ISLAMIAH WOMEN'S ARTS AND SCIENCE COLLEGE
Permanently Affiliated to Thiruvalluvar University
Recognized by UGC under sections 2(f) and 12(B) of the UGC Act 1956
Accredited with "B" Grade by NAAC
Approved by the Government of Tamil Nadu
Phone:04174-235266 Email: principaliwc@gmail.com
www.islamiahwomensartsandsciencecollege.com

1.2.1-Number of Certificate/Value added courses offered and online courses of MOOCs, SWAYAM, NPTEL etc & 1.2.2-Percentage of students enrolled in Certificate/ Value added courses and also completed online courses of MOOCs, SWAYAM, NPTEL etc.

2019-2020

S.No	Particulars	Proof
01	DMLT	Link
02	Employability Skill Training in Financial Literacy	Link
03	Stress Management	Link

Islamiah Women's Arts & Science College

(Recognized by UGC under Section 2(f) & 12(b) of the UGC Act 1956 & Permanent affiliation with Thiruvalluvar U
Accredited by NAAC with "B" Grade
Maintained and Managed by The Vaniyambadi Muslim Educational Society)

#10, Bye-Pass Road, New Town, Vaniyambadi - 635 752. Tirupattur Dist. Tamil Nadu.
Telefax : +91 4174 - 235 266, E-mail : principaliwc@gmail.com

CIRCULAR

29.08.2019

This is to inform you that the PG Department of **Biochemistry** wishes to organize **Diploma in Medical Laboratory** by the Resource Person **Mr. James Ponnudurai, Director, RBM Institute of Clinical Technology Vellore**, for the academic year 2019-2021 in our college Premises.

By Order

29/08/2019

PRINCIPAL

Copy to:

1. **Secretary & correspondent**
2. **Heads of the department**

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Diploma In Medical Laboratory Technology

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THE TAMIL NADIR DR. M.G.R. MEDICAL UNIVERSITY, CHENNAI

REGULATIONS FOR DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY

1. ELIGIBILITY FOR ADMISSION

i) Candidates belonging to all categories for admission to the **Diploma In Medical Laboratory Technology** should have passed the minimum education qualification is 12th science or equivalent schooling from recognized or University with any subjects.

2. AGE LIMIT FOR ADMISSION:

A candidate should have completed the age of 17 years at the time of admission or would complete the said age on or before 31st December of the year of admission to the **Diploma In Medical Laboratory Technology**

3. ELIGIBILITY CERTIFICATE:

The candidate who has passed 12th qualifying examinations other than HSS Examination conducted by the Government of Tamil Nadu, before seeking admission to any one of the affiliated institutions shall obtain an Eligibility Certificate from the University by remitting the prescribed fees along with application form, which shall be downloaded from the University website (www.tnmmu.ac.in)

4. REGISTRATION:

A Candidate admitted in any one of the **Diploma In Medical Laboratory Technology** in any one of the affiliated institutions of this University shall register his / her name with this university by submitting the prescribed application form for registration duly filled, along with the prescribed fee and a declaration in the format to the Academic Officer of this University through the affiliated institution within 30 days from the cut-off date prescribed for the course for admission. The applications should have date of admission of the course.

5 MIGRATION/TRANSFER OF CANDIDATE:

(a) A student studying in **Diploma In Medical Laboratory Technology** can be allowed to migrate/transfer to another institution of Allied Health Science under the same or another University.

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(b) Under extraordinary circumstances, the Vice Chancellor shall have the powers to place any migration/transfer he/she deems fit before the Governing Council and get its approval for grant of permission/ratification for Migration/Transfer to the candidates undergoing the course of study in affiliated institutions of this University.

6. COMMENCEMENT OF THE COURSE:

The course shall commence from 1st August of the academic year.

7. MEDIUM OF INSTRUCTION:

English shall be the Medium of Instruction for all the Subjects of study and for examinations of the **Diploma In Medical Laboratory Technology.**

8. CURRICULUM:

The Curriculum and the syllabus for the course shall be as prescribed in these regulations and are subject to modifications by the Standing Academic Board from time to time.

9. DURATION OF THE COURSE:

The duration of certified study for the **Diploma In Medical Laboratory Technology** shall be over a period of two academic years.

10. RE-ADMISSION AFTER BREAK OF STUDY:

The regulations for re-admission are as per the University Common Regulation for Re-admission after break of study for all courses.

11. WORKING DAYS IN THE ACADEMIC YEAR:

Each academic year shall consist of not less than 240 working days.

12. ATTENDANCE REQUIRED FOR ADMISSION TO EXAMINATION:

- No candidate shall be permitted to appear in any one of the parts **Diploma In Medical Laboratory Technology** Examinations unless he/she has attended the course in the subject for the prescribed period in an affiliated institution recognized by this University and produce the necessary certificate of study, attendance and satisfactory conduct from the Head of the institution.
- A candidate is required to put in a minimum of 85% of attendance in both theory and practical separately in each subject before admission to the examinations.

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13 CONDONATION OF LACK OF ATTENDANCE:

There shall be no condonation of lack of attendance.

14 VACATIONS:

Public holidays are applicable.

15. INTERNAL ASSESSMENT MARKS:

The Internal Assessment should consist of the following points for evaluation:-

i) Theory

ii) Practical / Clinical

iii) Viva

(a) A minimum of two written examinations shall be conducted in each subject during a year and the best marks of the one performance shall be taken into consideration for the award of Internal Assessment marks.

(b) A minimum of one practical examination shall be conducted in each subject (wherever practical has been included in the curriculum) and grades of ongoing clinical evaluation to be considered for the award of Internal Assessment marks.

16. CUT-OFF DATES FOR ADMISSION TO EXAMINATIONS:

(i) 30th September of the academic year concerned

(ii) The candidates admitted up to 30th September of the academic year shall be registered to take up the 1st year examination during August of the next year.

(iii) All kinds of admission shall be completed on or before 30th September of the academic year. There shall not be any admission after 30th September even if seats are vacant.

17. DURATION:

Course Duration	- 2 years
Weeks per year	- 52 weeks
Vacation	- 2 weeks
Hours per week	- 30 hours
Hours per academic year	- 1440 hours
No. of working days per year	- 240 days

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18. COMMENCEMENT OF THE EXAMINAITONS:

1st August / 1st February

If the date of commencement of examination falls on Saturdays / Sundays or declared Public Holidays, the examination shall begin on the next working day.

The University paper will be awarded for 100 marks and Internal 50 marks.

19. MARKS QUALIFYING FOR PASS:

50% of marks in the University Theory Examinations

50% of marks in the University Practical Examinations

50% of marks in the subject where internal evaluation alone is conducted

50% of marks in aggregate in Theory, Practical I.A. & Oral taken together

20. CARRY OVER OF FAILED SUBJECTS:

(1) A candidate has to pass in theory and practical examinations separately in each of the paper

(2) If a candidate fails in either theory or practical examinations, he/she has to reappear for both (theory and practical)

(3) The candidate has to successfully the course in double the duration of the course (i.e. 4 years from the date of joining)

22. PRACTICAL EXAMINATION

Maximum number of candidates for practical examination should not exceed 25 per day. An examiner should be a lecturer or above in any of the affiliated institutions of Allied Health Sciences.

23. NUMBER OF EXAMINERS One internal and one external examiner should jointly conduct practical/ oral examination for each student

24. REVALUATION/RETOTALLING OF ANSWER PAPERS:

Revaluation / Retotalling of answer papers is not permitted.

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SYLLABUS FOR DIPLOMA IN MEDICAL LABORATORY

I YEAR

PAPER I

Paper I- Human biology and Fundamental of medical laboratory technology

ANATOMY, PHYSIOLOGY & BIOCHEMISTRY

Total Theory: 150 hrs

Total Practical: 50 hrs

ANATOMY & PHYSIOLOGY

Module 1: Introduction to anatomy

Scope of Anatomy and Physiology - Definitions and Terms in Anatomy and Physiology- Structure and function of human cell - Elementary tissues of human body- Brief account on Composition of Blood - functions of blood elements - Blood Group and coagulation of blood.

Module 2: Cardio Vascular System

Structure and functions of various parts of the heart, arterial and venous system, brief account on common cardiovascular disorders

Module 3:Respiratory System

various parts of respiratory system and their functions, Physiology of Respiration

Module 4: Digestive System

names and various parts of digestive system-Liver, Spleen, Gall Bladder, Pancreas, Buccal Cavity, Pharynx, Oesophagus, Stomach, intestine etc.-physiology of digestion and absorption

Module 5: Urinary System

various parts of urinary system and its function-structure and function of kidneys-physiology of urine formation - pathophysiology of renal disease and edema

Module 6: Reproductive System

physiology and anatomy of Male & Female reproductive system-Prostate & Uterus & Ovaries etc

Module 7: Musculoskeletal System

Classification of bones & joints, structure of skeleton –structure of skeletal muscle – physiology of muscle contraction

Module 8: Nervous System

various parts of nervous system- Brain and its parts –functions of nervous system - Spinal Cord & Nerves

Module 8: Ear, Nose, Throat and Eye

Elementary knowledge of structure and functions of organs of taste, smell, hearing, vision

Module 9: Endocrine System

Endocrine glands ,their hormones and functions-Thyroid, Parathyroid, Suprarenal, Pituitary, pituitary and Thymus

Module 10: Haemopoietic and Lymphatic System

Name of the blood vessels & lymph gland locations

Module 11: Surface Anatomy & Surface Markings of Human Body

Practical's

- Study of Human Skeleton parts with skeletal models..
- Study with charts and models of all organ systems mentioned above.
- Microscopic slides examination of elementary human tissues, cells.

REFERENCES

1. Solomon. E.A., (2008) Introduction to Human Anatomy and Physiology 3rd Ed, Saunders: St Louis.

2. Chaursia, B.D., & Garg, K., (2012) *Human Anatomy Regional and Applied.* CBS Publications: New Delhi

3. T.S. Ranganathan – *A text book of Human Anatomy*

4. Fattana, Human anatomy (Description and applied) *Saunder's & C P Prism Publishers*, Bangalore – 1991

BIOCHEMISTRY

Course Hours (Theory): 30 hrs

Course Hours (Practicum): 20 hrs

COURSE OBJECTIVES: On completion of this course the students will be able to:

1. Define biochemistry and explain the major complex biomolecules of the cell.
2. Enumerate the chemical structure, classification and functions of proteins, lipids and carbohydrates.
3. Comprehend the classification & function of nucleic acids and enzymes.
4. Explain the biochemical structure of vitamins, its classification and the functions of vitamins and minerals.
5. List the various hormones, its action and function.
6. Describe acids and bases, the mechanism of homeostasis and acid base balance

BIOCHEMISTRY

Module 1: Carbohydrates

Glucose and Glycogen Metabolism

Module 2: Proteins:

Classification of proteins and functions

Module 3: Lipids:

Classification of lipids and functions

Module 4: Enzymes

Definition – Nomenclature – Classification – Factors affecting enzyme activity – Active site – Coenzyme – Enzyme Inhibition – Units of enzyme – Isoeznzymes – Enzyme pattern in diseases.

Module 5: Vitamins & Minerals:

Fat soluble vitamins(A,D,E,K) – Water soluble vitamins – B-complex vitamins- principal elements(Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chlorine and sulphur)- Trace elements – Calorific value of foods – Basal metabolic rate(BMR) – respiratory quotient(RQ) Specific dynamic action(SDA) – Balanced diet – Marasmus – Kwasoirkar

Module 6 : Acids and bases:

Definition, pH, Henderson – Hasselbalch equation, Buffers, Indicators, Normality, Molarity, Molality

BIOCHEMISTRY SYLLABUS FOR PRACTICALS

1 Benedict's test

2. Heat coagulation tests

REFERENCES

1. Teitz, *Clinical Chemistry*. W.B. Saunders Company Harcourt (India) Private Limited New Delhi.
2. Vasudevan D. & Sree Kumari S., *Text Book of Bio Chemistry for Medical Students*, Jaypee Brothers, New Delhi.
3. Biochemistry, U. Satyanarayan, Books and Allied (P) Ltd. Kolkata-India
4. Das Debajyothi, *Biochemistry*, Academic Publishers Calcutta.

FUNDAMENTALS OF MEDICAL LABORATORY TECHNOLOGY & MICROBIOLOGY

Course Hours (Theory): 200 hrs

Course Hours (Practicum): 100 hrs

Module 1: Introduction to Clinical laboratory

Basic laboratory principles - Code of conduct of medical laboratory personnel

The use of the laboratory - Basic laboratory principles - Code of conduct of medical laboratory personnel -Organization of clinical laboratory and role of medical laboratory technician - Safety measures - Medical laboratory professional and professionalism in laboratory workers - clinic borne infection and personnel hygiene

Module 2 Common Laboratory Equipment's Incubator, Hot Air Oven, Water Bath - Anaerobic Jar, Centrifuge, Autoclave -Microscope - Fundamentals of Microscopy, Resolution & Magnification, Light Microscopy, Electron Microscopy- Glassware – Description of Glassware, its use, handling and care

Module 3: Basic Steps for Drawing A Blood Specimen

Requirement of Blood Collection - Blood collection - Phlebotomy - Sampling errors - Collection and preservation of biological fluids - Anticoagulants - Preservation of samples - Chemical preservatives - Process of analysing the specimens - The laboratory report.

Module 4: Preparation of Reagents & Quality control

Buffer and pH- Preparation of reagents : Normal , per cent and Molar solution - normal saline -Methods of measuring liquids- Clinical Laboratory records- Modern Laboratory set up - Quality control: Accuracy, Precision, and Reference values.

Module 5: Manual Vs Automation in Clinical Laboratory

Types of analyzers - Semi-auto analyzer - Batch analyzer - Random Access autoanalyzers. Steps in the automated systems - Responsibilities of a technician in the maintenance of the analyzers.

Module 6: Characteristics of laboratory Substances

The chemical composition, structure, and properties of substances. The chemical processes and transformations that they undergo including the use of chemicals and their interactions, danger signs, production techniques, and disposal methods

MICROBIOLOGY& IMMUNOLOGY (Theory Outline)

Module I. Introduction and brief history of Microbiology

Historical Aspect -Branches of Microbiology-Prokaryotic Organisms - Prokaryote Vs Eukaryote-Cell Wall, Structures external to Cell Wall, Structures internal to Cell Wall, Spores.-Eukaryotic Organisms - Structure of eukaryotes, Characteristics of eukaryotes,

Module II. Common Laboratory Equipments

Incubator, Hot Air Oven, Water Bath - Anaerobic Jar, Centrifuge, Autoclave -Microscope - Fundamentals of Microscopy, Resolution & Magnification, Light Microscopy, Electron Microscopy- Glassware – Description of Glassware, its use, handling and care

Module III. Sterilization

Definition -Classification and General Principle of Sterilization

Module IV. Antiseptics & Disinfectants

Definition -Types - Mode of Action - Uses

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Module V: Growth and cultivation of Microorganisms.

Nutritional requirement of microorganisms-Types of media-Microbial growth and growth curve-Collection, Transportation and processing of clinical samples for Microbiological investigations.

Module VI: Bacteriology

Definition - Bacteria – General characteristics of Bacteria -Classification and morphology of Bacteria - Staphylococcus, Streptococcus, Pneumococcus, Neisseira gonorrhoea, Neisseira meningitis, Cornybacterium diptheriae, Mycobaterium, Clostridium, E.coli, Klebsiella, Salmonella, Proteus, Pseudomonas, Vibrio & Spirochaetes with reference to their : - Morphology, cultural characteristics, biochemical reaction, pathogenesis/disease caused & lab diagnosis.

Module VII Virology :

Definition - General Introduction of Virus - Physiochemical characteristic of Viruses - Isolation of Viruses in Laboratory by tissue culture -Cell and tissue culture technology - Embryonated Egg - Principles of animal cell culture and their use in Virology - Retro viruses - HIV, Hepatitis virus , Pox virus , Picrona virus - Polio - Orthomyxo virus - Influenza - Arbo virus - Chikungunya, Dengue - Herpes and Adeno virus with reference to their mode of infection, pathogenesis and diagnosis-Bacteriophages

Module VIII Parasitology :

Introduction of parasitology and classification

- Protozoa - Rhizopoda - Mastigophora (Haemoflagellates, Intestinal and genital flagellates)- Sprozoa (Malarial parasite, Toxoplasma)- Helminthes -Nematodes (Ascaris, Hookworm, Whipworm, pinworm, strongyloides trichinella, Filaria,Dracunculus medinensis) - Cestodes (Taenia Saginata, T. Sclium, Echinococcus, D. atum, Hymenolepis nana)Trematodes

Module IX Mycology

Definition - Structure – Classification-Cutaneous & Sub cutaneous and Systemic Mycosis - Opportunistic fungal infections -Diagnosis of fungal infections.

Module X Immunology:

Introduction -Non specific resistance to infection -Specific immunity. Antigens. Antibodies- Structure and function.- Complement and antigen-antibody reaction. Hybridoma and Monoclonal antibodies.

Applied immunology -Hypersensitivity. -Autoimmunity. -Transplantation and Tumour immunity.

MICROBIOLOGY & IMMUNOLOGY (Practicum Outline)

1. Use and care of microscopes.
2. Measurement of microbes by micrometry.
3. Simple staining methods and gram stains
4. Special staining methods – capsule, spore, acid fast, Metachromatic etc,
5. Tests for motility in bacteria.
6. Preparation of media.
7. Using of autoclave hot air oven, other common laboratory equipment etc.
8. Disinfection practices in laboratory and wards.
9. Assay for disinfection.
10. Techniques of cultivation of bacteria.
11. Isolation of bacteria from clinical specimens.
12. Biochemical testing – Catalase, oxidase, citrate, urease, TSI,Carbohydrate fermentation,MR VP, Indole
13. Purification of microbial cultures.
14. Standard Plate Count.
15. Antibiotic sensitivity test
16. Isolation, Characterization and identification of pathogens from various clinical specimens.
17. Techniques in tissue culture.
    a. Demonstration of Cytopathogenic effect (CPE)
    b. Haemagglutionation test.
    c. Haemagglutination inhibition test.
    d. Viral Serology,PCR

2. Mycology:
    a. Lactophenol blue staining.
    b. KOH Preparation.
    c. Morphology of fungi.
    d. Yeasts.
    e. Culture demonstration of contaminants- Aspergillus, Penicillium, Mucor, Rhizopus
    f. Dermatophytes.
    g. Dimorphic fungi.
3. Study of antibiotic sensitivity of common pathogens
4. Examination of stool for parasites.
5. Culture techniques for parasites

FUNDAMENTALS OF MEDICAL LABORATORY TECHNOLOGY (practicum)

1. Handling common laboratory equipment's
2. Preparation of various reagents.
3. Responsibilities of a technician in the maintenance of the analyzers.
4. Use and care of microscopes.
5. Measurement of microbes by micrometry.
6. Simple staining methods and gram stains
7. Special staining methods – capsule, spore, acid fast, Metachromatic etc,
8. Tests for motility in bacteria.
9. Preparation of media.
10. Using of autoclave hot air oven, other common laboratory equipment etc.
11. Disinfection practices in laboratory and wards.
12. Assay for disinfection.
13. Techniques of cultivation of bacteria.
14. Isolation of bacteria from clinical specimens.
15. Biochemical testing – Catalase, oxidase, citrate, urease, TSI,Carbohydrate fermentation,MR VP, Indole
16. Purification of microbial cultures.

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17. Standard Plate Count.
18. Antibiotic sensitivity test
19. Isolation, Characterization and identification of pathogens from various clinical specimens.
20. Techniques in tissue culture.
    a. Demonstration of Cytopathogenic effect (CPE)
    b. Haemagglutionation test.
    c. Haemagglutination inhibition test.
    d. Viral Serology,PCR
21. Mycology:
    e. Lactophenol blue staining.
    f. KOH Preparation.
    g. Morphology of fungi.
    h. Yeasts.
    i. Culture demonstration of contaminants- Aspergillus, Penicillium, Mucor, Rhizopus
    j. Dermatophytes.
    k. Dimorphic fungi.
22. Study of antibiotic sensitivity of common pathogens
23. Examination of stool for parasites.
24. Culture techniques for parasites

REFERENCE BOOKS:

1. Fischbach, 2005. Manual of lab and diagnostic tests, Lippincott Williams Wilkins, New York.
2. Gradwohls, 2000. Clinical laboratory methods and diagnosis. (ed) Ales C. Sonnenwirth and leonard jarret, M.D.B.I., New Delhi.
3. J Ochei and Kolhatkar, 2002. Medical laboratory science theory and practice, Tata McGraw- Hill, New Delhi.
4. Kanai L. Mukherjee, 2007, Medical laboratory technology Vol.1.Tata McGraw Hill.

PAPER – II CLINICAL BIOCHEMISTRY, PATHOLOGY AND HISTOPATHOLOGY

Course Hours (Theory): 200 hrs

Course Hours (Practicum): 100 hrs

COURSE OBJECTIVES: On completion of the course the students will be able to:

1. Describe the organization of a clinical biochemistry lab.
2. List the various tests done in a clinical biochemistry lab.
3. Enumerate on the various equipments in the clinical biochemistry laboratory.
4. Perform independently estimation of triglycerides, estimation of liver function tests and other clinical biochemistry tests.
5. Maintain independently the various equipments in the biochemistry laboratory.

Module 1: Introduction to clinical biochemistry

Definition of bio-chemistry, use of biochemical tests-the application of biochemistry in hospital setting.

Module 2: Photometery

Introduction and definition of photometry. Colorimetry - Lambert Beer's Law - Parts of photo colorimeter

Module 3: Electrophoresis & Chromatography

Introduction and General principle of Electrophoresis: Forces acting on the component in an electrophoresis system - Factors affecting the electrophoresis - Types of Electrophoresis - Applications - Separation of Serum Proteins by Agar Gel Electrophoresis. Chromatography Technique: General principle - Classification of chromatography - Principle of partition chromatography - Procedure - Other Chromatographic Techniques - Adsorption chromatography - Thin layer chromatography - Gas-liquid chromatography - Ion -exchange chromatography - Gel filtration chromatography - Affinity chromatography - HPLC (High performance liquid ChromCatography

Module 4: Evaluation of organ function test

Function of liver in health and disease: Jaundice, Hepatitis; liver function test. Assessment and clinical manifestation of renal, hepatic, pancreatic, gastric & intestinal function, enzyme of pancreatic origin and biliary tract, test of myocardial infarction.

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Module 5: Enzymes as clinical diagnostic tools.

Endocrinal disturbance: protein hormones and hormones of hypothalamus, pituitary, thyroid and steroid hormones- **In born errors in metabolism**: Introduction, Metabolic disorders of carbohydrates- galactosemia, glycogen storage disease, deficiency of glucose-6-phosphate dehydrogenase, Hypoglycemia, Diabetes mellitus. Metabolic disorder of lipid: Tay-Sachs disease, Nieman Pick disease. Metabolic disorder of amino acid: phenylketonuria, alkaptonuria, Maple syrup urine disease. Metabolic disorder of nucleotides: gout, Lesch-Nyhan Syndrome.

Module 6: Antibiotics

Classification. Primary mode of action of penicillin, streptomycin, chloramphenicol, tetracycline, actinomycin D, mitomycin C, polyenes, mechanism of antibiotics resistance, multiple drug resistance.

Module 7: Histology

Introduction - Tissue Preparation - Receipt of specimens - Labeling of specimens with numbering – Fixation - Aims and functions of a fixative - Classification of fixatives - Simple fixatives - Compound fixatives - Micro anatomical fixatives - Cytological fixatives - Histochemical fixatives - Post-chromatization - Fixation of specimens - Fixation for individual tissues – Dehydration - Ethyl alcohol – Acetone - Isopropyl alcohol – Dioxane - Clearing (Dealcoholisation) - Cedar wood oil – Benzene – Xylene – Chloroform - Embedding Media - Paraffin wax – Paraplast - Paraplast plus – Gelatin - Water soluble waxes – Celloidin - Techniques of impregnation - Embedding or Blocking - Type of mould - Techniques of moulding - Decalcifying Agents - Selection of the tissues - Determination of end point - Neutralization of acid - Washing - Decalcifying agents - Use of ion exchange resins - Chelating agents - Electrophoretic decalcification - Treatment of hard tissues - Section Cutting: Microtomes, Microtome knives, Sharpening of knives, Care of microtome knives - Techniques of section cutting - Mounting of Sections - Automatic Tissue Processor (Vacuum) - Application of Microwave Technology to Histology – Principle - Applications

Module 8: Handling and Embedding of Tiny Tissue Biopsies

Introduction - Labeling of Tissues - Fixation and Cutting of Small Biopsies - Renal biopsies - Intestinal biopsies - Skin biopsies - Muscle biopsies - Other tissues - Orientation of Tissue Blocks

Module 9: Staining Techniques

Routine staining techniques - Special Stains

Module 10: Frozen Technique

Introduction - Frozen Section – Overview - Use of Freezing Microtome – Fixation - Freezing Microtome - Fixing sections on slides - Staining of frozen sections (rapid staining) - Advantages and disadvantages - Frozen Sections Using Cryostat – Uses - The Cryostat - LEICA CM 1850 Cryostat - The components - Set up of instrument prior to operation - Operation of the Cryostat - Terminating work - Trouble shooting - Cleaning, disinfection, maintenance - Staining of Frozen Sections for Rapid Diagnosis

Module 11: Cytotechnology

Introduction - Specimen Collection - Specimen samples - Fine needle aspiration cytology (FNAC) – Preservation - Fresh specimen - Prefixation refers - Preparation of Smears - Viscid Secretions - Body fluids – Sputum - Precautions against infections – Fixation - Fixation method falls into one of 3 categories - Alcohol fixatives - Unstained smears which require to be mailed to a cytology laboratory – Staining - Papanicolaou method - Maygrunwald giemsa (MGG) stain - Mounting - Destaining Procedures - Automation

Mass screening methods for early detection of cancer, Sputum examination

Module 12: Examination of Urine

Introduction – Formation of urine, Collection of Urine - Special type of collection of urine - Biohazard management - Components of routine urine analysis - Colour - Clarity - Odour - Volume - Chemical Examination - Sugar in Urine - Tests for Sugar In Urine - Benedict's Test - Fehling's test - Chemistrip method - Protein in Urine - Test for Protein in Urine - Heat and Acetic Acid Test - Sulphosalicylic Acid Test - Heller's Test. - Heat and Acetic Acid Test - Ketone Bodies in Urine - Test for Ketones in Urine - Rothera's Test - Gerhardt's test - Bile in Urine - Test for Bilirubin - Fouchet's Test - Test for Bile salts - Hay's Test - Blood in Urine -

Test for Hematuria - Benzidine Test - Guaiacum Test - Gregersen's Test. Microscopic Examination of Urine: Crystals Found In Urine - Crystals Found In Acid Urine - Uric Acid & Urates - Calcium oxalates in Crystals - Cystine Crystals - Leucine and tyrosine crystals - Drug crystals - Crystals Found In Alkaline Urine - Ammonium magnesium phosphates - Dicalcium phosphates - Calcium carbonate - Ammonium biurate - Casts In Urine - Cells in Urine:- Red Blood cells, Pus cells, Epithelial cells, Spermatozoa, Bacteria, Tumour cells

Examination of stool- physical, chemical & microscopic examination

Module 13: Body Fluids: Characteristics of Cerebrospinal Fluid. - Synovial fluid - Pleural fluid - Pericardial fluids - Peritoneal fluids-Semen analysis- physical, chemical & microscopic examination, sperm count,motility,

CLINICAL BIOCHEMISTRY (Practicum)

- Glucose Determination - Body Sources Of Glucose - the Clinical Significance Of Abnormal Blood Sugar Levels - The Glucose Oxidase Method Of Glucose Determination -The Colormetric Method--Ortho-Toluidine - The Glucose Tolerance Test (GTT) - Glycated Hemoglobin
- Enzymatic using urease - 'Neseler's Method - Berthelot Reaction - In the urease/glutamate dehydrogenase method - Kinetic Method - GLDH method - Colorimetric Method - Diacetyl Monoxime Method - Estimation of Serum Creatinine
- Biuret Method
- Bromocresol Green Method
- Modified Reitman & Frankel Method
- King & King Method
- Jaundice - Biochemical tests - Unconjugated Hyperbilirubinaemia (Retention Jaundice - Haemolytic (Pre-hepatic Jaundice) - Non haemolytic - Conjugated Hyperbilirubinaemia (Regurgitation Jaundice)
- Lipid profile - Total lipids – Phospholipids
- Sackett's Method
- Estimation of Serum HDL cholesterol
- Method of Fiske and Subbarow
- Caraway's Method of Estimation - Hyperuricaemia – Hypouricaemia

- Collection of specimen and its preservation - Preservatives used - Physical examination of urine - Colour - Appearance - Turbidity - Specific gravity - Volume - Polyuria - Oliguria - Anuria - PH - Chemical Examination - Proteins - Glucose / Reducing Substances - Ketone Bodies - Blood - Bilirubin - Urobilinogen -Tests - For Proteins - Heat test - TCA test - For Sugars - Benedict's Tests - For Blood/Haemoglobin - Benzidine test - For Ketone bodies: Rothera's nitroprusside test - Gerhardt's Test. For Bile Salts: Hay'sTest - For Bile Pigments - Fouchet'sTest
- Collection- Appearance-Analysis of Cerebrospinal fluid- Synovial Fluid- Pleural Fluid- Pericardial Fluid- Peritoneal Fluid- Seminal Fluids- Needle aspiration Cytology- Discharge from any site. Determine the presence of normal or abnormal components-Know what is implied by the presence of abnormal constituents in body- Reporting of abnormal constituents. Relevant legislation, standards, policies, and procedures followed in the hospital.
- Assessment of the patient- Preparation of patient for the procedure-Education of the patient for the procedure- Procedure-Measures for the prevention of infection

HISTOPATHOLOGY (Practicum)

- Fixatives
- Processing Of the Tissues Including Bone
- Embedding
- Section Cutting
- Staining & mounting
- Special stains
- Handling and embedding of tiny tissue biopsies
- Frozen section technique
- Techniques Equipments &Procedures
- Specimen Collection and Preparation
- Staining Procedure and Mounting
- Preparation of Fluids for Cytological Examination
- Paraffin section cutting.
- H & E staining

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- Special staining
- PAS staining, principle&uses.
- Reticulin
- PTAM
- Van gerson
- Amyloid stain, pearl stain
- Melanin bleach& masson's Fontana
- AFB staining (TB and Leprosy)
- Pap staining
- MGG staining for enac
- Museum techniques
- Preparation of mounting medium & mounting of specimen-

Pathology (practical)

- Examination of Urine – Physical, chemical and microscopic
- Examination of Body fluids
- Semen Analysis
- Stool Examination

REFERENCES

1. Teitz, *Clinical Chemistry*. W.B. Saunders Company Harcourt (India) Private Limited New Delhi.
2. KAPLAN, *Clinical Chemistry*, Mosby Company, St. Louis Washington, D.C. Toronto.
3. Biochemistry, U. Satyanarayan, Books and Allied (P) Ltd. Kolkata-India
4. Ramanic Sood, Laboratory Technology (Methods and interpretation) 4th Ed. J.P. Bros, New Delhi
5. Mukharji, Medical Laboratory Techniques, Vol - I, II & III, 5th Edn. Tata McGrawHill, Delhi.

BLOOD BANK SERVICES & HEMATOLOGY

Course Hours (Theory): 200 hrs

Course Hours (Practicum): 100 hrs

COURSE OBJECTIVES: On completion of the course the student will be able to:

1. Explain the principles involved with antigen and antibodies reaction.
2. Discuss the concept of antigens, antibodies structure and function
3. Differentiate primary and secondary immune response in vivo.
4. Recognize antigen/antibody reactions and their application to immunohematology
5. Explain the principle of agglutination, fixation, precipitation and hemolysis
6. Classify ABO and Rh blood group system
7. Discuss the theory involved in the performance of ABO testing methods
8. Describe the importance of the Rh system in compatibility testing
9. Determine the safety of blood components for transfusion
10. Discuss the importance of serological testing of blood components prior to transfusion.
11. Enumerate the phases of the compatibility test
12. Comprehend the principle and application of the Coombs test
13. Perform safely cross matching for blood compatibility
14. List the methods of preservation of blood and blood products with the time period for each.

BLOOD BANK SERVICES

Module 1: Blood Grouping

Introduction- Human Blood Group system- ABO Subgroups- Red Cell Antigen- Natural Antibodies-Rh System- Rh Antigens & Rh Antibodies-Hemolytic Disease of Newborn & Prevention- Principal of Blood grouping, antigen-antibodyreaction-Agglutination, Haemagglutination, Condition required for antigen antibody reaction- Blood grouping techniques, Cell grouping, Serum grouping-Methods for ABO grouping. Slide & Tube Method, Cell grouping, Serum grouping, Rh grouping by slide & tube method-Difficulties in ABO grouping- Rouleaux formation, how it interfere with Blood grouping-Auto agglutinins - Antiserum used in ABO test procedures, Anti –A, Anti-B Anti- AB Antiserum-Inheritance of

the Blood groups-Control, A&B Cells preparation, Auto control-Medical applications of Blood groups.

Module 2: Blood Transfusion

Principal & Practice of blood Transfusion-Blood Transfusion service at District level- Guide lines for the use of Blood, Appropriate use of Blood, Quality Assurance-Antilogous Blood Transfusion practices-Objectives of Quality Assurance in Blood Transfusion services, Standard operating procedures for usage, donation & storage of blood, screening of donor, compatibility testing, safety, procurement of supplies.

Module 3: Blood Donation

Introduction -Blood donor requirements - Criteria for selection & rejection-Medical history & personal details -Self-exclusion-Health checks before donating blood-Screening for TTI. 4. Blood Collection -Blood collection packs-Anticoagulants-Taking & giving sets in Blood transfusion-Techniques of collecting blood from a doctor- Instructions given to the donor after blood donation-Adverse donor reaction.

Module 4: Testing Donor Blood

Screening donor's blood for infectious agents - HIV, HCV, HBV, Trepanoma palladium, Plasmodium, HTLV-Bacterially contaminated Blood.

Module 5: Blood Donor Records

Blood donation record book-Recording results- Blood donor card- Documentation in blood bank- Types of documents. Blood bank temperature sheet. Blood bank stock sheet. Blood transfusion request form-Record Maintenance- Period of record archival- Process information by compiling, coding, categorising, calculating, tabulating, auditing or verification of data- The standard protocol for documenting the data in the patient's files and in the computer for future records- Evaluate the completeness of patient data- Monitor quality control data to rapidly identify analytical deficiencies- Document errors and note the remedial actions they have taken

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Module 6: Storage, preservation & Transport of blood

Storage of Blood and its components - Whole Blood - Platelets - Leucocytes - Plasma - Fresh Frozen Plasma- Anticoagulant & Preservatives –- Whole Blood - Red Cells - Red Cells- Frozen State - High glycerol solution. - Low glycerol solution. – Changes in blood after storage-labelling of blood units-Gas refrigerator-Lay out of a blood bank refrigerator Packing and Transportation.

Module 7: Compatibility Testing

Purpose - Single tube compatibility techniques using AHG reagent.- Emergency compatibility testing-Difficulties in cross matching- Labeling & Issuing cross- matched blood.

Module 8: Blood Components

Collection of blood components for fractional transfusion-Platelets packed Red Cell, Platelet rich Plasma, Platelets concentrate-Preparation of concentrated (packed) Red cells-Techniques of preparation.

Module 9: Blood Transfusion Reactions

Investigation of a Transfusion reaction-Hemolytic transfusion reaction-Actions to take when transfusion reaction occurs.

Module 10: Introduction to Haematology

What is a blood - Components of blood - Functions of blood - Components of Blood

Module 11: Maintenance and Equipments of Haematology Lab

Introduction to a microscope - Parts of a microscope - Centrifuge - Automated Cell Counter - Urine Analyser - Maintenance of equipments in the hematology lab - Coagulometer Responsibilities of a lab technologist

Module 12: Principles of patient care

Assessment of a patient and brief history collection. Collection of blood, sputum, urine and stool specimens, packing of equipments for CSSD, Develop specific goals and plans to prioritise, organise, and accomplish work

Module 13: Collection of Blood Samples

Specimen Collection - Methods - venipuncture - Patient Identification - Site selection - Tourniquet application - Cleansing the Venipuncture site - Sample Collection - Specimen Collected by skin puncture - Collection from indwelling catheters- Use basic non-automated tests to assess blood cells- See and analyse details at close range- Collect, receive and conduct a pre-analytical processing of clinical laboratory specimens.

Module 14: Coagulation Studies

Hemostasis - Definition, Basic concept and principle, Basic steps involved in Hemastosis. Coagulation - a. Basic Physiology, coagulation factors. b. Mechanism of blood coagulation. Extrinsic Pathway, Intrinsic Pathway. Regulators of blood coagulation. Role in Diseases, Bleeding disorders- . Platelet disorder - Thrombocytopenias - causes including aplastic anemia. D I C IT P , Hemophilia

Module 15: Hematological Disorders

Classification of Anemia : Morphological & etiological. Iron Deficiency Anemia : Distribution of body Iron, Iron Absorption, causes of iron deficiency, lab findings. Megaloblastic Anemia : Causes, Lab findings. Hemolytic Anemia : Definition, causes, classification & lab findings. Bone Marrow : Cell composition of normal adult Bone marrow, Aspiration, Indication, Preparation & Staining, Special Stain for Bone Marrow -Periodic Acid Schiff, Sudan Black, Myeloperoxidase. Leukemia : Classification, Blood Picture, Differentiation of Blast cells

Module 16: Basic Haematological diagnosis

Preparation of Blood Smears - Specimen - Advantages of EDTA blood - Disadvantages of EDTA blood - Blood Smear Method - Cover slip method - Spreader slide method - Wedge method - Characteristics of a Proper Wedge Film - Types of Smear - Thick Smear - Thin Smear - Common causes of a poor blood smear - Biological (in diseased condition) causes of a poor smear - Precautions - Drying of Smears - Staining Of the Blood Films - Preparation of Stains - Leishman's stain - Wright's Stain - Field's stain - Romanowsky stains - Steps for staining - Manual staining methods - Rack method - Dip method. Automated staining methods: - Platen type - Carousel type. Criteria for a good stain: Problem encountered during staining – Troubleshooting

Total Cell Count – Rbc, Wbc, Platelets and Absolute Eosinophil Count, Estimation of Hemoglobin PCV & Erythrocyte Indices - M.C.V. - M.C.H - M.C.H.C - methods and process of estimation, Erythrocyte Sedimentation Rate [E.S.R.] - Westergren Method - Factors Influencing Sedimentation - Laboratory factors which influence ESR - Importance of ESR Reticulocyte Count , Differential Count , Bleeding time, clotting time, prothrombin time,

Module 17: General principle of hospital practice

Hospital structure and organization, Care of Patient, Basic Assessment Skills, First aid & Basic Life Support, Maintenance of Hygiene & Infection Control Practices, Principles of asepsis, Maintenance of Medications in the department, Specialized Investigations - Care of Patients, Medico - Legal Issues

BLOOD BANK SERVICES (Practicum)

- Screening of donors.
- Preparation of anticoagulant fluids
- Grouping of blood.
- Cross matching of blood samples.
- Coomb's test, ELISA Test
- Screening of HbS .Ag. HIV and HCV and rapid kit methods
- Antiglobulin Test
- Dat
- Ict
- Saline Cross-Matching
- Albumin Cross Matching
- Enzyme Cross Matching
- Antiglobulin Test (Ahg)
- Bio safety Precautions and Guidelines
- Abo Blood Grouping Procedure
- Slide or Tile Method, Tube Method, Microplate Method, Micro-Typing System (Diamed/Bioview), Automated or Semi-Automatic Instrumentation

HEMATOLOGY (Practicum)

- Collection of Blood Samples

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- Obtaining peripheral Blood Smear
- Staining Of Blood Smear
- Obtaining Cell Counts – Rbc, Wbc, Platelets both manual and automated
- Absolute Eosinophils Count
- Estimation of Haemoglobin
- Packed Cell Volume, Erythrocyte Indices
- Reticulocyte Count
- Differential Count
- Bleeding Time
- Clotting Time
- Pt
- Aptt

REFERENCES

1. Ramanic Sood, Laboratory Technology (Methods and interpretation) 4th Ed. J.P. Bros, New Delhi

2. Satish Gupta Short text book of Medical Laboratory for technician J.P. Bros, New Delhi

3. Shirley Mitchell Lewis, Barbara J. Bain, Imelda Bates (2006) Dacie And Lewis Practical Haematology, 10th Ed, Churchill Livingstone/Elsevier.

4. Barbara A. Brown (2008) Hematology: principles and procedures 6th Ed Lea & Febiger.

5. Bernadette F. Rodak, George A. Fritsma, Kathryn Doig (2007) Hematology: Clinical Principles and Applications 3rd Ed, Elsevier Health Sciences.

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CIRCULAR

01.02.2020

This is to inform you that the **ICT Academy** in association with **Reliance Home Finance and Reliance Money Initiative** will organize **"Skill Training in Financial Literacy"** for 50 final year students of BCOM, BBA & BCOM (CA). This course will be starting from 5th February 2020 onwards in our college at Seminar Hall.

By Order

01/02/2020

PRINCIPAL

Copy to:

1. **Secretary and Correspondent**
2. **Head of the Department**

Principal
Islamiah Women's Arts and Science College
Vaniyambadi - 635 752.

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Phone: 04174 – 235266

DEPARTMET OF COMPUTER SCIENCE

EMPLOYABILITY SKILL TRAINING IN FINANCIAL LITERACY- ICT

SYLLABUS-2019-2020

- **Business Correspondence and Customer Management**
- **Introduction To Banking & Financial Instruments**
- **Management of Funds & Insurance**
- **Enabling Technology in Modern Banking**
- **Interpersonal Skills to Build Confidence**

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SYLLABUS - STRESS MANAGEMENT

INTENDED AU gists, for anyone keen to develop stress management techniques, elective, Open Course (UG /PG)

PRE-REQUISITES : Basic knowledge in communication and a good understanding of English

Summary

Course Status :	Completed
Course Type :	Elective
Duration :	4 weeks
Category :	◦ Multidisciplinary
Credit Points :	1
Level :	Undergraduate
Start Date :	29 Jul 2019
End Date :	23 Aug 2019
Exam Date :	29 Sep 2019 IST

Note: This exam date is subjected to change based on seat availability. You can check final exam date on your hall ticket.

This is an AICTE approved FDP course

Course layout

Week 1 : Scientific Foundations Of Stress
Week 2 : Stress Psychophysiology
Week 3 : Developing Resilience To Stress
Week 4 : Strategies For Relieving Stress