Course Information:

School/ Department:	Glocal Collage Of Paramedical Science and Rearch Center
Programme:	BMLT
Course Tile:	HUMAN ANATOMY & PHYSIOLOGY
Course Code:	MLT 101
Course Level (UG/PG)	UG
Credits	4 L ----- T ----1P.
Prerequisite	
Year/Semester	1st year

Course Objectives Anatomy focuses on the structural organization of the human body and the standard naming and definition of the physical properties. Human Physiology introduces the functionality of the organ system of body. The complexity of human body is explored in this course.

Course Outcomes: 1. Student should be able to identify and locate all the structures of body.
2. Can mark the topography of living anatomy by dissection.
3. Identify the organs and tissue by observing under microscope.
4. Should be able to show anatomical relations of different organs and body parts.
5. Knowledge of major systems of the human body which includes, Circulatory system, Digestive system, Endocrine system, Respiratory system, immune system, reproductive system.

Teaching Methodology:

Methodology	Mention Appropriate Methods (Yes/No)
Explanations by the Instructor	Yes
Group/Pair Work	Yes
Class Discussion	Yes
Assignment/s	Yes
Viva Voice	Yes
Audio/video Class	Yes
Practical/ Case Study/Diary	Yes
Presentations	Yes

Hospital Posting	No

Course Content

COURSE CONTENT

No	Description	Weightage (%)
1	Introduction to human anatomy and physiology Organization of human body and integrated physiology. Cell organizations, fundamental tissues of body and organ system. Primary defense mechanism of human body against pathogenic microbes. Gross anatomy and histology of organs or respiratory system, organs of respiration, mechanism of respiration and factors controlling it. Gross anatomy and histology of organs of alimentary system, organs of digestive system, various glands associated with the digestive system, mechanism and physiology of digestion and absorption.	33.33%
2	Cells and organs of immune system: Morphology and their distribution. Gross anatomy and physiology of reticulo – endothelial system. Secondary immune response of human body to external stimuli. Physiology of various body fluids: CSF, Peritoneal, Pericardial, Pleural and synovial fluids. Gross anatomy, history & physiology of excretory system. Gross anatomy and histology of organs of cardiovascular system, organs of the system, mechanism and physiology of blood flow through the cardiovascular system.	33.33%
3	Gross Anatomy and histology of musculo-skeletal system, classification & functions of bones and muscles. Physiology of muscular contraction and factor controlling them various types of joints and their physiology.	33.33%

	Gross anatomy and histology of organs of nervous system, division of nervous system and mechanism of nerve impulse transmission & reflex arc, sensory and motor system, sensory & motor systems special sense organs. Gross Anatomy and histology of organs of reproductive system, mechanism of reproduction and factors controlling it Gross anatomy and histology of organs of endocrine system, different glands of the system and their distribution. Mechanism of hormone production, factors controlling it and their mechanism of action.	

Lecture Plan

Module Number	Module Title	Number of Lectures
Module 1	Introduction to human anatomy and physiology	
Module 2	Cells and organs of immune system	
Module 3	Gross	

Practical

1. Demonstration of Human cell, Cell division Mitosis & meiosis - from chart and slides.
2. Demonstration of various tissue- Epithelial, connective, muscular and nervous.
3. Demonstration of Individual Bones and Respiratory System from Chart
4. Measurement of Blood Pressure, Respiration and Heart Beat
5. Demonstration of Body Organ like Eye, Nose, Tongue etc.

Credit Hours: 2/week

Literature/Reference: Lab Manual

Evaluation Scheme

	External	Internal	Total
Assessment (theory)	70	30	100
Evaluation of Practical/Dissertations	35	15	50

Internal Evaluation of Theory	Class TestClass Test(2 best out of 3)	Assignment	Attendance	Total
	20	5	5	30

Textbooks, Supplementary Materials

1. Rose & Wilson, Anatomy & physiology 12 th edition, Esevere int. publication
2. G. J. Tortora, Anatomy & Physiology 2014 India edition, Willy publication.
3. B D Chaurasia, Human Anatomy, 6 th edition. CBS Publisher.
4. K Sambulingum, Essential Medical physiology, Latest edition, jaypee

Cos\ POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	✓											
CO2	✓											
CO3	✓											
CO4	✓											

CO5	✓											

Departmental Quality Assurance Committee Approval			
No.	**Name**	**Digital Signature**	**Date**
1			
2			

Course Information:

School/ Department:	Glocal Collage Of Paramedical Science and Rearch Center
Programme:	BMLT
Course Tile:	BASIC PATHOLOGY
Course Code:	MLT 102
Course Level (UG/PG)	UG
Credits	4 L ----- T 1 P.
Prerequisite	
Year/Semester	1st year

Course Objectives: the student will be able to explain the basic nature of blood, cells and cell death

Course Outcomes: 1. Student should know introduction of Hematology and formation and composition and function of blood.
2. Student should know collection and preservation of blood and anticoagulant and mode of action and their merits and demerits.
3. At the end of course students should know the procedure of blood smear and preparation and staining of various stain used in hematology laboratory.
4. Student should know the haematological parameters used in the Hematology laboratory.
5. Student should know about the inflammation and techniques for diagnosis of acute and chronic microbial infections.

Teaching Methodology:

Methodology	Mention Appropriate Methods (Yes/No)
Explanations by the Instructor	Yes
Group/Pair Work	Yes
Class Discussion	Yes
Assignment/s	Yes
Viva Voice	Yes
Audio/video Class	Yes
yes Practical/ Case Study/Diary	Yes
Presentations	Yes

Hospital Posting	Yes

Course Content

COURSE CONTENT

No	Description	Weightage (%)
1	Introduction to Hematology. Laboratory organization & Safety measures. Formation, Composition and functions of blood. Anticoagulants, mode of action of anticoagulants and their merits and demerits. Collection, preservation, transport and handling and disposal of blood samples. Basic hematology and estimation of haematocrit values, physiological variations, normal and absolute values and quality assurance in hematology.	33
2	Romanowsky dyes, preparation and staining procedure of blood smears Morphology of blood cells and their identifications. Haemo-globinometery : Various methods, errors involved and standardization of instruments. Haemo-cytometry : Procedure of cell count, visual as well as electronic, red cell, leukocyte and platelet count. Errors involved and mean to minimize such errors. Determinations of innate immunity and is mechanism, phagocytosis the compliment system, gross structure and development of cells concerned with antibody production, cellular processes involved in antibody formation.	34
3	Pathology of inflammation in response to microbial invasion. Pathology of localized and systematic infections. Various routes of transport of Microbes tto human body and methods of defense. Invasive techniques for diagnosis of acute and chronic microbial infections.	33

	Pathology of specific chronic infective disorders: Tuberculosis, Leprosy, Syphilis, SABE (subacute bacterial endocarditits) and rheumatological disorders. Study of microbes responsible for pathogenesis of tumors and their oncogenesis. Immuno- histopathology &Immuno – histochemistry (Basic Principles of Procedures and applications) Introduction to blood banking technology	

Lecture Plan

Module Number	Module Title	Number of Lectures
Module 1	Introduction to Hematology	
Module 2	Stains and Immunity	
Module 3	Inflammation	

Practical

1. Collection of blood Sample by Venous & capillary method.
2. Estimation of Hb By Sahli ‘s and CMG Method
3. Determination of RBC, WBC & Platelet Counts By Hem cytometer
4. Preparations of EDT and Sodium Citrate Vials
5. Preparation of thin and thick blood smear
6. Separation of Buffy Coat
7. Determination of ESR by Win Trobe and Western Green Method

Credit Hours: 2/week

Literature/Reference: Lab Manual

Evaluation Scheme

	External	Internal	Total
Assessment (theory)	70	30	100
Evaluation of Practical/Dissertations	35	15	50

Internal Evaluation of Theory	Class TestClass Test(2 best out of 3)	Assignment	Attendance	Total
	20	5	5	30

Textbooks, Supplementary Materials

1. Harsh Mohan, Text Book of Pathology, 6 th Edition, Jaypee Publicati
2. Robbins, Text Book of Pathology-, Latest edition, Elsevier Health Sciences
3. J V Deice & Lewis, Practical Hematology- 11 th edition, Churchill Livingstone,
4. Hematology- William J William, Ernest Butter, McGraw-Hill Education / Medical; 8edition
5. Altus of Hematology – George, A McDonald, T C Codde

Cos\ POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1											✓	
CO2		✓										

CO3					✓							
CO4							✓					
CO5								✓				

No.	**Name**	**Digital Signature**	**Date**
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Course Information:

Course Objectives: The objective of this subject is to provide knowledge to understand the fundamental chemical principles that govern complex biological systems. To introduce the close relationship which emphasize that, life depends on biochemical reactions and chemical changes.

Course Outcomes: 1. Knowledge about identification of the structural elements of different biomolecules and their basic features.

School/ Department:	Glocal College of Paramedical Science & Research Centre
Programme:	BMLT
Course Tile:	Medical Biochemistry
Course Code:	MLT-103
Course Level (UG/PG)	UG
Credits	4- L 0- T 1-P.
Prerequisite	
Year/Semester	1st

2. Demonstration and applicability of the metabolic role of biomolecules and metabolites in physiological and / or pathological processes.
3. Knowledge regarding specimen collection, transportation and storage.
4. Information about identification and handling of different laboratory apparatus, glassware, instruments and reagents and their use in sample processing and diagnosis.
5. Knowledge of nutritional importance of lipids, carbohydrates, proteins and vitamins. Estimation of different biomarkers, organ function tests and their importance in diagnostic field.

Teaching Methodology:

Methodology	Mention Appropriate Methods (Yes/No)
Explanations by the Instructor	**Yes**
Group/Pair Work	**Yes**
Class Discussion	**Yes**
Assignment/s	**Yes**
Viva Voice	**Yes**
Audio/video Class	**Yes**
Practical/ Case Study/Diary	**Yes**
Presentations	**Yes**
Hospital Posting	**No**

Course Content

COURSE CONTENT

No	Description	Weightage (%)
1	**Introduction**: Fundamental and Clinical Biochemistry, First aid in laboratory accidents. Principle, working, care & maintenance of Weighing balance, hotplate, centrifuges, incubator, hot air oven, colorimeter, spectrophotometer, pH meter.	12
2	**Types of Equipment & Glasswares:** Pipettes- different types (Graduated, volumetric, Pasteur, Automatic etc.), Calibration of glass pipettes, Burettes, Beakers, Petri dishes, depression plates. Flasks - different types) Volumetric, round bottomed, Erlenmeyer conical etc.). Funnels – different types (Conical, Buchner etc.) Bottles: Reagent bottles – graduated and common, Wash bottles – different types, Specimen bottles etc.	15
3	**Preparation of various solutions and measurement units:** Preparation of solution and reagents, normal solution, molar solutions, percent solution, buffer solution, dilutions, w/v,v/v, concepts of acid and base, units of measurement: SI unit, reference range, conversion factor, units for measurement of enzymes, protein, osmolarity, drugs, hormones, vitamins.	16
4	**Carbohydrates:** Structure, Classification and their function in biological system. **Proteins**: Classification, Primary, secondary and tertiary structure and functions of protein. **Amino acids**: classification, Structure, properties and biological functions. **Lipids:** Classification of lipids, Classification of fatty acids, their biological functions. **Enzymes**: Definition, classification of enzyme, units for measuring enzyme activity. **Nucleic acids:** Structure, function and types of DNA and RNA. Nucleotides, Nucleosides, Nitrogen bases, and role of Nucleic acid.	17
5	**Vitamins:** classification, function and disease associated with vitamins. Role of Minerals and ions: Calcium, Iron, Iodine, Zinc,	10

	Phosphorus, Copper, Potassium, Zinc.	
6	**Quality control:** Accuracy, Precision, Specificity, Sensitivity. Limits of error allowable in laboratory, Percentage error, Normal values and Interpretations, pH Regulation, Disturbance in acid Base Balance, Metabolic acidosis & alkalosis, Respiratory acidosis & alkalosis, Respiratory alkalosis, Basic Principles and estimation of Blood Gases and pH, Basic principles and estimation of Electrolytes, Nutritional importance of lipids, carbohydrates, proteins and Vitamins.	15
7	**Maintenance of Lab Glassware and Apparatus:** Glass and plastic ware in Laboratory, use of glass: significance of borosilicate glassware and cleaning of glassware, different cleaning solutions of glassware and cleaning of plastic ware, different cleaning solutions.	15

Lecture Plan

Unit Number	Unit Title	Number of Lectures
1	**Introduction**	
2	**Types of Equipment & Glasswares**	
3	**Preparation of various solutions and measurement units**	
4	**Carbohydrate, Proteins, amino acids, Lipids, Enzymes, Nucleic Acids**	
5	**Vitamins**	
6	**Quality Control**	
7	**Maintenance of Lab Glassware and Apparatus**	

Practical:

1. Analysis of Normal Urine
2. Liver Function tests
3. Lipid Profile
4. Renal Function test
5. Blood gas and Electrolytes

6. Demonstration of Glucometer with strips
7. Estimation of Carbohydrates

Credit Hours: 2/week

Literature/Reference: Lab Manual

Evaluation Scheme

	External	Internal	Total
Assessment (theory)	70	30	100
Evaluation of Practical/Dissertations	35	15	50

Internal Evaluation of Theory	Class Test(2 best out of 3)	Assignment	Attendance	Total
	20	5	5	30

Textbooks, Reference, Supplementary Materials

1. Varley, *Clinical Chemistry*
2. Teitz, *Clinical Chemistry*
3. Kaplan, *Clinical Chemistry*
4. Ramakrishna S, Prasanna KG, Rajna, *Text Book of Medical Biochemistry*, Orient Longman
5. Vasudevan DM & Sreekumari S, *Text Book of Biochemistry for Medical Students*.
6. Das, Debajyothi, Biochemistry, Academic, Publishers, Calcutta.
7. Chatterjee, *A Text book of Medical Biochemistry*
8. U. Satyanarayan, *Medical Biochemistry*
9. Satyanarayan, U., *Medical Biochemistry*

School/ Department:	Glocal College of Paramedical Science & Research Centre
Programme:	BRIT
Course Tile:	Preventive Medicine, Healthcare
Course Code:	MLT-104
Course Level (UG/PG)	UG
Credits	4- L 0- T 1-P.
Prerequisite	
Year/Semester	1st

Cos\ POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1											✓	
CO2		✓										
CO3			✓									
CO4											✓	
CO5											✓	

Departmental Quality Assurance Committee Approval			
No.	**Name**	**Digital Signature**	**Date**
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2			

Course Information:

Course Objectives: The aim of this subject is to describe concepts of health, important public health acts, of epidemiology, diseases, types and use of epidemiology, departmental protection and radiation signage's. This subject also focuses on National Health Policy and Programs, universal immunization programme and various problems of population growth.

Course Outcomes: 1.Knowledge of Basic emergency care and first aid.
2. Epidemiology, etiology, control of communicable disease like malaria, cholera, tuberculosis, leprosy, diarrhea, poliomyelitis, viral hepatitis, measles, dengue, rabies and AIDS.
3. Knowledge of nutrition and major nutritional problems, etiology, manifestations and prevention, components of RCH care.
4. Should be able to examine water, food adulteration.
5. Knowledge regarding role of regular exercise and yoga in prevention and management of various diseases.

Teaching Methodology:

Methodology	Mention Appropriate Methods (Yes/No)
Explanations by the Instructor	**Yes**
Group/Pair Work	**Yes**
Class Discussion	**Yes**
Assignment/s	**Yes**
Viva Voice	**No**
Audio/video Class	**Yes**
Practical/ Case Study/Diary	**Yes**
Presentations	**Yes**
Hospital Posting	**No**

COURSE CONTENT

No	Description	Weightage (%)
1	Definition and concepts of health, important public health acts, health problems of developed and developing countries, environment and health. Definition and concepts of epidemiology, diseases, types and use of epidemiology. Basic emergency care and first aid. Epidemiology, etiology, control of communicable disease like malaria, cholera, tuberculosis, leprosy, diarrhea, poliomyelitis, viral hepatitis, measles, dengue, rabies, AIDS	20

2	National Health Policy and Programs, DOTS, National AIDS control programme, National cancer control programme, universal immunization programme. Nutrition and major nutritional problems, etiology, manifestations and prevention, components of RCH care. Examination of water, food adulteration, role of regular exercise and yoga in prevention and management of various diseases.	25
3	Population, problems of population growth, birth rates, death rates, fertility rates, MMR.,CPR, Approaches and methods of contraception, Reproductive and child health. Hygiene and sanitation, sanitation barriers, excreta disposal.	25
4	Immunization programme, various national immunization programs and vaccine schedules, Family welfare and planning, communicable and non-communicable disease, Health planning in India including various committees, national health policy and health goals. Objectives and goals of WHO, UNICEF, Indian Red Cross Society, UNFPA,, FAO, ILO	30

Lecture Plan

Unit Number	Unit Title	Number of Lectures
1	**Introduction**	10
2	**Policies**	15
3	**Social Outreach**	15
4	**Goals and working of various Organizations**	15

Evaluation Scheme

	External	Internal	Total
Assessment (theory)	70	30	100
Evaluation of Practical/Dissertations	35	15	50

Internal Evaluation of Theory	Class Test(2 best out of 3)	Assignment	Attendance	Total
	20	5	5	30

Textbooks, Supplementary Materials

1. Park K. Park's textbook of preventive and social medicine.
2. Leavell HR, Clark EG. Preventive Medicine for the Doctor in his Community. An Epidemiologic Approach.
3. Durrani SA, Ilic R, editors. Radon measurements by etched track detectors: applications in radiation protection, earth sciences and the environment. World scientific; 1997 Jun 9.
4. Sherer MA, Visconti PJ, Ritenour ER, Haynes K. Radiation Protection in Medical Radiography-E-Book. Elsevier Health Sciences; 2014 Mar 12.

Cos\ POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1												
CO2												
CO3												
CO4												
CO5												

Wish you all the best!

School/ Department:	Glocal Collage Of Paramedical Science and Research Center
Programme:	BMLT
Course Tile:	MEDICAL MICROBIOLOGY
Course Code:	MLT 105
Course Level (UG/PG)	UG
Credits	4 L ----- T 1 P.
Prerequisite	
Year/Semester	1st year

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Course Information:

Course Objectives: this coure will demonstrate about microbes and basic knowledge of medical microbiology

Course Outcomes: 1.The student should know the basic of Microbiology at thre end of academic year.

2. the student should know morphology and nature of bacteria
3.should have knowledge of sterilization
4. should know culture tech
5. should know ast

Teaching Methodology:

Methodology	Mention Appropriate Methods (Yes/No)
Explanations by the Instructor	Yes
Group/Pair Work	Yes
Class Discussion	Yes
Assignment/s	Yes
Viva Voice	Yes
Audio/video Class	Yes
yes Practical/ Case Study/Diary	Yes
Presentations	Yes
Hospital Posting	Yes

Course Content

COURSE CONTENT

No	Description	Weightage (%)
1	**Microbiology & Medicine:** Introduction to Medical Microbiology, Discovery of micro-organisms, Contribution of Robert Koch, Antony Van Leeuwen hook, Louis Pasteur,Bordet, Paul Ehrlich, Alexander Fleming, Matchnikoff, Needham, Tyndall Jensson, Joseph lister, Karls Landsteiner etc. Scope & relevance and Safety measures of MedicalMicrobiology, Role of medical microbiology in identification and management of various infectious diseases. **Morphology & Nature of bacteria:** Anatomyof bacterial cell, intracellular components and their functions bacterial reproduction,	25

	morphological study of bacteria and its appendages – flagella, fimbriae, pili, capsule, spore and cysts. **Classification and identification of bacteria:** Biological groups, morphological and biological classification, DNA composition as a basis of classification system of identification-morphology, staining reactions, cultural characters, biochemical reactions & antigenic characters etc. **Sterilization and disinfection:** Various physical methods of sterilization – heat UV radiation, ionizing radiation, character affecting sterilization, auto clave control and sterilization indicators. Chemical disinfectants – phenol and its compounds, aldehyde, gaseous compound. Useand abuse of disinfectants.	
2	**Cultural Media:** Liquid and solid media, container for medias distribution of media in tubes, bottles and Petri dishes. Common ingredients of cultural Medias. Synthetic media, peptone water, nutrient agar and broth, chocolate and blood agar, meat extract broth milk agar etc. Special Medias for neisseria, corrynebacterium, mycobacterium &Enterobacteriacae group etc. **Cultivation of bacteria:** Instruments used, inoculation hood, laminar flow, culture procedure, incubation (Aerobic and Anaerobic). Isolation of pure culture and its preservation. Suspending media for freeze drying of bacteria. Blood culture. **Pure cultures:** Maintenance & preservation of pure cultures. Collection, transport processing & storage of clinical samples for microbiological Analysis. **Growth and Nutrition of Bacteria:** Typical growth, curve, various phases of growth, physiology of bacteria – catabolism and anabolism. Nutrition of microbes and physical condition required for growth. Effect of Carbon, Nitrogen, Growth factors, Vitamins, Temperature, pH, Osmotic pressure, Oxygen and Carbon Di oxide on microbial growth.	25
3	Lab. Organization, Management, Recording of Results and Quality Control in Medical Microbiology.	20

	Principles of Staining Techniques, Preparation Stains and their storage. **<u>Antimicrobial agents and antibiotic:</u>** Disinfectants, antiseptics, chemotherapeutic agents' chemotherapeutic index, development of chemotherapy, antibiotics and effect of antibiotics on protein & nucleic acid synthesis and cytoplasmic membrane. Future development of chemotherapy.	
4	Immunity Antigen Antibody Ag Ab reactions	30

Lecture Plan

Module Number	Module Title	Number of Lectures
Module 1	Introduction to Medical Microbiology	
Module 2	CULTURE	
Module 3	QC And AST	
Module 4	IMMUNOLOGY	

Practical

1. Preparation of smear.
2. Perform Ziehl-Neelsen staining.
3. Perform Gram's staining
4. Perform Negative staining
5. Perform capsule staining
6. Perform spore staining
7. Any other practical's based on theory paper

Credit Hours: 2/week

Literature/Reference: Lab Manual

Evaluation Scheme

	External	Internal	Total
Assessment (theory)	70	30	100
Evaluation of Practical/Dissertations	35	15	50

Internal Evaluation of Theory	Class TestClass Test(2 best out of 3)	Assignment	Attendance	Total
	20	5	5	30

Textbooks, Supplementary Materials

1. Medical Laboratory Technology by Kanai Lal Mukherjee; Tata McGraw Hill Publishers, New Delhi
2. Textbook of Microbiology by Ananthanarayan and Panikar; Orient Longman, Hyderabad
3. Practical Book of Medical Microbiology by Satish Gupta; JP Brothers, New Delhi
4. Text Book of Medical Microbilogy by Satish Gupta; JP Brothers, New Delhi
5. Text Book of Medical Laboratory Technology by Praful B Godkar; Bhalani Publishing House; Mumbai
6. Medical Laboratory Science Theory and Practice by J Ochei and A Kolhatkar
7. A Textbook of Microbiology New Central Book Agency (P) Ltd By P Chakrabor

Cos\ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												✓
CO2												✓
CO3						✓						
CO4												✓
CO5										✓		

School/ Department:	Glocal Collage Of Paramedical Science and Rearch Center
Programme:	BMLT
Course Tile:	TECHNICAL METHODS IN MICROBIOLOGY
Course Code:	MLT 106
Course Level (UG/PG)	UG
Credits	4 L ----- T 1 P.
Prerequisite	
Year/Semester	1st year

Departmental Quality Assurance Committee Approval			
No.	**Name**	**Digital Signature**	**Date**
1			
2			

Course Information:

Course Objectives: this course will introduce the various techniques used in microbiology

Course Outcomes: 1. the student should be able to explain microscopy and ph
2. the student should know preparation of stains
3.should have knowledge of general instrumentation
4. should know safety measure in lab
5. should know drug sensitivity

Teaching Methodology:

Methodology	Mention Appropriate Methods (Yes/No)
Explanations by the Instructor	Yes
Group/Pair Work	Yes
Class Discussion	Yes
Assignment/s	Yes
Viva Voice	Yes
Audio/video Class	Yes
yes Practical/ Case Study/Diary	Yes
Presentations	Yes
Hospital Posting	Yes

Course Content

COURSE CONTENT

No	Description	Weightage (%)
1	**1. Microscopy:** Study of compound microscope-magnifying, numerical aperture, resolution and components of microscope. Dark ground illumination care of microscope and common difficulties. Micrometry Study of phase contrast, interference, fluorescent an electron microscope. Preparation of smear for electron microscope. **2. Study of pH in Microbiology:** Methods for measurements pH meter. Preparation, dilution and	20

	chemistry of suspension fluid. Oxidation-reduction redox) potential.	
2	**Preparation of stains:**Making of films, staining methods, mounting media. Gram's stain-Preparation of stain and staining methods. Special stains for AFB, Diphtheria, spores, capsule, intracytoplasmioc lipids, polysaccharides, nuclear material, field's stain, stain for amoeba, fungi and rickettssiae.	40
3	Study of instruments used in medical microbiology- 1. **General Instruments:** Distillation plant, centrifuge Machine, Analytical Balance, Hotplate, Magnetic Stirrer, Water Bath, Automatic Dispensers and diluters, De-idonizer etc. 2. **Microbiological Instruments:** Autoclave, Incubator, Hot air oven, Laminar Air flow, Colony Counter, Muffle furnace, Refrigerator, Inculator, Mac-Intos, intos field- jar etc. 3. **Instruments used in immunology:** Electrophoresis, Immunodiffusion, starplate, chromatography, Elisa reader, automatic washer and RIA equipments etc. 4. **Care and management of experimental animals:** General directions for the care of animals, material inoculated, necropsy common diseases and experimental procedures. Various experimental animals-rabbits, guinea pigs, mice, rat, hamsters' fowls and monkeys-their data, cages, feeding and handling. 5. **Safety measures in Microbiology Laboratory:** Occurrence of lab infections, route of infection in Laboratory, safety measure precaution in use of pathogens in teaching lab organization, management, recording of results and quality control n Medical Microbiology Lab. 6. **Culture and Drug Sensitivity tests:** Culture, isolation and identification of pathogens from urine, pus and sputum and recording of their results.	40
4		

Lecture Plan

Module Number	Module Title	Number of Lectures
Module 1	INTRODUCTION TO MICROSCOPY	
Module 2	STAINING	
Module 3	INSTRUMENTION	

Practical

1. Demonstration of Compound Microscope.
2. Demonstration of Centrifuge
3. Demonstration of Analytical Balance
4. Demonstration of Incubator
5. Demonstration of Hot Air Oven
6. Demonstration of Autoclave
7. Demonstration of Water Bath
8. Demonstration of Colony Counter
9. Demonstration ofLaminar Air flow
10. Any other practical's based on theory paper

Credit Hours: 2/week

Literature/Reference: Lab Manual

Evaluation Scheme

	External	Internal	Total
Assessment (theory)	70	30	100

Evaluation of Practical/Dissertations	35	15	50

Internal Evaluation of Theory	Class TestClass Test(2 best out of 3)	Assignment	Attendance	Total
	20	5	5	30

Textbooks, Supplementary Materials

8. Medical Laboratory Technology by Kanai Lal Mukherjee; Tata McGraw Hill Publishers, New Delhi
9. Textbook of Microbiology by Ananthanarayan and Panikar; Orient Longman, Hyderabad
10. Practical Book of Medical Microbiology by Satish Gupta; JP Brothers, New Delhi
11. Text Book of Medical Microbilogy by Satish Gupta; JP Brothers, New Delhi
12. Text Book of Medical Laboratory Technology by Praful B Godkar; Bhalani Publishing House; Mumbai
13. Medical Laboratory Science Theory and Practice by J Ochei and A Kolhatkar
14. A Textbook of Microbiology New Central Book Agency (P) Ltd By P Chakraborty

Cos\ POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1		✓										
CO2												✓
CO3					✓							
CO4									✓			
CO5												✓

Departmental Quality Assurance Committee Approval			
No.	**Name**	**Digital Signature**	**Date**
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