

2007

RAJIV GANDHI UNIVERSITY OF HEALTH SCIENCES, KARNATAKA, BANGALORE.

SYLLABUS FOR FIRST YEAR DEGREE COURSES IN ALLIED HEALTH SCIENCE

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

1. 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

2. Embryology

Theory:

Spermatogenesis & oogenesis
 Ovulation, fertilization
 Fetal circulation
 Placenta

Internal Assessment

| | |
|--|----|
| Theory - Average of two exams conducted. | 10 |
| Record & Lab work | 10 |
| Total | 20 |

Scheme of Examination *Theory*

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 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) | 2 | 10 | 20 |
| Short Essay (SE) | 6 | 5 | 30 |
| Short Answer (SA) | 10 | 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. Lippincott. Philadelphia

SYLLABUS FOR FIRST YEAR ALLIED SCIENCE COURSES - RGUHS

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 signification. 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 nepron, 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

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| Theory - Average of two exams conducted. | 10 |
| Record & Lab work | 10 |
| Total | 20 |

Scheme of Examination *Theory*

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| 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

SYLLABUS FOR ALLIED HEALTH SCIENCE COURSES RGUHS BIOCHEMISTRY

No. Theory classes : 70hours

No. of practical classes : 20 hours

Theory:

1. **Specimen collection** : Pre-analytical variables

Collection of blood

Collection of CSF & other fluids

Urine collection

Use of preservatives

Anticoagulants

2. **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, Erlemeyer conical etc.,)

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

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

Specimen bottles etc.,

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

1. 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 maintenance

Reflux condenser : Use, care and maintenance

2. 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

3. 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.

4. Colorimeter and spectrophotometer (Theory and Practicals) Diagrams to be drawn
Principle, Parts Diagram.

Use, care and maintenance.

5. 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

1. 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.
2. Electronic configuration – Aufbau principle, Pauli's exclusion principle, etc.,
3. Valency and bonds – different types of strong and weak bonds in detail with examples

1. Theory & Practicals for all the following under this section

1. **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.,

2. **Percent solutions.** Preparation of different solutions – v/v w/v (solids, liquids and acids)
Conversion of a percent solution into a molar solution

3. 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.,

4. **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

2. **Acids, bases, salts and indicators.**

Acids and Bases: Definition, physical and chemical properties with examples.

Arrhenius concept of acids and bases, Lowery – Bronsted theory of acids and bases classification of acids and bases. Different 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

3. 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

4. Basic Principles and estimation of Blood Gases and pH

5. Basic principles and estimation of Electrolytes

Water Balance

Sodium regulation

Bicarbonate buffers

6. 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

1. Analysis of Normal Urine
 - Composition of urine
 - Procedure for routine screening
 - Urinary screening for inborn errors of metabolism
 - Common renal disease
 - Urinary calculus

2. Urine examination for detection of abnormal constituents

3. Interpretation and Diagnosis through charts
 - a. Liver Function tests
 - b. Lipid Profile
 - c. Renal Function test
 - d. Cardiac markers
 - e. Blood gas and Electrolytes

4. Estimation of Blood sugar, Blood Urea and electrolytes

5. Demonstration of Strips

7. Demonstration of Glucometer

Internal Assessment

| | |
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| Theory - Average of two exams conducted. | 10 |
| Record & Lab work[4+6] | 10 |
| Total | 20 |

Scheme of Examination

Theory

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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 science courses RGUHS

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]

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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.

Syllabus for BSc. Allied Science Courses - RGHUS

Microbiology

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

1. Principles & practice of sterilization methods.
2. Collection and despatch of specimens for routine microbiological investigations.

3. Interpretation of commonly done bacteriological and serological investigations.
4. Control of Hospital infections
5. Biomedical waste management
6. 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

Practical 20 hours

1. Compound Microscope.
2. Demonstration and sterilization of equipments – Hot Air oven, Autoclave, Bacterial filters.
3. 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
4. Antibiotic susceptibility test
5. Demonstration of common serological tests – Widal, VRDL, ELISA.
6. Grams stain
7. Acid Fast staining
8. Stool exam for Helminthic ova
9. Visit to hospital for demonstration of Biomedical waste mangement.
10. Anaerobic culture methods.

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NO PRACTICAL EXAMINATION

REFERENCE BOOKS

Microbiology

1. Ananthanarayana&Panikar Medical Microbiology
2. Robert Cruickshank – Medical Microbiology – The practice of Medical Microbiology
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 – 1992
7. Basic laboratory procedures in clinical bacteriology 1st Ed, J.P. Brothers,
New Delhi –
8. Medical Parasitology – Ajit Damle