

**CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED WITH “A+” GRADE BY NAAC
TIRUCHIRAPPALLI**

PG & RESEARCH DEPARTMENT OF CHEMISTRY



**B.Sc., Chemistry
Syllabus
2026-2027 and Onwards**

**CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG & RESEARCH DEPARTMENT OF CHEMISTRY**

VISION

- To progress into a centre of superiority in Chemistry that will blend state-of-the-art practices in professional teaching in a communally enriching way, with the holistic progress of the students as its prime emphasis.

MISSION

- To produce graduates committed to integrity, professionalism and lifelong learning by widening their knowledge horizons in range and depth.
- To awaken the young minds and discover talents to achieve personal academic potential by creating an environment that promotes frequent interactions, independent thought, innovations, modern technologies and increased opportunities.
- To enhance the quality through basic and applied research frameworks, and encourage the students to take part in entrance and competitive examinations for higher studies and career.
- To enhance services to the community and build partnerships with the industry.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

**PROGRAMME OUTCOMES FOR B.Sc., Mathematics, B.Sc., Physics,
B.Sc., Chemistry PROGRAMME**

PO No.	Programme Outcome On completion of B.Sc., Mathematics, B.Sc., Physics, B.Sc. Chemistry Programme, the students will be able to
PO1	Domain knowledge: Analyze, design and develop solutions by applying firm fundamental concepts of basic sciences and expertise in discipline.
PO2	Problem solving: Ability to think rationally, analyze and solve problems adequately with practical knowledge to assess the environmental issues
PO3	Creative thinking and Team Work: Develop prudent decision-making skills and mobility to work in teams to solve multifaceted problems.
PO4	Employability: Self-study acclimatize them to observe effective interactive practices for practical learning enabling them to be a successful science graduate.
PO5	Life Long Learning: Assure consistent improvement in the performance and arouse interest to pursue higher studies in premium institutions.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc., CHEMISTRY

PSO NO	Programme Specific Outcomes Students of B.Sc., Chemistry will be able to	POs Addressed
PSO1	Afford a firm foundation in Chemistry that stresses scientific reasoning, analytical problem solving with a molecular perspective	PO1 PO2
PSO2	Acquire knowledge in theoretical and practical tools to exemplify entirely in the working environment.	PO4 PO5
PSO3	Inculcate scientific temperament and create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.	PO3 PO4
PSO4	Scale up of chemical process after designing, optimization and analysis for developing products required for society.	PO4
PSO5	Expand the knowledge available opportunities related to chemistry in the government services through public service commission particularly in the field of food safety, health inspector, pharmacist etc.	PO4 PO5



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PG AND RESEARCH DEPARTMENT OF CHEMISTRY

B.Sc. CHEMISTRY

Choice Based Credit System - Learning Outcome Based Curriculum Framework

(CBCS - LOCF)

(For the Candidates admitted from the Academic year 2026-2027 and onwards)

Semester	Part	Course	Course Title	Course Code	Hrs./Week	Credits	Exam			Total
							Hrs.	Mark		
								Int	Ext	
I	I	Ability Enhancement Course – I (AEC - I)	Pothutamil – I	26ULT1	6	3	3	30	70	100
			Hindi Language & Literature-I	26ULH1						
			Sanskrit Prose and Vocabulary	26ULS1						
			Basic French-I	26ULF1						
	II	Ability Enhancement Course – II (AEC - II)	General English-I	26UE1	6	3	3	30	70	100
	III	Core Course - I (CC-I)	General Chemistry – I	26UCH1CC1	5	5	3	30	70	100
				Core Practical- I (CP-I)	Quantitative Titrimetric Estimation and Inorganic Preparations (P)	26UCH1CP1	3	3	3	40
		Allied Course- I (AC-I)	Mathematics – I	26UCH1AC1A	3	3	3	30	70	100
				Biochemistry –I	26UCH1AC1B					
		Allied Course Practical – I (ACP-I)	Mathematics -II	26UCH1AC2A	3	3	3	30	70	100
				Biochemistry- I (P)	26UCH1ACP1B				40	60
	IV	Ability Enhancement Compulsory Course - I (AECC-I)	Value Education	26UGVE	2	2	-	100	-	100
				Ability Enhancement Compulsory Course - II (AECC-II)	Cyber Security	26UGCS	2	2	-	100
	Total					30	24			
		Ability Enhancement	Pothutamil – II	26ULT2	6	3	3	30	70	100
			Hindi Language &	26ULH2						

II	I	Course – III (AEC - III)	Literature- II							
			Sanskrit Poetry and Grammar -I	26ULS2						
			Basic French -II	26ULF2						
	II	Ability Enhancement Course – IV (AEC - IV)	General English- II	26UE2	6	3	3	30	70	100
	III	Core Course -II (CC-II)	General Chemistry – II	26UCH2CC2	5	5	3	30	70	100
				Core Practical - II (CP-II)	Inorganic Materials of Industrial Importance (P)	26UCH2CP2	3	3	3	40
		Allied Course - II (AC-II)	Mathematics -III	26UCH2AC3A	3	3	3	30	70	100
			Biochemistry -II	26UCH2AC2B						
		Allied Course Practical - II (ACP-II)	Mathematical Computation using MATLAB (P)	26UCH2ACP1A	3	3	3	40	60	100
	IV	Ability Enhancement Compulsory Course - III (AECC-III)	Environmental Science	26UGES						
				2	2	-	100	-	100	
	Ability Enhancement Compulsory Course - IV (AECC-IV)	Innovation and Entrepreneurship	26UGIE	2	2	-	100	-	100	
	Extra Credit Course	SWAYAM NPTEL	As per UGC recommendation							
Total					30	24				800
III	I	Ability Enhancement Course – V (AEC - V)	Pothutamil – III	26ULT3	6	3	3	30	70	100
			Hindi Language & Literature- III	26ULH3						
			Sanskrit Didactics, Alankara and Grammar -II	26ULS3						
			Intermediate French -I	26ULF3						
	II	Ability Enhancement Course – VI (AEC - VI)	Learning Grammar Through Literature – I	26UE3	6	3	3	30	70	100
	III	Core Course - III (CC-III)	General Chemistry – III	26UCH3CC3	6	5	3	30	70	100
				Core Practical – III (CP-III)	Analysis and Preparation of Organic Compounds (P)	26UCH3CP3	3	3	3	40
		Allied Course- III (AC-III)	Physics -I	26UCH3AC4	4	3	3	30	70	100
Allied Course- Practical-III (ACP-III)		Physics -I (P)	26UCH3ACP3	3	3	3	40	60	100	

	IV	Interdisciplinary Course- I (IDC-I)	Introduction to NCC @	26UNC3ID1	2	2	2	-	100	100		
			Natural Dye Extraction and Textile Dyeing (P)	26UCH3IDP1			3	40	60			
			Basic Tamil-I	26ULC3BT1			3	30	70			
			Special Tamil-I	26ULC3ST1								
		Ability Enhancement Compulsory Course - V (AECC-V)	Health and Wellness*	26UGHW	2*	1	-	100	-	100		
		Extra Credit Course	SWAYAM	As per UGC recommendation								
Total					30	23				800		
IV	I	Ability Enhancement Course – VII (AEC - VII)	Pothutamil – IV	26ULT4	6	3	3	30	70	100		
			Hindi Language & Literature- IV	26ULH4								
			Sanskrit Drama and Grammar -III	26ULS4								
			Intermediate French -II	26ULF4								
	II	Ability Enhancement Course – VIII (AEC - VIII)	Learning Grammar Through Literature – II	26UE4	6	3	3	30	70	100		
	III	Core Course – IV	General Chemistry – IV	26UCH4CC4	5	5	3	30	70	100		
				Core Practical -IV (CP-IV)	Inorganic Qualitative Semimicro Analysis (P)	26UCH4CP4	3	3	3	40	60	100
				Allied Course-IV (AC-IV)	Physics -II	26UCH4AC5	3	3	3	30	70	100
				Allied Course Practical – IV (ACP-IV)	Physics -II (P)	26UCH4ACP4	3	3	3	40	60	100
	IV	Interdisciplinary Course- II (IDC-II)	Specialization in Army @	26UNC4ID2	2	2	3	2	-	100	100	
				Cosmetics Formulations (P)				26UCH4IDP2	3	40		60
				Basic Tamil -II				26ULC4BT2		30		70
				Special Tamil -II				26ULC4ST2				
		Skill Enhancement Course – I (SEC-I)	Chemistry of Consumer Products (P)	26UCH4SEP1	2	2	3	40	60	100		
		Extra Credit Course	SWAYAM	Asper UGC recommendation								
Total					30	24				800		

30 Days INTERNSHIP during Semester Holidays										
V	III	Core Course – V (CC-V)	Inorganic Chemistry	26UCH5CC5	6	5	3	30	70	100
		Core Course – VI (CC-VI)	Physical Chemistry -I	26UCH5CC6	6	5	3	30	70	100
		Core Practical – V (CP-V)	Physical Chemistry -I (P)	26UCH5CP5	3	3	3	40	60	100
		Core Practical –VI (CP-VI)	Analytical Techniques (P)	26UCH5CP6	3	3	3	40	60	100
		Discipline Centric Elective Course - I (DCEC-I)	Nuclear and Industrial Chemistry	26UCH5DCE1A	5	4	3	30	70	100
			Transition and Inner-transition Elements	26UCH5DCE1B						
			Electrochemistry and Corrosion	26UCH5DCE1C						
		Discipline Centric Elective Course - II (DCEC-II)	Nanomaterials and Nanochemistry	26UCH5DCE2A	5	4	3	30	70	100
	Advanced Analytical Techniques		26UCH5DCE2B							
	Chemistry of Biomolecules		26UCH5DCE2C							
Internship *	Internship	26UCH5INT	-	2	-	20	80	100		
IV	Ability Enhancement Compulsory Course-VI (AECC-VI)	Introduction to Disaster Management	26UGDM	2	2	-	100	-	100	
Extra Credit Course #		SWAYAM	As per UGC Recommendation							
Total					30	28				800
VI	III	Core Course – VII (CC-VII)	Organic Chemistry	26UCH6CC7	5	5	3	30	70	100
		Core Course – VIII (CC-VIII)	Physical Chemistry -II	26UCH6CC8	5	5	3	30	70	100
		Core Practical – VII (CP-VII)	Physical Chemistry -II (P)	26UCH6CP7	3	3	3	40	60	100
		Core Practical – VIII (CP-VIII)	Gravimetric Analysis and Physical Constant (P)	26UCH6CP8	4	3	4	40	60	100
		Discipline Centric Elective – III (DCEC-III)	A. Polymer Chemistry	26UCH6DCE3A	5	4	3	30	70	100
			B. Pharmaceutical Chemistry	26UCH6DCE3B						
			C. Surface and Colloidal Chemistry	26UCH6DCE3C						
	Project	Project Work	26UCH6PW	5	3	-	20	80	100	
IV	Skill Enhancement Course -II (SEC-II)	Competitive Chemistry	26UCH6SE2	2	2	2	-	100	100	

		Ability Enhancement Compulsory Course - VII (AECC-VII)	Gender Studies	26UGGS	1	1	-	100	-	100
	V	Extension Activity*		26UGEA	-	1	-	-	-	-
Total					30	27				800
Grand					180	150				4800
Total										


Dr. K. SRINIVASAN
 PROFESSOR
 School of Chemistry
 Bharathidasan University
 Tiruchirappalli - 620 024


Courses & Credits for UG Science Programmes

Part	Course	No. of Courses	Hours	Credits	Total Credits
I	Ability Enhancement Course	4	6	12	12
II	Ability Enhancement Course	4	6	12	12
III	Core (Theory)	8	5/6	8*5=40	105
	Core (Practical)	8	3/4	8*3=24	
	Project Work	1	5	3	
	Internship	1	-	2	
	Allied Courses	8	4/3	8*3=24	
	DCEC	3	5	3*4=12	
IV	IDC	2	2	2*2=4	20
	SEC	2	2	2*2=4	
	AECC-I -Value Education	1	2	2	
	AECC-II Cyber Security	1	2	2	
	AECC-III- Environmental Science	1	2	2	
	AECC-IV-Innovation and Entrepreneurship	1	2	2	
	AECC-V- Health and Wellness	1	-	1	
	AECC-VI - Introduction to Disaster Management	1	2	2	
AECC-VII Gender Studies	1	1	1		
V	Extension Activities		-	1	01
		48		150	150



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
TIRUCHIRAPPALLI
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
B.Sc., CHEMISTRY
CHOICE BASED CREDIT SYSTEM-LEARNING OUTCOME BASED
CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the candidates admitted from the academic year 2026-2027 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / Week	Credit	Exam Marks		
							Int	Ext	Total
I	I	Ability Enhancement Course – I (AEC - I)	Pothutamil - I	26ULT1	6	3	30	70	100
			Hindi Language & Literature-I	26ULH1					
			Sanskrit Prose and Vocabulary	26ULS1					
			Basic French-I	26ULF1					
	II	Ability Enhancement Course – II (AEC - II)	General English-I	26UE1	6	3	30	70	100
	III	Core Course – I(CC-I)	General Chemistry - I	26UCH1CC1	5	5	30	70	100
				Core Practical - I (CP-I)	Quantitative Titrimetric Estimation and Inorganic Preparations (P)	26UCH1CP1	3	3	40
		Allied Course- I (MC-I)	Mathematics - I	26UCH1AC1A	3	3	30	70	100
				Biochemistry –I					
		Allied Course Practical-I (MCP-I)	Mathematics -II	26UCH1AC2A	3	3	30	70	100
				Biochemistry- I (P)					
	IV	Ability Enhancement Compulsory Course-I (AECC-I)	Value Education	26UGVE	2	2	100	-	100
				Ability Enhancement Compulsory Course-II (AECC-II)					
	Total					30	24		


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Semester I	Internal Marks: 30		External Marks: 70	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
26UCH1CC1	GENERAL CHEMISTRY-I	CORE	5	5

Course Objective

- To enable students to understand the fundamental concepts of atomic structure, quantum mechanics and electronic configuration.
- To develop the ability to interpret atomic spectra, apply quantum principles, and analyze the significance of wave functions.
- To help students evaluate periodic trends such as atomic/ionic radii, ionization enthalpy, electron gain enthalpy, and electronegativity.

S.No.	Course Features	Relevance Status
1.	Course emphasis on Employability / Entrepreneurship / Skill Development	Employability and Skill development
2.	Course integrates cross cutting issues relevant to Professional Ethics /Gender sensitization / Environment and Sustainability/ Human Values/Indian Knowledge System	Professional Ethics
3.	Course relevant to Local/Regional/National/ Global needs	Global Needs
4.	Course focus on Sustainable Developmental Goals	SDGs 4, 6, 9, 12, 13

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall and describe the fundamental concepts of atomic structure, chemical bonding, organic reaction intermediates and colloids.	K1
CO2	Explain the trends in periodic properties, principles of ionic and covalent bonding and the properties of colloids.	K2
CO3	Apply the concepts of wave mechanics, lattice energy calculations hybridization and demonstrate the preparation and purification of colloids.	K3
CO4	Analyze the stability of reaction intermediates, polarization, molecular orbital configuration and the colloidal systems.	K4
CO5	Evaluate and compare VB and MO theories, reactivity trends in inorganic and organic compounds and colloidal applications.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	2	1	3	2
CO2	3	2	1	2	2	3	3	1	1	2
CO3	3	2	2	3	3	3	3	2	2	3
CO4	3	1	2	3	2	3	3	2	1	2
CO5	3	1	2	3	2	3	3	2	1	2

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“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Atomic Structure and Periodic Properties Bohr's theory - limitations - atomic spectrum of hydrogen atom - de Broglie equation - Heisenberg's Uncertainty principle - postulates of wave mechanics - time independent Schrödinger's wave equation - significance of ψ and ψ^2 - Pauli's Exclusion principle - Hund's rule - Aufbau principle - limitations - Periodic properties of s- & p-block elements - trends in atomic and ionic radii - ionization enthalpy - electron gain enthalpy - electronegativity - scales of electronegativity.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Chemical Bonding - I General characteristics of ionic compounds - formation and types of ions - size effects - radius ratio rule - limitations - packing of ions in crystals - lattice energy - Born-Landé equation - Madelung constant - Kapustinskii equation - Born-Haber cycle - applications - covalent character in ionic compounds - polarizing power - polarizability - Fajan's rules - consequences.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Chemical Bonding - II VB theory - postulates - limitation - types of hybridization - VSEPR theory - shapes of the following: H ₂ O, NH ₃ , PCl ₃ , PCl ₅ , SF ₆ , ClF ₃ , BrF ₂ ⁺ , PCl ₆ ⁻ , ICl ₂ ⁻ , ICl ₄ ⁻ and SO ₄ ²⁻ - molecular orbital theory - bonding - nonbonding and antibonding MOs -	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	combinations of atomic orbitals, MO treatment of N ₂ , O ₂ , O ₂ ⁺ , O ₂ ²⁺ , F ₂ , CO, NO – comparison of VB and MO approaches.			
IV	<p>Basic concepts in Organic Chemistry and Electronic effects</p> <p>Types of bond cleavage – homolytic and heterolytic – Reactive species and reagents - types of reagents - electrophiles, nucleophiles- reaction intermediates – generation - stability of carbanions - carbocations - free radicals - carbenes and nitrenes – Electronic effect: inductive effect (+I, -I)- reactivity of alkyl halides- acidity of halo acids - basicity of amines - resonance effect – conditions for resonance - acidity of phenols -basicity of aromatic amines - hyperconjugation.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	<p>Colloids</p> <p>Colloids – types of colloids - preparation -purification - dialysis - optical properties - kinetic properties - electrical properties of colloids - gold number - stability of sols - associated colloids - cleansing action of soaps and detergents - emulsions – gels – applications of colloids.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	<p>Self Study for Enrichment (Not to be included for External Examination)</p> <p>Electronic configuration of polyelectronic atoms, Calculation of screening constant and effective nuclear charge - Lewis electron dot structure - Oxidation State and valency of element - electromeric effect.</p>	-	CO1	K1, K2

Text Books

1. Puri, B.R., Sharma, L. R.& Kalia,K.K. (2018). Principles of Inorganic Chemistry. Shoban Lal Nagin Chand & Co., 33rd edition, New Delhi.
2. Madan, R.D. (2019). Modern Inorganic Chemistry. 3rd edition, S. Chand & Company Ltd,
3. A Textbook of Organic Chemistry Bahl, A., & Bahl, B. S. (2019). A textbook of organic chemistry (22nd ed.). S. Chand Publishing.
4. Puri, B.R., Sharma, L.R. &Pathania, M.S. (2022). Principles of Physical Chemistry. ShobanLal 48th edition. Nagin Chand & Co, New Delhi.

Reference Books

1. Soni, P.L.& Mohan Katyal. (2017). Text book of Inorganic Chemistry. 25th revised edition, Sultan Chand & Sons.
2. Peter Atkins, Julio de Paula, and James Keeler, (2017). Atkins' Physical Chemistry II, 11th Edition, Oxford University Press, UK.

3. B.S. Bahl, Arun Bahl & G.D.Tuli, (2020) Essentials of Physical Chemistry, 28th Edition, S. Chand Publishing.
4. Organic Chemistry Jain, M. K., & Sharma, S. C. (2014). *Organic chemistry*. Vishal Publishing Co.

Web References


1. <https://www.thoughtco.com/definition-of-quantum-number-604629>
2. <https://www.youtube.com/watch?reload=9&v=QAH-cCK1bS8>
3. <https://ncert.nic.in/textbook/pdf/kech202.pdf>
4. <https://unacademy.com/content/wp-content/uploads/sites/2/2022/10/2.-Atomic-Structure.pdf>

Pedagogy

Lecture based teaching and learning, Group - teaching and learning, Peer teaching, Game - based learning, Expeditionary learning, Inquiry based learning, Learning through problem-solving etc.,

Course Designer

Dr. P. Thamizhini


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PROFESSOR
School of Chemistry
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Semester I	Internal Marks: 40	External Marks: 60		
COURSECODE	COURSETITLE	CATEGORY	Hrs/Week	CREDITS
26UCH1CP1	QUANTITATIVE TITRIMETRIC ESTIMATION AND INORGANIC PREPARATIONS (P)	CORE	3	3

Course Objective

- To learn the techniques of titrimetric analyses.
- To know the estimation of several cations and anions.
- To estimate of total hardness of water and acid value of oils.

S. No	Course Features	Relevance Status
1.	Course emphasis on Employability/ Entrepreneurship/Skill Development	Employability and Skill Development
2.	Course integrates cross cutting issues relevant to Professional Ethics/Gender sensitization/ Environment and Sustainability/ Human Values / Indian Knowledge System	Professional Ethics
3.	Course relevant to Local/Regional/National/ Global needs	Global needs
4.	Course focus on Sustainable Developmental Goals	SDG2, 12

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Describe the basic principles involved in volumetric analysis.	K1
CO2	Demonstrate the experimental methods of volumetric analysis and estimate the chlorine content in bleaching powder.	K2
CO3	Determine the hardness of water and saponification value of oil.	K3
CO4	Apply volumetric analysis for the applied experiments.	K4
CO5	Application of volumetric principle in estimating of alkali content in soaps and detergents.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	-	2	3	3	2
CO2	2	2	2	3	2	3	3	3	3	2
CO3	2	3	3	1	2	2	3	3	2	1
CO4	2	3	2	1	2	2	3	2	2	1
CO5	2	2	2	3	2	2	2	3	2	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

SYLLABUS

I. Titrimetric Quantitative Analysis:

Laboratory Safety and Basic Techniques

- Introduction to laboratory apparatus.
- Safety rules and handling of chemicals
- Cleaning and drying of glassware

Calculation of equivalent weight and Preparation of standard solution.

a) Acid-Base Titrimetric Experiments:

- 1) Estimation of HCl using NaOH as link and standard oxalic acid.
- 2) Estimation of Na_2CO_3 using HCl as link and standard Na_2CO_3 .
- 3) Estimation of free alkali present in different soaps/detergents.

b) Oxidation-Reduction Titrimetric Experiments:

- 1) Estimation of Iron (II) sulphate using KMnO_4 as link and standard Mohr's salt.
- 2) Estimation of oxalic acid using KMnO_4 as link and standard oxalic acid.
- 3) Estimation of KMnO_4 using thio solution as link and standard $\text{K}_2\text{Cr}_2\text{O}_7$.
- 4) Estimation of copper (II) sulphate using $\text{K}_2\text{Cr}_2\text{O}_7$.

c) Complexometric and argentometric Experiments:

- 1) Estimation of Mg (II) ions by EDTA solution.
- 2) Estimation of chloride ion in barium chloride solution using standard sodium chloride.

II. Applied Experiments:

- 1) Estimation of total hardness of water.
- 2) Estimation of chlorine in bleaching powder.
- 3) Estimation of acid value of an oil.

III. Inorganic Compound Preparations:

- 1) Potassium trioxalato ferrate (III).
- 2) Preparation of cuprous chloride.
- 3) Preparation of Potash Alum.

Text Books

1. Venkateswaran, V., Veeraswamy R., and Kulandaivelu (1997). Basic Principles of Practical Chemistry. 2nd edition. New Delhi, Sultan Chand & Sons.
2. Bassett, J. (1985). Text Book of Quantitative Inorganic Analysis. 4th edition. ELBS Longman.

Reference Book

1. Vogel A. I. (2000) Text book of quantitative inorganic analysis. The English language book society.

Web References


1. <https://chemlab.truman.edu/files/2015/07/edta.pdf>.
2. <https://www.youtube.com/watch?v=wh6-cYjNNiA>
3. <https://www.slideshare.net/mithilfaldesai/estimation-of-feii-ions-by-titrating-against-k2-cr2o7- using-internal-indicator>.
4. <https://www.youtube.com/watch?v=qmVQs6Q7tso>.
5. <http://www.titrations.info/EDTA-titration-calcium>.

Pedagogy

Demonstration and Practical Sessions.

Course Designers

Dr. K. Uma Sivakami.


Dr. K. SRINIVASAN
PROFESSOR
School of Chemistry
Bharathidasan University
Tiruchirappalli - 620 024

ALLIED COURSE -I (AC-I)
MATHEMATICS-I
(For B.Sc Physics & Chemistry)
(2026-2027 and Onwards)

Semester I	Internal Marks: 30		External Marks:70	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
26UPH1AC1/ 26UCH1AC1A	MATHEMATICS-I	ALLIED COURSE -I	3	3

Course Objectives

- Explore the students with mathematical methods formatted for their major concepts and train them in basic Integrations.
- Analyze mathematical statements and expressions.
- Evaluate the fundamental concepts of Differentiation and Integration.

S. No.	Course Features	Relevance Status
1.	Course emphasis on Employability/Entrepreneurship/Skill Development	Employability Skill Development
2.	Course integrates cross cutting issues relevant to Professional Ethics/Gender sensitization/ Environment and Sustainability/ Human Values\ Indian Knowledge System	Professional Ethics/Environment and Sustainability
3.	Course relevant to Local/Regional/National/ Global needs	National/ Global need
4.	Course focus on Sustainable Developmental Goals	SDG 4,8,9,12

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Explain the concepts of Calculus and Fourier series.	K1,K2
CO2	Classify the problem models in the respective area.	K3
CO3	Solve various types of problems in the corresponding stream.	K3
CO4	Identify the properties of solutions in the core area.	K3
CO5	Discover the applications of Calculus and Fourier series.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	3	2	2	2	2
CO2	3	2	2	2	2	3	2	2	2	2
CO3	3	2	2	2	2	3	2	2	2	2
CO4	3	2	2	2	2	3	2	2	2	2
CO5	3	2	2	2	2	3	2	2	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Successive Differentiation: The n^{th} derivative – Standard results – Method of splitting the fractional expressions into partial fractions - Trigonometrical transformation – Formation of equations involving derivatives – Leibnitz formula for the n^{th} derivative of a product (proof not needed) – A complete formal proof by induction (proof not needed).	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Curvature: Definition of Curvature – Circle, Radius and Centre of Curvature – Cartesian formula for the radius of curvature - The coordinates of the centre of curvature – Radius of Curvature when the curve is given in Polar Co-ordinates.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Evaluation of integrals: Integration of Rational algebraic functions– Rule (a) – Rule (b) Type ii: Integration of the form $\int \frac{lx+m}{ax^2+bx+c} dx$ – Rule (c) - Integration of Irrational functions: Case II: Integration of the form $\int \frac{px+q}{\sqrt{ax^2+bx+c}} dx$ – Case V: Integration of the form $\int \frac{dx}{(x+p)\sqrt{ax^2+bx+c}}$ - Integration of the form $\int \frac{dx}{a+b \cos x}$.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Double Integrals: Definition of the double integral-Evaluation of Double integral- Change of order and evaluation of the double integral (Simple Problems Only in all these).	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Fourier Series: Definition of Fourier Series – Finding the Fourier Coefficients for a given periodic function with period 2π - Even and Odd functions –Half range Fourier series.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment : (Not to be included for External examination) Evolutes and Involute - (i) $\int \frac{dx}{ax^2+bx+c}$ (ii) $\int \frac{dx}{\sqrt{ax^2+bx+c}}$ -Double integral in polar co-ordinates - Triple Integrals - Development in cosine series - Development in sine series.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Narayanan, S & Manichavasagam Pillay, T.K. (2015). *Calculus Volume I*. S. Viswanathan (Printers and Publishers) Pvt Limited.
2. Narayanan, S & Manichavasagam Pillay, T.K. (2015). *Calculus Volume II*. S. Viswanathan (Printers and Publishers) Pvt Limited.
3. Narayanan, S & Manichavasagam Pillay, T.K. (2015). *Calculus Volume III*. S. Viswanathan (Printers and Publishers) Pvt Limited.

Chapters and Sections

UNIT-I	Chapter 3:Sections 1.1 - 1.6,2.1,2.2[1]
UNIT-II	Chapter 10:Sections 2.1- 2.4,2.6 [1]
UNIT-III	Chapter 1:Sections 7.1,7.3 (Rule (a),Rule (b)-Type ii,Rule (c)),7.4,8(CASE II, CASE V), 9 [2]
UNIT-IV	Chapter 5:Sections 2.1,2.2[2]
UNIT-V	Chapter 6:Sections 1 - 4[3]

Reference Books

1. Sankarappan, S. Arulmozhi,G. (2006). Vector Calculus, Fourier series and Fourier Transforms. Vijay Nicole Imprints Private Limited.
2. Vittal, P.R.(2014). Allied Mathematics. Margham Publications.
3. Singaravelu, A.(2003). Differential Calculus and Trigonometry. R Publication.

Web References

1. <https://theengineeringmaths.com/wp-content/uploads/2017/08/Chapter-1-Successive-Differentiation-.pdf>
2. <https://www.youtube.com/watch?v=tBtF3Lr-VLk&t=64s>
3. https://www.sathyabama.ac.in/sites/default/files/course-material/2020-10/UNIT-2_14.pdf
4. <https://www.youtube.com/watch?v=AEdGYEiE86Q>
5. <https://www.youtube.com/watch?v=Z4oSGuAZrZM>
6. <https://www.youtube.com/watch?v=GAwQGCyWy0>
7. <https://www.youtube.com/watch?v=9X3gqehcFII>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr.L.Mahalakshmi

Semester I	Internal Marks: 30		External Marks: 70	
COURSECODE	COURSETITLE	CATEGORY	Hrs/Week	CREDITS
26UCH1AC1B	BIOCHEMISTRY -I	ALLIED	3	3

Course Objective

- To enable students to understand the fundamental concepts of atomic structure, quantum mechanics and electronic configuration.
- To develop the ability to interpret atomic spectra, apply quantum principles, and analyze the significance of wave functions.
- To help students evaluate periodic trends such as atomic/ionic radii, ionization enthalpy, electron gain enthalpy, and electronegativity.

S. No	Course Features	Relevance Status
1.	Course emphasis on Employability/ Entrepreneurship/Skill Development	Employability, entrepreneurship and Skill Development
2.	Course integrates cross cutting issues relevant to Professional Ethics/Gender sensitization/ Environment and Sustainability/ Human Values / Indian Knowledge System	Professional Ethics, Gender sensitization and Human Values
3.	Course relevant to Local/Regional/National/ Global needs	Global needs
4.	Course focus on Sustainable Developmental Goals	SDG 2, 3, 4, 12

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Overview the fundamental concepts of biomolecules, micronutrients and blood constituents.	K1
CO2	Summarize structural features, physiological roles and metabolic events.	K2
CO3	Interpret pathway functions, regulatory mechanisms and laboratory parameters.	K3
CO4	Differentiate pathological conditions based on biochemical changes.	K4
CO5	Assess clinical findings for diagnostic relevance.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	3	2	2	2	2
CO2	3	2	2	2	2	3	2	2	2	2
CO3	3	3	2	2	3	3	3	2	3	2
CO4	3	3	3	2	3	3	3	2	3	2
CO5	3	3	3	2	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Carbohydrates Fundamental terms - classification - digestion - absorption of glucose - intermediary metabolism of carbohydrates - glycogenesis, glycogenolysis, glycolysis, - regulation of blood sugar - normal range - hypoglycemia - hyperglycemia - diabetic mellitus - types - symptoms.	09	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Proteins Introduction - classification - structure of proteins - primary - secondary - tertiary - denaturation - absorption - general pathway of protein metabolism. In born errors of amino acid metabolism - phenylketonuria and albinism.	09	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Lipids Essential terms – classification of lipids - oxidation of fatty acids - ketogenesis, ketolysis, role of liver in fat metabolism - cholesterol - absorption - factors influencing absorption - lipid profile - triglycerides - lipoproteins - HDL and LDL - fatty liver - Inborn errors of lipid metabolism.	09	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Vitamins and Minerals Classification - fat soluble and water - soluble vitamins - sources – general characteristics- metabolism -physiological functions - deficiency. Minerals - requirements - essential macro and micro minerals - sources - functions – deficiency and toxicity.	09	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	Blood and Bile Pigments Blood - functions of plasma proteins - blood groups - Rh factor - haemoglobin - structure - properties - metabolism. Bile pigments - examples – Types – structure and properties- metabolism – biological importance.	09	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not to be included for External Examination) Structure and classification of carbohydrates - categories of amino acids - types and functions of lipids - properties and examples of bile pigments.	-	CO1	K1, K2

Text Books

1. Ambika, S. (2012). Fundamentals of Biochemistry for Medical Students. (7th ed.). Ippincott Williams & Wilkins.
2. Fatima, D., Nallasingam, K., Narayanan, L. M., Arumugam, N., Meyyan, R. P., & Prasanna Kumar, S. (2019). Biochemistry. (7th ed.). Saras Publication.
3. Jain, J. L., Jain, S., & Jain, N. (2016). Fundamentals of Biochemistry. (Revised ed.). S Chand & Co Ltd.

Reference Books

1. Annie Ragland, & Arumugam, N. (2015). Biochemistry and Biophysics. (3rd ed.). Saras Publication.
2. Nelson, D. L., & Cox. M. M. (2017). Lehninger Principles of Biochemistry. (7th ed.). WH Freeman.
3. Voet, D., Pratt, C. W., & Voet, J. G. (2012). Principles of Biochemistry. (4th ed.). John Wiley & Sons.
4. Berg, J. M., Stryer, L., Tymoczko, J., & Gatto, G. (2019). Biochemistry. (9th ed.). WH Freeman.
5. Mathews, C. K., Van Holde, K. E., & Ahern, K. G. (2000). Biochemistry. (3rd ed.). Pearson.

Web References

1. https://www.biologie.ens.fr/~mthomas/L3/intro_biologie/2-sucres-lipides-acides-nucleiques.pdf
2. <https://www.hrpatelpharmacy.co.in/files/notes/vitamins-notes.pdf>
3. <https://www.scribd.com/presentation/983624717/bile-pigment-blood>


4. https://www.uomustansiriyah.edu.iq/media/lectures/6/6_2018_10_03!03_49_00_PM.pdf
5. https://uomustansiriyah.edu.iq/media/lectures/4/4_2022_05_21!02_30_32_AM.pdf

Pedagogy

Lecture based teaching and learning, Group - teaching and learning, Peer teaching, Game - based learning, Expeditionary learning, Inquiry based learning, Learning through problem-solving etc.

Course Designer

Dr. S. Devi


Dr. K. SRINIVASAN
PROFESSOR
School of Chemistry
Bharathidasan University
Tiruchirappalli - 620 024

ALLIED COURSE -II (AC - II)
MATHEMATICS-II
(2026-2027 and Onwards)

Semester I	Internal Marks: 30		External Marks:70	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
26UPH1AC2 / 26UCH1AC2A	MATHEMATICS-II	ALLIED COURSE	3	3

Course Objectives

- Analyze the mathematical methods formatted for their major concepts.
- Evaluate the problems in Algebra and Trigonometry.
- Explain the basics of Three-Dimensional geometry.

S. No.	Course Features	Relevance Status
1.	Course emphasis on Employability/Entrepreneurship/Skill Development	Employability, Entrepreneurship, Skill Development
2.	Course integrates cross cutting issues relevant to Professional Ethics/Gender sensitization/ Environment and Sustainability/ Human Values/ Indian Knowledge System	Professional Ethics, Sustainability
3.	Course relevant to Local/Regional/National/ Global needs	Global need
4.	Course focus on Sustainable Developmental Goals	SDG 4,5,9,12

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Explain various notions in Algebra, Analytical Geometry of 3D & Trigonometry.	K1,K2
CO2	Identify the problem models.	K3
CO3	Apply the concepts of Algebra, Analytical Geometry of 3D & Trigonometry.	K3
CO4	Solve the given problems in the respective stream.	K3
CO5	Analyze the applications of the core area.	K4

Mapping of CO with POs and PSOs

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	2	3	2	2	2	2
CO2	2	2	2	3	2	3	2	2	2	2
CO3	2	2	2	3	2	3	2	2	2	2
CO4	2	2	2	3	2	3	2	2	2	2
CO5	2	2	2	3	2	3	2	2	2	2

“1” – Slight (Low) Correlation □ “2” – Moderate (Medium) Correlation □
 “3” – Substantial (High) Correlation □ “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Series Expansion: Application of the Binomial Theorem to summation of series.</p> <p>Summation: Exponential series - Logarithmic series- Series which can be summed up by the Logarithmic series (Problems only).</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.
II	<p>Matrices: Inverse Matrix- Inner product- Solution of Simultaneous Equations-Rank of a matrix- Elementary transformation of a matrix-A system of m homogeneous linear equations in n unknowns- Linear dependence and independence of vectors-System of non-homogeneous linear equations - Eigen values and Eigenvectors. (Applications only)</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.
III	<p>Three Dimensional Geometry: The Sphere – Definition- The equation of a sphere when the center and radius are given-The equation of a sphere to find its center and radius- The length of the Tangent Plane from a point to the sphere – The Plane Section of a sphere is a circle – Equation of a circle on a sphere –Intersection of two spheres in a circle.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.
IV	<p>Expansion of Trigonometric functions: Expansions of $\cos n\theta$ and $\sin n\theta$ - Expansion of $\tan(A \pm B \pm C \pm \dots)$ (omitting examples on formation of equations) –Powers of sines and cosines of θ in terms of functions of multiples of θ – Expansions of $\cos^n \theta$ when n is a positive integer – Expansions of $\sin^n \theta$ when n is a positive integer.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.
V	<p>Hyperbolic functions: Hyperbolic functions – Relation between hyperbolic functions – Relations between hyperbolic functions and circular functions - Inverse hyperbolic functions.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.
VI	<p>Self-Study for Enrichment : (Not to be included for External examination) Series which can be summed up by the Logarithmic series - Matrix-Special types of Matrices – Scalar multiplication of a matrix-Equality of matrices- Addition of matrices-Subtraction of matrices- Symmetric matrix- Skew symmetric matrix-Hermitian and Skew Hermitian matrix –Multiplication of matrix-Simple applications of Matrices- The equation of the tangent plane to the sphere at a point. (Only problems) - Expansion of $\tan^{-1} x$ in terms of powers of x- Separation of real and imaginary parts of $\tanh(x+iy)$.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.

Text Books

1. Manichavasagam Pillai, T.K. Natarajan, T. & Ganapathy, K.S. (2015). *Algebra, Volume I*. S. Viswanathan Pvt Limited.
2. Manichavasagam Pillai, T.K. (2015). *Algebra, Volume II*. S. Viswanathan Pvt Limited.
3. Manichavasagam Pillai, T.K. & Natarajan, T. (2016). *A Text book of Analytical Geometry Part-II 3D*. S. Viswanathan Pvt Limited .
4. Manichavasagam Pillai, T.K. & Narayanan, S. (2013). *Trigonometry*. S. Viswanathan Pvt Limited.

Chapters and Sections

- UNIT-I Chapter 3: Sections 10 [1]
Chapter 4: Sections 3, 7, 9 [1]
- UNIT-II Chapter 2: Sections 8 -11, 13- 16 [2]
- UNIT-III Chapter 4: Sections 1- 7 [3]
- UNIT-IV Chapter 3: Sections 1 to 4 [4]
- UNIT-V Chapter 4: Sections 1, 2 [4]

Reference Books

1. Arumugam, S. Issac, A. (2017), *Analytical Geometry 3D and Vector calculus*, New Gamma Publishing house.
2. Pandey, H.D. Khan, M.Q. & Gupta, B.N. (2011), *A Text Book of Analytical Geometry and Vector Analysis*, Wisdom Press.
3. Singaravelu, A. (2003), *Differential Calculus and Trigonometry*, R Publication.

Web References

1. <https://www.youtube.com/watch?v=JayFh5EJHcU>
2. <https://www.youtube.com/watch?v=h5urBuE4Xhg>
3. <https://www.youtube.com/watch?v=59z6eBynJuw>
4. <https://www.youtube.com/watch?v=9DyPyJb2N9g>
5. <https://www.youtube.com/watch?v=HOk2XLeFPDk>
6. <https://www.youtube.com/watch?v=G1C1Z5aTZSQ>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. R. Radha

Semester I	Internal Marks: 40		External Marks: 60	
COURSECODE	COURSETITLE	CATEGORY	Hrs/Week	CREDITS
26UCH1ACP1B	BIOCHEMISTRY-I (P)	ALLIED	3	3

Course Objective

- To expertise the student for analysis of any biological sample for identification of its chemical composition

S. No	Course Features	Relevance Status
1.	Course emphasis on Employability/Entrepreneurship/Skill Development	Employability and Skill Development
2.	Course integrates cross cutting issues relevant to Professional Ethics/Gender sensitization/ Environment and Sustainability/ Human Values/ Indian Knowledge System	Professional Ethics
3.	Course relevant to Local/Regional/National/ Global needs	Global needs
4.	Course focus on Sustainable Developmental Goals	SDG 1,3,4,6,11,12

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Classify given compounds of carbohydrates, amino acids and lipids based on the characteristic reactions	K1&K2
CO2	Analyze functional group and nature of bonding in a given compound.	K3
CO3	Prepare and isolate the biomolecules present in food products	K3
CO4	Estimate the amount of carbohydrate and protein present in the given solution	K4
CO5	Assess the quality and quantity of biomolecules by analytical methods	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	2	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	2	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

SYLLABUS

QUALITATIVE ANALYSIS

1. Preparation of Solutions

- ❖ Preparation of molar, normal, and percentage solutions
- ❖ Preparation of buffer solutions (phosphate buffer)

2. Qualitative Analysis of Carbohydrates

- ❖ Molisch's Test
- ❖ Benedict's Test
- ❖ Fehling's Test
- ❖ Iodine Test for starch

3. Qualitative Analysis of Proteins

- ❖ Biuret Test
- ❖ Ninhydrin Test
- ❖ Xanthoproteic Test
- ❖ Millon's Test

4. Qualitative Analysis of Lipids

- ❖ Solubility test
- ❖ Grease spot test
- ❖ Emulsification test

5. Identification of Unknown Samples

- ❖ Detection of carbohydrates, proteins, and lipids in given samples

Record Work

- ❖ Observation

Text Books

1. Rajendiran, S., & Sivakumar, T. (2018). *Biochemistry practical manual*. Chennai: Margham Publications.
2. Basu, P., & Chakraborty, S. (2017). *Biochemistry laboratory manual*. New Delhi: New Central Book Agency.

Reference Books

1. Zubay, C. (1986). *Biochemistry*. Addison Wesley.
2. Wood, W. B. (1981). *Biochemistry- A problem Approach*. Addison Wesley.

3. Sengar, R. S. (2015). *Laboratory manual of biochemistry: Methods and techniques*. New Delhi: CBS Publishers & Distributors.
4. Tarakaram, K. (2016). *Biochemical techniques: A practical approach*. Hyderabad: Universities Press.
5. Patil, V. U. (2019). *Biochemical estimations: A laboratory manual*. New Delhi: Academic Publishers.

Web References


1. http://nec.edu.np/Publications/Chemistry_LAB_Manual/Experiment%204.pdf
2. <https://microbenotes.com/osazone-test/>
3. https://www.mlsu.ac.in/econtents/1616_Biochemical%20Tests%20of%20Carbohydrate,%20protein,%20lipids%20and%20salivary%20amylase.pdf
4. <https://vlab.amrita.edu/?sub=2&brch=191&sim=692&cnt=2>
5. https://webstor.srmist.edu.in/web_assets/srm_mainsite/files/files/2%20ESTIMATION%20OF%20PROTEIN%20BY%20LOWRY.pdf

Pedagogy

Demonstration and practical sessions

Course Designer

Dr. N. Anusuya


Dr. K. SRINIVASAN
PROFESSOR
School of Chemistry
Bharathidasan University
Tiruchirappalli - 620 024