KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

Re-accredited by NAAC with 'A' Grade – 3.64 CGPA out of 4 (3rd Cycle)College of Excellence (UGC)

Coimbatore – 641 029

DEPARTMENT OF BIOCHEMISTRY (Aided)COURSE

OUTCOMES (CO) OF

B.SC BIOCHEMISTRY

For the students admitted
In the Academic Year
2021-2022

Programme Code: 07		B.Sc. Biochemistry		
Course Code: 21UBC101		Core Paper 1 – CHEMISTRY OF BIOMOLECULES		
Batch	Semester	Hours / Week	Total Hours	Credits
2021-2022	I	7	105	6

Course Objectives

i) To learn the chemistry and structure of different biomolecules
ii) To understand the biological significance of different biomolecules

Course Outcomes (CO)

K1 to K5	CO1	Define the functions and properties of carbohydrates, lipids, amino acids, proteins and nucleic acids
	CO2	Classify the biomolecules according to their structures
	CO3	Sketch the basic structure of biomolecules and reactions involving them
	CO4	Distinguish different types of sugars, fats, amino acids and proteins based on the physical, chemical and biological aspects
	CO5	Describe the various types of nucleic acids and their structures

21UBC202

Programme Code: 07		**B.Sc. Biochemistry**		
Course Code: 21UBC202		**Core Paper 2- BIOANALYTICAL TECHNIQUES**		
Batch 2021-2022	Semester II	Hours / Week 7	Total Hours 105	Credits 6

Course Objectives

1. To know the various types of buffer systems in blood and plasma and its significance in the maintenance of blood pH
2. To understand the principle, materials, methods and applications of chromatography, electrophoresis and colorimetry.
3. To detect and measure the radioactivity and explore its role in biological and clinical fields.

Course Outcomes (CO)

K1 to K5	CO1	Recall the definition of acids, bases and buffers.
	CO2	Describe the various buffer systems present in blood and plasma, andtheir role in maintaining the blood pH and various bioanalytical techniques.
	CO3	Demonstrate the types and techniques of chromatography, electrophoresis and colorimetry.
	CO4	Analyze the separated/purified components from the samples by chromatography, electrophoresis and colorimetry.
	CO5	Describe the radioactivity types and their applications.

Programme Code:07		B.Sc. Biochemistry		
Course Code: 21UBC303		**Core Paper III – ENZYMES AND ENZYME TECHNOLOGY**		
Batch 2021-2022	Semester III	Hours / Week 4	Total Hours 60	Credits 5

Course Objectives

1. To perceive knowledge about enzymes and their kinetics.
2. To study about the coenzymes and their roles in the biological system.
3. To know about the recent enzyme technologies and their applications for diagnostic purpose.

Course Outcomes (CO)

K1 To K5	CO1	Remember the role of enzymes in biological system
	CO2	Acquire thorough knowledge on the enzyme kinetics and inhibition.
	CO3	Deploy the properties and functions of coenzymes and cofactors.
	CO4	Analyze the biological importance of immobilized enzymes and applications
	CO5	Understand the types of biosensors, and Artificial enzymes

Programme Code: 07		**B.Sc Biochemistry**		
Course Code: 21UBC404		**Core Paper 4 – CELL BIOLOGY**		
Batch	Semester	Hours / Week	Total Hours	Credits
2021-2022	IV	4	60	4

Course Objectives

1. To perceiveknowledgeaboutstructureofanimalcellmembraneanditsfunction.
2. To study about the mechanism of proteinsorting and transport in the biological system.
3. To know about the cell cycle and about cancer development.

Course Outcomes(CO)

K1 to K5	CO1	Appreciates and understands the dynamic nature of the cell, including how it occurs and response to the information from its environment.
	CO2	Remembers the different mechanism of receptor activation and regulation.
	CO3	Explores the role of growth hormones in the biological system
	CO4	Predict how alterations or given drugs or chemical treatment would impact cell behavior
	CO5	Describe the Cancer and their types, Tumor suppressor genes function and their products

Programme Code: 07		**B. Sc Biochemistry**		
Course Code: 21UBC4S2		**Skill Based Subject II - TECHNIQUES IN BIOTECHNOLOGY**		
Batch 2021-2022	Semester IV	Hours / Week 2	Total Hours 30	Credits 3

Course Objectives

1. To provide a broad overview of the common and important techniques in Biotechnology
2. To provide sufficient knowledge about the overall biotechnology skills
3. To address the aspects of developmental biology, plant and animal tissue culture, fermentation, bioprocessing and bio nanotechnology

Course Outcomes (CO)

K1 to K5	CO1	Recollect the basics of developmental biology
	CO2	Understand the techniques of plant tissue culture
	CO3	Describe the process and introduce about bioprocess techniques
	CO4	Acquire knowledge fermentation and its role in biotechnology
	CO5	Remember Bio Nanotechnology and their materials applications

Programme Code: 07		**B.Sc Biochemistry**		
Course Code: 21UBC505		**Core Paper 5 – HUMAN PHYSIOLOGY**		
Batch 2021-2022	Semester V	Hours / Week 4	Total Hours 60	Credits 4

Course Objectives

1. To understand the basic principles and mechanisms involved during the functioning of various organs of the physiological system.

2. To learn the mechanism of action of hormones, and their role under normal and abnormal conditions of the physiological system.

Course Outcomes (CO)

K1 to K5	**CO1**	Recall of the structure of skeletal muscle, GI tract, lungs, nephrons, neurons and reproductive system
	CO2	Understanding the mechanism of muscle contraction, mechanism of buffer action , transport of gases between tissues and blood, formation of urine, propagation of nerve application ,mechanism of action of hormones.
	CO3	Explanation of sources of energy for muscle contraction, functions of hormones, spermatogenesis, ovarian cycle, chemical changes during muscle contraction.
	CO4	Synaptic transmission of neuro-muscular transmission, pathophysiology of hormones of pituitary, thyroid, parathyroid and adrenal glands.
	CO5	Understand thestructure and function of male and female reproductive system

ProgrammeCode: 07		B.Sc Biochemistry		
CourseCode:21UBC506		Core Paper 6–INTERMEDIARYMETABOLISM		
Batch 2021-2022	Semester V	Hours/Week 4	Total Hours 60	Credits 4

Course Objectives

1. To learn the fate of dietary carbohydrates,proteins and lipids.
2. To study the various catabolic and bio synthetic pathways of bio molecules and their significance.
3. To understand the inter relationship between carbohydrate,protein and fat metabolism.

Course Outcomes(CO)

K1 to K5	CO1	Understand the various metabolic pathways of carbohydrates, proteins, fat and nucleic acid metabolism
	CO2	Remember the glycolysis, TCA cycle, Glycogenesis, glycogenolysis, β-oxidation, phospholipid biosynthesis, Urea cycle, Nucleic acid biosynthetic pathway and degradation of purine and pyrimidine
	CO3	Assessment of Bio energetics of various metabolism pathways, role of inhibitors and uncouple electron transport chain
	CO4	Analysis of regulation of various metabolic pathways and their significance
	CO5	Acquire the knowledge of purine and pyrimidine metabolism and biological significance of uric acid and β-amino isobutyrate.

Programme Code: 07		**B.Sc. Biochemistry**		
Course Code: 21UBC507		**Core Paper 7- CLINICAL BIOCHEMISTRY**		
Batch 2021-2022	Semester V	Hours / Week 4	Total Hours 60	Credits 4

Course Objectives

1. To provide students with a conceptual background in Clinical Biochemistry
2. To provide students with an understanding of various types of diseases and their causes, symptoms, prevention, management and treatment

Course Outcomes (CO)

K1 to K5	CO1	Recall the metabolism of carbohydrates, lipids and proteins
	CO2	Describe the disorders of carbohydrate, lipids, protein and amino acids metabolism & assess the gastric, intestinal, liver and kidney functions
	CO3	Demonstrate the types, clinical pathology and diagnosis of disorders of carbohydrate, lipids, protein and amino acids
	CO4	Analyze the blood and serum samples for the diagnosis and prognosis of Diseases
	CO5	Analyze the Liver and Kidney function tests

Programme Code: 07		**B.Sc Biochemistry**		
Course Code: 21UBC508		**Core Paper 8 – MOLECULAR BIOLOGY**		
Batch 2021-2022	Semester V	Hours / Week 4	Total Hours 60	Credits 4

Course Objectives

1. To understand the scientific process in the content of learning the fundamental biologicaland chemical factors of molecular biology.
2. To gain knowledge about DNA replication, DNA repair mechanism and mutation.
3. To understand the mechanism of transcription and reverse transcription.
4. To acquire the knowledge about gene regulation.

Course Outcomes (CO)

K1 to K5	CO1	Understand the dynamics of protein synthesis with respect to ribosome structure, function and accuracy of translation
	CO2	Remember the Genetic Code and the amino acid which it codes. the role of various enzymes and proteins in DNA replications, transcription and translation
	CO3	Advanced and integrated knowledge of the process on transcription and DNA recombination and repair process
	CO4	Explore the process of translation, genetic code and post translational modifications
	CO5	Describe the regulation of gene expression and types of operon and their regulation

Programme Code: 07		**For B.Sc Botany, Zoology, Chemistry& Biotechnology**		
Course Code: 21UBC5X1		**Extra Departmental Course DIAGNOSTIC BIOCHEMISTRY**		
Batch	Semester	Hours / Week	Total Hours	Credits
2021-2022	V	2	30	3

Course Objectives

1. To make the students to know the principles for routinely conducted tests indiagnostic laboratories.
2. To select the appropriate biochemical tests to the diagnosis of thediseases.
3. To enable the students to interpret the laboratory dataproperly.

Course Outcomes (CO)

K1 to K5	CO1	Remember the basic concepts of collection of samples
	CO2	Understand the idea about the tests performed using blood, serum and enzymes
	CO3	Familiarize with the clinical importance of hormones
	CO4	Analyze and execute the clinical laboratory techniques
	CO5	Recollect Bio safety measures and laboratory wastes

Programme Code: 07		**B.ScBiochemistry**		
Course Code: 21UBC609		**Core Paper 9 – PLANT BIOCHEMISTRY**		
Batch 2021-2022	Semester VI	Hours / Week 4	Total Hours 60	Credits 4

Course Objectives

1. To understand the metabolic processes in plants and role of various biosyntheticpathways.
2. To acquire knowledge about photosynthetic apparatus, role of nitrogen in plants and plantgrowth regulators
3. To explore about the photo morphogenesis and secondary metabolites inplants.

Course Outcomes (CO)

K1 to K5	CO1	Recollect the structure and function of plant cell.
	CO2	Understand the mechanism of photosynthesis in plants.
	CO3	Execute the concept of role of minerals and growth hormones in plants.
	CO4	Acquire the Photo morphogenesis function and development of plant
	CO5	Analyze the nature and functions of secondary metabolites

Programme Code: 07		B.Sc Biochemistry		
Course Code: 21UBC610		**Core Paper 10 – IMMUNOLOGY AND IMMUNOTECHNIQUES**		
Batch	Semester	Hours / Week	Total Hours	Credits
2021-2022	VI	4	60	4

Course Objectives

1. To learn about the basic principles of immunology, functioning of immune system,and immunological techniques in clinical and research laboratories.
2. To comprehend about the different types of immune mechanisms involving in various abnormal conditions and diseases.

Course Outcomes (CO)

K1 to K5	CO1	Learning the basics of immunity and immune system, formation role of cytokines, different features of antigens and antibodies.
	CO2	Understanding of the mechanism of antibody and cell mediated immunity, action of complement system.
	CO3	Learning the development of various clinical conditions during the different abnormal conditions.
	CO4	Define the Autoimmune diseases and AIDS development of clinical symptoms
	CO5	Applications of antigen – antibody reactions in the diagnosis of various infectious diseases using different techniques.

Programme Code: 07		**B.Sc Biochemistry**		
Course Code: 21UBC611		**Core Paper 11 – GENETIC ENGINEERING**		
Batch 2021-2022	Semester VI	Hours / Week 4	Total Hours 60	Credits 4

Course Objectives

1. To provide students with a broad conceptual background in the field of genetic engineering
2. To describe the methods used to create recombinant DNA molecules and introduce them into prokaryotic cells
3. To expose the students to the application of genetic engineering in medicine and agriculture

Course Outcomes (CO)

K1 to K5	CO1	Recognize the concept of recombinant DNA technology or genetic engineering
	CO2	Describe a range of techniques in gene manipulation, the cloning vectors available and the containment procedures
	CO3	Understanding the techniques of DNA sequencing, Genetic finger printing, and PCR applications
	CO4	Examine the difficulties during the expression of eukaryotic DNA in prokaryotes and how to overcome these difficulties
	CO5	Demonstrate the application of transgenic plants with herbicide resistance, virus resistance, pest resistance and male infertility and the production of recombinant insulin

Programme Code: 07		**B.Sc Biochemistry**		
Course Code: 21UBC6S3		**Skill Based Subject 3– TECHNIQUES IN GENOMICS AND PROTEOMICS**		
Batch	Semester	Hours / Week	Total Hours	Credits
2021-2022	VI	2	30	3

Course Objectives

1. To perceive knowledge about structure of animal cell membrane and itsfunction.
2. To study about the mechanism of protein sorting and transport in the biologicalsystem.
3. To know about the cell cycle and about cancer development.

Course Outcomes (CO)

K1 to K5	CO1	Recollect the organization of the nuclear DNA and mapping
	CO2	Get thorough knowledge about human genome project and sequencing
	CO3	Update the knowledge about comparative genomics
	CO4	Understanding the transcriptomics and Pharmacogenomics applications
	CO5	Analyze the applications of proteomics in various diseases

ProgrammeCode: 07	B.Sc Biochemistry		
Major Elective –MICROBIOLOGY			
Batch 2021-2022	Hours/Week 4	Total Hours 60	Credits 5

Course Objectives

1. To provide students with a conceptual background in microbiology
2. To provide students with an understanding of various microbiological techniques
3. To make the students to be familiar with the relationship between microbes and human beings

Course Outcomes (CO)

K1 to K5	CO1	Recall the characteristics of bacteria, algae, fungi and viruses
	CO2	Describe the role of microbes as normal flora and as disease causing agents
	CO3	Demonstrate the microscopic techniques, staining and culturing methods
	CO4	Recollect the microbial diseases and their symptoms and prevention
	CO5	Analyze the bacteriological examination and purification of drinking water

Programme Code: 07	**B.Sc Biochemistry**		
Major elective- BASICS OF BIOINFORMATICS			
Batch 2021-2022	Hours / Week 4	Total Hours 60	Credits 5

Course Objectives

1. To know about various tools for data base search.
2. To acquire knowledge about different biological databases.
3. To provide knowledge about Gene prediction and drug designing.

Course Outcomes (CO)

K1 to K5	CO1	Recognize the available bioinformatics resources on web like DNA and protein databases
	CO2	Understand concepts of similarity searching databases and algorithms
	CO3	Construct genome annotations and algorithms
	CO4	Outline the concepts of structure based drug design, protein structure levels and databases
	CO5	Analyze the biological sequence databases and their tools

Programme Code: 07	**B.Sc Biochemistry**		
Major Elective – BIOPHARMACEUTICALS			
Batch 2021-2022	Hours / Week 4	Total Hours 60	Credits 5

Course Objectives

1. To demonstrate the basics of biopharmaceutical to the undergraduatestudents.
2. To motivate the undergraduate students in analyzing the drug metabolism and mode of action.
3. To elaborate basic of formulations of drugs and to apply them in clinical trials.

Course Outcomes (CO)

K1 to K5	CO1	Acquire knowledge on drug development, principles, mechanism of actions of drugs
	CO2	Outline on preparation of biotechnology oriented pharmaceutical products.
	CO3	Quality control tests and manufacturing, packaging of drugs
	CO4	Help them to analyze the pharmaceutical products available in the market and Evaluate the recent advances in drug manufacturing
	CO5	Relate the regulations in clinical trial and management.

Programme Code: 07	B.ScBiochemistry		
Major elective- DAIRY BIOCHEMISTRY			
Batch 2021-2022	Hours / Week 4	Total Hours 60	Credits 5

Course Objectives

1. To understand the basic concepts of dairy technology.
2. To provide knowledge about the milk processing techniques.

Course Outcomes (CO)

K1 to K5	CO1	Recognize the properties of milk.
	CO2	Recall the methods of testing density, fat content and acidity of milk.
	CO3	Analyze the carbohydrates, lipids, proteins and enzymes present in milk.
	CO4	Understand the non-fermented milk products
	CO5	Acquire knowledge about the various milk products available and milk processing techniques practiced.

Programme Code: 08	B.ScBiochemistry		
Major elective- BIOSTATISITICS			
Batch 2021-2022	Hours / Week 4	Total Hours 60	Credits 5

Course Objectives

1. To learn the different methods of collecting data and processing
2. Toknowaboutthedifferentstatisticalmethodstointerpretthecollectedstatisticaldata
3. To know the concept of article writing,report writing and thesis making soon

Course Outcomes (CO)

K1 to K5	CO1	The students get an idea on choosing the appropriate method of collecting data
	CO2	The students learn how to select the statistical method and process the collected data
	CO3	The students can device and standardize the statistical methods
	CO4	The students can understand the classification and tabulation data problems
	CO5	The students will be well versed in preparing a report, publishing an article and writing a project dissertation.

Programme Code: 09	**B.ScBiochemistry**		
Major elective- NUTRITIONAL BIOCHEMISTRY			
Batch 2021-2022	Hours / Week 4	Total Hours 60	Credits 5

Course Objectives

1. To impart the knowledge on historical overview of nutrition, essential nutrients formetabolism
2. To provide an overview of the major macro and micro nutrients relevant to human health
3. To discuss the scientific rationale for defining nutritional requirements in healthy individuals and populations, with reference to specific conditions such as pregnancy, lactation, and olderage

Course Outcomes (CO)

K1 to K5	CO1	Lean about the significance and role of nutrition in maintaining the health
	CO2	Describe the biochemical and physiological functions of the nutrients and their integrated role.
	CO3	Explore the nutritive value of carbohydrates, proteins and amino acids and their importance
	CO4	Learning about malnutrition and balanced diets
	CO5	Evaluate the therapeutic role of key nutrients in maintaining health.

Programme Code: 07		**For B.Sc Zoology**		
Course Code: 21UBC3A3		**ALLIED BIOCHEMISTRY I**		
Batch 2021-2022	Semester III	Hours / Week 5	Total Hours 75	Credits 4

Course Objectives

1. To make the students to understand the basic principles of biochemistry.
2. To learn about the mechanism of action of enzymes in the biological system.

Course Outcomes (CO)

K1 to K5	CO1	Understands the properties, types and functions of carbohydrates, proteins, lipids, enzymes, nucleic acids and their and functions.
	CO2	Remembers the structures of monosaccharides, dis saccharides and polysaccharides and amino acids
	CO3	Applies the concept of enzymatic activity in biological system.
	CO4	Acquire knowledge about the nuclear organization of prokaryotes in eukaryotes.
	CO5	Describe the Nucleic acid structure and their types, Denaturation and Renaturation of DNA

Programme Code: 07		**For B.Sc Zoology**		
Course Code: 21UBC4A4		**Title: ALLIED BIOCHEMISTRY II**		
Batch 2021-2022	Semester IV	Hours / Week 5	Total Hours 75	Credits 4

Course Objectives

1. To learn about the various biochemical techniques applicable in both research and clinical laboratories.
2. To provide knowledge on metabolic reactions involved in biological reactions.

Course Outcomes (CO)

K1 to K5	CO1	Remember the concept of pH and buffer system.
	CO2	Understand the idea about the working principle of various analytical techniques.
	CO3	Deploy the activity of radioisotopes and their applications in biological system.
	CO4	Interpret the metabolic pathways of various molecules.
	CO5	General pathway of lipid and protein metabolism

Programme Code: 07		**B.Sc Biochemistry**		
Course Code: 21UBC2CL		**C.Pr.1. BIOCHEMISTRY (Lab)**		
Batch 2021-2022	Semester I & II	Hours / Week 2	Total Hours 60	Credits 2

Course Objectives

- To acquire skill of analyzing carbohydrates and aminoacids.
- To provide practical knowledge about the characterization oflipids.
- To learn the methodology of separation of amino acids by paperchromatography.

Course Outcomes (CO)

K3 to K5	CO1	Learn the reagent preparation methods for qualitative analysis of biomolecules
	CO2	Practice the qualitative analysis of different carbohydrates and amino acids through individual experiments
	CO3	Practice the qualitative analysis of different amino acids through individual experiments
	CO4	Calculate iodine number of lipids, thereby characterizing them
	CO5	Assess the separation technique of amino acids through paper chromatography

Programme Code: 07		**B.Sc. Biochemistry**		
Course Code: 21UBC4CM		**Title: C.Pr.2 BIOCHEMISTRY**		
Batch 2021-2022	Semester III & IV	Hours / Week 3	Total Hours 90	Credits 2

Course Objectives

1. To perceive knowledge about λmax of the substances.
2. To learn about the methods to quantify the components colorimetrically.
3. To learn about the factors influencing the enzyme activity.

Course Outcomes (CO)

K1 to K5	CO1	Recalling the preparation of reagents.
	CO2	Understanding the principles of techniques.
	CO3	Carrying out the experiments using various techniques.
	CO4	Techniques are used to analyze the components both qualitatively and quantitatively.
	CO5	Carrying out the experiments using various enzymes factors

Programme Code: 07		**B.Sc Biochemistry**		
Course Code: 21UBC6CN		**C.Pr.3. BIOCHEMISTRY (Lab)**		
Batch 2021-2022	Semester V & VI	Hours / Week 4	Total Hours 120	Credits 3

Course Objectives

1. To make students learn the methods of collection of blood and urine samples and separation of serum

2. To analyze the biochemical parameters in urine and blood samples and indicate their clinical significance

3. To demonstrate the kit methods for the assay of bio chemical parameters

Course Outcomes (CO)

K3 to K5	CO1	Apply various techniques for the assay of important biochemical parameters and interpret their values
	CO2	Calculate the values from the graph obtained in the experiment
	CO3	Estimate the level of bilirubin, SGOT, SGPT, LDH, CKMB in the given sample using kit method
	CO4	Understanding the quantitative estimation of Glucose and Calcium in urine
	CO5	Analyze the quantitative estimation of biochemical parameters in blood

Programme Code: 07		**B.Sc Biochemistry**		
Course Code: 21UBC6CO		**C.Pr.4. BIOCHEMISTRY (Lab)**		
Batch 2021-2022	Semester V & VI	Hours / Week 2	Total Hours 60	Credits 2

Course Objectives

1. To isolate plasmid DNA and genomic DNA, isolation and restriction digestion of DNA through demonstration experiments
2. To perform simple staining, gram staining and negative staining, isolation of microbes and biochemical tests for identifying bacteria
3. To demonstrate media preparation, callus initiation in plant tissue and mitosis in onion roottips

Course Outcomes (CO)

K3 to K5	CO1	Recall the methods of genetic technology and Employ molecular methods in isolation, restriction digestion and separation of DNA
	CO2	Recall the microbiological methods and performing of staining, plating techniques
	CO3	Analyze biochemical tests for identifying microorganisms
	CO4	Familiarize the techniques of plant tissue culture and cell biology through demonstrations
	CO5	Introducing bioinformatics tools and learning basic tools on proteomics and genomics

Programme Code: 07		**B.ScBiochemistry**		
Course Code: 21UBC6CP		**C.Pr.5. BIOCHEMISTRY (Lab)**		
Batch 2021-2022	Semester V & VI	Hours / Week 2	Total Hours 60	Credits 2

Course Objectives

1. To estimate chlorophyll, starch, total phenols and qualitatively analyze various secondary metabolites in plant sample
2. To determine RA and pregnancy tests using kit method
3. To demonstrate RBC count, total and differential count of WBCs and identifying blood groups

Course Outcomes (CO)

K3 to K5	CO1	Practice techniques of different plant component isolation and qualitative analysis of secondary metabolites
	CO2	Performing quantification methods of chlorophyll, starch and total phenols present in plant sample
	CO3	Recollecting the techniques antigen- antibody interactions in immunological kit methods
	CO4	Learning identification of blood groups
	CO5	Calculate the number of RBC and WBCs

Programme Code: 07		**For B.Sc Zoology**		
Course Code: 21UBC4AL		**A.Pr.2. BIOCHEMISTRY**		
Batch 2021-2022	Semester III & IV	Hours / Week 2	Total Hours 60	Credits 2

Course Objectives

1. To acquire the skill of analyzing carbohydrates and amino acids.
2. To provide practical knowledge about the quantitative analysis of carbohydrate and protein.
3. To learn the methodology of separation of amino acid by paper chromatography.

Course Outcomes (CO)

K3 to K5	CO1	Recall the classification of biomolecules and iearn the preparation of reagents
	CO2	Practice the qualitative analysis of different carbohydrates through individual experiments
	CO3	Qualitative various amino acids through individual experiments
	CO4	Calculate acid and iodine number of lipids, thereby characterizing them
	CO5	Assess the separation technique of amino acids through paper chromatography