

REVISED ORDINANCE GOVERNING
REGULATIONS & CURRICULUM FOR BACHELOR OF SCIENCE
DEGREE COURSES IN
ALLIED HEALTH SCIENCE FOR FIRST YEAR
B.Sc. Renal Dialysis Technology

1. Title of the Courses offered in Allied Health Sciences:

1. Bachelor of Science in Medical Laboratory Technology [B.Sc. (M.L.T)]
2. Bachelor of Science in Operation Theatre Technology [BSc .O.T. Technology]
3. Bachelor of Science in Cardiac CareTechnology [B.Sc Cardiac CareTechnology]
- 4 .Bachelor of Science in PerfusionTechnology [BSc. PerfusionTechnology]
5. Bachelor of Science in Neuro Science Technology [BSc. Neuro Science Technology]
6. Bachelor of Science in . Renal Dialysis Technology [BSc. Renal Dialysis Technology]
7. Bachelor of Science in Respiratory Care Technology [BSc. Respiratory Care Technology]
8. Bachelor of Science in Anaesthesia Technology [BSc. Anaesthesia Technology]
9. Bachelor of Science in Imaging Technology [BSc. Imaging Technology]
10. Bachelor of Science in Radiotherapy Technology [BSc. Radiotherapy Technology]

2. Eligibility for admission:

A candidate seeking admission to the Bachelor of Science Degree Courses in the Allied Health Sciences course from Sl.No. 1 to 10 shall have studied English as one of the principal subject during the tenure of the course and for those seeking admission to the Bachelor of Science Degree Courses in the Allied Health Sciences courses from Sl.No. 1 to 8 mentioned above except for B.Sc. Imaging Technology and B.Sc. Radiotherapy Technology shall have passed:

1. Two year Pre-University examination or equivalent as recognized by Rajiv Gandhi University of Health Sciences with, Physics, Chemistry and Biology as principle subjects of study.
- OR
2. Pre-Degree course from a recognized University considered as equivalent by RGUHS, (Two years after ten years of schooling) with Physics, Chemistry and Biology as principal subjects of study.

OR

3. Any equivalent examination recognized by the Rajiv Gandhi University of Health Sciences, Bangalore for the above purpose with Physics, Chemistry and Biology as principal subjects of study.

OR

4. The vocational higher secondary education course conducted by Vocational Higher Secondary Education, Government of Kerala with five subjects including Physics, Chemistry, Biology and English in addition to vocational subjects conducted is considered equivalent to plus TWO examinations of Government of Karnataka Pre University Course.

OR

5. Candidates with two years diploma from a recognized Government Board in a subject for which the candidate desires to enroll, in the respective Allied Health Sciences course mentioned in Sl. No. 1 to 10 shall have passed plus 12 [10+2] with Physics, Chemistry and Biology, as principal subjects or candidates with 3 years diploma from a recognized Government Board in a subject for which the candidate desires to enroll, in the respective Allied Health Sciences course mentioned in Sl. No. 1 to 10 should have studied Physics, Biology and Chemistry as principal subjects during the tenure of the course.

6. Lateral entry to second year for allied health science courses for candidates who have passed diploma program from the Government Boards and recognized by RGUHS, fulfilling the conditions specified above under sl. No. 5 and these students are eligible to take admission on lateral entry system only in the same subject studied at diploma level from the academic year 2008-09 vide RGUHS Notification no. AUTH/AHS/317/2008-09 dated 01.08.2008.

7. In case of admission to B.Sc. Imaging Technology or B.Sc. Radiotherapy Technology the candidate should have passed Pre-University or equivalent examination with Physics, Chemistry, Biology and Mathematics, as principal subjects of study.

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.

3. Duration of the course:

Duration shall be for a period of three and half years including six months of Internship.

4. Medium of instruction:

The medium of instruction and examination shall be in English.

5. Scheme of examination:

There shall be three examinations one each at the end of 1st, 2nd and 3rd year.

6. Attendance

Every candidate should have attended at least 80% 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 university in each of the subjects prescribed for that year separately in theory and practical. 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 .

7. Internal Assessment (IA) :

Theory - 20 marks.

Practical - 10 marks. [Lab work- 06 marks and Record-04 marks]

There shall be a minimum of two periodical tests preferably one in each term in theory and practical of each subject in an academic year. The average marks of the two tests will be calculated and reduced to 20. 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.

The marks of the internal assessment must be displayed on the notice board of the respective colleges with in 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.

*** There shall be no University Practical Examination in First year.**

8. Subject and hours of teaching for Theory and Practicals

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 Science.

The number of hours for teaching theory and practical for main subjects in first, Second and Third year are shown in Table-I, II and III.

Table - I Distribution of Teaching Hours in First Year Subjects

Main Subjects

S L No	Subject	Theory No. of Hours	Practical No. of Hours	Total No. of Hours
1	Human Anatomy	70	20	90

2	Physiology	70	20	90
3	Biochemistry	70	20	90
4	Pathology-[Clinical Pathology, Hematology & Blood –Banking	70	20	90
5	Microbiology	70	20	90
	Total	350	100	450

The classes in main and subsidiary subjects are to be held from Monday to Thursday. On Fridays and Saturdays students shall work in hospitals in the respective specialty or department chosen by them

Subsidiary Subjects

English 25 Hours

Kannada 25 Hours

Health-Care 40 Hours

Hospital posting –470 hours- Fri day 9am – 1pm and 2 pm - 4-30 pm
Saturday 9am - 1 pm

Table -II Distribution of Teaching Hours in Second Year Subjects

Main Subjects

S L No	Subject	Theory No. of Hours	Practical No. of Hours	Clinical posting	Total No. of Hours
1	Applied anatomy & physiology related to dialysis technology	80 (40+40)	30 (15+15)	--	110
2	Pharmacology related to dialysis technology	40	10	--	50
3	Concepts of renal disease	50	100	630	780

	& its management				
4	Applied aspects of pathology & microbiology	80 (40+40)	30 (15+15)		110
	Total	250	170	630	1050

Subsidiary Subjects

Sociology	20 Hours
Constitution of India	10 Hours
Environmental Science & Health	10 Hours
Nutrition	20 Hours
Basics in Renal Dialysis Technology	20 Hours

Table - III Distribution of Teaching Hours in Third Year Subjects

Main Subjects

S L No	Subject	Theory No. of Hours	Practical No. of Hours	Clinical posting	Total No. of Hours
1	APPLIED DIALYSIS TECHNOLOGY PAPER I	125	100	300	525
2	APPLIED DIALYSIS TECHNOLOGY PAPER II	125	100	300	525
	Total	250	200	600	1050

Subsidiary Subjects

Ethics, Database Management	50 Hours
Research & Biostatistics	20 Hours
Computer application	10 Hours
Basic Sciences	35 Hours

*** There shall be no University Practical Examination in First year.**

10. Scheme of Examination:

There shall be three examinations, one each at the end of I, II and III year. The examination for both main and subsidiary subjects for all courses in Allied Health Sciences shall be common in the first year.

Distribution of Subjects and marks for First Year, Second year & Third year University theory and practical Examinations are shown in the Table – IV, V & VI.

First year examination:

The University examination for 1st year shall consist of only theory examination and there shall be no University Practical Examination.

Second & Third year examination:

The University examination for 2nd and 3rd year shall consist of Written Examination & Practical.

Written Examinations consists of

04 papers in the 2nd Year

02 papers in the 3rd Year.

Practical examination:

One practical examinations, at the end 2nd Year and one practical examination at the end of the 3rd year.

TABLE-IV

Distribution of Subjects and marks for First Year University theory Examination

A	Main Subjects*	Written Paper		I .A Theory	Total
		Duration	Marks		
1	Basic Anatomy [Including Histology]	3 hours	80	20	100
2	Physiology	3 hours	80	20	100
3	Biochemistry	3 hours	80	20	100
4	Pathology	3hours	80	20	100
5	Microbiology	3 hours	80	20	100
B	Subsidiary Subject**				Total
1	English	3 hours	80	20	100
2	Kannada	3 hours	80	20	100
3	Health Care	3 hours	80	20	100

Note * I A = Internal Assessment

Main Subjects shall have University Examination.
 There Shall be no University Practical Examination.

** Subsidiary subjects : Examination for subsidiary subjects shall be conducted by respective colleges.

TABLE – V Distribution of Subjects and marks for Second Year Examination.

Paper	Subjects	Theory				Practicals			Grand Total
		Theory	Viva-voca	IA	Sub Total	Practicals	I.A.	Sub Total	
I	Concepts of renal disease & its management	80	--	20	100	No Practicals			100
II	Applied aspects of pathology & microbiology	100	30	20	150	80	20	100	250
III	Applied anatomy & physiology related to dialysis technology	80	--	20	100	No Practicals			100
IV	Pharmacology related to dialysis technology	80	--	20	100	No Practicals			100

Distribution of Subsidiary Subjects and marks for Second Year Examination.

B	Subsidiary Subject**	Duration	Marks	I .A Theory Marks	Total Marks
1	Sociology	3 hours	80	20	100
2	Constitution of India	3 hours	80	20	100
3	Environmental Science & Health	3 hours	80	20	100
4	Nutrition	3 hours	80	20	100
5	Basics in Renal Dialysis Technology	3 hours	80	20	100

** Subsidiary subjects : Examination for subsidiary subjects shall be conducted by respective colleges

TABLE – VI
Distribution of Subjects and marks for Third Year Examination.

Paper	Subjects	Theory				Practicals **			Grand Total
		Theory	Viva-voca	IA	Sub Total	Practicals	I.A.	Sub Total	
I	Applied dialysis technology Paper I	100	30	20	150	80 (40+40)	20 (10+10)	100	400
II	Applied dialysis technology Paper II	100	30	20	150				

** Practicals-One common practical for the two papers with equal weight age of marks

i.e. 40 practical mark and 10 I.A. marks for each paper.

Distribution of Subsidiary Subjects and marks for Third Year Examination.

Subsidiary B	Subsidiary Subject**	Duration	Marks	I .A Theory Marks	Total Marks
--------------	----------------------	----------	-------	-------------------	-------------

1	Ethics, Database Management	3 hours	80	20	100
2	Research & Biostatistics	3 hours	80	20	100
3	Computer application	3 hours	80	20	100
4	Basic Sciences	3 hours	80	20	100

** Subsidiary subjects : Examination for subsidiary subjects shall be conducted by respective colleges

11. Pass criteria

11.1. First year examination.

a. Main Subjects: A candidate is declared to have passed in a subject, if he/she secures, 50% of marks in University Theory exam and internal assessment added together.

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.

11.2. Second and Third year Examination

a. Main Subjects: A candidate is declared to have passed the Examination in a subject if he/she secures 50% of the marks in theory and 50% in practical separately. For a pass in theory, a candidate has to secure a minimum of 40% marks in the University conducted written examination, and 50% in aggregate in the University conducted written examination, internal assessment and Viva-Voce added together and for pass in Practical, a candidate has to secure a minimum of 40% marks in the university conducted Practical/Clinical examination and 50% in aggregate i.e. University conducted Practical/Clinical and Internal Assessment.

In the third year a candidate is declared to have passed only if he/she passes all the two theory papers and one practical examination in a single attempt failing which where in the candidate fails in one or more theory papers and /or practical examination he/she will have to re appear for all the two theory papers and the practical examination in the subsequent attempt.

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.

12. Carry over benefit

12.1 First year examination:

A candidate who fails in any two of the five main subjects of first year shall be permitted to carry over those subjects to second year. However, he/se must pass the carry over subjects before appearing for second year examination; otherwise he/she shall not permitted to proceed to third year.

12.2. Second year examination.

A candidate is permitted to carry over any one main subject to the third year but shall pass this subject before appearing for the third year examination

13. Declaration Of Class

- a. A candidate having appeared in all the subjects in the same examination and passed that examination in the first attempt and secures 75% of marks or more of grand total marks prescribed will be declared to have passed the examination with Distinction.
- b. A candidate having appeared in all subjects in the same examination and passed that examination in the first attempt and secures 60% of marks or more but less than 75% of grand total marks prescribed will be declared to have passed the examination in First Class.
- c. A candidate having appeared in all the subjects in the same examination and passed that examination in the first attempt and secures 50% of marks or more but less than 60% of grand total marks prescribed will be declared to have passed the examination in Second Class.
- d. A candidate passing the university examination in more than one attempt shall be placed in Pass class irrespective of the percentage of marks secured by him/her in the examination.
- e. The marks obtained by a candidate in the subsidiary subjects shall not be considered for award of Class or Rank.

[Please note fraction of marks should not be rounded off clauses (a), (b) and (c)]

14. Eligibility for the award of Degree:

A candidate shall have passed in all the subjects of first, second and third year to be eligible for award of degree.

15. Distribution of Type of Questions and Marks for Various Subjects

THEORY

SUBJECTS HAVING MAXIMUM MARKS = 100		
TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS FOR EACH QUESTION
ESSAY TYPE	3 (2x10)	10
SHORT ESSAY TYPE	12 (10 × 5)	5
SHORT ANSWER TYPE	12 (10 × 3)	3

SUBJECTS HAVING MAXIMUM MARKS = 80		
TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS FOR EACH QUESTION
ESSAY TYPE	3 (2x10)	10
SHORT ESSAY TYPE	8 (6 × 5)	5
SHORT ANSWER TYPE	12(10 × 3)	3

SUBJECTS HAVING MAXIMUM MARKS = 60		
TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS FOR EACH QUESTION
ESSAY TYPE	3 (2x10)	10
SHORT ESSAY TYPE	7(5×5)	5
SHORT ANSWER TYPE	7(5×3)	3

SUBJECTS HAVING MAXIMUM MARKS = 50		
TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS FOR EACH QUESTION
ESSAY TYPE	3 (2x10)	10
SHORT ESSAY TYPE	5(3×5)	5
SHORT ANSWER TYPE	7(5×3)	3

**Syllabus for First year Allied Health science courses RGUHS
BSc. Renal Dialysis Technology**

ANATOMY

No. of theory classes: 70 hours

No. of practical classes : 20 hours

1. Introduction: human body as a whole

Theory:

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 gland

2. Locomotion and support

Theory:

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 fetal 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

Practical: Histology of the 3 types of cartilage

Demo of all bones showing parts, radiographs of normal bones & joints

Histology of compact bone (TS & LS)

Demonstration of all muscles of the body

Histology of skeletal (TS & LS), smooth & cardiac muscle

3. Cardiovascular system

Theory:

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 pulse

Inferior venacava, portal vein, portosystemic anastomosis

Great saphenous vein

Dural venous sinuses

Lymphatic system- cisterna chyli & thoracic duct

Histology of lymphatic tissues

Names of regional lymphatics, axillary and inguinal lymph nodes in brief

Practical:

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

4. Gastro-intestinal system

Theory:

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. Respiratory system

Parts of RS, nose, nasal cavity, larynx, trachea, lungs, bronchopulmonary segments

Histology of trachea, lung and pleura

Names of paranasal air sinuses

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

6. Peritoneum

Theory: Description in brief

Practical: Demonstration of reflections

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 cystogram

8. Reproductive system

Theory:

Parts of male reproductive system, testis, vas deferens, epididymis, prostate (gross & histology)

Parts of female reproductive system, uterus, fallopian tubes, ovary (gross & histology)

Mammary gland – gross

Practical: demonstration of section of male and female pelvis with organs in situ

Histology of testis, vas deferens, epididymis, prostate, uterus, fallopian tubes, ovary

Radiographs of pelvis – hysterosalpingogram

9. Endocrine glands

Theory:

Names of all endocrine glands in detail on pituitary gland, thyroid gland, parathyroid gland, suprarenal gland – (gross & histology)

Practical: Demonstration of the glands
Histology of pituitary, thyroid, parathyroid, suprarenal glands

10. Nervous system

Theory:

Neuron

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

Practical: Histology of peripheral nerve & optic nerve
Demonstration of all plexuses and nerves in the body
Demonstration of all part of brain
Histology of cerebrum, cerebellum, spinal cord

Sensory organs:

Theory:

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

Practical: Histology of thin and thick skin
Demonstration and histology of eyeball
Histology of cornea & retina

Embryology:

Theory:

Spermatogenesis & oogenesis

Ovulation, fertilization

Fetal circulation

Placenta

Internal Assessment

Theory - Average of two exams conducted. 20

Practicals: Record & Lab work* 10

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

Scheme of Examination Theory

There shall be one theory paper of three hours duration carrying 80 marks. Distribution of type of questions and marks for Anatomy shall be as given under.

Type of Questions	No. of Questions	Marks	Sub-total
Long Essay (LE)	3 (To attempt 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 3	30
Total Marks			80

NO PRACTICAL EXAMINATION

REFERENCE BOOKS

Anatomy

- 1 William Davis (P) understanding Human Anatomy and Physiology MC Graw Hill
2. Chaurasia –A Text book of Anatomy
T.S. Ranganathan – A text book of Human Anatomy
3. Fattana, Human anatomy
(Description and applied)
Saunders & C P Prism Publishers, Bangalore – 1991
4. ESTER . M. Grishcimer,
Physiology & Anatomy with Practical
Considerations, J.P. Lippin Cott. Philadelphia

BSc. Renal Dialysis Technology

PHYSIOLOGY

Theory 70 hours

Practical 20hours

Introduction – 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

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

Crossmatching

Rh system – Rh factor, Rh in compatibility.

Blood transfusion – Indication, universal donor and recipient concept.

Selection criteria of a blood donor. transfusion reactions Anticoagulants – Classification, examples and uses

Anaemias : Classification – morphological and etiological. effects of anemia 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

Cardiovascular system

Heart – Physiological Anatomy, Nerve supply

Properties of Cardiac muscle,

Cardiac cycle-systole,diastole. Intraventricular 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, Triple response

Heart sounds – Normal heart sounds, cause characteristics and significance. Heart rate

Electrocardiogram (ECG) –significance.

Digestive System - Physiological anatomy of Gastro intestinal tract, Functions of digestive system

Salivary glands Structure and functions. Deglutination –stages and regulation

Stomach – structure and functions

Gastric secretion – Composition function regulation of gastric juice secretion

Pancrease – structure, function, composition, regulation of pancreatic juice

Liver – functions of liver

Bile secretion, composition, function regulation of bile secretion .Bilirubin metabolism types of bilirubin, Vandernberg reaction, Jaundice- types, significance.

Gall bladder – functions

Intestine – small intestine and large intestine

Small intestine –Functions- Digestive, absorption ,movements.

Large intestine – Functions, Digestion and absorption of Carbohydrates,Proteins, Fats,Lipids.Defecation

Respiratory system

Functions of Respiratory system, Physiological Anatomy of Respiratory system, Respiratory tract, Respiratory Muscles, Respiratory organ-lungs, Alveoli, Respiratory membrane, stages of respiration.

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.

H

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 what? Why? How? Mechanisms of Regulation, nervous and chemical regulation. Respiratory centre. Hearing Brier, Reflexes.

Applied Physiology and Respiration : Hypoxia, Cyanosis, Asphyxia, Dyspnea, Dysbarism, Artificial Respiration, Apnoea.

Endocrine System - Definition Classification of Endocrine glands & their Harmones Properties of Harmones .

Thyroid gland hormone – Physiological, Anatomy, Hormone scerated, Physiological function, regulation of secretion. Disorders – hypo and hyper secretion of hormone

Adrenal gland, Adrenal cortex physiologic anatomy of adrenal gland, Adrenal cortex, cortical hormones – functions and regulation

Adrenal medulla – Hormones , regulation and secretion. Functions of Adrenaline and nor adrenaline

Pituitary hormones – Anterior and posterior pituitary hormones, secretion ,function

Pancreas – 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

Special senses

Vision – structure of eye. Function of different parts.

Structure of retina

Hearing structure and function of can mechanism of hearing

Taste – Taste buds functions . Smell physiology, Receptors.

Nervous system

Functions of Nervous system, Neurone 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.

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.

Excretory System

Excretory organs

Kidneys: Functions of kidneys structural and functional unit nephron, vasarecta, cortical and juxtamedullary nephrons – Comparison, Juxta Glomerular Apparatus –Structure and function. Renal circulation peculiarities.

Mechanism of Urine formation : Ultrafiltration criteria for filtration GFR, Plasma fraction, EFP, factors effecting EFR. 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 e 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

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.

Muscle nerve physiology

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 Rigour mortis

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

Haemoglobinometry

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

Internal Assessment

Theory - Average of two exams conducted. 20

Practicals: Record & Lab work* 10

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

Scheme of Examination Theory

There shall be one theory paper of three hours duration carrying 80 marks. Distribution of type of questions and marks for Physiology shall be as given under.

Type of Questions	No. of Questions	Marks	Sub-total
Long Essay (LE)	3(To attempt 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 3	30
Total Marks			80

NO PRACTICAL EXAMINATION

REFERENCE BOOKS

Physiology

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 . Appleton

BSc. Renal Dialysis Technology

BIOCHEMISTRY

No. Theory classes: 70hours

No. of practical classes: 20 hours

Theory:

Specimen collection: Pre-analytical variables

Collection of blood

Collection of CSF & other fluids

Urine collection

Use of preservatives

Anticoagulants

1. Introduction to Laboratory apparatus

Pipettes- different types (Graduated, volumetric, Pasteur, Automatic etc..)

Calibration of glass pipettes

Burettes, Beakers, Petri dishes, depression plates.

Flasks - different types)Volumetric, round bottmed, Erlenmeyer conical etc..)

Funnels – different types (Conical, Buchner etx..)

Bottles – Reagent bottles – graduated and common, Wash bottles – different type

Specimen bottles etc.,

2. Measuring cylinders, Porcelain dish

Tubes – Test tubes, centrifuge tubes, test tube draining rack

Tripod stand, Wire gauze, Bunsen burner.

Cuvettes, significance of cuvettes in colorimeter, cuvettes for visible and UV range,

cuvette holders Racks – Bottle, Test tube, Pipette

Dessicator, Stop watch, rimers, scissors

Dispensers – reagent and sample

Any other apparatus which is important and may have been missed should also be covered

Maintenance of lab glass ware and apparatus:

Glass and plastic ware in Laboratory

*use of glass: significance of boro silicate glass ; care and cleaning
of glass ware, different cleaning solutions of glass

* care and cleaning of plastic ware, different cleaning solutions

3. Instruments (Theory and demonstration) Diagrams to be drawn

Water bath: Use, care and maintenance

Oven & Incubators : Use, care and maintenance.

Water Distillation plant and water deionisers. Use, care and maintenance

Refrigerators, cold box, deep freezers – Use, care and maintainance

Reflux condenser : Use, care and maintenance

Centrifuges (Theory and demonstration) Diagrams to be drawn

Definition, Principle, svedberg unit, centrifugal force, centrifugal field rpm,
ref.Conversion of G to rpm and vice versa.

Different types of centrifuges

Use care and maintenance of a centrifuge

Laboratory balances [Theory & Practicals) Diagrams to be drawn

Manual balances: Single pan, double pan, trip balance

Direct read out electrical balances.

Use care and maintenance. Guideline to be followed and precautions to be taken while weighing

Weighing different types of chemicals, liquids. Hygroscopic compounds etc.
Colorimeter and spectrophotometer (Theory and Practicals) Diagrams to be drawn
Principle, Parts Diagram.

Use, care and maintenance.

pH meter (Theory & practicals) Diagrams to be drawn
principle, parts, Types of electrodes, salt bridge solution.

Use, care and maintenance of Ph meter and electrodes

Guidelines to be followed and precautions to be taken while using pH meter

4. Safety of measurements

5. Conventional and SI units

6. Atomic structure

Dalton's theory, Properties of electrons, protons, neutrons, and nucleus, Rutherford's model of atomic structure, Bohr's model of atomic structure, orbit 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., 1N Na₂CO₃, 0.1N Oxalic acid, 0.1 N HCl, 0.1N 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

Dilutions

Diluting solutions: eg. Preparation of 0.1 N NaCl from 1 N NaCl from 2 N HCl 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.

Standard 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.

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. Difference between bases and alkali, acidity and basicity, monoprotic and polyprotic acids and bases

Concepts 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

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 a 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

Quality control : Accuracy
Precision
Specificity
Sensitivity
Limits of error allowable in laboratory
Percentage error

Normal values and Interpretations

Special Investigations: Serum Electrophoresis
Immunoglobulins
Drugs: Digitoxin, Theophyllines

Regulation of Acid Base status:
Henderson Hasselback Equations
Buffers of the fluid

pH Regulation

Disturbance in acid Base Balance

Anion Gap

Metabolic acidosis

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 gas and Electrolytes

4. Estimation of Blood sugar, Blood Urea and electrolytes

5. Demonstration of Strips

Demonstration of Glucometer

Internal Assessment

Theory - Average of two exams conducted. 20

Practicals: Record & Lab work* 10

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

Scheme of Examination Theory

There shall be one theory paper of three hours duration carrying 80 marks. Distribution of type of questions and marks for Biochemistry shall be as given under.

Type of Questions	No. of Questions	Marks	Sub-total
Long Essay (LE)	3(To attempt 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 3	30
Total Marks			80

NO PRACTICAL EXAMINATION

REFERENCE BOOKS

Biochemistry

1. Varley – Clinical chemistry
2. TEITZ – Clinical chemistry
3. Kaplan – Clinical chemistry
4. Ramakrishna(S) Prasanna(KG), Rajna ® Text book of Medical Biochemistry Latest Ed Orient longman Bombay –1980
5. Vasudevan (DM) Sreekumari(S) Text book of Biochemistry for Medical students ,Latest Ed
6. DAS(Debajyothi) Biochemistry Latest ED Academic, Publishers, Culcutta – 1992

Syllabus for First year Allied Health science courses **RGUHS** **BSc. Renal Dialysis Technology**

PATHOLOGY

Histo Pathology ,Clinical Pathology, Haematology and Blood Banking

Theory – 70 hours

Practical – 20 hours

HistoPathology - Theory

- Introduction to Histo Pathology
- Receiving of Specimen in the laboratory
- Grossing Techniques
- Mounting Techniques – various Mountants
- Maintenance of records and filing of the slides.
- Use & care of Microscope
- Various Fixatives, Mode of action, Preparation and Indication.
- Bio-Medical waste management
 - Section Cutting
 - Tissue processing for routine paraffin sections
 - Decalcification of Tissues.
 - Staining of tissues - H& E Staining
 - Bio-Medical waste management

Clinical Pathology – Theory

- Introduction to Clinical Pathology
- Collection, Transport, Preservation, and Processing of various clinical specimens
- Urine Examination – Collection and Preservation of urine.
Physical, chemical, Microscopic Examination
- Examination of body fluids.
- Examination of cerebro spinal fluid (CSF)
- Sputum Examination.
- Examination of feces

Haematology – Theory

- Introduction to Haematology
- Normal constituents of Blood, their structure and function.
- Collection of Blood samples
- Various Anticoagulants used in Haematology
- Various instruments and glassware used in Haematology, 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.

Blood Bank

Introduction

Blood grouping and Rh Types

Cross matching

PRACTICALS

- Urine Examination.
- Physical
- Chemical
- Microscopic
- Blood Grouping Rh typing.
- Hb Estimation, Packed Cell Volume [PCV], Erythrocyte Sedimentation rate [ESR]
- Bleeding Time, Clotting Time.
- Histopathology – Section cutting and H & E Staining. [For BSc MLT only]

Internal Assessment

Theory - Average of two exams conducted. 20

Practicals: Record & Lab work* 10

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

Scheme of Examination Theory

There shall be one theory paper of three hours duration carrying 80 marks. Distribution of type of questions and marks for Pathology shall be as given under.

Type of Questions	No. of Questions	Marks	Sub-total
Long Essay (LE)	3 (To attempt 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 3	30
Total Marks			80

NO PRACTICAL EXAMINATION

REFERENCE BOOKS

Pathology –

1. Culling Histopathology techniques
2. Bancroft Histopathology techniques
3. Koss – cytology
4. Winifred greg – Diagnostic cytopathology
5. Orell – Cyto Pathology
6. Todd & Sanford Clinical Diagnosis by laboratory method
7. Dacie & Lewis – Practical Haematology
8. Ramanic Sood, Laboratory Technology (Methods and interpretation) 4th Ed.
J.P. Bros, New Delhi –1996)
9. Satish Gupta Short text book of Medical Laboratory for technician
J.P. Bros, New Delhi – 1998
10. Sachdev K.N. Clinical Pathology and Bacteriology 8th Ed, J.P. Bros,
New Delhi-1991.
11. Krishna - Text book of Pathology, Orient Longman PVT Ltd.

Syllabus for First year Allied Health science courses **RGUHS** **BSc. Renal Dialysis Technology**

Microbiology

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 despatch 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 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 4 hours
Principles and use of equipments of sterilization namely Hot Air oven, Autoclave and serum inspissator. Pasteurization, Anti septic and disinfectants.
Antimicrobial sensitivity test
4. Immunology 6 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 20 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, Esch coli, Klebsiella, Proteus,vibrio cholerae, Pseudomonas & Spirochetes
6. Parasitology 10 hours
Morphology, life cycle, laboratory diagnosis of following parasites
E. histolytica, Plasmodium, Tape worms, Intestinal nematodes
7. Mycology 4 hours
Morphology, diseases caused and lab diagnosis of following fungi.
Candida, Cryptococcus, Dermatophytes ,opportunistic fungi.
8. Virology 10 hours
General properties of viruses, diseases caused, lab diagnosis and prevention of following viruses, Herpes, Hepatitis, HIV, Rabies and Poliomyelitis.
9. Hospital infection Causative agents, transmission methods, investigation, prevention and control Hospital infection. 4 hours
10. Principles and practice Biomedical waste management 4 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

Stool exam for Helminthic ova

Visit to hospital for demonstration of Biomedical waste mangement.

Anaerobic culture methods.

Internal Assessment

Theory - Average of two exams conducted. 20

Practicals: Record & Lab work* 10

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

Scheme of Examination Theory

There shall be one theory paper of three hours duration carrying 80 marks. Distribution of type of questions and marks for Microbiology shall be as given under.

Type of Questions	No. of Questions	Marks	Sub-total
Long Essay (LE)	3(To attempt 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 3	30
Total Marks			80

NO PRACTICAL EXAMINATION

REFERENCE BOOKS

Microbiology

1. Anathanarayana & Panikar Medical Microbioloty
2. Roberty Cruckshank – Medical Microbiology – The Practice of Medical Mircrobiology
3. Chatterjee – Parasitology – Interpretation to Clinical medicine.
4. Rippon – Medical Mycology
5. Emmons – Medical mycology
6. Basic laboratory methods in Parasitology, 1st Ed, J P Bros, New Delhi – 199
7. Basic laboratory procedures in clinical bacteriology, 1st Ed, J P Brothers,
New Delhi
8. Medical Parasitology – Ajit Damle

**Syllabus for First year Allied Health science courses RGUHS
 BSc. Renal Dialysis Technology**

SUBSIDIARY SUBJECTS

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.

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

Social Factors in Health and Disease:

Meaning of social factors

Role of social factors in health and disease

Socialization :

Meaning and nature of socialization

Primary, Secondary and Anticipatory socialization

Agencies of socialization

Social Groups:

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

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

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

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

Social Security :

Social Security and social legislation in relation to the disabled

Social Work :

Meaning of Social Work

The role of a Medical Social Worker

ENGLISH

COURSE OUTLINE

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.

BEHAVIOURAL OBJECTIVES :

The student at the end of training is able to

1. Read and comprehend english language
2. Speak and write grammatically correct english
3. Appreciates the value of English literature in personal and professional life.

UNIT - I : INTRODUCTION :

Study Techniques
Organisation of effective note taking and logical processes of analysis and synthesis
Use of the dictionary
Enlargement of vocabulary
Effective diction

UNIT - II : APPLIED GRAMMAR :

Correct usage
The structure of sentences
The structure of paragraphs
Enlargements of Vocabulary

UNIT - III : WRITTEN COMPOSITION :

Precise writing and summarising
Writing of bibliography
Enlargement of Vocabulary

UNIT - IV : READING AND COMPREHENSION :

Review of selected materials and express oneself in one's words.
Enlargement of Vocabulary.

UNIT - V : THE STUDY OF THE VARIOUS FORMS OF COMPOSITION :

Paragraph, Essay, Letter, Summary, Practice in writing

UNIT - VI : VERBAL COMMUNICATION :

Discussions and summarization, Debates, Oral reports, use in teaching

Scheme of Examination

Written (Theory): Maximum Marks: –80 marks.

No Practical or Viva voce examination

This is a subsidiary subject, examination to be conducted by respective colleges. Marks required for a pass is 35%

REFERENCE

1. English Grammar Collins, Birmingham University, International Language Data Base, Rupa & Co. 1993

2. Wren and Martin - Grammar and Composition, 1989, Chanda & Co, Delhi
3. Letters for all Occasions. A S Myers. Pub - Harper Perennial
4. Spoken English V. Shasikumar and P V Dhanija. Pub. By: Tata Mcgraw Hill, New Delhi
5. Journalism Made Simple D Wainwright
6. Writers Basic Bookself Series, Writers Digest series
7. Interviewing by Joan Clayton Platkon
8. Penguin Book of Interviews.

BIO STATISTICS

Time Allotted: 20 Hours

Course Description:

Introduction to basic statistical concepts: methods of statistical analysis; and interpretation of data

Behavioural Objectives:

Understands statistical terms.

Possesses knowledge and skill in the use of basic statistical and research methodology.

Unit – I : Introduction

Meaning, definition, characteristics of statistics.

Importance of the study of statistics.

Branches of statistics.

Statistics and health science including nursing.

Parameters and estimates.

Descriptive and inferential statistics.

Variables and their types.

Measurement scales

Unit – II : Tabulation of Data

Raw data, the array, frequency distribution.

Basic principles of graphical representation.

Types of diagrams - histograms, frequency polygons, smooth frequency polygon, commulative frequency curve, ogive.

Normal probability curve.

Unit - III : Measure of Central Tendency

Need for measures of central tendency

Definition and calculation of mean - ungrouped and grouped

Meaning, interpretation and calculation of median ungrouped and grouped.

Meaning and calculation of mode.

Comparison of the mean, and mode.

Guidelines for the use of various measures of central tendency.

Unit - IV : Measure of Variability

Need for measure of dispersion.

The range, the average deviation.

The variance and standard deviation.

Calculation of variance and standard deviation ungrouped and grouped.

Properties and uses of variance and SO

Unit -V : Probability and Standard Distributions.

Meaning of probability of standard distribution.

The Binominal distribution.

The normal distribution.

Divergence from normality - skewness, kurtosis.

Unit - VI : Samling Techniques

Need for sampling - Criteria for good samples.

Application of sampling in Community.

Procedures of sampling and sampling designs errors.
Sampling variation and tests of significance.

Unit - VII : Health Indicator

Importance of health Indicator.

Indicators of population, morbidity, mortality, health services.

Calculation of rates and ratios of health.

Recommended Books.

B.K. Mahajan & M. Gupta (1995) Text Book of Preventive & Social Medicine, 2002, 17th
Edition Jaypee Brothers.

HEALTH CARE

Teaching Hours : 40

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

Introduction to Nursing

What is Nursing ? Nursing principles. Inter-Personnel relationships. Bandaging : Basic turns; Bandaging extremities; Triangular Bandages and their application.

Nursing Position, Bed making, prone, lateral, dorsal, dorsal re-cumbent, 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

First Aid :

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

INDIAN CONSTITUTION

Prescribed for the First Year students of all degree classes

Unit-I: Meaning of the term 'Constitution' making of the Indian Constitution 1946-1949.

Unit-II: The democratic institutions created by the constitution Bicameral system of Legislature at the Centre and in the States.

Unit-III: Fundamental Rights and Duties their content and significance.

Unit – IV: Directive Principles of States Policies the need to balance Fundamental Rights with Directive Principles.

Unit – V: Special Rights created in the Constitution for: Dalits, Backwards, Women and Children and the Religious and Linguistic Minorities.

Unit-VI: Doctrine of Separation of Powers legislative, Executive and Judicial and their functioning in India.

Unit – VII: The Election Commission and State Public Service commissions.

Unit – VIII: Method of amending the Constitution.

Unit – IX: Enforcing rights through Writs:

Unit – X: Constitution and Sustainable Development in India.

- 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.

ENVIRONMENT SCIENCE AND HEALTH

Introduction to Environment and Health

Sources, health hazards and control of environmental pollution

Water

The concept of safe and wholesome water.

The requirements of sanitary sources of water.

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.

Domestic refuse, sullage, human excreta and sewage their effects on environment and health, methods and issues related to their disposal.

Awareness of standards of housing and the effect of poor housing on health.

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.

BASICS IN COMPUTER APPLICATIONS

The course enables the students to understand the fundamentals of computer and its applications.

Introduction to Data processing :

Features of computers, Advantages of using computers. Getting data into / out of computers. Role of computers. What is Data processing? Application areas of computers involved in Data processing. Common activities in processing. Types of Data processing, Characteristics of information. What are Hardware and Software?

Hardware Concepts :

Architecture of computers, Classification of computers, Concept of damage. Types of storage devices. Characteristics of disks, tapes, Terminals, Printers, Network. Applications of networking concept of PC System care, Floppy care, Data care.

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

Principles of programming

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

Data processing

Computers in physical therapy - principles in EMG, Exercise testing equipment, Laser.

Scheme of Examination for *MEDICAL ELECTRONICS including COMPUTER APPLICATIONS*

One Written (Theory) paper: Maximum Marks: –80 marks.

No Practical or Viva voce examination

Syllabus for Second year Allied Health science courses **RGUHS** **BSc. Renal Dialysis Technology**

Main Subjects

APPLIED ANATOMY & PHYSIOLOGY RELATED TO DIALYSIS

TECHNOLOGY PAPER 1

Applied ANATOMY

1. BASIC ANATOMY OF URINARY SYSTEM – STRUCTURAL ANATOMY OF KIDNEY, BLADDER, URETR, URETHRA, PROSTATE
2. HISTOLOGY OF KIDNEY
3. BLOOD SUPPLY OF KIDNEY
4. DEVELOPMENT OF KIDNEY IN BRIEF
5. ANATOMY OF PERITONEUM INCLUDING CONCEPT OF ABDOMINAL HERNIAS
6. ANATOMY OF VASCULAT SYSTEM
 - UPPER LIMB VESSELS – COURSE, DISTRIBUTION, BRANCHES, ORIGIN & ABNORMALITIES
 - NECK VESSELS – COURSE, DISTRIBUTION, BRANCHES, ORIGIN & ABNORMALITIES
 - FEMORAL VESSELS - COURSE, DISTRIBUTION, BRANCHES, ORIGIN & ABNORMALITIES

PHYSIOLOGY

1. MECHANISM OF URINE FORMATION
2. GLOMURULAR FILTRATION RATE (GFR)
3. CLEARANCE STUDIES
4. PHYSIOLOGICAL VALUES – UREA, CREATININE, ELECTROLYTES, CALCIUM, PHOSPHOROUS, URIC ACID, MAGNESIUM, GLUCOSE
24 HOURS URINARY INDICES – UREA, CREATININE, ELECTROLYTES, CALCIUM, MAGNESIUM
5. PHYSIOLOGY OF RENAL CIRCULATION
 - FACTORS CONTRIBUTING & MODIFYING RENAL CIRCULATION
 - AUTOREGULATION
6. HORMONES PRODUCED BY KIDNEY & PHYSIOLOGIC ALTERATIONS IN PREGNANCY
7. HAEMOSTASIS – COAGULATION CASCADE, COGULATION FACTORS, AUTO REGULATION, BT, CT, PT, PTT, THROMBIN TIME

8. ACID BASE BALANCE – BASIC PRINCIPLES & COMMON ABNORMALITIES
LIKE HYPOKALEMIA, HYPONATREMIA, HYPERKALEMIA, HYPERNATREMIA,
HYPOCALCEMIA, HYPERCALCEMIA, PH, etc.
9. BASIC NUTRITION IN RENAL DISEASES

Scheme of Examination *Theory*

There shall be one theory paper of three hours duration carrying 80 marks. Distribution of type of questions and marks for APPLIED

ANATOMY & PHYSIOLOGY RELATED TO DIALYSIS TECHNOLOGY PAPER 1

shall be as given under.

Type of Questions	No. of Questions	Marks	Sub-total
Long Essay (LE)	3 (To attempt 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 3	30
Total Marks			80

NO PRACTICAL EXAMINATION

Syllabus for Second year Allied Health science courses RGUHS

PHARMACOLOGY RELATED TO HAEMO & PERITONEAL

DIALYSIS PAPER II

1. IV FLUID THERAPY WITH SPECIAL EMPHASIS IN RENAL DISEASES
2. DIURETICS – CLASSIFICATION, ACTIONS, DOSAGE, SIDE EFFECTS & CONTRAINDICATIONS
3. ANTI HYPERTENSIVES – CLASSIFICATION, ACTIONS, DOSAGE, SIDE EFFECTS & CONTRAINDICATIONS, SPECIAL REFERENCE DURING DIALYSIS , VASOPRESSORS, DRUGS USED IN HYPOTENSION
4. DRUGS & DIALYSIS – DOSE & DURATION OF ADMINISTRATION OF DRUGS
5. DIALYSABLE DRUGS – PHENOBARBITONE, LITHIUM, METHANOL etc.
6. VITAMIN D & ITS ANALOGUES, PHOSPHATE BINDERS, IRON, FOLIC ACID & OTHER VITAMINS OF THERAPEUTIC VALUE
7. ERYTHROPOIETIN IN DETAIL
8. HEPARIN INCLUDING LOW MOLECULAR WEIGHT HEPARIN
9. PROTAMINE SULPHATE
10. FORMALIN, SODIUM HYPOCHLORITE, HYDROGEN PEROXIDE – ROLE AS DISINFECTANTS & ADVERSE EFFECTS OF RESIDUAL PARTICLES APPLICABLE TO FORMALIN
11. HAEMODIALYSIS CONCENTRATES – COMPOSITION & DILUTION (ACETATE & BICARBONATES)
12. PERITONEAL DIALYSIS FLUID IN PARTICULAR HYPERTONIC SOLUTIONS – COMPOSITION
13. POTASSIUM EXCHANGE RESINS WITH SPECIAL EMPHASIS ON MODE OF ADMINISTRATION

Scheme of Examination *Theory*

There shall be one theory paper of three hours duration carrying 50 marks. Distribution of type of questions and marks for PHARMACOLOGY RELATED TO HAEMO & PERITONEAL DIALYSIS PAPER II

shall be as given under.

Type of Questions	No. of Questions	Marks	Sub-total
Long Essay (LE)	3 (To attempt 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 3	30
Total Marks			80

NO PRACTICAL EXAMINATION

Syllabus for Second year Allied Health science courses RGUHS

CONCEPTS OF RENAL DISEASES

CLINICAL MANIFESTATIONS EVALUATION & MANAGEMENT OF THE FOLLOWING DISEASES

1. ACUTE RENAL FAILURE
2. NEPHROTIC SYNDROME – PRIMARY & SECONDARY
3. NEPHRITIC SYNDROME
4. UTI – URINARY TRACT INFECTIONS
5. ASYMPTOMATIC URINARY ABNORMALITIES
6. CHRONIC RENAL FAILURE
7. RENAL STONE DISEASES
8. OBSTRUCTIVE UROPATHIES
9. CONGENITAL & INHERITED RENAL DISEASES
10. TUMORS OF KIDNEY
11. PREGNANCY ASSOCIATED RENAL DISEASES
12. RENAL VASCULAR DISORDERS & HYPERTENSION ASSOCIATED RENAL DISEASES

Scheme of Examination *Theory*

There shall be one theory paper of three hours duration carrying 50 marks.

**Distribution of type of questions and marks for CONCEPTS OF RENAL
DISEASES PAPER III**

TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS FOR EACH QUESTION	Sub-total
ESSAY TYPE	3(To attempt 2)	10	20
SHORT ESSAY TYPE	12 (10 × 5)	5	50
SHORT ANSWER TYPE	12 (10 × 3)	3	30
Total			100

Syllabus for Second year Allied Health science courses RGUHS

APPLIED ASPECTS OF PAHTOLOGY & MICROBIOLOGY

PAPER IV

PATHOLOGY

1. CONGENITAL ABNORMALITIES OF URINARY SYSTEM
2. CLASSIFICATION OF RENAL DISEASES
3. GLOMERULAR DISEASES – CAUSES, TYPES & PATHOLOGY
4. TUBULOINTERSTITIAL DISEASES
5. RENAL VASCULAR DISORDERS
6. END STAGE RENAL DISEASES – CAUSES & PATHOLOGY
7. PATHOLOGY OF KIDNEY IN HYPERTENSION, DIABETES MELLITUS, PREGNANCY
8. PATHOLOGY OF PERITONEUM – PERITONITIS – BACTERIAL, TUBULAR & SCLEROSING PERITONITIS DIALYSIS INDUCED CHANGES
9. PATHOLOGY OF URINARY TRACT INFECTIONS
10. PYELONEPHRITIS & TUBERCULOUS PYELONEPHRITIS

MICROBIOLOGY

1. HEPATOTROPIC VIRUSES IN DETAIL – MODE OF TRANSFUSION, UNIVERSAL PRECAUTIONS, VACCINATIONS
2. HUMAN IMMUNODEFICIENCY VIRUS (HIV), MODE OF TRANSFUSION, UNIVERSAL PRECAUTIONS
3. OPPURTUNISTIC INFECTIONS
4. MICROBIOLOGY OF URINARY TRACT INFECTIONS
5. MICROBIOLOGY OF VASCULAR ACCESS INFECTION (FEMORAL, JUGULA, SUBCLAVIAN CATHETERS)
6. SAMPLING METHODOLOGIES FOR CULTURE & SENSITIVITY

Scheme of Examination *Theory*

There shall be one theory paper of three hours duration carrying 50 marks. Distribution of type of questions and marks for APPLIED ASPECTS OF PAHTOLOGY & MICROBIOLOGY
PAPER IV

TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS FOR EACH QUESTION	Sub-total
ESSAY TYPE	3(To attempt 2)	10	20
SHORT ESSAY TYPE	12 (10 × 5)	5	50
SHORT ANSWER TYPE	12 (10 × 3)	3	30
Total			100

PRACTICAL EXAM: 80 Marks

Syllabus for Second year Allied Health science courses RGUHS
Subsidiary Subjects

BSc. Renal Dialysis Technology

BASICS OF DIALYSIS TECHNOLOGY

1. INDICATIONS OF DIALYSIS
2. TYPES OF DIALYSIS
3. PRINCIPLES OF DIALYSIS – DEFINITION
4. HAEMODIALYSIS APPARATUS – TYPES OF DIALYSER & MEMBRANE
5. TYPES OF VASCULAR ACCESS FOR HAEMODIALYSIS
6. INTRODUCTION TO HAEMODIALYSIS MACHINE
7. PRIMING OF DIALYSIS APPARATUS
8. DIALYSER REUSE
9. COMMON COMPLICATIONS OF HAEMODIALYSIS
10. MONITORING OF PATIENTS DURING DIALYSIS

NUTRITION

INTRODUCTION TO SCIENCE OF NUTRITION

- DEFINITION
- FOOD PATTERN AND ITS RELATION TO HEALTH
- FACTORS INFLUENCING FOOD HABITS, SELECTION AND FOOD STUFFS
- SUPERSTITIONS, CULTURE, RELIGION, INCOME, COMPOSITION OF FAMILY, AGE, OCCUPATION, SPECIAL GROUP etc
- FOOD SELECTION, STORAGE & PRESERVATION
- PREVENTION OF BLOOD ADULTERATION

CLASSIFICATION OF NUTRIENTS

- MACRONUTRIENTS AND MICRONUTRIENTS
- PROTEINS – TYPES, SOURCES, REQUIREMENTS AND DEFICIENCIES OF PROTEINS
- CARBOHYDRATES SOURCES, REQUIREMENTS & DEFICIENCY
- FATS – TYPES, SOURCES, REQUIREMENTS AND DEFICIENCY OF FATS
- WATER – SOURCES OF DRINKING WATER, REQUIREMENTS, PRESERVATION OF WATER
- MINERALS – TYPES, SOURCES, REQUIREMENTS DEFICIENCIES OF MINERALS
- VITAMINS - TYPES, SOURCES, REQUIREMENTS DEFICIENCIES OF VITAMINS

PLANNING DIETS

- NEED FOR PLANNING DIETS
- CONCEPT OF A BALANCED DIET
- FOOD GROUP & BALANCED DIET
- INFLUENCE OF AGE, SEX, OCCUPATION & PHYSIOLOGICAL STATE
- RECOMMENDED DIETARY INTAKE IN PLANNING DIET
- STEPS IN PLANNING BALANCED DIET
- PLANNING RENAL DIET

INTRODUCTION TO COOKERY

- PURPOSES AND METHODS OF COOKING
- EFFECTS OF HEAT ON COOKING OF FOODS
- PREPARATION OF BASIC RECIPES – CLEAR FLUIDS
- FULL FLUIDS, VEGETABLE PREPARATION, EGG RECIPES, FISH AND MEAT RECIPES, LIGHT PUDDINGS

Syllabus for Third year Allied Health science courses RGUHS BSc. Renal Dialysis Technology

MAIN SUBJECTS

APPLIED DIALYSIS TECHNOLOGY PAPER I

1. INDICATIONS OF DIALYSIS
2. HISTORY & TYPES OF DIALYSIS
3. THEORY OF HAEMODIALYSIS – DIFFUSION, OSMOSIS, ULTRAFILTRATION & SOLVENT DRAG
4. HAEMODIALYSIS APPRATUS – TYPES OF DIALYSER & MEMBRANE, DIALYSATE
5. PHYSIOLOGY OF PERITONEAL DIALYSIS
6. VASCULAR ACCESS FOR HAEMODIALYSIS & ASSOCIATED COMPLICATIONS
7. PERITONEAL ACCESS DEVICES – TYPES OF CATHETER, INSERTION TECHNIQUES & ASSOCIATED COMPLICATIONS
8. DIALYSIS MACHINES - MECHANISM OF FUNCTIONING & MANAGEMENT
 - HAEMODIALYSIS MACHINE
 - PERITONEAL DIALYSIS MACHINE
9. COMPLICATIONS OF DIALYSIS

- HAEMODIALYSIS – ACUTE & LONG TERM COMPLICATIONS
- PERITONEAL DIALYSIS – MECHANICAL & METABOLIC COMPLICATIONS

10. BIOCHEMICAL INVESTIGATIONS REQUIRED FOR RENAL DIALYSIS

11. ADEQUACY OF DIALYSIS

- HAEMODIALYSIS
- PERITONEAL DIALYSIS
- PERITONEAL EQUILIBRIATION TEST (PET)

12. ANTI COAGULATION

13. PERITONITIS & EXIT SITE INFECTION

14. WITHDRAWAL OF DIALYSIS CRITERIA

- ACUTE DIALYSIS
- CHRONIC DIALYSIS

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 APPLIED DIALYSIS

TECHNOLOGY PAPER I shall be as given under.

Type of Questions	No. of Questions	Marks	Sub-total
Long Essay (LE)	3 (To attempt 2)	2 x 10	20
Short Essay (SE)	14 (To attempt 12)	12 x 5	60
Short Answer (SA)	12 (To Attempt 10)	10 x 2	20
Total Marks			100

PRACTICAL EXAMINATION

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

Syllabus for Third year Allied Health science courses **RGUHS** **BSc. Renal Dialysis Technology**

APPLIED DIALYSIS TECHNOLOGY PAPER II

1. DIALYSIS IN SPECIAL SITUATIONS

- PATIENTS WITH CONGESTIVE CARDIAC FAILURE
- ADVANCED LIVER DISEASE

- PATIENTS POSITIVE FOR HIV, HBsAg & HCV
 - FAILED TRANSPLANT
 - POISONING CASES
 - PREGNENCY
2. DIALYSIS IN INFANTS & CHILDREN
 3. DIALYSER REUSE
 4. SPECIAL DIALYSIS PROCEDURES
 - CONTINUOUS THERAPIES IN HAEMODIALYSIS
 - DIFFERENT MODALITIES OF PERITONEAL DIALYSIS
 - HAEMODIAFILTRATION
 - HAEMOPERFUSION
 - SLED
 - MARS
 5. PLASMAPHERESIS
 6. SPECIAL PROBLEMS IN DIALYSIS PATIENTS
 - PSYCHOLOGY & REHABILITATION
 - DIABETES
 - HYPERTENSION
 - INFECTIONS
 - BONE DISEASES
 - ALUMINIUM TOXICITY
 7. RECENT ADVANCES IN HAEMODIALYSIS
 - NOCTURNAL DIALYSIS
 - ONLINE DIALYSIS
 - DAILY DIAYSIS
 8. TELEMEDICINE IN DIALYSIS PRACTICE
 9. WATER TREATMENT SYSTEM
 10. RENAL ANAEMIA MANAGEMENT
 - CHRONIC DIALYSIS

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 APPLIED DIALYSIS

TECHNOLOGY PAPER II shall be as given under.

Type of Questions	No. of Questions	Marks	Sub-total
Long Essay (LE)	3(To attempt 2)	2 x 10	20
Short Essay (SE)	14 (To attempt	12 x 5	60

	12)		
Short Answer (SA)	12 (To Attempt 10)	10 x 2	20
Total Marks			100

PRACTICAL EXAMINATION

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

Syllabus for Third year Allied Health science courses RGUHS BSc. Renal Dialysis Technology

PRACTICAL SCHEDULE

1. SETTING UP DIALYSIS MACHINE FOR DIALYSIS
2. A V CANNULATION
3. A V FISTULA/A V GRAFT CANNULATION
4. INITIATION OF DIALYSIS THROUGH CENTRAL VENOUS CATHETERS LIKE INTERNAL JUGULAR, FEMORAL & SUBCLAVIAN VEIN
5. PACKING & STERILISATION OF DIALYSIS TRAYS
6. CLOSING OF DIALYSIS
7. PREPARATION OF CONCENTRATES DEPENDING ON THE SITUATIONS
8. REUSE OF DIALYSIS APPARATUS
9. ISOLATED ULTRAFILTRATION
10. PERFORMANCE OF PERITONEAL DIALYSIS EXCHANGE MANUALLY
11. SETTING UP OF AUTOMATED PERITONEAL DIALYSIS EQUIPMENT
12. FIRST ASSISTANT IN MINOR PROCEDURES
13. SKIN SUTURING
14. CPR DEMONSTRATIONS

Scheme of examination for Practicals

**Syllabus for Third year Allied Health science courses RGUHS
BSc. Renal Dialysis Technology**

Subsidiary Subjects

BASIC SCIENCE

1. MEDICAL ETHICS & THE RELEVANT MEDICO LEGAL ASPECTS
 - RESPONSIBILITIES & DUTIES
 - ETHICAL BEHAVIOUR & CONDUCT
 - MEDICO LEGAL ASPECTS AND ITS RELATION TO CONSUMER PROTECTION ACT
2. BIOMEDICAL WASTE & ITS MANAGEMENT
3. CARDIO PULMONARY RESUSCITATION – BASIC CARDIAC LIFE SUPPORT & ADVANCED CARDIAC LIFE SUPPORT
4. CRITICAL CARE NEPHROLOGY – MANAGEMENT OF RENAL FAILURE IN ICU
5. BASIC PRINCIPLES OF BLOOD TRANSFUSION & FLUID THERAPY
6. STERILISATION – MATERIAL & METHODS
7. RENAL TRANSPLANTATION – PRINCIPLES, IMMUNOLOGY, PATIENTS SELECTION, SURGICAL PROCEDURE, COMPLICATIONS, POST TRANSPLANT EVALUATION & MANAGEMENT