetics
<b>TOPIC PH 8: CHEMOTHERAPY</b>	
22	<b>General chemotherapy</b> - Basic principles of chemotherapy
23	<b>Systematic chemotherapy</b> - Classification / examples, spectrum uses and adverse effects a) Antibacterial drugs: Sulphonamides, fluoroquinolones, beta-lactam antibiotics, tetracycline and chloramphenicol, macrolides, aminoglycosides, other: polymyxin, bacitracin  b) Antifungal, Antiviral, Antitubercular, Antileprosy drugs in brief
<b>TOPIC PH 9: MISCELLANEOUS TOPICS</b>	
24	Immunosuppressive agents
25	Intravenous fluids - various preparations and their usages Electrolyte supplements
26	Cardioplegic drugs- History, Principles and types of cardioplegia
27	Primary solutions - History, principles & types
28	Pharmacological protection of organs during CPB
29	New drugs included in perfusion technology

### Marks Distribution

SUBJECT PAPERS	Theory (Th)				Practical (Pr)			Total (Th+Pr)
	UE	Viva (UE)	IA	TOTAL	UE	IA	TOTAL	
Basic and Applied Pharmacology	70	-	30	100	-	-	-	100
Grand Total Marks				100				100

## **PRACTICALS: - No Practical Examination**

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.

## **RECOMMENDED BOOKS (Latest editions)**

1. Essentials of Medical Pharmacology KD Tripathi, Jaypee Publishers
2. Pharmacology & Pharmacotherapeutics, R.S. Satoskar, Nirmala N. Rege, Raakhi K.
  - Tripathi, SD Bhandarkar by Elsevier
  - Textbook of Pharmacology for Paramedical Students by Pathania J.S. CBS Publishers
3. Pharmacology Essentials For Allied Health Jill Marquis, Jennifer Danielson and Skye
4. Mc.Kennon, EMC Paradigm Publishers
5. Textbook of Pharmacology for Paramedical Students by Pathania J.S. CBS Publishers

**Paper-2: Applied Pathology & Applied Microbiology**  
**APPLIED PATHOLOGY**

**I. CARDIOVASCULAR SYSTEM**

- Atherosclerosis- Definition, risk factors, briefly Pathogenesis & morphology, clinical significance and prevention.
- Hypertension- Definition, types and briefly Pathogenesis and effects of Hypertension.
- Aneurysms - Definition, classification, Pathology and complications.
- Pathophysiology of Heart failure.
- Cardiac hypertrophy - causes, Pathophysiology & Progression to Heart Failure.
- Ischaemic heart diseases- Definition, Types. Briefly
- Pathophysiology, Pathology & Complications of various types of IHD.
- Valvular Heart diseases- causes, Pathology & complication. Complications of artificial valves.
- Cardiomyopathy - Definition, Types, causes and significance.
- Pericardial effusion- causes, effects and diagnosis.
- Congenital heart diseases - Basic defect and effects of important types of congenital heart diseases.

**II. HAEMATOLOGY**

- Anaemia - Definition, morphological types and diagnosis of anaemia. Brief concept about
- Haemolytic anaemia and polycythaemia.
- Leukocyte disorders- Briefly leukaemia, leukocytosis, agranulocytosis etc.,
- Bleeding disorders- Definition, classification, causes & effects of important types of bleeding disorders. Briefly various laboratory tests used to diagnose bleeding disorders.

### **III. RESPIRATORY SYSTEM**

- Chronic obstructive airway diseases - Definition and types. Briefly causes, Pathology and complications of each type of COPD.
- Briefly concept about obstructive versus restrictive pulmonary disease.
- Pneumoconiosis- Definition, types, Pathology and effects in brief.
- Pulmonary congestion and edema.
  
- Pleural effusion - causes, effects and diagnosis.

### **IV. RENAL SYSTEM**

- Clinical manifestations of renal diseases. Briefly causes, mechanism, effects and laboratory diagnosis of ARF & CRS. Briefly Glomerulonephritis and Pyelonephritis.
- End stage renal disease - Definition, causes, effects and role of dialysis and renal transplantation in its management.
- Brief concept about obstructive uropathy.

### **PRACTICALS**

1. Interpretation and diagnosis of the following charts
  - a. Hematology Chart – AML, CML, Hemophilia, neutrophilia, eosinophilia
  - b. Urine chart – ARF, CRF, Acute glomerulonephritis
2. Transfusion protocols, Blood bank
3. Collection of specimens and transport

## **APPLIED MICROBIOLOGY**

### THEORY - 40 HOURS

#### 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 blood stream 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. 6 Hours

2. Disease communicable to Healthcare workers in hospital set up and its preventive measure: Occupationally acquired infections in healthcare professionals by respiratory route (tuberculosis, varicellazoster, respiratory syncytial virus etc), blood borne transmission (HIV, Hepatitis B, Hepatitis C, Cytomegalovirus, Ebola virus etc), orofaecal route ( Salmonella, Hepatitis A etc), direct contact ( Herpes Simplex Virus etc). Preventive measures to combat the spread of these infections by monitoring and control. 6 Hours

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. 6 Hours

#### 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 10 Hours

#### 5. Sterilization:

- a. Rooms: Gaseous sterilization, one atmosphere uniform glow discharge plasma (OAUGDP).
- b. Equipments: 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. 8 Hours



6. Preparation of materials for autoclaving: Packing of different types of materials, loading, holding time and unloading.

4 Hours

**PRACTICALS- 30 HOURS**

1. Principles of autoclaving & quality control of Sterilization.
2. Collection of specimen from outpatient units, inpatient units, minor operation theater and major operation theater 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.

SUBJECT PAPERS	Theory (Th)				Practical (Pr)			Total
	UE	Viva (UE)	IA	TOTAL	UE	IA	TOTAL	
Applied Pathology and Microbiology	35	-	15	100	-	-	-	100
	35		15					
Grand Total Marks				100				100

- **No Practical Examination**

**Paper-3 Medicine relevant to O.T. technology**

CVS –

- Hypertension
- Ischemic Heart Disease – Acute MI

Endocrine

- Diabetes Mellitus
- Thyroid – Hypo & Hyper
- Obesity

Respiratory System –

- Pneumonia
- COPD
- Bronchial Asthma

GIT –

- Peptic ulcer disease & Upper GI bleed
- Cirrhosis

Anemia –

- Iron & B12 deficiency

CNS -

- Epilepsy
- CVA

Renal -

- UTI
- AKI/CKD

Infectious Disease -

- Gastroenteritis
- Enteric Fever
- Dengue
- Malaria

### Marks Distribution

SUBJECT PAPERS	Theory (Th)				Practical (Pr)			Total (Th+Pr)
	UE	Viva (UE)	IA	TOTAL	UE	IA	TOTAL	
Medicine relevant to O.T. technology	70	10	20	100	40	10	50	150
Grand Total Marks				100			150	150

Reference books:

1. Berry and Kohn's operating room technique.  
Author - Berry, Edna Cornelia; Kohn, Mary Louise.
2. Clinical anaesthesiology.  
Author - Morgan, G. Edward; Mikhail, Maged; Murray. Michael.J.
3. Clinical anaesthesia.  
Author - Paul, Arun Kumar.

**Paper – 4**  
**Introduction to Operation Theatre Technology**

**INTRODUCTION TO OPERATION THEATRE TECHNOLOGY**

1. C.S.S.D, and logistics

Cleaning and dusting – methods of cleaning, composition of dust. General care and testing of instruments-forceps haemostatic, needle, holders, Knife, blade, scissor, use/ abuse, care during surgery.

Disinfectants and of there instruments and Sterilization- Definition, Methods cleaning agents detergents, Mechanical washing, ultrasonic cleaner, lubrication inspection and pitfalls Various methods of chemical treatment- formalin, glutarylaldehyde etc, thermal. Hot Air oven- dry heat, Autoclaving, steam Sterilization water etc,. UV treatment.

Instrument's Etching, care of micro surgical and titanium instruments

Sterilization of equipments – Arthroscope, Gastroscope, imago Lamp, Apparatus, suction Apparatus Anaesthetic equipments including endotracheal tubes –

OT Sterilization including laminar Air flow

Trouble shooting – colored spots and corrosion, staining, dust deposit, recent amendment in EPA with reference to waste disposal.

2. Anaesthesia Service,

History, pre-operative, Intra operative & post operative care

3. General Anaesthesia Techniques

4. Local Anaesthesia Techniques

5. Blood Transfusion

6. Monitoring in the Operation Theatre

7. Positioning of Patient

8. Instrument planning for various surgical procedure and Auxillary instrumentation.

9. O.T. Techniques O.T. environment, control of infection scrubbing, theatre cloths including lead apron and goggles.

10. Duties of Nurses – Ethics, behaviour during surgery, etc,.

### **Scheme of Examination**

#### **Theory**

There shall be one theory paper of three hours duration carrying 100 marks including 30 IA marks. Distribution of type of questions and marks for Introduction to Operation Theatre Technology shall be as given under.

Type of Questions	No. of Questions	Marks	Sub-total
Long Essay (LE)	2	2 x 10	20
Short Essay (SE)	8 (To attempt 6)	6 x 5	30
Short Answer (SA)	All are Compulsory	10 x 2	20
Total Marks			70

**PRACTICAL EXAMINATION -**  
**Practical IA – 10 Marks**

**40 Marks**

### Scheme of Examination for 2nd Year B. Sc OT

SUBJECT PAPERS	Theory (Th)				Practical (Pr)			Total (Th+Pr)
	UE	Viva (UE)	IA	TOTAL	UE	IA	TOTAL	
Basic and Applied Pharmacology	70	-	30	100	-	-	-	100
Applied Pathology and Microbiology	35 35	-	15 15	100	-	-	-	100
Medicine relevant to O.T. technology	70	10	20	100	40	10	50	150
Operation Theatre Technology – Basics	70	10	20	100	40	10	50	150
<b>Grand Total Marks</b>				<b>400</b>			<b>100</b>	<b>500</b>

#### SECOND YEAR- Subsidiary subjects

Sl No	Subject	Teaching hours
1	Indian constitution	20
2	Sociology	20
3	Environment science and health	20
4	Clinical psychology	20

#### I. INDIAN CONSTITUTION Teaching Hours: 20

1. Meaning of the term 'Constitution' Making of the Indian Constitution 1946- 1950
2. The democratic institutions created by the constitution Bicameral system of Legislature at the Centre and in the States.
3. Fundamental Rights and Duties their content and significance
4. Directive Principles of States Policies the need to balance Fundamental Rights with

Directive Principles.

5. Special Rights created in the Constitution for: Dalits, Backwards, Women and Children and the Religious and Linguistic Minorities.
6. Doctrine of Separation of Powers legislative, Executive and Judicial and their functioning in India
7. The Election Commission and State Public Service commissions
8. Method of amending the Constitution
9. Enforcing rights through Writs:
10. Constitution and Sustainable Development in India

### **Reference 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, Allahbad, Central Law Agency, 1998.
3. Granville Austin: The Indian Constitution – Corner Stone of a Nation-Oxford, New Delhi, 2000.

## **II. SOCIOLOGY Teaching Hours: 20**

### Course Description

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

#### 1. Introduction:

Meaning – Definition and scope of sociology. Its relation to Anthropology, Psychology, Social Psychology

Methods of Sociological investigations – Case study, social survey, questionnaire, interview and opinion poll methods.

Importance of its study with special reference to health care professionals

#### 2. Social Factors in Health and Disease:

Meaning of social factors, Role of social factors in health and disease

### 3. Socialization:

Meaning and nature of socialization, Primary, Secondary and Anticipatory socialization, Agencies of socialization

### 4. Social Groups:

Concepts of social groups influence of formal and informal groups on health and sickness. The role of peoples involved in the primary and secondary health care groups in the hospital and rehabilitation setup.

### 5. Family:

The family, meaning and definitions, Functions of types of family, Changing family patterns. Influence of family on individual's health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to physiotherapy

### 6. Community:

Rural community: Meaning and features – Health hazards to rural communities, health hazards to tribal community.

Urban community: Meaning and features – Health hazards of urbanities Culture and Health: Concept of Health Concept of culture and Health, Culture and Health Disorders

Social Change: Meaning of social changes, Factors of social changes, Human adaptation and social change, Social change and stress, Social change and deviance, Social change and health programme. The role of social planning in the improvement of health and rehabilitation

Social Problems of disabled: Consequences of the following social problems in relation to sickness and disability remedies to prevent these problems, Population explosion Poverty and unemployment Beggary, Juvenile delinquency Prostitution Alcoholism, Problems of women in employment

7. Social Security: Social Security and social legislation in relation to the disabled

8. Social Work: Meaning of Social Work, The role of a Medical Social Worker

### **Reference Books:**

1. Sachdeva & Vidyabhushan, Introduction to the study of sociology
2. Indrani T.K., Text book of sociology for graduates nurses and Physiotherapy students, JP Brothers, New Delhi 10

### **III. ENVIRONMENT SCIENCE AND HEALTH Teaching hours: 20**

1. Introduction to Environment and Health
2. Sources, health hazards and control of environmental pollution
3. Water
4. The concept of safe and wholesome water.
5. The requirements of sanitary sources of water.
6. Understanding the methods of purification of water on small scale and large scale. Various biological standards, including WHO guidelines for third world countries. Concept and methods for assessing quality of water.
7. Domestic refuse, sullage, human excreta and sewage their effects on environment and health, methods and issues related to their disposal.
8. Awareness of standards of housing and the effect of poor housing on health.
9. Role of arthropods in the causation of diseases, mode of transmission of arthropods borne diseases, methods of control

#### Recommended Books:

1. Text Book of Environmental Studies for under graduate courses By Erach Bharucha Reprinted in 2006, Orient Longman Private Limited /Universities Press India Pvt. Ltd.

### **IV. CLINICAL PSYCHOLOGY**

**Total teaching hours: 20**

1. Introduction to psychology
2. Intelligence, Learning, Memory, Personality, Motivation
3. Body integrity- one's body image
4. Patient in his Milan
5. Self-concept of the therapist, Therapist patient relationship-some guidelines
6. Illness and its impact on the patients
7. Maladies of the age and their impact on the patient's own and others concept of his body image
8. Adapting changes in vision
9. Why Medical Psychology needs / demands commitment?

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<b>MASTER PLAN OF SESSIONAL EXAMINATION 2023</b>					
<b>S.N</b>	<b>SUBJECT</b>	<b>Theory/ Practicals</b>	<b>1st IA Date /Day</b>	<b>2nd IA Date /Day</b>	<b>Tentative Final Examination Date /Day</b>
	<b>Class: Course-Year (Stud 92)</b>				
	<b>II Yr. B.Sc. OT Technology</b>				
1	Basic and Applied Pharmacology	T	25.04.2023	21.08.2023	25.10.2023
2	Applied Pathology and Microbiology	T	26.04.2023	22.08.2023	26.10.2023
3	Operation Theatre Technology – Basics	T	27.04.2023	23.08.2023	27.10.2023
		P	04.05.2023	30.08.2023	04.11.2023
4	Medicine relevant to O.T. technology	T	28.04.2023	24.08.2023	28.10.2023
		P	05.05.2023	31.08.2023	06.11.2023
	Theory Timings		02 PM- 05 PM	02 PM- 05 PM	02 PM- 05 PM

**Third Year B.Sc. Operation Theatre Technology**  
**Paper-1: Operation Theatre Technology – Clinical**

Paper-I Operation Theatre Technology - Clinical

- Physical Facility
- Layout of Operation theatres
- Transition
- Peripheral Support areas
- Operating room
- Special procedure rooms
- Potential sources of injury to the caregiver & patient

Principles of aspects & sterile technologies, surgical scrub, gowning & gloving  
 Decontamination & disinfections Sterilization Assembly & packing Thermal sterilization  
 Chemical sterilization Radiation sterilization Surgical instrumentation Fabrication  
 Classification Powered surgical instruments Handling instruments Specialized surgical  
 equipment Electro caretery Laser Microsurgery Ultrasonography Positioning prepping and  
 draping the patient General surgery Breast procedures Abdominal surgery Liver Procedures  
 Splenic procedures Pancreatic Procedures Osophagial

Scheme of Examination Theory There shall be one theory paper of three hours duration carrying 70 marks. Distribution of type of questions and marks for Paper-I Operation Theatre Technology – Clinical shall be as given under.

Type of Questions	No. of Questions	Marks	Sub-total
Long Essay (LE)	2	2 x 10	20
Short Essay (SE)	8 (To attempt 6)	6 x 5	30
Short Answer (SA)	12 (To Attempt 10)	10 x 2	20
<b>Total Marks</b>			<b>70</b>

## PRACTICAL EXAMINATION

One common practical for all the three papers with equal weight age of marks i.e. 40 practical marks for each paper.

### Paper-2: Operation Theatre Technology – Applied

Preoperative preparation of the patient Diagnostic procedures Pathological examination Radiological examination MRI Nuclear medicine studies Ultrasonography Endoscopy Anaesthesia techniques Historical background Types of Anaesthesia Choice of Anaesthesia General Anaesthesia Indication of general anaesthesia Endotracheal intubation Maintenance Monitoring Emergency Balanced Anaesthesia Care of Anaesthetized patient

Local & regional anaesthesia Spinal and epidural anaesthesia Intravenous anaesthesia agents Inhalational anaesthetic agents Anaesthetic Adjuvant drugs Complication of general anaesthesia Complication of local/regional anaesthesia Blood transfusion Anaesthesia Machine & central gas supply Difficult intubation

### Scheme of Examination Theory

There shall be one theory paper of three hours duration carrying 100 marks. Distribution of type of questions and marks for Paper-II Operation Theatre Technology - Applied shall be as given under.

Type of Questions	No. of Questions	Marks	Sub-total
Long Essay (LE)	2	2 x 10	20
Short Essay (SE)	8 (To attempt 6)	6 x 5	30
Short Answer (SA)	12 (To Attempt 10)	10 x 2	20
Total Marks			70

## PRACTICAL EXAMINATION

One common practical for all the three papers with equal weight age of marks i.e. 40

practical marks for each paper.

**Reference books:**

1. Berry and Kohn's operating room technique.  
Author - Berry, Edna Cornelia; Kohn, Mary Louise.
2. Ward's anaesthetic equipment.  
Author – Ward, Crispian.
3. Clinical anaesthesiology.  
Author – Morgan, G. Edward; Mikhail, Maged; Murray. Michael.J.
4. Clinical anaesthesia.  
Author - Paul, Arun Kumar.
5. Drugs and equipment in anaesthetic practice.  
Author - Paul, Arun Kumar.

**Paper-3; Operation Theatre Technology – Advanced**

Paper-III Operation Theatre Technology - Advanced

Operation Theatre Techniques for Speciality Surgery:- Preparation, nursing requirement, equipments including instruments, Sutures & etc Anaesthesia techniques, patient positioning & recovery Gynecological /obstetric surgery Urologic surgery Orthopedic surgery Neurosurgery Ophthalmic surgery Plastic and reconstructive surgery Otorhinolaryngologic and head and neck surgery Thoracic surgery Cardiac surgery Vascular surgery Organ procurement and transplantation Thyroid surgery

### Scheme of Examination Theory

There shall be one theory paper of three hours duration carrying 70 marks. Distribution of type of questions and marks for Paper-III Operation Theatre Technology - Advanced shall be as given under.

Type of Questions	No. of Questions	Marks	Sub-total
Long Essay (LE)	2	2 x 10	20
Short Essay (SE)	8 (To attempt 6)	6 x 5	30
Short Answer (SA)	12 (To attempt 10)	10 x 2	20
Total Marks			70

## PRACTICAL EXAMINATION

One common practical for all the three papers with equal weight age of marks i.e. 40

SUBJECT PAPERS	Theory (Th)				Practical (Pr)			Total (Th+Pr)
	UE	Viva (UE)	IA	TOTAL	UE	IA	TOTAL	
Operation Theatre Technology – Clinical	70	10	20	100	40	10	50	150
Operation Theatre Technology – Applied	70	10	20	100	40	10	50	150
Operation Theatre Technology – Advanced	70	10	20	100	40	10	50	150
Grand Total Marks				300			150	450

practical marks for each paper

### THIRD YEAR- Subsidiary subjects

	Subject	Teaching
	Research methodology	20
	Biostatistics	20

#### I. RESEARCH METHODOLOGY Teaching hours:20

##### 1. Introduction: Research Methodology

- Research process
- Steps involved in research process
- Research methods and methodology

##### 2. Variables and scales of measurements

- Definitions and examples of qualitative, quantitative, continuous discrete, dependent and independent variable
- Definitions, properties and examples of nominal, ordinal, interval and ratio scales of measurements.

##### 3. Sampling

- Population, sample, sampling, reasons for sampling, probability and non-probability sampling.

- Methods of probability sampling – simple random, stratified, systematic procedure
  - Merits and demerits.
  - Use of random number table.

#### 4. Organization of data

- Frequency table, histogram, frequency polygon, frequency curve, bar diagram, pie chart

#### 5. Measures of location

- Arithmetic mean, median, mode, quartiles and percentiles – definition
- Computation (for raw data), merits, demerits and applications

#### 6. Measures of variation

- Range, inter-quartile range, variance, standard deviation, coefficient of variation- definition
- Computation (for raw data), merits, demerits and applications

## **II. BIO-STATISTICS**

**Teaching hours:20**

### 1. Introduction I: Biostatistics

- Definition
- Role of statistics in health science and health care delivery system

### 2. Normal distribution

- Concept, graphical form, properties, examples
- Concept of Skewness and Kurtosis

### 3. Correlation

- Scatter diagram
- Concept and properties of correlation coefficient, examples [No computation]

### 4. Health Information System

- Definition, requirement, component and uses of health information system.
- Sources of health information system- Census, Registration of vital events, Sample registration system (SRS), Notification of diseases, Hospital records, Disease registries, Record linkage, Epidemiological surveillance, Population survey

### 5. Vital statistics and hospital statistics

- Rate, ratio, proportion, Incidence, Prevalence. Common morbidity, mortality and

### 6. Fertility statistics – Definition and computation.

### 7. Hypothesis

- What is hypothesis
- Formulation of hypothesis
- Characteristics of good hypothesis.

8. Epidemiology
  - Concept of health and disease
  - Definition and aims of Epidemiology,
  - Descriptive Epidemiology- methods and uses.
9. Concept of reliability & validity

#### **RECOMMENDED BOOKS**

1. Methods in Biostatistics for medical students & Research workers, Mahajan B.K.- 6th edition
2. Research methodology – Methods & techniques, Kothari. C.R
3. Introduction to Biostatistics: A manual for students in health sciences, Sundar Rao PSS, Richard. J
4. Text book of Preventive and social medicine, Park. E. Park

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**Internship – 1 year**





SDM College of Medical Sciences & Hospital



SDM College of Dental Sciences & Hospital



SDM College of Physiotherapy &  
SDM Institute of Nursing Sciences



Shri Dharmasthala Manjunatheshwara University



SDM Research Institute for Biomedical Sciences



Panoramic View of Campus