



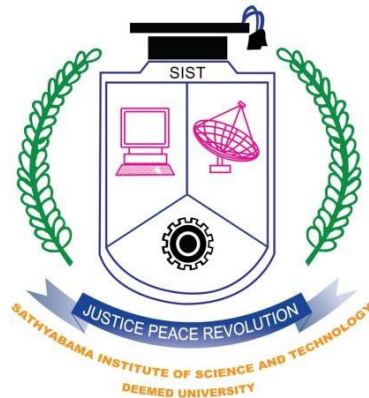
SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

Accredited "A" Grade by NAAC | 12B Status by UGC | Approved by AICTE

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**SCHOOL OF ALLIED HEALTH SCIENCES
DEPARTMENT OF MEDICAL LABORATORY TECHNOLOGY**



**CRITERION 1.1.3
2019 Regulations**

PROGRAMME: B.Sc
MEDICAL LABORATORY TECHNOLOGY
CURRICULUM 2019

YEAR – 2										
Sl. No.	Course type	Course code	Course title	L	T	P	C	Marks		Page No.
								CAE	ESE	
1	Theory	SAMA1301	Immunology, Serology & Parasitology	4	0	0	5	50	50	23
2	Theory	SAMA1302	Clinical Biochemistry	4	0	0	5	50	50	25
3	Theory	SAMA1303	Endocrinology, Tumor & Cancer Markers	4	0	0	5	50	50	27
4	Theory	SAMA1304	Blood Bank Procedures & Hemoglobinopathies	4	0	0	5	50	50	29
5	Practical	SAMA2301	Immunology & Parasitology Lab	0	0	3	3	50	50	31
6	Practical	SAMA2302	Clinical Biochemistry Lab	0	0	3	3	50	50	32
7	Practical	SAMA2303	Endocrinology Lab	0	0	3	3	50	50	33
8	Practical	SAMA2304	Laboratory Practices for Blood Bank	0	0	3	3	50	50	34
Total Credits for II YEAR = 32										
Total Marks for II YEAR = 800										

L – LECTURE HOURS, T – TUTORIAL HOURS, P – PRACTICAL
HOURS, C – CREDITS CAE – CONTINUOUS ASSESSMENT
EXAMINATION, ESE – END SEMESTER EXAMINATION,

YEAR - 3										
Sl. No.	Course type	Course code	Course title	L	T	P	C	Marks		Page No.
								CA E	ESE	
1	Theory	SAMA1501	Histopathology & Cytology Techniques	4	0	0	5	50	50	35
2	Theory	SAMA1502	Systematic Bacteriology, Mycology & Virology	4	0	0	5	50	50	37
3	Theory	SAMA1503	Coagulation Studies	4	0	0	5	50	50	39
4	Theory	SAMA1504	Theory of Quality Management & Automation	4	0	0	5	50	50	41
5	Practical	SAMA2501	Histopathology & Cytology Lab	0	0	3	3	50	50	42
6	Practical	SAMA2502	Medical Microbiology Lab	0	0	3	3	50	50	43
7	Practical	SAMA2503	Coagulation Studies Lab	0	0	3	3	50	50	44
8	Practical	SAMA2504	Quality Laboratory Management & Automation	0	0	3	3	50	50	45
9	Practical	S737AIT	Internship	0	0	8	16		100	46
Total Credits for III YEAR = 48										
Total Marks for III YEAR = 900										

SAMA1301	IMMUNOLOGY, SEROLOGY AND PARASITOLY	L	T	P	Credits	Total marks
		4	0	0	5	100

Course Objectives:

- To understand the basic principles of immunity and serological diagnosis, vaccination, their schedules
- To introduce the students to human parasites of medical and clinical importance.

UNIT I Immunity

Definition and classification- General Principles of Innate & Acquired immunity - Immune Response - Humoral immunity & cell mediated immunity.

UNIT II Antigens and Antibodies - Definition, classes and properties – Antibodies / Immunoglobulins - Definition, Properties, Sub types of Immunoglobulins

UNIT III Antigen Antibody Reactions I – Ag - Ab Reactions /Serological Refrctions-Features of antigen / antibody Reaction – Precipitation – Agglutination - Complement fixation test – Neutralization – Opsonization – Immune adherence– Immunofluorescence - Immuno electron microscopic test

UNIT IV Structure and functions of Immune System - Parts of Immune system - T/B cells, other cells & their functions

UNIT V Hypersensitivity Reactions and Autoimmunity - General Principles of different types of hypersensitive reactions i.e., type I, II, III and IV.

UNIT VI Autoimmunity, molecular diagnosis and vaccination – Autoimmune disorders – ELISA - Vaccination
Schedule & Vaccines

UNIT VII General Parasitology Definition - parasitism, host, vectors etc - Classification of Parasites - Phylum Protozoa- general Pathogenic and non – pathogenic protozoa - Phylum Nematelminths / Round words (Nematoda) - Phylum Platyhelminths – class - Cestoda,class - Trematoda - Lab diagnosis of parasitic infections.

UNIT VIII Human Parasites

Protozoa - Intestinal Amoebae - E. histolytica : Life cycle, Morphology, Disease & Laboratory Diagnosis - E. coli : Life cycle, Morphology, Disease & Lab Diagnosis - Flagellates of intestine / genitalia - Giardia lamblia : Life cycle, Morphology, Disease & Lab Diagnosis – Trichomonas vaginalis : Life cycle, Morphology, Disease & Lab Malarial Parasite - Plasmodium vivax : Life cycle, Morphology, disease & lab diagnosis - Differences between P. vivax, P. malaria, P. falciparum and P.ovale - Nematodes - Intestinal Nematodes - Ascaris : Life cycle, Morphology, disease & lab diagnosis - Brief discussion about Enterobius vermicularis (Thread worm) and Ancylostoma duodenale (Hookworm) - Tissue Nematodes - W. bancrofti - Life cycle, Morphology, Disease & Lab Diagnosis - Phylum Platyhelminths - Cestodes - T. solium, T. saginata and E. granulosus.- Trematodes - S. haematobium & F. hepatica

Course Outcomes:

On completion of the course, students will be able to **CO1** Understand the basic structure of immune system **CO2** Know antigens and antibodies, and their reactions

CO3 Gain knowledge about defense mechanism of our body through innate immunity and acquired immunity

CO4 Enlighten about prophylaxis for infectious diseases through various types of vaccines and vaccination schedules

CO5 Gain knowledge about the role serological diagnosis

CO6 Learn about human parasites of medical and clinical importance

Text / Reference Books

1. Practical Microbiology Protozoology and Parasitology: Including Bacteriology, Virology, Mycology, Immunology, Serology, and Automated Methods Paperback –Import, 1 January 2011 N. C. Dey (Author), T. K. Dey (Author)
2. Practical Immunology Paperback – Import, 21 January 2002 Frank C. Hay (Author), Olwyn M. R. Westwood (Author)
3. A Handbook of Practical and Clinical Immunology Vol 2 2ed (Pb 2017): Volume Ii Paperback – 1 January 2017by Talwar (Author)

Talwar (Author) END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

PART A: 10 Questions – 2 marks each – No choice

PART B: Short Answers – 5 Questions 8 marks each – 5 out of 8

PART C: Long Answers – 2 Questions 20 marks each – 2 out of 3

Exam Duration: 3Hrs

20 Marks

40 Marks

40 Marks

SAMA1302	CLINICAL BIOCHEMISTRY	L	T	P	Credits	Total marks
		4	0	0	5	100

Course Objectives:

- To impart experiential learning to the students in order to develop a desired workforce to combat ever increasing demand of medical lab technicians in the healthcare sector.
- To enable the students to function efficiently, confidently and safely in clinical laboratory settings including hospital environments.

UNIT I Photometry

Definition, laws of photometry, absorbance, transmittance, absorption maxima, instruments, parts of photometer, types of photometry—colorimetry, spectrophotometry, flame photometry, fluorometry, choice of appropriate filter, measurements of solution, calculation of formula, applications.

UNITII Water, Vitamins & Mineral Metabolism

Distribution of fluids in the body, ECF & ICF, water metabolism, dehydration, mineral metabolism, macronutrients (principal mineral elements) & trace elements. Fat & water soluble vitamins, sources, requirement, deficiency disorders & biochemical functions.

UNIT III Liver & Renal Functions & their Assessment

Based on: 1-Carbohydrate metabolism 2-Protein metabolism 3- Lipid metabolism 4-Measurements of serum enzyme levels 4-Bile pigment metabolism, Jaundice, its types and their biochemical findings. Various Tests, GFR & Clearance

UNIT IV Techniques on Immunology

Immunodiffusion Techniques, Radioimmunoassay & ELISA-Principles & Applications.

UNIT V Electrophoresis

Definition, Principle, Types & Applications.

UNIT VI Polymerase Chain

Reaction Definition, Types,
Principle & Applications

UNIT VII Lipids and Cardiac Profile

In brief Hypertension, Angina, Myocardial Infarction, Pattern of Cardiac Enzymes in heart diseases, Different methods of Cholesterol Estimation- Principle, advantage and disadvantage of different methods.

UNITVIII Carbohydrate Profile and Autoanalyzer

Auto analyzers - Principle & Applications, Different methods of Glucose Estimation- Principle advantage and disadvantage of different methods.

Course outcomes:

On completion of the course, students will able to

CO1 Understand the different analytical techniques for analyzing samples

CO2 Acquire knowledge about various diseases and their causes

CO3 Learn different types of immune techniques and its analysis of various microorganism

CO4 Demonstrate on various types of glucose estimation and its interpretation

CO5 Implement various methods to diagnose the lipid profile.

CO6 Understand various deficiency diseases of vitamins.

Text / Reference Books

1. Textbook of Medical Biochemistry by MN Chatterjea & Rana Shinde, 7th Edition, Jaypee Publishers.
2. Analytical Biochemistry by Dr.P.Asokan, Chinnaa publications edition 3, 2010
3. Analytical Biochemistry by Asima Hamid, Mohammad Raies, Gulzar Ahmad Book Enclave publisher, first edition, 2019
4. Principles of Biochemistry by Voet & Voet fourth edition, 2018 , Wiley publishers.
5. Wilson And Walkers Principles And Techniques Of Biochemistry And Molecular Biology 8th edition Cambridge University Press, 2018

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

PART A: 10 Questions – 2 marks each – No choice

PART B: Short Answers – 5 Questions 8 marks each – 5 out of 8

PART C: Long Answers – 2 Questions 20 marks each – 2 out of 3

Exam Duration: 3Hrs

20 Marks

40 Marks

40 Marks

SAMA1303	ENDOCRINOLOGY, TUMOR & CANCER MARKERS	L	T	P	Credits	Total marks
		4	0	0	5	100

Course Objectives:

- To develop an understanding of the role of the endocrine system in maintaining homeostasis and health.
- To understand the integrative workings of the human body by studying this signaling system

UNIT I Introduction - Difference between hormones and enzymes - Classification of hormones - Regulation and general mechanism of action of hormones

UNITII Pituitary gland & hypothalamus, Hormones of the Anterior Pituitary - Growth hormone, Prolactin, Gonadotropin, Follicle Stimulating hormone, Luteinizing Hormone, Thyroid stimulating hormone (TSH), Adrenocorticotrophic hormone (ACTH), Hormones of neurohypophysis- Oxytocin, Antidiuretic hormone(ADH)

UNITIII Hormones of the Thyroid gland - chemistry and normal physiology, Thyroid disorders-goiter, myxedema, autoimmune thyroiditis, tumors of the thyroid gland, hyperthyroidism, Graves' disease, Calcitonin, Parathyroid Hormone (PTH), Adrenocortical hormones-synthesis and secretion, Aldosterone & its function, Addison's disease, Glucocorticoids & functions, Mineralocorticoids & functions, Cortisol & functions, Cushing's syndrome, Conn's syndrome

UNIT IV Adrenal medulla-metabolism of catecholamines, Hormones of the gonads, Testosterone, Estrogens, Progesterone, their synthesis and functions, Human Chorionic Gonadotropin (HCG), hormone, menstrual cycle, Menopause

UNIT V Hormone of pancreas - Insulin- its metabolic effects on carbohydrates, fats & protein, control of insulin secretion, Glucagon- functions, metabolic effects, blood glucose regulation, Diabetes mellitus, Somatostatin, Hormone of kidney – Renin

UNIT VI Introduction, The Carcinogens - definition, Oncogene - definition, Mechanism of action of Oncogenes (outline), Characteristics of growing tumor cells-general and morphological changes, biochemical changes, Tumor Markers- Introduction and definition, Clinical applications of tumor markers. Enzymes as tumor markers, Alkaline Phosphatase (ALP), Creatine kinase (CK), Lactate dehydrogenase (LDH), Prostatic acid phosphatase (PAP), Prostate specific antigens(PSA).

UNIT VII Hormones as tumor markers (introduction of each type in brief), Oncofetal antigens, Carcino-embryonic antigen (CEA), Squamous cell carcinoma (SCC)antigen Carbohydrate markers (brief introduction of each type) CA 15-3, CA125, Blood group antigen (brief introduction of each type) CA 19-9, CA 50, CA 72-4, CA242.

UNIT VIII Bladder cancer markers (introduction in brief) - Bladder tumor antigen(BTA), Fibrin-Fibrinogen degradation product(FDP), Nuclear matrix protein(NMP22), Biomarkers still in research (introduction in brief), telomeres, TRAP assay, hyaluronic acid and Hyaluronidase

Course Outcomes:**On completion of the course, students will be able to**

- CO1** Explain the roles of the endocrine system in maintaining homeostasis, integrating growth and development, responding to environmental insults and promoting successful reproduction
- CO2** Investigate how the secretion of hormones is regulated, including the principles of negative and positive feedback mechanisms
- CO3** Apply endocrinological principles to determine the pathophysiological basis and consequences of specific endocrine disorders
- CO4** Understand the role of tumor markers for diagnosis, management and therapeutic selection.
- CO5** Correlate the presence of a tumor marker with its associated affected organ system
- CO6** Differentiate between carbohydrate-rich tumor markers, protein-rich tumor markers, enzymatic tumor markers, and oncofetal antigens

Text / Reference books

1. Basic Endocrinology for Students of Pharmacy and Allied Health Sciences, Andrew Constanti, Andrzej Bartke, Harwood Academic Publishers 2005.
2. Basic Medical Endocrinology, H. Maurice Goodman, Academic Press, Elsevier, 2003
3. Endocrinology – An Integrated Approach, S.S. Nussey & S.A. Whitehead, 2001
4. Textbook of Endocrinology – S Dharmalingam, Jaypee Publishers, 2010
5. Endocrinology: Hormones and Human Health” Prakash S Lohar, MJP Publishers, 2005

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

PART A: 10 Questions – 2 marks each – No choice

PART B: Short Answers – 5 Questions 8 marks each – 5 out of 8

PART C: Long Answers – 2 Questions 20 marks each – 2 out of 3

Exam Duration: 3Hrs

20 Marks

40 Marks

40Marks

SAMA1304	BLOOD BANK PROCEDURES & HEMOGLOBINOPATHIES	L	T	P	Credits	Total marks
		4	0	0	5	100

Course Objectives:

- To understand the principles of immunohematology and be competent to handle routine blood bank organization and procedures.
- To understand structure and function of hemoglobin and hemoglobinopathies.

UNIT I Principles of blood groups and antigen antibody reactions

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- antibody reaction, Agglutination, Hemagglutination, 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, Autocontrol, Medical applications of Blood groups.

UNIT II Principles and practice of blood transfusion

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, Blood Donation, Introduction, Blood donor requirements, Criteria for selection & rejection, Medical history & personal details, Self-exclusion, Health checks before donating blood, Screening for TT

UNIT III Blood collection and preservation

Blood Collection, Blood collection packs, Anticoagulants, Taking & giving sets in Blood transfusion, Techniques of collecting blood from a donor, Instructions given to the donor after blood donation, Adverse donor reaction, Testing Donor Blood, Screening donor's blood for infectious agents - HIV, HCV, HBV, Treponema palladium, Plasmodium, HTLV, Bacterially contaminated Blood.

UNIT IV Blood donor selection and screening

Blood Donor Records, Blood donation record book, Recording results, Blood donor card, Storage & Transport, Storage of blood, Changes in blood after storage, Gas refrigerator, Lay out of a blood bank refrigerator, Transportation, Maintenance of Blood Bank Records, Blood bank temperature sheet, Blood bank stock sheet, Blood transfusion request form.

UNIT V Blood components, preparation, indications, storage and autologous transfusions

Blood components, preparation, indications, storage and autologous transfusions, Compatibility Testing, Purpose, Single tube compatibility techniques using AHG reagent, Emergency compatibility testing, Difficulties in cross matching, Labeling & Issuing cross- matched blood.

UNIT VI Transfusion transmitted diseases & their lab diagnosis

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, Blood Transfusion Reactions, Investigation of a Transfusion reaction, Hemolytic transfusion reaction, Actions to take when transfusion reaction occurs.

UNIT VII Quality assurance in blood banking practices

Objectives of Quality Assurance in Blood Transfusion services, Standard operating procedures for usage, donation & storage of blood, screening, safety, procurement of supplies.

UNIT VIII - Hemoglobinopathies

Distribution, morphology, kinetics of hemoglobin synthesis, Normal and abnormal hemoglobin molecules

Course Outcomes:

On completion of the course, student will be able to

CO1 Learn the basics of blood grouping and cross matching.

CO2 Understand the principles and the practice of blood transfusion.

CO3 Familiarize with the use of routine tasks in blood collection and blood transfusion.

CO4 Understand blood donor selection and screening and use them effectively in healthcare issues. **CO5** Exposure to the scope and application of Blood components, preparation, indications, storage **CO6** Learn and implementing Transfusion transmitted diseases & their lab diagnosis

Text / Reference books

1. Dacie and Lewis Practical Haematology / edition 12 (2017) Barbara J. Bain
2. Hand book of Medical laboratory technology/ edition 2 Robert H Carman, Christian Medical Association of India (publishers)
3. Textbook of Medical Laboratory Technology/ edition 3 (2020) Godkar P.B
4. Clinical Pathology, Hematology and Blood Banking (For DMLT Students)/ edition 3 (2017) Maheshwari Nanda

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

PART A: 10 Questions – 2 marks each – No choice

PART B: Short Answers – 5 Questions 8 marks each – 5 out of 8

PART C: Long Answers – 2 Questions 20 marks each – 2 out of 3

Exam Duration: 3Hrs

20 Marks

40 Marks

40 Marks

SAMA1501	HISTOPATHOLOGY & CYTOLOGY TECHNIQUES	L	T	P	Credits	Total marks
		4	0	0	5	100

Course Objectives:

- To be able to fix, process, embed tissues and make sections for micro section studies
- To be competent to make routine cytological preparation

UNIT I Introduction to Histopathology and Cytopathology Techniques – Basic concepts and principles. Applications

UNIT II Reception of specimens– Criteria, Requisites, Container, Identity, Labeling, Rejection

UNIT III Tissue processing- Micro techniques I
Basic steps, Fixing – Types of fixatives, Factors, Dehydration, Embedding

UNIT IV Micro techniques II
Microtomy, Staining, Mounting, Methods of decalcifications

UNIT V Equipment
Microscope, Microtome -Types, Uses, Parts, different types of microtome knives, care and maintenance, Automated tissue processor- components, working and precautions during use, Tissue floating bath

UNIT VI Staining
Hematoxylin and Eosin staining, preparation of hematoxylin and eosin stains, Reticulin stain, PAP staining- components and methods.

UNIT VII Cytology
Introduction to FNAC and Exfoliative cytology, Processing of fluids- Sputum, bronchial aspirates, bronchial washings, gastric washings, Urine and other watery fluids, Cerebrospinal fluid

UNIT VIII Museum techniques
The mounting of pathological specimens - Introduction., Preparation of specimen, Fixation of specimen- Kaiserling solution- 1 and Kaiserlingsolution-2, Precaution taken for the Fixation of Specimens, Storage of Specimens, Mounting of Museum Specimens, Filling and Scaling

Course Outcomes:

On completion of the course, student will be able to

- CO1** Identify the basic structure of cells, tissues and organs and describe their contribution to normal function.
CO2 Interpret light- and electron-microscopic histologic images and identify the tissue source and structures.
CO3 Demonstrate common histology procedures such as embedding tissue in paraffin, tissue sectioning and mounting, or routine staining of tissue sections
CO4 Describe common histology laboratory procedures used to prepare stained slides from tissue samples.
CO5 Outline the principles of histochemistry and types of microscopy utilized in histology
CO6 Understand professional procedures in museum display, collections, care and preservation

Reference books

1. Bancroft's Theory and Practice of Histological Techniques by John D Bancraft /Edition 8 (2018)
2. Handbook of Histopathological and Histochemical Techniques: Including Museum Techniques / edition 3 (1974) by C. F. A. Culling
3. Hand book of Medical laboratory technology, 2nd edition by Robert H Carman, Christian Medical Association of India (publishers)
4. Textbook of Medical Laboratory Technology/ edition 3 (2020) by Godkar P.B

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

PART A: 10 Questions – 2 marks each – No choice

PART B: Short Answers – 5 Questions 8 marks each – 5 out of 8

PART C: Long Answers – 2 Questions 20 marks each – 2 out of 3

Exam Duration: 3Hrs

20 Marks

40 Marks

40 Marks

SAMA1502	SYSTEMIC BACTERIOLOGY, MYCOLOGY & VIROLOGY	L	T	P	Credits	Total marks
		4	0	0	5	100

Course Objectives:

- To describe about the important medically important bacteria its mode of disease transmission, pathogenesis, diagnosis, prophylaxis and treatment.
- To aims at understanding important medically important virus and fungi its mode of disease transmission, pathogenesis, diagnostic method and treatment.

UNIT I Cocci and Acid fast bacillus

Systematic Bacteriology - Staphylococcus, Streptococci, Neisseria, Corynebacterium and related organisms. Mycobacterium
- typical and atypical. Aerobic pathogenic Actinomycetes

UNIT II Enterobacteriaceae

Vibrios, Helicobacter Pseudomonas, Brucella, Haemophilus, Bordetella. Enterobacteriaceae, Salmonella, Shigella, Proteus, Escherichia, Klebsiella

UNIT III Bacilli and Spirochetes

Bacillus, B.anthraxis Clostridia, Mycoplasma, Rickettsia, Spirochetes, Treponema, Leptospira and Borrelia.

UNIT IV Laboratory diagnosis is bacterial pathogens

Recommendation for collection, transport of specimens, isolation of bacteria from clinical specimens. Primary media for isolation and their quality control - Antibiotic sensitivity discs, testing procedures and their quality control

UNIT V Superficial and opportunistic mycoses

Introduction to Mycology, Dermatophytes and agents of superficial mycoses, Trichophyton, Epidermophyton and Microsporum. Opportunistic mycoses, Candidiasis, Cryptococcosis, Aspergillosis,

UNIT VI Subcutaneous and systemic mycoses

Systemic mycoses Histoplasmosis, Coccidioidomycosis, Blastomycosis. Subcutaneous mycoses, Mycetoma, Morphology, cultural characteristics, pathogenesis/disease caused & lab diagnosis.

UNIT VII Medical importance of DNA Virus

Introduction to Virology General characteristics of virus, Classification of virus, Pox, Herpes, Hepatitis B virus, Adeno virus

UNIT VIII Medical importance of RNA Virus

Orthomyxovirus, paramyxovirus, Adenovirus, Arbovirus, HIV, Rabies, Morphology, cultural characteristics, pathogenesis/disease caused & lab diagnosis.

Course Outcomes:

On completion of the course, students will be able to

CO1 Understand basic bacterial structure and staining .

CO2 Learn an overview of medically important bacterial families like Enterobacteriaceae

CO3 Familiarize with bacilli and spirochetes

CO4 Understand laboratory diagnosis of bacterial pathogens

CO5 Learn about superficial, systemic and opportunistic mycoses.

CO6 Learn and understand diagnosis of medically important viruses

Text / Reference Books

1. David Greenwood, Richard CD., Slack, John Forrest Peutherer. (1992). Medical Microbiology. 16th edition. ELBS with Churchill Livingstone.
2. Ananthanarayan, R. and JeyaramPaniker, C.K. (1994) Text Book of Microbiology, 6th Edn. Orient Longman, Chennai.
3. Alexopoulos CJ and C W. Mims.(1993).Introductory Mycology (3rd edition) Wiley Eastern Ltd, New Delhi.
4. Jagadish Chander (1996) A Text Book of Medical Mycology. Interprint, New Delhi.
5. Jewetz, E., Melnic, J.L. and Adelberg, E.A. (2000) Review of Medical Microbiology, 19th Edn. Lange Medical Publications, U.S.A
6. Topley & Wilson's. (1990) Principles of Bacteriology, Virology and Immunity, VIII edition, Vol. III Bacterial Diseases, Edward Arnold, London.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

PART A: 10 Questions – 2 marks each – No choice

PART B: Short Answers – 5 Questions 8 marks each – 5 out of 8

PART C: Long Answers – 2 Questions 20 marks each – 2 out of 3

Exam Duration: 3Hrs

20 Marks

40 Marks

40 Marks

SAMA1503	COAGULATION STUDIES	L	T	P	Credit	Total marks
		4	0	0	5	100

Course Objectives:

- To understand the mechanism and factors involved in coagulation
- To apply the concepts of coagulation in analyzing the associated disorders

UNIT I

Hemostasis - Definition, Basic concept and principle, Basic steps involved in Hemostasis.

UNIT II

Coagulation - Basic Physiology, coagulation factors, Mechanism of blood coagulation, Extrinsic Pathway, Intrinsic Pathway

UNIT III

Regulators of blood coagulation – Factors, Regulation, Clinical Significance

UNIT IV

Blood coagulation tests I, Bleeding Time, Duke's method, Clotting Time- Capillary tube method & Lee white's method.

UNIT V

Blood coagulation tests II - PT, aPTT, TT, Clot retraction time, Determination of fibrinogen.

UNIT VI

Quality Assurance for routine Hemostasis Laboratory - Introduction, Sample collection technique (Phlebotomy, Sample preparation, Anticoagulant used, Importance of use of Sodium

UNIT VII

Bleeding disorders I: Coagulation factor deficiencies – congenital, acquired Fibrinolytic defects

UNIT VIII

Bleeding disorders II: Vascular disorders, Platelet disorders

Course Outcomes:

On completion of the course, students will be able to

CO1 Understand the physiological and biomechanical aspects of coagulation.

CO2 Identify factors and pathways of blood coagulation.

CO3 Recognise the regulators and clinical significance of coagulation. **CO4** Apply the various coagulation tests in diagnostic and clinical services. **CO5** Appreciate the need of quality practices.

CO6 Understand pathophysiology and management of coagulation disorders.

Text / Reference Books

1. Ramnik Sood, Concise Book of Medical Laboratory Technology (Methods and interpretation), 2nd Ed., N.A. Publishers, 2015
2. Satish Gupta Short text book of Medical Laboratory for technician J.P. Bros, New Delhi, 2014
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.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

PART A: 10 Questions – 2 marks each – No choice

PART B: Short Answers – 5 Questions 8 marks each – 5 out of 8

PART C: Long Answers – 2 Questions 20 marks each – 2 out of 3

Exam Duration: 3Hrs

20 Marks

40 Marks

40 Marks

SAMA1504	THEORY OF QUALITY MANAGEMENT & AUTOMATION	L	T	P	Credits	Total marks
		4	0	0	4	100

Course Objectives:

- To introduce the concept of quality management
- To apply the significances of analyzers in automation

UNIT I Automation - Introduction, meaning, advantages, history

UNITII Continuous flow analyzers, Single channel continuous flow analyzers- advantages, disadvantages

UNIT III Multi channel flow analyzers, discrete auto analyzers - basic features, types, semi automated, fully automated Batch analyzers

UNIT IV Random access analyzers (RAA), Component steps in fully automated analyzers, Auto analyzers based on immunoassay techniques

UNIT V Micro particle enzyme immunoassay (MEIA), various random access analyzers - Hitachi- 704, BM/Hitachi -717

UNIT VI Centrifugal analyzers, ASCA, Dry chemistry analyzers, Dimension RxL clinical chemistry system, The Heterogeneous Immunoassay module components, Beckman Array 360system, Mini Vidas analyzers

UNITVII Immulite automated immunoassay analyzers, Latest trends in Automation

UNIT VIII Biochips, Lab on a chip (LoC), Nano sensors - advantages and disadvantages, PCR & its applications.

Course Outcomes

On completion of the course, students will be able to

- CO1** Understand the principles of automation.
CO2 Identify role of automation in flow analyzers.
CO3 Recognise the types of analyzer and their significance.
CO4 Apply the theoretical understanding to practical usage. **CO5** Recognise the latest trends and quality practices.
CO6 Bridge the gap between clinical and industry in theory and practice Of automation.

Reference Books

1. Laboratory management – Quality in Laboratory diagnosis – Candis A Kinkus, Demos medical publishers, 2011
2. Quality control in Laboratory – Gaffar Sarwar Zamman, Intech open publishers, 2011
3. Clinical Diagnosis and Management by Laboratory Methods, Henry 23rd edition, 2016

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration:

3Hrs

PART A: 10 Questions – 2 marks each – No choice

20 Marks

PART B: Short Answers – 5 Questions 8 marks each – 5 out of 8

40 Marks

PART C: Long Answers – 2 Questions 20 marks each – 2 out of 3

40 Marks