Department of Clinical Laboratory Technology

Board of Studies Meeting

The minutes of the 17th meeting of Board of Studies held on 05.04.2024 at 10.30 am at the Innovation center.

Members Present:

S.No.	Name	Category
1	Dr. S.Kokila	Chairman
2	Dr.K.R.Muthusami, Chief Biochemist, KMCH, Coimbatore	University Nominee
3	Dr. T.M. Kartikeyan Professor, KMCH Institute of Health Sciences & Research, Coimbatore	Subject Expert
4	Dr. S. Gayathri Devi Professor, Avinashilingam University, Coimbatore	Subject Expert
3	Mr. M.Vasanth Kumar Assistant Professor, CMS College of Science and Commerce, Coimbatore	Meritorious Alumni
4	Dr. M.Thiruselvi	Member
5	Dr.C.Hemalatha	Member
6	Dr. S.Sasikala	Member
7	Dr. K.Anbalagan	Member
8	Ms. R.Swathi	Student Representative

The HoD and Chairman of the department of Clinical Laboratory Technology welcomed and introduced all the members and appreciated them for their continuous support and contribution for the development of academic standard and enrichment of the syllabus.

Further, Chairman informed the inability of the following members to attend the meeting and requested to grant leave of absence.

1. Dr. R. Ragunathan, Director, CBNR, Coimbatore- Industrial Expert
2. Dr. A.Adhiselvam - Co-opted Member

After brief discussion the items of the agenda were taken one by one for discussion and the following resolutions were passed.

Item 17.1: *To review and approve the minutes of the previous meeting held on* ***16.10.2023.***

The chairman of the Board presented the minutes of the previous meeting held on **16.10.2023** and requested the members to approve. After brief discussion the following resolution was passed.

Resolution:

Resolved to approve the minutes of the previous meeting held on 16.10.2023.

Item 17.2: *To consider and approve the scheme and syllabi for I semester for the students admitted during the academic year 2024-2025.*

The chairman presented the detailed Scheme and Regulation for the students admitted during the academic year 2024-25 and syllabi for the I semester. The members deliberated in detail about the modification required. After discussion it is unanimously decided to adopt the following changes.

Changes Made:

Course Code	Course	Change and Reason
24CLU1CA	Core: Human Anatomy and Physiology	Dr. Karthikeyan suggested to include skeletal system in Unit I as it is mandatory topic under anatomy.
24CLU1CB	Core: General Biochemistry	To signify the applications of enzymes, Dr.Gayathri Devi suggested to incorporate the topics isozymes and industrial applications of enzymes in Unit V.
24CLU1IA	IDC: Biochemistry	Dr.Gayathri Devi suggested to incorporate the topics coenzymes and cofactors in Unit IV to emphasize its role in metabolism.

New Courses Introduced:

Course Code	Course	Reason
-	-	-

Courses Removed

Course Code	Course	Reason
-	-	-

After discussion the following resolution was passed.

Resolution:

Resolved to approve the above modification and adopt the revised syllabi for the students admitted during the academic year 2024-2025.

Item 17.3 : *To consider and approve the syllabi for III Semester for the students admitted during the academic year 2023-24.*

The chairman presented the detailed syllabi for III Semester for the students admitted during the academic year 2023-24. The members deliberated in detail about the modification required. After discussion it is unanimously decided to adopt the following changes.

Changes Made:

Course Code	Course	Change and Reason
233CL1A3CA	Core:Clinical Pathology	Dr. K.R. Muthusami recommended to include critical values in Unit I inorder to interpret the clinical reports Dr. Karthikeyan suggested to include Isomorphic in RBC in Unit III as it is a required concept for RBC related disease diagnosis. He also insisted to specify Eosin staining in Sperm viability under Unit V as it is a routine lab practice in pathology.
233CL1A3CB	Core: Histopathology	To expose the recent automation, the following topics have been included as recommended by Dr. Karthikeyan. Unit II: Grossing station, AI in histopathology Unit IV: Immunohistochemistry

233CL1A3CP	Core Practical: Pathology	Dr.Muthusami suggested to include the following experiments to impart the practical skills. Glucose, protein, calcium, bile salt, Ketone bodies and bile pigment has been spelled out under biochemical composition.
233CL1A3SA	SEC: Laboratory Automation and Quality Control	As per the recommendation of Dr. Karthikeyan, automated semen analyser has been added in Unit IV to update with recent practice in laboratories and Supply chain management in Unit V has been included as it is an essential process under lab management.

New Courses Introduced:

Course Code	Course	Reason
-	-	-

Courses Removed

Course Code	Course	Reason
-	-	-

After discussion the following resolution was passed.

Resolution:

Resolved to approve the above modification and adopt the revised syllabi for students admitted during the academic year 2023-2024.

Item 17.4: *To consider and approve the changes in the syllabi for V Semester for the students admitted during the academic year 2022-23.*

The chairman presented the detailed syllabi for the semester V to the students admitted during the academic year 2022-23. The members deliberated in detail about the modification required. After discussion it is unanimously decided to adopt the following changes.

Changes Made:

Course Code	Course Code	Change and Reason
223CL1A5CA	Core: Immunology	The topic classical and alternative pathway has been included in Unit II as suggested by Dr.Muthusami so as to gain in depth knowledge in complement system. Dr.Muthusami suggested to rename the title of Unit V as Transplantation Immunology and vaccination since the concepts of vaccination are included.
223CL1A5CB	Core: Hematology	To ascertain the importance of hematological tests, the below mentioned topics has been included as recommended by Dr.Gayathri Devi. Unit III: Saturation capacity, Coombs test Unit IV – Prothrombin time, INR
223CL1A5CP	Core Practical: Hematological Techniques	Dr.Muthusami insisted to add following experiments to acquire skills in disease diagnosis 1. PT and aPTT Tests 2. ABO blood grouping and Rh titre 3. Demonstration of malarial parasites and microfilaria by thick and thin smear and JSB staining
223CL1A5SA	SEC: Research Methodology and Biostatistics	Dr.Gayathridevi suggested to include the Standard Deviation and t–test in unit V to interpret the significance of research findings. .
223CL1A5DA	DSE - Organisation of Clinical Laboratory and Lab Management	To understand the essence of lab safety, Dr.Muthusami suggested to include the following topics. Personal Protective Equipment and Biosafety - Eye wash, Body wash in Unit I & II respectively. To develop entrepreneurship skill, Dr.Muthusami recommended to add Lab Quality Manager (Role and Responsibilities), NABL, NABH in Unit V.
223CL1A5DB	DSE- Human Genetics and Foetal Medicine	To learn the basic concepts in Foetal Medicine, Dr. Muthusami suggested to include Cord Blood, Placental components in Unit IV Dr.Karthikeyan suggested to add Twins (Homo and heterozygous), Down Syndrome, Tay–Sachs disease, anomaly scan under Antenatal complication, Anomaly scan in Unit V inorder to update the technique involved

		in foetal growth anomalies.
223CL1A5DC	DSE-Clinical Enzymology	The contents of unit III on Clinical Enzymes has been incorporated to understand the sources and medical importance of enzymes as suggested by Dr.Gayathridevi.
223CL1A5GA	GE: Concepts of Health	To create awareness on disease prevention Dr. Muthusami suggested to include communicable and non-communicable diseases in Unit I.

New Courses Introduced:

Course Code	Course	Reason
223CL1A5CQ	Core Practical: Molecular and Immunotechniques	Dr.Karthikeyan suggested to introduce the practical course as it plays a significant role in disease diagnosis and provide employability skills.

Courses Removed

Course Code	Course	Reason
-	-	-

After discussion the following resolution was passed.

Resolution:

Resolved to approve the above modification and adopt the revised syllabi for students admitted during the academic year 2022-23.

Item 17.5: *To consider and approve the PG Diploma in Clinical Laboratory Techniques and Value-Added Certificate Course to be offered during the academic year 2024-25.*

The chairman presented the syllabi for semester I for the students admitted during the academic year 2024-25. The members unanimously decided to retain the existing syllabi of 2023-24 batch without any modification.

The following Value-Added Certificate Courses are to be offered during the academic year 2024-25

- Laboratory Automation
- Medical coding and Underwriting
- Good Clinical Laboratory Practices
- Bioanalytical techniques

Resolution:

Resolved to approve the PG Diploma in Clinical Laboratory Techniques and Value-Added Certificate Course for the academic year 2024-2025.

Item 17.6: *To approve the panel of examiners for question paper setting and evaluation of answer scripts for the odd semester of the academic year 2024-2025.*

The chairman presented the panel of examiners for question paper setting, question paper scrutiny and conduct of practical and theory examinations are submitted to CoE for exam related work.

Resolution:

Resolved to approve the panel of examiners for question paper setting and evaluation of answer scripts for the odd semester of the academic year 2024-2025.

Item 17.7: *To consider and approve any other item brought forward by the Chairman and the members of the board.*

To open up new directions for future research and to resolve practical problems, the board recommended to give case studies as a part of discussion and assignment in the applicable courses.

Finally, the chairman thanked all the members for their cooperation and contribution in enriching the syllabus with active participation in the meeting and sought the same spirit in the future also. The meeting was closed with formal vote of thanks proposed by Dr.S.Kokila, Head and Chairman - Clinical Laboratory Technology.

Date: 05.04.2024 **(Dr. S.Kokila)**

Syllabus Revision

Faculty: Bio Sciences **Board: Clinical Laboratory Technology**
Semester: I
Course Code/ Name: 24CLU1CA, HUMAN ANATOMY AND PHYSIOLOGY

Unit	Existing	Changes
I	Introduction to anatomical terms and organization of the human body. Tissues –Definitions, Types, characteristics, classification, location, functions and formation. Blood – morphology, composition, functions. Peripheral Nervous system and Central Nervous system: Spinal cord, Anatomy, Functions. Structure of neuron, neurotransmitters, nerve impulse, myelinated and non-myelinated nerve. Brief account of resting membrane potential, action potential and conduction of nerve impulse, and exocrine & Endocrine- an overview	Skeletal system
II	Circulatory system – Structure of the Heart, Blood Vessels -Structure of arterial and venous system. Definitions of cardiac output, stroke volume, principles of measurements of cardiac output. Normal values of blood pressure, heart rate and their regulation in brief	
III	Parts- Nasal cavity and Paranasal air sinuses, trachea, Gross and microscopic structure of lungs, Diaphragm and Pleura. Principles of respiration, respiratory muscles, lung volumes and capacities, collection and composition of inspired alveolar and expired airs. Transport of oxygen and carbondioxide. Digestive System: Parts, Structure of Tongue, Salivary glands, stomach, Intestines, Liver, Pancreas. functions of G.I secretions, principles of secretion and movements of GIT	
IV	Parts, structure of Kidney, Ureters, Urinary Bladder and Urethra, Structure of Nephron, measurement and regulation of GFR, mechanism of urine formation. Clearance tests- urea & creatinine. Reproductive System: Parts of the system. Gross structure of both male and female reproductive organs	
V	Gross and microscopic structure of lymphatic tissue. Special Senses: Structure of Skin, Eye, Nose, Tongue (Auditory and Olfactory apparatus). Anatomical Techniques: Embalming of human cadaver, Museum Techniques	

PERCENTAGE OF SYLLABUS REVISED: 5 %

COURSE FOCUS ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Bio Sciences **Board: Clinical Laboratory Technology**

Semester: I

Course Code/ Name: 24CLU1CB, GENERAL BIOCHEMISTRY

Unit	Existing	Changes
I	An overview of cells and their molecular composition:- prokaryotic and eukaryotic cells and their comparison , Function of cells. Cell organelles and their functions: Cell membrane, Endoplasmic reticulum, Golgi apparatus, lysosomes, peroxisomes and glyoxysomes. Mitochondria, Cytoskeleton and Nucleus	
II	Carbohydrates: Classification, Properties, biological significance and functions of monosaccharides, disaccharides and polysaccharides. Lipids: Definition; classification, significance and functions of lipids-simple, compound and derived lipids. Steroids- functions	
III	Amino acids: Definitions, classification of essential and non-essential amino acids. Classification of proteins, Peptide linkage, Structure of proteins- primary, secondary and tertiary. Properties of peptides and proteins, Examples: albumin, globulins. Protein denaturation.	
IV	Structure of purines and pyrimidines; nucleotides and nucleosides, DNA. Double helical structure, A, B & Z forms of DNA; DNA denaturation and renaturation, functions. RNA: Types and functions. Vitamins: Definition, classification, Sources physiological functions of water and fat soluble vitamins. Minerals: Mineral requirement, essential macro and micro minerals: - Sources and functions	.
V	Names of endocrine glands & their secretions, functions of various hormones- hypothalamus, Pituitary, thyroid, adrenal, male and female reproductive hormones. Brief account of these hormonal disorders	Isozymes, industrial applications of enzymes,

PERCENTAGE OF SYLLABUS REVISED: 7 %

COURSE FOCUS ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Bio Sciences **Board: Clinical Laboratory Technology**

Semester: III

Course Code/ Name: 233CL1A3CA, Core: Clinical Pathology

Unit	Existing	Changes
I	Analytical measures - Importance of pre-analytical measures and post-analytical measures, Generation of request, Instructions for sample collection, Rejection criteria and preservation, dispatch of reports, records keeping, Coding and Indexing	Critical values
II	Formation of urine, Macroscopic Examination –Volume, Colour, transparency, pH and Specific gravity. Normal and Abnormal constituents in urine. Microscopical examination – Cells (RBC, WBC), casts, crystals, Bacteria. Detection of microalbumin and 24 hours urine protein estimation (Isomorphic and dismorphic RBCs	
III	Macroscopic examination and Microscopic examination of motion for colour, mucus, consistency, ova, ameba, cysts, parasites, pus cells, RBC and crystals. Detection of occult blood in stool and concentration techniques	Isomorphic in RBC
IV	Examination of body fluids, cell counts and biochemical Analysis : Collection and preservation, Collection and Examination of ascitic fluid , pleural fluid, synovial fluid, pericardial fluid, cerebro spinal fluid and amniotic fluid and pathological studies	
V	Sample Collection protocol, Macroscopic Examination and Microscopic examination of semen, liquefaction time, volume, colour, pH, motility of sperm, sperm count and other findings. Staining, morphological study, pathophysiology and vitality of spermatozoa, semen fructose determination and antisperm antibodies	Eosin staining

PERCENTAGE OF SYLLABUS REVISED: 7 %

COURSE FOCUS ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Bio Sciences **Board: Clinical Laboratory Technology**

Semester: III

Course Code/ Name: 233CL1A3CB, Core: Histopathology

Unit	Existing	Changes
I	Guidelines for receiving specimen in laboratory –Examination of specimen, specimen containers, Grossing and Preservation. Preservatives - Various fixatives – Mode of action, Indications, preparation, Decalcification, Processing of tissues for routine paraffin sections and methods of embedding, Introduction on different types of stains, Discarding of histopathological specimens and safe disposal of reagents.	
II	Tissue Processor- Difference between Manual tissue processor and Automated tissue processor, Types of microtome, Parts of Microtome- knives and Knife sharpener, Instruments for grossing, Automatic slide stainer, Automated cover slipper and Digital slide scanner.	Grossing station, AI in histopathology
III	Principle and Types of Microscopy - . Use of microscope – Polarisers, Introduction to Electron Microscopy, Introduction to immunohistochemistry and preparation and processing, technique of preparing slides, Types of glass slides and cover slips.	
IV	CO2 Freezing, cryostat and freezing microtome. Principles and techniques of sections cutting, staining and staining principles, preparation of reagents and techniques , routine staining ,special staining (any five) , Mounting techniques and care of cryostat.	Immunohistochemistry
V	Maintenance of records, filing and storage of specimen, wax blocks and slides. Microphotography – Photography and interfacing technique. Museum technology - preservation and organisation, Coding - ICDS – Introduction and importance.	

PERCENTAGE OF SYLLABUS REVISED: 10 %

COURSE FOCUS ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Bio Sciences **Board: Clinical Laboratory Technology**
Semester: III
Course Code/ Name: 233CL1A3CP, Practical: Pathology

Existing	Changes
1. Collection, preservation and storage of urine sample and Physical Examination of urine 2. Bio chemical examination of urine: 3. Microscopic examination of urine 4. Physical examination of stool 5. Chemical examination of stool 6. Microscopic examination of stool 7. Preparation of staining reagents 8. Preparation of various fixatives 9. Tissue processing 10. Tissue embedding and section cutting 11. Staining and mounting of tissues 12. Body Fluids - CSF, Pleural, Peritoneal, Synovial, Semen Analysis- Demonstration	Glucose, protein, calcium, bile salt, Ketone bodies and bile pigment

PERCENTAGE OF SYLLABUS REVISED: 9 %
COURSE FOCUS ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Bio Sciences **Board: Clinical Laboratory Technology**

Semester: III

Course Code/ Name: 233CL1A3SA, SEC: LABORATORY AUTOMATION AND QUALITY CONTROL

Unit	Existing	Changes
I	Functional components of clinical laboratories, cleanliness, precautions to be taken with respect to patients, reports and analysis. Communication between physician, patients and the medical laboratory professional. Basic needs of clinical laboratory technician and awareness of soft skills.	
II	Identification, use and maintenance of equipments, Handling and cleaning of common laboratory glassware. Principle and use of Centrifuge, Colorimeter, Oven, Incubator, Laminar air flow chamber, Microscope, Neubauer chamber, Autoclave and Makler chamber for Semen analysis.	
III	Quality Assurance in clinical Laboratory - Introduction, Common terms used in Quality control (QC), Westgard rules and L.J. Chart. Internal QC and External QC, Proficiency testing and inter lab comparison -Assessment, corrective action and preventive action. Total Quality management- water quality, electrical stability, equipment calibration, glassware and preventive measures.	
IV	Automation and Recent advances - Need for Automation, Advantages of Automation Types of Auto Analysers - Semi and Fully automated, Routine biochemistry analysers, Ion selective electrodes (ISE), Immuno-based analysers, Hematology analysers - Cell counters, Coagulometers, ESR Analyser, Peripheral smear makers and stainers, Platelet aggregation analysers , Bar coding and Total Laboratory Automation (TLA	Automated semen analyser
V	Laboratory informatics- data acquisition, data processing, laboratory information management system (LIS), scientific data management and Hospital information management system (HIS). Auto validation of reports and Artificial intelligence in lab.	Supply chain management

PERCENTAGE OF SYLLABUS REVISED: 10 %

COURSE FOCUS ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Bio Sciences **Board: Clinical Laboratory Technology**
Semester: V
Course Code/ Name: 223CL1A5CA, Immunology

Unit	Existing	Changes
I	Historical development of the science of the immunology. Innate and acquired immunity, Antibody mediated and cell mediated immunity. Primary and secondary lymphoid organs. Cells of immune system - T, B and NK cells. Receptors on the surface of lymphocytes. Structure and functions of neutrophils, Macrophages (phagocytosis and inflammation), eosinophils and basophils	
II	Antigen: Properties, Specificity and Cross reactivity, antigenicity, immunogenicity, antigen determinants, Haptens, adjuvants, Self antigens (MHC) an outline only. Antibodies: Properties, classes and subclasses of immunoglobulin: Structure, specificity and distribution, Clonal selection theory of antibody formation. Cytokines and their functions. Complement components	classical and alternative pathway
III	Antigen-antibody interaction – Precipitation and agglutination. Precipitation in gel. Immuno diffusion and Immuno electrophoresis. Agglutination: Slide agglutination, Widal test. Principle and application of RIA, ELISA, Fluorescent antibody technique. Applications of immuno assay turbidometric, electro chemiluminescence assay. Monoclonal antibodies and their application	
IV	Allergy and Hypersensitivity – Type I, II, III and IV and clinical manifestations. Immuno Disease: Rheumatoid arthritis, Myasthenia gravis and Muscular dystrophy. Immunity to bacteria and viruses. Skin Test: Montex and Penicillin test.	
V	Transplantation: Tissue cross matching, HLA – class I & II. Allograft rejection: Graft Vs Host Diseases: Immuno suppressors: mechanism of graft rejection. Resistant to tumors: NK Cells: Tumor immuno therapy. Vaccination: Passive and active immunization, Recombinant vaccines: DNA vaccines and RNA Vaccine. Benefits and adverse effects of vaccination. AIDS - structure of HIV and clinical manifestation.	vaccination

PERCENTAGE OF SYLLABUS REVISED: 5 %

COURSE FOCUS ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Bio Sciences **Board: Clinical Laboratory Technology**
Semester: V
Course Code/ Name: 223CL1A5CB, HEMATOLOGY

Unit	Existing	Changes
I	Blood, Blood collection, Anticoagulants used in Hematology, Normal values in Hematology, Basic Hematological tests: RBC Count, Hemoglobin estimation, Packed cell volume, WBC counts - Total and differential, Absolute eosinophil Count, Platelet count, Erythrocyte sedimentation rate , Reticulocyte count.	
II	Preparation of blood films, Stains used in Hematology, Morphology of red cells, Morphology of Leukocytes and platelets, Bone marrow - Techniques of aspiration, preparation and staining of films, Bone marrow biopsy, Preparation of buffy coat smears.	
III	B12 and folate assay, Serum iron and iron bonding capacity - saturation capacity, Laboratory methods used in the investigation of hemolytic anemias : Osmotic fragility , Investigation of G-6 PD deficiency , Test for sickling , Estimation on of Hb-F,Hb-A2 , Test for auto immune hemolytic anemia - Direct Coombs test , Measurements of abnormal Hb pigments.	Saturation capacity, Coombs test
IV	Mechanism of coagulation, Bleeding time and clotting time, Other coagulation studies: PT, aPTT, Mean Prothrombin Time (MPT) , International normalized Ratio(INR), Fibrinogen. Assay of clotting factors. Test for blood fibrinolytic activity, fibrinogen mixing study, Prothrombin time, detection of D-dimers, Platelet function tests.	Prothrombin time, INR
V	Automated ESR, Automated coagulometers, Diagnosis of hemoglobinopathies by HPLC,Hemoglobin electrophoresis, Cell counts (Automated hematology analysers) ,Organization and quality control in hematology laboratory.	

PERCENTAGE OF SYLLABUS REVISED: 6 %
COURSE FOCUS ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Bio Sciences **Board: Clinical Laboratory Technology**
Semester: V
Course Code/ Name: 223CL1A5CP Core Practical: Hematological Techniques

Existing	Changes
1. Hemoglobin estimation by Cyanmethemoglobin method. 2. Total R.B.C count and W.B.C count. 3. Differential W.B.C Count 4. Platelet count. 5. Absolute Eosinophil and Reticulocyte count. 6. Bleeding time, clotting time 7. Preparation of blood smears and staining with Leishmann's stain. 8. Preparation of Buffy coat smears. 9. Packed cell volume- Wintrobe's method. 10. Erythrocytes sedimentation rate- Westergren method. 11. Osmotic fragility test. 12. Sickling test	1. PT and aPTT Tests 2. ABO blood grouping and Rh titre 3. Demonstration of malarial parasites and microfilaria by thick and thin smear and JSB staining

PERCENTAGE OF SYLLABUS REVISED: 41 %
COURSE FOCUS ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Bio Sciences **Board: Clinical Laboratory Technology**
Semester: V **Course Code/ Name:** 223CL1A5SA
SEC : RESEARCH METHODOLOGY AND BIOSTATISTICS

Unit	Existing	Changes
I	Meaning of Research, Types of Research. Research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem.	
II	Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations. Effective literature studies approaches, analysis Plagiarism and Research ethics.	
III	Preparation of Research Papers and Dissertation, Illustrations and Tables. Guidelines for writing the research paper. Efficient technical writing and how to write a report. Developing a Research Proposal, Format of research proposal.	
IV	Introduction Biostatistics - Definition, steps in statistics, Sampling Design-Principles of sampling, Census and sampling, Essential of sampling, Methods of sampling – Random sampling and Non-random sampling, Statistical laws- law of statistical regularities, law of inertia of large numbers, Statistical errors. (Theory only	
V	Classification and Tabulations, Diagrammatic representation of data- Bar diagram, Pie diagram, Graphical presentation of data - Histogram, Frequency polygon, Frequency curve, Ogive, Pictograph. Measures of Central Tendency- Definition, Objectives, Characteristics, Types- Mean, median and mode, Merits and demerits.	Standard Deviation and t–test

PERCENTAGE OF SYLLABUS REVISED: 5 %
COURSE FOCUS ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Bio Sciences **Board: Clinical Laboratory Technology**
Semester: V
Course Code/ Name: 223CL1A5DA DSE: ORGANISATION OF CLINICAL LABORATORY AND LAB MANAGEMENT

Unit	Existing	Changes
I	Introduction, Functional Components of Clinical Laboratories, Clinical Laboratory Set up -Laboratory building and space, Physical aspects of laboratory, Universal work precautions (UWP) for lab personnel (HIV), Medico-legal aspects of clinical practice.	Personal Protective Equipment
II	Laboratory Safety - Common causes of Laboratory Hazards, Types of laboratory hazards, Biomedical Waste – Classification, treatment and disposal, Biosafety Levels.	Biosafety - Eye wash, Body wash
III	Sterilization techniques - Sterilization by heat (Hot air oven, Autoclave), Sterilization by filtration (Membrane filter & HEPA), Sterilization by radiation (Ionizing and Non- ionizing), Sterilization by chemical (Alcohol, Phenols, Aldehydes, Ethylene oxide	
IV	Operations Management- planning of activities, organizing, directing and controlling. Personnel management - Personnel policy manual; job descriptions, conducting job interviews; motivation, recognizing job distress syndrome; delegation to a laboratory manager. Service Management - Patient management for clinical sample collection, transportation and preservation, Sample accountability, Purpose of accountability, Methods of accountability.	
V	Total quality management; development and monitoring of performance indicators Introduction and Importance of Audit, NABL & CAP. Responsibility, Planning, Horizontal, Vertical and Test audit, Frequency of audit, Documentation.	Lab Quality Manager (Role and Responsibilities), NABL, NABH

PERCENTAGE OF SYLLABUS REVISED: 16 %
COURSE FOCUS ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Bio Sciences **Board: Clinical Laboratory Technology**
Semester: V
Course Code/ Name: 223CL1A5DB DSE- Human Genetics and Foetal Medicine

Unit	Existing	Changes
I	Model systems in Genetic Analysis: Bacteriophage –Lytic and Lysogenic cycle, E. coli – Fission and Conjugation, Yeast, Maize, Drosophila, Rattus albicans, Homo sapiens - General outline of life cycle and importance in Genetic analysis.	
II	Principle of Genetic Transmission – Gene, Mendel's Laws - Laws of inheritance, Concept of dominance, Law of segregation, Independent assortment, Chromosome theory of inheritance, Allelic and Non-allelic interactions: Concept of alleles, Types of dominance with example, Alleles types, Test of allelism- Compliment Test and Epistasis.	
III	Concepts of linkage, recombination, gene mapping in prokaryotes and eukaryotes, Sex-linked inheritance: Conceptual basis, sex influenced traits, mechanism of sex determination in Drosophila and Human. Quantitative inheritance – Concept, Genes and Environment - heritability, penetrance and expressivity.	
IV	General embryology –Sperm and Ovum, Ovulation to implantation – Zygote formation, Development of amniotic sacs, Placenta and Membranes, Placental and Cord blood components, Development of main organ systems, Teratogens - Mechanism of teratrogenesis, Types of teratrogens and its effects.	Cord Blood, Placental components
V	Twins (Homo and heterozygous), Triplets and more, Inherited antenatal complications – Down Syndrome, Tay–Sachs disease, Anomaly scan, IUF death. Perinatal infectious diseases – Toxoplasmosis, CMV, Herpes, HBV, HIV, HPV, Rubella, streptococcal infection and syphilis.	Double marker analysis

PERCENTAGE OF SYLLABUS REVISED: 9 %
COURSE FOCUS ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Bio Sciences **Board: Clinical Laboratory Technology**
Semester: V
Course Code/ Name: 223CL1A5DC DSE- Clinical Enzymology

Unit	Existing	Changes
I	Introduction to enzymes: nomenclature, classification and characteristics of enzymes, enzyme specificity, activators, inhibitors, active site, metalloenzymes, isozymes and multienzyme complexes, units of enzyme activity, factors affecting enzyme activity, measurement of enzyme activity.	
II	Coenzymes - prosthetic group, classification - vitamin and nonvitamin coenzymes, thiamine pyrophosphate, FMN and FAD - flavoprotein enzymes, NAD and NADP role in enzyme catalysis, PALP and PAMP, coenzyme A, biotin, folate coenzymes, coenzyme vitamin Bl2, Cofactors and prosthetic group.	
III	Enzymes as analytical reagents, immobilized enzymes, applications of enzymes, industrial uses of enzymes - sources of industrial enzymes, thermophilic enzymes, amylases, glucose isomerases, cellulose degrading enzymes, lipases, proteolytic enzymes in meat and leather industry, detergents and cheese production.	Clinical Enzymology - functional plasma enzymes and nonfunctional plasma enzymes. Sources of non-functional plasma enzymes. Medical importance of non-functional plasma enzymes. Diagnostic precision of plasma enzyme analysis. Factors affecting results of plasma enzyme assays.
IV	Therapeutic use of asparginase, streptokinase. Diagnostic enzymes. Immobilization of enzymes and their applications. Therapeutic uses of Abzymes and Isoenzymes. Isolation and purification of enzymes from liver and blood.	
V	Serum enzymes in Heart diseases: CK, LDH, Aspartate aminotransferase, Alanine aminotransferase, γglutamyltransferase and Histaminase. Serum enzymes in Liver diseases: SGOT, SGPT, Serum Alkaline phosphatase. Serum enzymes in GI Tract diseases: Amylase, Lipase, Serum enzymes in Muscles diseases : Aldolase, CPK, Serum enzymes in Bone diseases and Enzymes in Malignancy.	

PERCENTAGE OF SYLLABUS REVISED: 32 %
OURSE FOCUS ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Bio Sciences **Board: Clinical Laboratory Technology**
Semester: V
Course Code/ Name: 223CL1A5GA GE: Concepts of Health

Unit	Existing	Changes
I	Health- Definition, Health and quality of life, Hygiene. Food factors for human beings and their requirements. Calorific value of food. Obesity: Definition and classification, Genetic and environmental factors leading to obesity, Obesity related diseases	Communicable and non-communicable diseases
II	Diabetes: Normal level of Blood sugar, types of Diabetes mellitus, GTT, HbA1c, Insulin and Glucagons, Etiology and pathogenicity, Diabetic insipidus, Management of diabetes	
III	Cardiovascular diseases: Reference level of Lipid profile, Cholesterol and Lipoproteins, Types of Cardiac diseases- Myocardial infarction- Signs and Symptoms, Risk factors.	
IV	Kidney Stones – Types of kidney stones and factors causing kidney stones, Diet and Prevention. Cancer – Types, Food habits and its preventive measures	
V	Health Insurance: Different types of health insurance policy, Individual, family mediclaim policy, domiciliary hospitalization, Group Mediclaim Policy, health insurance for senior citizens, Government and private policies	

PERCENTAGE OF SYLLABUS REVISED: 5 %
COURSE FOCUS ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

ATTENDANCE OF THE SEVENTEENTH BOARD OF STUDIES MEETING

Faculty: Biosciences **Board: Clinical Laboratory Technology**

S. No.	Name	Position	Signature
1	Dr.S.Kokila Assistant Professor & Head Department of Clinical Lab Technology Dr. N. G. P. Arts and Science College, Coimbatore	Chairman	5/4/24
2	Dr.K.R.Muthusami Chief Biochemist, Deprtment of Biochemistry KMCH Institute of Laboratory Medicine KMCH, Coimbatore - 641 048.	Member (Subject Expert) University Nominee	05/04/24
3	Dr. T.M. Kartikeyan Professor, Department of Pathology KMCH Institute of Health Sciences & Research, Coimbatore - 641 014.	Member (Subject Expert)	5/4/24
4	Dr. S.Gayathri Devi Professor, Department of Biochemistry Biotechnology & Bioinformatics Avinashilingam University Coimbatore - 641043	Member (Subject Expert)	5/4/24
5	Dr.R.Ragunathan Director, Centre for Bioscience and Nanoscience Research Coimbatore – 641021	Member (Industry Expert)	Absent
6	M. Vasanth Kumar Assistant Professor, Department of Criminology, CMS College of Science and Commerce ,Coimbatore .	Alumni	5/4.24
7	Dr.A. Adhiselvam Associate Professor & Head i/c Department of Information Technology Dr. N. G. P. Arts and Science College, Coimbatore	Co-opted Member	Absent

8	Ms.R Swathi III B.Sc. CLT Dr.N.G.P. Arts and science College	Student Representatives	
9	Dr.M.Thiruselvi Professor Dept of CLT Dr.N.G.P.Arts and science College	Member	
10	Dr.S.Sasikala Associate Professor Dept of CLT Dr.N.G.P.Arts and science College	Member	
11	Dr.C.Hemalatha Assistant Professor Dept of CLT Dr.N.G.P.Arts and science College	Member	
12	Dr.K.Anbalagan Assistant Professor Dept of CLT Dr.N.G.P.Arts and science College	Member	

Date : 05.04.2024

Place : Coimbatore

Academic Council
CHAIRMAN
Dr.N.G.P. Arts and Science College

05/04/24.

Board Chairman

(Dr.S.Kokila)

BoS Chairman/HoD
Department of Clinical Laboratory Technology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048