



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

1.1.2 Number of Courses where syllabus revision was carried out during the year Academic year 2023-24

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SHSB1103	GENERAL ENGLISH LANGUAGE LEARNING I	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To improve the comprehension and critical thinking skills.
- To develop and integrate the use of the four language skills i.e., Listening, Speaking, Reading and Writing.
- To enhance the vocabulary knowledge by learning various strategies.
- To train academic and professional skills like interview skills, ICT and Presentation skills.
- To enable the learner to communicate effectively and appropriately in real life situation.

UNIT 1 LANGUAGE AT THE WORD LEVEL 9 Hrs.

Parts of Speech – Kinds of sentences- Tense- Voice-Impersonal Passive – Reading: Comprehension passages – Writing: Letter writing – Job Application with CV- Speaking: Self Introduction, listening: Introduction to Internet & World Wide Web - Creating and Managing Email Accounts

UNIT 2 LANGUAGE AT THE SENTENCE LEVEL 9 Hrs.

Concord- Phrases and Clauses-Adjectives and adverbs-Modals - Prefix-Suffix-Identifying topic sentence, Connectives and discourse markers - Writing: Paragraph Writing- Compare/ contrast paragraphs, Bar diagrams- Tabular columns– Listening: Using audio and video to learn vocabulary and grammar.

UNIT 3 WRITING FOR THE SCREEN 9 Hrs.

Reported Speech, Compound nouns, Abbreviations/ Acronyms- Types of Sentences- Simple, Compound, Complex-Transformation of sentences- Flow chart-Writing process descriptive paragraphs/drawing diagram from the paragraph –Creating and writing online quiz tests using Kahoot application- E-mail writing- letters inviting dignitaries-Accepting and Declining.

UNIT 4 LANGUAGE AT DISCOURSE LEVEL 9 Hrs.

Cloze reading exercises- Developing dialogues- Question tags- Instructions- Recommendations-Group Presentations - Preparing Checklist-Posting Online feedback for any article- Writing classified Advertisements- Argumentative Essay writing- Creating Blogs using wordpress.com.

UNIT 5 CREATIVE THINKING 9 Hrs.

Identifying the topic sentences by reading the content - Group discussions on a given topic – Mock interview – Story cluster – Rearrange the story – News report – Ad making - Writing Letters – Job application – Accepting/Declining job offers.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, students will be able to know

- CO1** - Analyse any piece of work critically employing reading and vocabulary strategies.
- CO2** - Understand the importance of vocabulary words used in verbal and written conversation.
- CO3** - Enhance critical thinking skills by composing questions in reasoning format.
- CO4** - Equip themselves with professional soft skills to meet the industry demands.
- CO5** - Construct and evaluate written discourse with advanced skill set.
- CO6** - Equip the students with the required Professional Skills.

TEXT / REFERENCE BOOKS

1. Bhattacharya, Indrajit. An Approach to Communication Skills, Dhanpat Rai Co. Pvt Ltd; New Delhi.
2. Jones, Leo. Cambridge Advanced English: Student's Book New Delhi: Cambridge University Press, 1998.
3. Mohan, Krishna and Meenakshi Raman. Advanced Communicative English. New Delhi: Tata McGraw Hill Company Ltd., 2010.
4. Rajendra, Pal and Korlhalli. Essentials of Business Communication. J.S. Sultan Chand & Sons, 2007
5. Seely, John. The Oxford Guide to Writing and Speaking Oxford: Oxford University Press, 1998.

English for Science and Technology (2013) by Department of English, Sathyabama

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max.Marks:100

Exam Duration: 3 Hrs.

Part A : 10 Questions of 2 marks each-No choice

20 Marks

Part B : 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SAMB1101	FUNDAMENTALS OF ANATOMY AND PHYSIOLOGY	L	T	P	EL	Credits	Total Marks
		4	0	0	2	4	100

COURSE OBJECTIVES

- To understand how organs and structures present and how they function and how both structure and function are modified by deficiency to disorder or pathology to disease will be understood.
- To achieve through demonstrations using prosected cadavers, student dissection, anatomical models, plastinated specimens, online learning modules, labeled gross specimens and models.

UNIT 1 THE SKELETAL SYSTEM&MUSCULAR SYSTEM 12 Hrs.

Bones – Types, structure, Axial & Appendicular Skeleton, Bone formation and growth, Description of bones. Joints –classification and structure. Alterations in disease, Classification, Structure and properties of muscles, Neuromuscular junction, Electromyogram and disorders of muscles.

UNIT 2 CARDIOVASCULAR AND LYMPHATIC SYSTEM 12 Hrs.

Blood, Blood groups, Hemoglobin and iron metabolism, Coagulation of Blood, Structure of heart, Cardiac cycle, Electrocardiogram, Blood Pressure, Circulation: systemic, pulmonary, coronary, Lymphatic system, Lymphatic vessels and Lymphatic tissues, Lymph nodes.

UNIT 3 RESPIRATORY SYSTEM & DIGESTIVE SYSTEM 12 Hrs.

Structure of the organs of respiration, Muscles of respiration: intercostal and Diaphragm Alterations in disease, Structure of Alimentary tract and accessory organs of digestion – Mouth, Stomach, Liver and Gall bladder.

UNIT 4 EXCRETORY SYSTEM, NERVOUS SYSTEM & SPECIAL SENSES 12 Hrs.

Kidney, Ureter, Urinary bladder, Urethra (male and female), Urine Formation, Structure of neuralgia & neurons, Somatic Nervous system, Structure of brain, spinal cord, cranial nerves, peripheral nerves, Autonomous Nervous system – sympathetic, parasympathetic Structure, location. Alterations in disease. Structure of, eye and ear, Physiology of vision, Auditory & Olfactory apparatus.

UNIT 5 REPRODUCTIVE SYSTEM 12 Hrs.

Male Gonad: Testes, Epididymis, Female Gonad: Ovary, Fallopian Tube, Uterus, Vagina and Mammary gland. Introduction of male Genital Organs, Introduction of female Genital Organs.

Max. 60 Hrs.

COURSE OUTCOMES

On completion of the course, students will be able to know

- CO1** - Use anatomical terminology to identify and describe locations and functions of major organs of each system covered.
- CO2** - Understand the interrelationships among molecular, cellular, tissue, and organ functions in each system. Correlate the inter-dependency and interactions of the systems.
- CO3** - Acquire knowledge about homeostatic imbalances
- CO4** - Acquire knowledge about the causes.
- CO5** - Understand the contributions of each organ and tissue system

TEXT / REFERENCE BOOKS

1. Human Anatomy and Physiology for Courses in Nursing and Allied Health Sciences 4th Ed, Yalayyaswamy N.N., CBS Publishers, 2017.
2. Ross & Wilson Anatomy and Physiology in health and Illness, Anne Waugh & Allison Grant, Elsevier, 13th edition, 2013.
3. Fundamentals of Anatomy & Physiology, Judi L Nath, Edwin F. Bartholomew, Frederic H. Martini, Pearson, 9th Edition, 2016.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN**Max.Marks:100****Exam Duration: 3 Hrs.****Part A** : 10 Questions of 2 marks each-No choice**20 Marks****Part B** : 2 Questions from each unit of internal choice, each carrying 16 marks**80 Marks**

SAMB1102	BASICS OF BIOCHEMISTRY	L	T	P	EL	Credits	Total Marks
		4	0	0	0	4	100

COURSE OBJECTIVES

- Aim to provide a basic understanding of the core principles and topics of Biochemistry and their experimental basis.
- To enable to perform routine as well as special investigative procedures in different specialties of Medical Laboratory Technology.

UNIT 1 Chemistry, metabolism & Clinical pathology of Carbohydrate 12 Hrs.

Chemistry of carbohydrates & their related metabolism - Introduction, definition, classification, biomedical importance Brief outline of metabolism: Glycogenesis & glycogenolysis (in brief), Glycolysis, citric acid cycle & its significance, HMP shunt & Gluconeogenesis, Diabetes mellitus, gestation diabetes mellitus, Hyperglycemia & hypoglycemia and its causes.

UNIT 2 Chemistry of Amino acids and Protein- Protein Metabolism and its clinical pathology 12 Hrs.

Amino acids -Definition, classification, essential & non-essential amino acids. Chemistry of Proteins - Introduction, definition, classification, structure, and its biomedical importance, Transformation, Decarboxylation, Ammonia formation & transport, Urea cycle, metabolic disorders in urea cycle, catabolism of amino acids especially Phenylalanine, Tyrosine & Tryptophan, Creatinine, Proteinuria.

UNIT 3 Chemistry of Lipids, Lipids metabolism & clinical Pathology 12 Hrs.

Introduction, definition, classification, biomedical importance, essential fatty acids. Non-essential fatty acids, Brief outline of metabolism: Beta oxidation of fatty acids, fatty liver, Ketosis, Cholesterol & its clinical significance, Lipoproteins in the blood composition & their functions in brief, Atherosclerosis

UNIT 4 Enzymes and its clinical significance 12 Hrs.

Introduction, definition, classification, coenzymes, isoenzymes, properties, factors affecting enzyme action, enzyme inhibition, diagnostic value of serum enzymes - Creatinine kinase, Alkaline phosphatase, Acid phosphatase, LDH, SGOT, SGPT, Amylase, Lipase, Carbonic anhydrase etc

UNIT 5 Acid base balance concepts & disorders 12 Hrs.

Water metabolism, Distribution of fluids in the body, ECF, ICF, dehydration. - pH, Buffers, Acidosis, Alkalosis

Max. 60 Hrs.

COURSE OUTCOMES

On completion of the course, students will be able to know

- CO1** - Attain knowledge about the basics of biochemistry and the importance.
- CO2** - Attain knowledge on carbohydrates, proteins, fats and their functions in the body.
- CO3** - Attain knowledge on the basic principles of metabolism and its regulation
- CO4** - Understand the role of enzymes and its importance in diagnosis of various diseases.
- CO5** - Understand the role of pH, buffer system and water balance in the body.
- CO6** - Understand and access various biochemical parameters and its relation to disease and dysfunction of organs.

TEXT / REFERENCE BOOKS

1. Text book of Medical Biochemistry by MNChatterji & Rana Shinde, 7th Edition, Jaypee Publishers.
2. Handbok of Biochemistry & Nutrition by Shivanand Nayak B, by Jaypee publishers, fourth edition, 2020.
3. Harper's Illustrated Biochemistry 31st edition, by Lange Publishers, 2018.
4. Principles of Biochemistry by Voet & Voet fourth edition, Wiley publishers, 2010.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max.Marks:100

Exam Duration: 3 Hrs.

Part A : 10 Questions of 2 marks each-No choice

20 Marks

Part B : 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SAMB1103	BASIC MEDICAL LABORATORY SCIENCE	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVE

- To know basic of laboratory management and laboratory management.
- To have basic understanding of reagents preparation, sample collection.

UNIT 1 INTRODUCTION TO SAMPLE COLLECTION

9 Hrs.

Methods of collection, Transport, packing and storing of specimens, importance of labeling and identification.

UNIT 2 PREPARATION OF SOLUTIONS

9 Hrs.

Units of weight and volume, Calculation of concentration and methods of expressing concentration of solutions, types of water and their properties and uses. Preparation of standard solutions and reagents, Calculation of concentration and dilution factor, Interconversion of concentration - Normal, Molar, Molal and Percentage solution. Preparation of reagents for various biochemical analysis, chemical indicators and theory of indicators.

UNIT 3 LABORATORY CHEMICAL & GLASSWARE AND ITS USES

9 Hrs.

Cleaning of glassware's, Types and use of pipettes and calibration of pipettes. Stores and supplies: Indenting, ordering, storage, shelf-life of various reagents and grades of chemicals. Grades of chemicals, storage and handling of chemicals and reagents.

UNIT 4 CALIBRATION AND VALIDATION OF CLINICAL LABORATORY INSTRUMENT

9 Hrs.

Principle and QC procedure for lab instruments - parts, principle, maintenance, and care of microscope. microscope, incubator, Hot air oven, Autoclave, Centrifuge, Colorimeter, Spectrophotometer, Flame photometer, Refrigerator, pH meter.

UNIT 5 LABORATORY SAFETY

9 Hrs.

First aid in the laboratory, Precautions for infective material, common lab accidents and their prevention, first aid. Handling of infective materials: General principles, laboratory hazards and safety measures, universal safety precautions.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, students will be able to know

- CO1** - Understand the General knowledge of laboratory organization
- CO2** - Understand the sample collection procedure
- CO3** - To know about basic laboratory procedure and reagents preparation.
- CO4** - To learn about laboratory chemical and glassware uses
- CO5** - To know about Laboratory safety, and rules regarding safe disposal.
- CO6** - To know about laboratory reporting, recoding procedures and management.

TEXT / REFERENCE BOOKS

1. MLT Text book of Anatomy and Physiology, Mahendra Kumar Gupta, 2003.
2. Anatomy for MLT & other Allied Courses, Dr. Renu Chauhan, APC Books, 2016.
3. Human Anatomy and Physiology for Courses in Nursing and Allied Health Sciences 4th Ed, Yalayaswamy N.N., CBS Publishers, 2017.
4. Ross & Wilson Anatomy and Physiology in Health and Illness, Anne Waugh & Allison Grant, Elsevier, 13th edition, 2013.

5. Fundamentals of Anatomy & Physiology, Judi L Nath, Edwin F. Bartholomew, Frederic H. Martini, Pearson, 9th Edition, 2016.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max.Marks:100

Exam Duration: 3 Hrs.

Part A : 10 Questions of 2 marks each-No choice

20 Marks

Part B : 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SAMB2101	ANATOMY & PHYSIOLOGY LAB	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVE

- To apply the anatomy and physiological concepts in laboratory techniques.

LIST OF EXPERIMENTS

1. Identification and description of all anatomical structures.
2. Demonstration of dissected parts (upperextremity, lowerextremity, thoracic & abdominal viscera, face and brain)
3. Demonstration of skeleton-articulated and disarticulated.
4. Determination of Bleeding Time.
5. Determination of Clotting Time by capillary tube method.
6. Estimation of Haemoglobin by sahli's method.
7. Measurement of pulse, blood pressure.
8. Enumeration of Red Blood Cell by Hemocytometer.
9. Enumeration of Total Leucocytes by Hemocytometer.

COURSE OUTCOMES

On completion of the course, students will be able to know

- CO1** - understands the identification of human bones, types, classification and parts of the bones.
- CO2** - recognize the structures and functions of major organs of the human body.
- CO3** - Classifies the human blood based on their inherited properties of RBC, WBC, ABO antigens.
- CO4** - Compare the major bones and their processes as they relate to each region of the body.
- CO5** - understands the causes of symptoms, causes of hypertension and its diagnostic methods.
- CO6** - interprets the reference range, purpose, causes, types of clotting time and bleeding time.

SAMB2102	BASIC BIOCHEMISTRY LAB	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To understand the basic components of Practical Biochemistry.
- To identify and analyze biochemical parameters of various biological samples.

LIST OF EXPERIMENTS

1. Introduction: Aim, basis, interpretation, safety in clinical biochemistry Laboratory.
2. Laboratory organization Instruments, glassware, sample collection & specimen labeling, routine tests, anticoagulants, reagents, cleaning of glassware, isotonic solution, standardization of methods, preparation of solution & interpretation of result, normal values.
3. Identification of Carbohydrates (qualitative tests).
4. Identification of Proteins (qualitative tests).
5. To study general properties of the enzyme (Urease) & Achromatic time of salivary. amylase. Glucose tolerance test & Glycosylated hemoglobin.

COURSE OUTCOMES

On completion of the course, students will be able to know

- CO1** - Acquire knowledge about Instruments, glassware, sample collection & specimen labeling.
- CO2** - Acquire knowledge about identifying different type of carbohydrates and proteins.
- CO3** - Understand about the activity of urease and amylase.
- CO4** - Acquire knowledge about estimation of glucose.
- CO5** - Understand the various normal & abnormal constituents of urine.
- CO6** - To know how to interpret results based on normal values.

SHSB1202	GENERAL ENGLISH LANGUAGE LEARNING II	L	EL	T	P	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To equip students to use the language effectively in daily life.
- To improve the knowledge of Computing and Information and Communication Technology.
- To find the relevance of grammar in conversational skills.
- To build the professional and industrial skills like Personality development and critical thinking, etc.
- To enhance creative writing for interactive media.

UNIT 1 LANGUAGE FOR EVERY DAY USAGE

9 Hrs.

Parts of speech- Tenses-Types of sentences - Degree of comparison – Dialogue writing- Building conversation with imaginary situation – Listening and Reading skills through teacher led practice – writing agenda for a meeting – note taking – Summary writing.

UNIT 2 SOCIAL MEDIA STRATEGIES

9 Hrs.

Editing the passage with respect to spelling, grammar and punctuation-Rearranging Jumbled sentences -Writing effective headlines – Giving feedback online-Letter to the editor- Problems and Solutions-Campaign Leaflet and Writing Film Review.

UNIT 3 LANGUAGE FOCUS

9 Hrs.

WH questions-Framing open-ended questions -Auxiliaries - Finites - Non – finites: Modal auxiliaries: Verbs: use of Transitive, Intransitive verbs - Phrasal verbs – Quantifiers- Identifying the odd word out- Collocations- Writing informal mails to friends and relatives

UNIT 4 PROFESSIONAL WRITING

9 Hrs.

Simile, Metaphor- Connotations- denotations- Idioms and Phrases-Letter to the editor with solutions to current problems –Essay writing- Paragraph writing – Line Graph- Creating Accounts - On line Groups - Twitter- Face book - Skype- Linked in - Research Gate-You Tube - Flickr.

UNIT 5 CREATIVE WRITING FOR INTERACTIVE MEDIA

9 Hrs.

Report Writing- Letter writing- Request for practical training-Projects – Creating PowerPoint Presentation and uploading – Creating Blogs and uploading data – Creative writing - stories and poems article writing and presentation.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, students will be able to know

CO1 - Improve communication skills effectively in everyday conversation.

CO2 - Use ICT tools efficiently to improve communication skills.

CO3 - Enhance conversation skills, impromptu speech inculcating basic grammar.

CO4 - Equip themselves with professional soft skills to meet the industry demands.

CO5 - Construct creative article demanded for interactive media.

CO6 - Equip the students with the required Professional Skills.

TEXT / REFERENCE BOOKS

1. Bhattacharya, Indrajit. An Approach to Communication Skills, Dhanpat Rai Co. Pvt Ltd; New Delhi.
2. Rajendra, Pal and Korlhalli. Essentials of Business Communication. J.S.Sultan Chand & Sons, 2007

3. Seely, John. The Oxford Guide to Writing and Speaking Oxford: Oxford University Press, 1998
4. English for Science and Technology (2013) by Department of English, Sathyabama

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max.Marks:100

Exam Duration: 3 Hrs.

Part A : 10 Questions of 2 marks each-No choice

20 Marks

Part B : 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SAMB1201	CLINICAL BIOCHEMISTRY	L	T	EL	P	Credits	Total Marks
		4	0	0	0	4	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 1 PHOTOMETRY

12 Hrs.

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.

UNIT 2 WATER, VITAMINS & ENZYMES OF CLINICAL IMPORTANCE

12 Hrs.

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. Introduction to enzymes of clinical importance, Study on the distribution, clinical significance, and determination of AST, ALT, LDH and serum levels of LDH in pathological conditions. Study on the clinical significance and biological role of creatine kinase, alkaline phosphatase and gamma glutamyl transferase.

UNIT 3 LIVER & RENAL FUNCTIONS & THEIR ASSESSMENT

12 Hrs.

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. Detailed study on renal clearance and glomerular filtration rate and study on non-protein nitrogen containing compound. Study on biochemistry and physiology of urea and clinical significance of urea measurement. Detailed study on biochemistry and physiology of creatinine and creatine, clinical significance of creatinine clearance and plasma creatinine.

UNIT 4 LIPIDS AND CARDIAC PROFILE

12 Hrs.

Introduction to lipid profile tests and study on the diagnostic tests done for lipoprotein disorders, Study on the clinical significance of lipid profile test and the changes in values in different lipoprotein disorders like Atherosclerosis, Fatty streak, Fibrous Plaque. In brief Hypertension, Angina, Myocardial Infarction, Pattern of Cardiac Enzymes in heart diseases.

UNIT 5 ACID BASE BALANCE

12 Hrs.

Introduction, detailed study on the electrolyte composition of body fluids. Study on distribution of ions by passive and active transport and detailed study on Henderson –Hasselbach equation, study on bicarbonate carbonic acid buffer system, phosphate buffer system, plasma protein buffer system and haemoglobin buffer system. Study on isohydric and chloride shift, respiratory compensatory mechanism and renal compensatory mechanism in the regulation of acid- base. Detailed study on metabolic acidosis, metabolic alkalosis –classification, compensatory mechanism and laboratory findings. Detailed study on respiratory acidosis and respiratory alkalosis- classification, compensatory mechanism and laboratory findings.

Max. 60 Hrs.

COURSE OUTCOMES

On completion of the course, students will be able to know

- 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 and biochemicals.

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. Principles of Biochemistry by Voet&Voet fourth edition, 2018, Wiley publishers.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max.Marks:100

Exam Duration: 3 Hrs.

Part A : 10 Questions of 2 marks each-No choice

20 Marks

Part B : 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SAMB1202	GENERAL MICROBIOLOGY	L	T	P	EL	Credits	Total Marks
		4	0	0	0	4	100

COURSE OBJECTIVES

- To develop an understanding of the basic concepts and terminology in general pathology and microbiology.
- To understand the methods of microbial staining, media, transport and control of microbial pathogens.

UNIT 1 GENERAL MICROBIOLOGY

12 Hrs.

General characters and classification of Bacteria - Characteristics of Bacteria - Morphology - Shape, Capsule, Flagella, Inclusion, Granule, Spore - Growth and Maintenance of Microbes - Bacterial division, Batch Culture, Continuous culture, bacterial growth- total count, viable count, bacterial nutrition, oxygen requirement, CO₂ - requirement, temperature, pH, light.

UNIT 2 STERILIZATION AND DISINFECTION IN MICROBIOLOGY

12 Hrs.

Definition of sterilization and disinfection, Brief description of various agents used in sterilization by physical method like sunlight, drying, dry heat, moist heat, filtration, radiation and ultrasonic vibrations., Sterilization by chemical methods – Alcohols, Aldehyde, Dyes, Halogens, Phenols, Surface-active agents, Metallic salts and gases., Sterilization by Gases & vapours by Ethylene Dioxide, Formaldehyde vapours., Testing of disinfectants to determine the efficiency of disinfectant.

UNIT 3 MEDIA & STAINING

12 Hrs.

Culture Media - Definition, uses, basic requirements, classification, Agar, Peptone, Transport Media, Sugar Media, Anaerobic Media, Containers of Media, Forms of Media – Staining Methods - Simple, Grams staining, Ziehl - Neelsen staining or AFB staining, Negative Impregnation.

UNIT 4 COMMONLY USED INSTRUMENTS, EQUIPMENTS IN MICROBIOLOGY

12 Hrs.

Optical or light microscope, phase contrast microscope, dark field microscope, Fluorescence Microscopy, Electronic Microscopy, Safety hood chamber

UNIT 5 LABORATORY DIAGNOSIS OF BACTERIAL PATHOGENS

12 Hrs.

Collection and Transportation of Specimen - General Principles, Containers, Rejection, Samples- Urine, Faeces, Pus, Sputum Body fluids, Swab, Blood. Isolation of bacteria from clinical specimens. Primary media for isolation and their quality control - Antibiotic sensitivity discs, testing procedures and their quality control.

Max. 60 Hrs.

COURSE OUTCOMES

On completion of the course, students will be able to know

- CO1** - Understand the basic samples collection and transport in microbiology lab.
- CO2** - Demonstrate media and staining used in microbiology lab.
- CO3** - Describe the role of various instruments in laboratory.
- CO4** - To explore the scope of microbiology, microbial structure and their growth.
- CO5** - Carry out the process of sterilization, media preparation, staining methods to control microbes.
- CO6** - Acquire the knowledge to process various clinical samples and interpret the results.

TEXT / REFERENCE BOOKS

1. Microbiology with Diseases by Taxonomy Paperback by Bauman Robert W. (Author) 2017.
2. Textbook of Pathology - Harsh Mohan - 8th Edition (English) Paperback – 2019.
3. Robbins & Cotran Pathologic Basis of Disease: South Asia Edition Paperback – 2014.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN**Max.Marks:100****Exam Duration: 3 Hrs.****Part A** : 10 Questions of 2 marks each-No choice**20 Marks****Part B** : 2 Questions from each unit of internal choice, each carrying 16 marks**80 Marks**

SAMB1203	HOSPITAL AND LABORATORY MANAGEMENT	L	T	P	EL	Credits	Total Marks
		3	0	0	2	3	100

COURSE OBJECTIVES

- To help the students to know about Health care Management.
- Train them to acquire Family and Communal health knowledge.
- To be aware of with specimen collection procedures.

UNIT 1 PRINCIPLES OF HOSPITAL MANAGEMENT

9 Hrs.

Hospital planning - Organization of O.P & I.P., Ancillary services, Hospital statistics, Evaluation of patient care, Resource mobilization, Public Relations in Hospital. Human Resource Management Manpower planning - Recruitment procedures - Training and Development, Educational institutions and consultants - Principles and methods of executive development programmes - Performance appraisals, Job satisfaction.

UNIT 2 INVENTORY MANAGEMENT

9 Hrs.

Need for adopting materials management concept, Norms for inventory, Inventory carrying cost, Understocking, Overstocking - ABC analysis - Inventory reports - Materials handling, Store keeping and warehousing management.

UNIT 3 BOOK AND RECORD KEEPING

9 Hrs.

Meaning and Objectives – Double entry system, Trial balance, Profit and loss account, Preparation of balance sheet, Medical records Maintenance

UNIT 4 MANAGEMENT OF BIO-MEDICAL WASTE

9 Hrs.

Technologies for Treatment for BMW, Criteria for selecting appropriate Medical Waste Technologies

UNIT 5 GENERAL KNOWLEDGE OF LABORATORY ORGANIZATION

9 Hrs.

Reporting and recoding procedures, Ethics of laboratory practice including confidentiality of reports, medicolegal aspects of record keeping, Audit in a Medical Laboratory, Introduction and Importance, NABL & CAP, Responsibility, Planning, Horizontal, Vertical and Test audit, Frequency of audit, Documentation.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, students will be able to know

CO1 - Understand the organization routine functioning and operational standards of laboratories.

CO2 - To be aware of with specimen collection procedures.

CO3 - Recognize the aware of pre analytical, analytical, and post analytical stages of processing.

CO4 - Apply the theoretical understanding to practical usage and recognize the latest trends and quality practices.

CO5 - To have a general understanding of the organization routine functioning.

CO6 - To know operational standards of laboratories.

TEXT / REFERENCE BOOKS

1. Gupta, Hospital & Health care Administration, 2000, Jaypee Brothers Medical Publishers, New Delhi.
2. Jha, S.M., Hospital Management, 2003, Himalaya publishing house, New Delhi.
3. Mohd.Faisal Khan, Hospital Waste Management, 2004, Kanishka publishers, New Delhi.

4. Shakti Gupta & Sunil Gupta, Hospital Stores Management – An Integrated Approach, 2000, Jaypee Brothers Medical Publishers, New Delhi. Social and preventive Medicine, K. Park, Brimnot publishers.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max.Marks:100

Exam Duration: 3 Hrs.

Part A : 10 Questions of 2 marks each-No choice

20 Marks

Part B : 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SAMB2201	Clinical Biochemistry-Lab	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- To analyze the biochemical parameters in clinical samples.
- To identify the clinical significance of biochemicals in normal and pathological conditions.

LIST OF EXPERIMENTS

1. Blood urea estimation
2. Serum creatinine estimation
3. Serum uric acid estimation
4. Serum total protein, Serum albumin estimation and Serum globulin estimation
5. Serum glucose estimation
6. Total cholesterol, HDL cholesterol (direct), LDL cholesterol (direct) estimation, Triglyceride estimation
7. Serum Bilirubin total, Serum Bilirubin direct estimation
8. Serum amylase estimation
9. Serum GOT (AST) & Serum GPT (ALT) estimation
10. Alkaline phosphatase estimation
11. Acid phosphatase estimation
12. Serum sodium & Serum potassium estimation
13. Serum chloride estimation

COURSE OUTCOMES

On completion of the course, students will be able to know

- CO1** - Understand the lab safety measures and handling of glass and instruments.
- CO2** - Acquire knowledge about handling instruments like colorimeter.
- CO3** - Learn different types of estimation of glucose and lipids.
- CO4** - Demonstrate on kidney function test which helps to assess the function of kidney.
- CO5** - To know how to implement various enzyme assays to monitor and measure the function of liver.
- CO6** - Understand quantitative analysis of electrolytes to diagnose cardiovascular.

SAMB2202	General Microbiology Lab	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- To understand the principle and working of microscope and different types of microscopes.
- To learn basic microbial techniques.

LIST OF EXPERIMENTS

1. Components and settings of the Compound microscope Focusing of the object, Use of low and high-power objectives of the microscope, Use of oil immersion lens.
 2. Care and Maintenance of the microscope.
- Different types of microscopes
- Dark field microscopy
 - Fluorescence Microscopy
 - Electronic Microscopy in brief.
3. Preparation of swabs/sterile tubes & bottles.
 4. Preparation of smear.
 5. Identification of Culture media.
 6. Identification of instruments.
 7. Identification of common microbes.
 8. General requirements of collections, transport of clinical Specimens, Maintenance of stock culture.
 9. Method of collection of clinical material for culture – urine, blood, sputum, and CSF, throat swab, faeces, body fluids.
 10. Simple, differential and special staining of clinical materials viz: Throat swab, Pus, Urine, Sputum, Stool etc. Staining - Gram & Ziehl – Neelsen staining.

COURSE OUTCOMES

On completion of the course, students will be able to know

- CO1** - Analyze fundamental approaches for basic concepts about the microscope.
- CO2** - Demonstrate about the preparation of smear using microbes.
- CO3** - Describe about the staining procedures adopted to visualize microorganisms.
- CO4** - Explore the knowledge to handle and maintain microbiological instruments.
- CO5** - Recognize the procedures adopted for identification of microbes.
- CO6** - Acquire knowledge about different morphology of bacteria, fungi and parasites.

SACB1204	FUNDAMENTALS OF COMPUTING	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To understand the basics of parts of a computer.
- To Understand operation of word documents.
- To understand about files, spread sheets and Networking.

UNIT 1 INTRODUCTION TO COMPUTERS 9 Hrs.

Cassification of computers; Computers inside — Hardware (processing, memory i/o, storage etc), Software (Systems, application); Operating Systems —DOS, LINUX, UNIX, Windows; Programming — Overview, need and skills; Networking Basics; Virus; Hacking.

UNIT 2 WORD PROCESSING 9 Hrs.

Operating of word documents like open, close, save, print; Editing Text— tools, formatting, bullets, layout; Navigating word—Keyword, mouse, document forming; paragraph alignment— indentation, headers, footers, numbering; printing—preview, options.

UNIT 3 FILE 9 Hrs.

Importance of file management, backing of files, files and folders- editing, deleting, retrieving, renaming, subfolders; Manipulating windows — minimize, mazimize; power point basics- terminology- templates, viewing.

UNIT 4 SPREADSHEETS 9 Hrs.

MS Excel opening, entering text and data, formatting, navigating; Formulas- entering, handling and copying; charts- creating, formatting and printing, header and footer, centering of data; printing.

UNIT 5 NETWORKING 9 Hrs.

Internet explorer; www—working, browsing, searching, saving; bookmark—features, favorite, create, delete; printing webpage; email —creating, receiving, reading and sending messages.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of this course students will be able to

- CO1** - Understand the computing skills.
- CO2** - Understand the concept of input and output devices of Computers.
- CO3** - Learn the functional units and classify types of computers, how they process information and how individual computers interact with other computing systems and devices.
- CO4** - Understand an operating system and its working, and solve common problems related to operating systems.
- CO5** - Able to apply Basic word processing, Spreadsheet and Presentation Graphics Software skills.
- CO6** - Develop the basic skills to use the Internet safely, legally, and responsibly.

TEXT / REFERENCE BOOKS

1. Introduction to Computers — Peter Norton, Tata McGraw-Hill, India.
2. Microsoft 2003 — Jennifer Ackerman Kettel et al., Tata Mc-Graw Hill, India.
3. Working in Microsoft office 2006- Ron Mansfield, Tata Mc-Graw Hill, India.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A: 10 Questions of 2 mark each - No choice.

20 Marks

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks.

80 Marks

SAMB1104	SOCIOLOGY AND PSYCHOLOGY	L	T	P	EL	C	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To help the students to know about social process and characteristic of socialization.
- Train them to acquire Family and Communal health knowledge and be aware of with Professional Socialization during hospitalization.

UNIT 1

9 Hrs.

Interdependence between man and society, Family organization.

UNIT 2

9 Hrs.

Social processes, associative and disassociate, social groups characteristics functions in a health setting, Socialization during hospitalization.

UNIT 3 PROFESSIONAL SOCIALIZATION

9 Hrs.

Culture - health & illness, System of social stratification, social control, social change, social disorganisation, social planning and social reconstruction

UNIT 5

9 Hrs.

Introduction, definition, Branches, Methodology involved, Psychology in health care, Sensation, attention and perception

UNIT V

9 Hrs.

Personality, Motivation, Learning, Mental health, Creative thinking

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 Understand the basic of society.
- CO2 get familiar with social processes and hospitalization
- CO3 Recognize the Professional Socialization and culture health & illness.
- CO4 Apply the practical knowledge and understanding to usage of instruments.
- CO5 Bridge the gap between society and hospitalization.
- CO6 Familiar with Psychology in health care.

TEXT / REFERENCE BOOKS

1. Sica, A. (2001). Encyclopedias, Handbooks, and Dictionaries. In N.J. Smelser & P.B. Baltes (Eds.), International Encyclopedia of the Social & Behavioral Sciences.
2. Handbook of Psychology, 2nd edition by Irving B. Weiner (Editor)
3. Oishi S, Kesebir S, Snyder BH. Sociology: A lost connection in social psychology. Personality and Social Psychology Review. 2009 Nov.13(4):334-53.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A: 10 Questions of 2 mark each - No choice.

20 Marks

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks.

80 Marks