



## Dr. Umayal Ramanathan College for Women

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Affiliated to Alagappa University

(Estd. by Dr. Alagappa Chettiar Educational Trust)

Karaikudi - 3



### DEPARTMENT OF MICROBIOLOGY AND CLINICAL LAB TECHNOLOGY

Programme: B. Sc., Microbiology & CLT

Course outcomes of all courses under regulations 2023

Semester I	
<b>Course Name &amp; Code: தமிழ் இலக்கிய வரலாறு - I - 2311T</b>	
CO1	சங்க இலக்கியத்தில் காணப்பெறும் வாழ்வியல் சிந்தனைகளை அறிந்து கொள்வர்
CO2	அற இலக்கியம் மற்றும் தமிழ் காப்பியங்களின் வழி வாழ்வியல் சிந்தனையைப் பெறுவர்
CO3	பக்தி இலக்கியங்களைக் கற்பதன் மூலம் பக்தி நெறியினையும், பகுத்தறிவு இலக்கியங்களைக் கற்பதன் வழி நல்லிணக்கத்தையும் தெரிந்து பின்பற்றுவர்
CO4	மொழியறிவோடு சிந்தனைத் திறனைப் பெறுவர்
CO5	மொழிப் பயிற்சிக்குத் தேவையான இலக்கணங்களைக் கற்பர்
<b>Course Name &amp; Code: – Hindi ka Samanya Gyan, Vyakaran aur Nibandh - 2311H</b>	
CO1	Introduction to Hindi sounds
CO2	Sentence formation in Hindi
CO3	Acquisition of Hindi Vocabulary
CO4	Reading of stories and other passages
CO5	Modules to increase language ability through general essays based on competitive exams
<b>Course Name &amp; Code: General English – I - 2312E</b>	
CO1	Acquire self-awareness and positive thinking required in various life situations.
CO2	Acquire the attribute of empathy.
CO3	Acquire creative and critical thinking abilities.
CO4	Learn basic grammar.
CO5	Development and integrate the use of four language skills i.e., listening, speaking, reading and writing.
<b>Course Name &amp; Code: Cell Biology - 23BMC1C1</b>	
CO1	The students will get depth knowledge in fundamental principles of cellular biology
CO2	Able to understand the principles behind cell movement, cell growth, cell division, cell death, and cell signaling.
CO3	Aware of the pathways of intracellular receptors
<b>Course Name &amp; Code: Lab in Cell Biology - 23BMC1P1</b>	
CO1	The students are being able to identify standard methods for the isolation, identification and culturing of microorganisms.
CO2	The students can be able to identify the different groups of microorganisms from different habitats.
<b>Course Name &amp; Code: Allied Biochemistry I - 23BBCA1</b>	
CO1	Classify the structure of carbohydrates and its properties
CO2	Explain the metabolism of carbohydrates and its significance
CO3	Classify amino acids and its properties

<b>CO4</b>	Explain the classification and elucidate the different levels of structural organization of proteins
<b>CO5</b>	Identify the disease caused by the deficiency of vitamins
<b>Course Name &amp; Code: Allied Biochemistry Practical-I - 23BBCAP1</b>	
<b>CO1</b>	Qualitatively analyze and report the type of carbohydrate based on specific tests
<b>CO2</b>	Quantitatively estimate the carbohydrates, amino acids and ascorbic acid
<b>CO3</b>	Estimate protein by colorimetric method
<b>Course Name &amp; Code: Skills in Microbiology and Clinical Laboratory - 23BMC1S1</b>	
<b>CO1</b>	Understand sterilization, disinfection, and aseptic techniques
<b>CO2</b>	Comprehend host-pathogen interactions
<b>CO3</b>	Apply basic haematology and clinical biochemistry techniques
<b>CO4</b>	Explore antimicrobial drugs, antibiotics, and vaccines
<b>CO5</b>	Familiarize with diagnostic methods and medical imaging
<b>Course Name &amp; Code: Introduction to Clinical Lab Diagnosis - 23BMC1FC</b>	
<b>CO1</b>	The students will gain knowledge on standard methods and techniques in the laboratory
<b>CO2</b>	Understand and acquire knowledge on basic laboratory glasswares and instruments.

<b>Semester II</b>	
<b>Course Name &amp; Code: தமிழ்இலக்கியவரலாறு - II - 2321T</b>	
<b>CO1</b>	சுற்றிலக்கியங்களின் வழி இலக்கியச் சுவையினையும் பண்பாட்டின் அறிவினையும் பெறுவர்.
<b>CO2</b>	புதுக்கவிதை வரலாற்றினை அறிந்து கொள்வர்.
<b>CO3</b>	திராவிடஇயக்க இலக்கியங்களைக் கற்பதன் மூலம் மொழிஉணர்வு, இன உணர்வு, சமத்துவம் சார்ந்த சிந்தனையைப் பெறுவர்.
<b>CO4</b>	தமிழ் மொழியைப் பிழையின்றி எழுதவும் புதிய கலைச் சொற்களை உருவாக்கும் அறிந்து கொள்வர்.
<b>CO5</b>	போட்டித்தேர்வுகளில் வெற்றி பெறுவதற்குத் தமிழ் பாடத்தினைப் பயன் கொள்ளும் வகையில் பயிற்சி பெறுவர்.
<b>Course Name &amp; Code: Kahani, Ekanki aur Vyakran - 2321H</b>	
<b>CO1</b>	Get an introduction to Hindi fiction
<b>CO2</b>	Social values are taught through stories.
<b>CO3</b>	Development of critical ability through reading novels.
<b>CO4</b>	Practical application of grammar
<b>CO5</b>	Modules related to fiction based on competitive examinations.
<b>Course Name &amp; Code: General English – II - 2312E</b>	
<b>CO1</b>	Realize the importance of resilience
<b>CO2</b>	Become good decision-makers
<b>CO3</b>	Imbibe problem-solving skills
<b>CO4</b>	Use tenses appropriately
<b>CO5</b>	Use English effectively at the work place.
<b>Course Name &amp; Code: General Microbiology - 23BMC2C1</b>	
<b>CO1</b>	Can clearly understand the history and classification of bacteria
<b>CO2</b>	The students are getting depth knowledge of various types of microscopes and their application.
<b>CO3</b>	Able to understand various (physical and chemical) methods of control of microorganisms
<b>CO4</b>	The students are aware of the structure of bacterial cells and also the staining methods used to identify the bacteria
<b>CO5</b>	Can clearly understand the history and classification of bacteria

**Course Name & Code: Lab in General Microbiology - 23BMC2P1**

<b>CO1</b>	The students are be able to identify standard methods for the isolation, identification and culturing of microorganisms
<b>CO2</b>	The students can able to identify the different groups of microorganisms from different habitats

**Course Name & Code: Allied Biochemistry II - 23BBCA2**

<b>CO1</b>	Elaborate on classification, structure, properties, functions and characterization of lipids
<b>CO2</b>	Discuss the metabolism of lipids and its importance
<b>CO3</b>	Explain about structure, properties and functions of nucleic acids
<b>CO4</b>	Derive Michaelis Menten equation and concepts of enzyme inhibition
<b>CO5</b>	Classify the Hormones and its biological functions

**Course Name & Code: Allied Biochemistry Practical II - 23BBCAP2**

<b>CO1</b>	Qualitatively analyze the amino acids and report the type of amino acids based on specific tests
<b>CO2</b>	Prepare the macronutrients from the rich sources
<b>CO3</b>	Check the quality of edible oil

**Course Name & Code: Human Anatomy and Haematology - 23BMC2S1**

<b>CO1</b>	Identify the structure and functions of internal organs
<b>CO2</b>	Acquire knowledge on cellular level and tissue level organizations
<b>CO3</b>	Identify the structure and functions of the blood cell.
<b>CO4</b>	Correlate hematological findings with those generated in other areas of the clinical laboratory

**Course Name & Code: Microbial Physiology and Metabolism - 23BMC2S2**

<b>CO1</b>	Know the various phases involved in the microbial growth
<b>CO2</b>	Understand the general concepts of pathways in microbial metabolism
<b>CO3</b>	Acquire a clear idea of the role of photosynthetic pigments and the mechanism of photosynthesis

**Semester III****Course Name & Code: தமிழகவரலாறும்பண்பாடும்-2331T**

<b>CO1</b>	தமிழக வரலாற்றை அறிந்துகொள்வர்.
<b>CO2</b>	தமிழரின் தொன்மையை அறிவர்.
<b>CO3</b>	தமிழரின் பண்பாட்டினை அறிந்துகொள்வர்.
<b>CO4</b>	பிற பண்பாட்டுத்தாக்கம் ஏற்படும் முறையினை அறிவர்.
<b>CO5</b>	தமிழரின் வரலாற்றுத் தொன்மையையும் பண்பாட்டு பழமையையும் அறிந்து கொள்வர்.

**Course Name & Code: Patra Lekhan aur Paribhashik Shabdavali - 2331H**

<b>CO1</b>	Providing knowledge of Letter writing in Hindi
<b>CO2</b>	Telling about the rules of Official Correspondence
<b>CO3</b>	Providing knowledge of Official language Hindi
<b>CO4</b>	Providing practice on Drafting and noting
<b>CO5</b>	Knowing about the names of posts, names of sections and related terminology

**Course Name & Code: General English -III-2332E**

<b>CO1</b>	Listen actively
<b>CO2</b>	Develop interpersonal relationship skills
<b>CO3</b>	Acquire self - confidence to cope with stress
<b>CO4</b>	Master grammar skills
<b>CO5</b>	Carryout business communication effectively

**Course Name & Code: Clinical Biochemistry- 23BMC3C1**

<b>CO1</b>	The students are able to understand the basic fundamentals of Bio molecules
<b>CO2</b>	The students can able to identify the different groups of enzymes from different habitats and their clinical importance.
<b>Course Name &amp; Code: Lab in Clinical Biochemistry- 23BMC3P1</b>	
<b>CO1</b>	Collect the blood sample from patients
<b>CO2</b>	Identify the sugar level in the urine, blood glucose, cholesterol, and iron
<b>CO3</b>	Perform staining techniques and calculate the levels of uric acid and Creatinine
<b>CO4</b>	Isolate and identify the peripheral cells
<b>Course Name &amp; Code: Clinical Laboratory Technology - 23BMIA3</b>	
<b>CO1</b>	Describe characteristics of laboratory organizations and demonstrate professionalism by displaying professional conduct, model ethical behaviour and operate as a vital member of the medical lab team. Practice safety or infection control procedures in the clinical laboratory, properly use safety equipment and maintain a clean, safe work environment
<b>CO2</b>	Accurately collect specimens for various purposes. Determine appropriate tests based on test request, Maintain standard and transmission-based precautions, Engage in the scientific process by understanding the principles and practices of clinical study design, implementation, and dissemination of results
<b>CO3</b>	Identify the basic structure of cells, tissues and organs and describe their contribution to normal function. Interpret light and electron microscopic histological images and identify the tissue source and structures. Relate and recognize the histological appearance of affected tissues to the underlying pathology
<b>CO4</b>	Recognize the pathologies behind benign and malignant disorders of erythrocytes, leucocytes, thrombocytes and familiar with the diagnosis, evaluation, and management of hematologic malignancies.
<b>CO5</b>	Interpret, implement, and complying with laws, regulations and accrediting standards and guidelines of relevant governmental and non-governmental agencies.
<b>Course Name &amp; Code: Clinical Laboratory Technology Practical - 23BMIAP3</b>	
<b>CO1</b>	Accurately determine ABO and Rh blood groups using standard laboratory methods, ensuring proper transfusion compatibility and diagnostics.
<b>CO2</b>	Perform qualitative analysis of urine sugar and quantitative analysis of blood glucose, aiding in the diagnosis and management of diabetes mellitus.
<b>CO3</b>	Perform protein estimation in serum samples, understanding its clinical significance in diagnosing and monitoring conditions such as liver and kidney disorders
<b>CO4</b>	Demonstrate proficiency in preparing blood agar media and interpret hemolysis patterns to identify pathogenic organisms, particularly haemolytic bacteria
<b>CO5</b>	Conduct antibiotic sensitivity testing to determine the effectiveness of antimicrobial agents against specific pathogens and also evaluate the minimum inhibitory concentration of antibiotics against microbial strains, ensuring a deeper understanding of dosage optimization and resistance management
<b>Course Name &amp; Code: Entrepreneurship- 23BMC3S1</b>	
<b>CO1</b>	To understand the significance of entrepreneurship and entrepreneur qualities
<b>CO2</b>	To know about the developing ideas and techniques of business
<b>CO3</b>	To understand about the procedures of start-up
<b>CO4</b>	To identify the institutional support provided to entrepreneurs
<b>CO5</b>	To analyse the women entrepreneurship development
<b>Course Name &amp; Code: Medical Microbiology - 23BMC3S2</b>	
<b>CO1</b>	The student will be able to explain general and specific mechanisms by which an infectious agent causes disease

<b>CO2</b>	The student will be able to describe the epidemiology of infectious agents including how infectious diseases are transmitted
<b>Course Name &amp; Code: Adipadai Tamil -233AT</b>	
<b>CO1</b>	தமிழ்உயிமெழுத்துவடிவங்கடைஅறிந்துமகொள்வர்
<b>CO2</b>	மமய்யமுத்துக்கள்வடிவங்கடைஅறிந்துமகொள்வர்
<b>CO3</b>	எழுதும்பயிற்சிமபறுவர்
<b>CO4</b>	மசொற்கடைஅறிவர்
<b>CO5</b>	எழுத்துக்கள்ஒலிக்கும்முடறஅறிவர்

<b>Semester IV</b>	
<b>Course Name &amp; Code: Tamilum Ariviyalum -2341T</b>	
<b>CO1</b>	தாய்மொழி வழியாக அறிவியல் பற்றி சிந்தித்து செயலாற்றும் திறன் பெற்றிருப்பர்.
<b>CO2</b>	தாய்மொழி வழியாக அறிவியல் பற்றி சிந்திக்கவும் செய்திருப்பர்.
<b>CO3</b>	அறிவியல் கலைச் சொல்லாக்கம் பற்றி அறிய செய்வர்.
<b>CO4</b>	அறிவியல் தொழில் நுட்பத்தின் வளர்ச்சி பற்றி அறிந்திருப்பர்.
<b>CO5</b>	அறிவியல் வளர்ச்சியில் தகவல் தொழில்நுட்பத்தின் பங்கு பற்றி அறிந்து கொள்ளுதல்.
<b>Course Name &amp; Code: General English-IV -2342E</b>	
<b>CO1</b>	Determine their goals
<b>CO2</b>	Identify the value of integrity.
<b>CO3</b>	Deal with emotions.
<b>CO4</b>	Frame grammatically correct sentences
<b>CO5</b>	Write cohesive reports.
<b>Course Name &amp; Code: Hindi Bhasha aur Computer- 2341H</b>	
<b>CO1</b>	Getting knowledge of computer terms in Hindi
<b>CO2</b>	Knowing the difference between Devanagari Script and Unicode and its application
<b>CO3</b>	Providing knowledge of usage of Hindi in different govt. offices
<b>CO4</b>	Know about E-Patrikas
<b>CO5</b>	Getting knowledge of Competitive exams through online
<b>Course Name &amp; Code: Molecular Biology and Microbial Genetics- 23BMC4C1</b>	
<b>CO1</b>	Able to understand the function of genes and their regulation
<b>CO2</b>	Understand the level of gene expressions
<b>CO3</b>	Acquire depth knowledge on the activation of oncogenes
<b>Course Name &amp; Code: Lab in Molecular Biology - 23BMC4P1</b>	
<b>CO1</b>	Able to perform isolation of nucleic acids and its confirmation by gel electrophoresis
<b>CO2</b>	Understand the principles of inducing mutation
<b>Course Name &amp; Code: Food Processing Technology - 23BMIA4</b>	
<b>CO1</b>	Assess the fundamental concepts of food preservation
<b>CO2</b>	Investigate the quality assessment of meat and fish
<b>CO3</b>	Design the processing of milk and milk quality assessment
<b>CO4</b>	Explain about the importance of fats and oils
<b>CO5</b>	Plan the food safety and adulteration detection
<b>Course Name &amp; Code: Food Processing Technology Practical - 23BMIA4P4</b>	
<b>CO1</b>	Demonstrate the ability to estimate the viable bacterial load in milk samples using standard microbiological techniques, ensuring compliance with food safety and quality standards
<b>CO2</b>	Perform methylene blue dye reduction tests to assess the microbial quality of milk and interpret results based on the rate of decolourization



<b>CO3</b>	Apply the resazurin dye reduction method to determine the microbial load and evaluate the freshness of milk samples
<b>CO4</b>	Test for the presence of phosphatase enzyme in milk to verify the effectiveness of pasteurization and ensure milk safety
<b>CO5</b>	Observe and interpret litmus milk reactions to study the metabolic activities of microorganisms, such as fermentation, peptonization, and gas production, in milk samples
<b>Course Name &amp; Code: Communicable and Non- Communicable Diseases – 23BMC4S1</b>	
<b>CO1</b>	The students are able to know the risk factors for the communicable and non-communicable diseases
<b>CO2</b>	The students can take preventive measures to avoid severe diseases
<b>CO3</b>	Understand the role of vaccines in the global health maintenance
<b>Course Name &amp; Code: Environmental Microbiology - 23BMC4S2</b>	
<b>CO1</b>	Understand on soil characteristics and biogeochemical cycling
<b>CO2</b>	Be familiar with the microbial analysis of drinking water and Aeromicrobiology
<b>CO3</b>	Know the different aspects of waste management and sewage Treatment systems
<b>CO4</b>	Acquire knowledge on bioremediation and microbial leaching
<b>Course Name &amp; Code: Adipadai Tamil- 234AT</b>	
<b>CO1</b>	அறம் உணர்தல்
<b>CO2</b>	அறச்சிந்தடைகடைப் ிந்துமகொள்ளுதல்
<b>CO3</b>	குறள்கூறும் அறத்ததம்ம பொருத்திப் பொர்த்தல்
<b>CO4</b>	தமிழறிஞர்கடை அறிதல்
<b>CO5</b>	சுயமொக எழுதத்தமதொங்஑ுதல்
<b>Course Name &amp; Code: Environmental Studies - 23BES4</b>	
<b>CO1</b>	Renewable and non-renewable resources
<b>CO2</b>	Species and Ecosystem Diversity, Bio-Geographical Classification of India, Value of Biodiversity
<b>CO3</b>	Causes, Effects and Control Measures of environmental pollution
<b>CO4</b>	Field work knowledge of studying eco system pond, river, hill and common plants, insects and birds
<b>CO5</b>	Documentation of environmental assets

### Semester V

#### Course Name & Code: Systematic Bacteriology and Virology - 23BMC5C1

<b>CO1</b>	Acquire information about the concepts of systematic bacteriology and gain knowledge on medically important micro-organisms
<b>CO2</b>	Attain knowledge of morphology, cultural characteristics, biochemical tests, epidemiology, laboratory diagnosis etc of pathogenic organisms
<b>CO3</b>	Understand the concepts involved in the cultivation and diagnosis of viruses

#### Course Name & Code: Clinical Immunology - 23BMC5C2

<b>CO1</b>	The students after completing the course would be aware of structure and functions of immune system
<b>CO2</b>	Aware of immunity to various pathogens
<b>CO3</b>	Able to understand the concepts and mechanism behind antigen-antibody interactions, hypersensitivity reactions and immunochemical reactions.

#### Course Name & Code: Recombinant DNA Technology and Molecular Diagnostics - 23BMC5C3

<b>CO1</b>	The students are be able to understand the concepts and methods in rDNA technology
<b>CO2</b>	Enable the students to know about cloning vectors
<b>CO3</b>	Acquire knowledge on the construction of DNA libraries and DNA sequencing and an applications of rDNA technology
<b>CO4</b>	The students are being able to diagnose the genetic diversity and gene pattern by molecular methods
<b>Course Name &amp; Code: Lab in Bacteriology, Virology and Clinical Immunology - 23BMC5P1</b>	
<b>CO1</b>	Able to isolate and identify the pathogen from the clinical samples
<b>CO2</b>	Knowledge in the analysis of antibiotic sensitivity
<b>CO3</b>	Understand the role of environmental factors affecting bacterial growth
<b>Course Name &amp; Code: Basics of Bioinformatics - 23BMC5E1</b>	
<b>CO1</b>	Understand the different tools for data analysis and apply the appropriate tool for data processing
<b>CO2</b>	Know the whole genome analysis methods and the computational tools used for sequence analysis
<b>CO3</b>	Acquire knowledge on Homology modelling of protein
<b>Course Name &amp; Code: Food and Dairy Microbiology - 23BMC5E2</b>	
<b>CO1</b>	The students are able to know the role of microorganisms in food (beneficial as well as harmful) and also the factors influencing their growth
<b>CO2</b>	The students can be easily understood in depth the techniques/process involved in the production of microbial products in food and dairy industries
<b>CO3</b>	Able to identify the key problems and prospects in food processing and preservation of perishable food products and also understand the microbial hazards involved in food spoilage
<b>Course Name &amp; Code: Value Education - 23BVE5</b>	
<b>CO1</b>	Knowledge about Humanism and Humanistic Movement in the World and in India
<b>CO2</b>	Understand the Social Reformers and Their Role in Value Education
<b>CO3</b>	Explore the theories of Fundamental Duties, Ethics, Extra-Curricular Activities – N.S.S., N.C.C
<b>CO4</b>	Know the concept of Value Education on College Campus, Project Work regarding Writing Poems, Skits, Stories Centering on Value-Erosion in Society

### Semester VI

<b>Course Name &amp; Code: Clinical Parasitology and Mycology - 23BMC6C1</b>	
<b>CO1</b>	Able to understand the effects of human parasites and their diagnostic methods
<b>CO2</b>	Able to prevent the parasitic and helminthic infections
<b>CO3</b>	Acquire depth knowledge on the role of mycotoxins and other fungal toxins
<b>Course Name &amp; Code: Clinical Bioinstrumentation and Diagnostics - 23BMC6C2</b>	
<b>CO1</b>	Identify the need of understanding human anatomy and physiology system
<b>CO2</b>	Select the suitable acquisition method for analyzing biomedical signal and vital parameter measurement
<b>CO3</b>	Apply the knowledge of biomedical instruments to practical applications
<b>CO4</b>	Categorize the parameter monitoring techniques based on the application and relevance
<b>Course Name &amp; Code: Lab in Clinical Parasitology, Mycology and Bioinstrumentation - 23BMC6P1</b>	
<b>CO1</b>	Learn the basics of python, Do simple programs on python, Learn how to use an array.
<b>CO2</b>	Develop program using selection statement, Work with Looping and jump statements, Do programs on Loops and jump statements.

<b>CO3</b>	Students will be familiar with the identification of pathogenic organism from clinical samples
<b>Course Name &amp; Code: Agricultural Microbiology - 23BMC6E1</b>	
<b>CO1</b>	Understand the role of microbes in the different cycles and their role in agriculture
<b>CO2</b>	Be familiar with biological nitrogen fixation in symbiotic and non-symbiotic associations with plants
<b>CO3</b>	Know the value, production, application in pest control and crop response of biofertilizers and biopesticides
<b>Course Name &amp; Code: Environmental Microbiology - 23BMC6E2</b>	
<b>CO1</b>	Understand on soil characteristics and biogeochemical cycling
<b>CO2</b>	Be familiar with the microbial analysis of drinking water and Aeromicrobiology
<b>CO3</b>	Know the different aspects of waste management and sewage Treatment systems
<b>CO4</b>	Acquire knowledge on bioremediation and microbial leaching
<b>Course Name &amp; Code: Essential Reasoning and Quantitative Aptitude-23BMC6S1</b>	
<b>CO1</b>	Develop quantitative aptitude and problem-solving skills
<b>CO2</b>	Understand profit and loss, time, and work calculations
<b>CO3</b>	Demonstrate proficiency in calculating simple and compound interest, applying these concepts to practical and financial problem-solving contexts
<b>CO4</b>	Analyze and solve verbal reasoning problems, including analogy, coding and decoding, directions and distance, and blood relation scenarios, enhancing logical thinking
<b>CO5</b>	Develop the ability to solve problems involving data sufficiency, non-verbal analogy, classification, and series, fostering critical thinking and reasoning skills