CAUVERYCOLLEGE FOR WOMEN(AUTONOMOUS)

Nationally Accredited with 'A+' Grade by NAAC

TIRUCHIRAPPALLI

PG AND RESEARCH DEPARTMENT OF MICROBIOLOGY

B.Sc., MICROBIOLOGY

SYLLABUS

2025 -2026 and Onwards

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG AND RESEARCH DEPARTMENT OF MICROBIOLOGY

VISION

Our vision is to encourage eminent research work through the conception of an attractive and vibrant environment to achieve goals of our department.

MISSION

- To impart relevant, ultimate, principle-oriented education and practical expertise in the field of Microbiology.
- To strive to provide quality education conjugated with innovative technology so as to be able to gain technical and educational expertise locally, nationally, internationally.
- Our prime focus is to enrich the ambitions of our students, staff and steer with constructive collaboration towards excellence.

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., MICROBIOLOGY PROGRAMME

PONO.	On completion of B.Sc., Microbiology, the students will be able to
PO1	**Academic Excellence and Competence:** Elicit firm fundamental knowledge in theory as well as practical for coherent understanding of academic field to pursue multi and inter disciplinary science careers in future.
PO2	**Holistic and Social approach:** Create novel ideas related to the scientific research concepts through advanced technology and sensitivity towards sustainable Environmental practices as well as social issues.
PO3	**Professional ethics and Team Work:** Explore professional responsibility through projects, internships, field trip/industrial visit and mentorship Programmes to transmit communication skills.
PO4	**Critical and Scientific thinking:** Equip training skills in Internships, Research Projects to do higher studies in multidisciplinary path with higher level of specialization to become professionals of high-quality standards.
PO5	**Social Responsibility with ethical values:** Ensure ethical, social and holistic values in the minds of learners and attain ender parity for building a healthy nation.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc., MICROBIOLOGY

PSO NO.	Students of B.Sc., Microbiology will be able to	Pos Addressed
PSO1	Improve their knowledge on the basic concepts for retaining competence and confidence which enables them to develop interest in the new arena of Microbiology	PO1, PO5
PSO2	Acquire expertise in practical work within dependent equipment Handling skill along with collection and interpretation of scientific data	PO2, PO3
PSO3	Legitimize knowledge by emerging multiple aspects of current research.	PO3, PO5
PSO4	Pursue the importance of substantial original Research to meet the current and future expectation.	PO4, PO1
PSO5	Beware of the ethical issues for the benefit of the society by adding skilled scientific work for across the country.	PO5, PO2

Cauvery College for Women (Autonomous)

PG & Research Department of Microbiology

B.Sc., Microbiology

Learning Outcome Based Curriculum Framework (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2025-2026 and onwards)

Semester	Part	Course	Title	Course Code	Inst. Hrs.	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Language Course-I (LC) Tamil / other languages	தமிழ் இலக்கிய வரலாறு – I	25ULT1	6	3	3	25	75	100
			Poetry, Grammar and History of Sanskrit Literature	23ULS1						
			Hindi Ka Samanya Gyan aur Nibandh	23ULH1						
			Foundation Course: PaperI- French-I	23ULF1						
	II	English Language Course- I(ELC)	General English -I	23UE1	6	3	3	25	75	100
	III	Core Course – I(CC)	Fundamentals of Microbiology and Microbial Diversity	23UMB1CC1	5	5	3	25	75	100
		Core Practical - I (CP)	Fundamentals of Microbiology and Microbial Diversity (P)	23UMB1CC1P	3	3	3	40	60	100
		First Allied Course- I (AC)	Biochemistry I	23UMB1AC1	4	3	3	25	75	100
		First Allied Course- II (AC)	Biochemistry I (P)	23UMB1AC1P	4	3	3	40	60	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal Universal Human Values	25UGVE	2	2	-	100	-	100
	TOTAL				**30**	**22**				**700**

Courses & Credits for UG Science Programmes

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the Candidates admitted from the Academic year 2025-2026and onwards)

Part	Course	No. of Courses	Hours/ Course	Credits	Total Credits
I	Tamil/ Other Language	4	6	12	12
II	English	4	6	12	12
III	Core (Theory) Core (Practical) CC/CP-III Cyber Security	9 6 1 1	5/6 3/4 2 5	9*5=45 6*3=18 1*2=2 1*4=4	**98**
	Project Work	1	4	3	
	Internship	1	-	2	
	First Allied	3	3/4	3*3=9	
	Second Allied	3	3/4	3*3=9	
	DSE	2	5	2*3=6	
IV	GEC	2	2	2*2=4	17
	SEC	2	2	2*2=4	
	AECC-I -Universal Human Values	1	2	2	
	AECC-II-Environmental Studies	1	2	2	
	AECC-III-Innovation and Entrepreneurship	1	2	1	
	AECC-IV- Health and Wellness	1	-	1	
	AECC-V Professional Skills	1	2	2	
	AECC-VI Gender Studies	1	1	1	
V	Extension Activities	0	-	1	01
		45		140	**140**

Internal and external marks for theory and practical papers are as follows:

Subject	Internal Marks	External Marks
Theory	25	75
Practical	40	60

For Theory:

a) The passing minimum for CIA shall be 40% out of 25marks (i.e. 10marks)

b) The passing minimum for End Semester Examinations shall be 40% out of 75 marks (i.e.30marks)

For Practical:

a) The passing minimum for CIA shall be 40% out of 40 marks (i.e. 16marks)

b) The passing minimum for End Semester Examinations shall be 40% out of 60marks (i.e.,24 marks)

Internal Component (Theory)

Component	Marks
Quiz	10
Assignment &Seminar	10
CIA -I	05
Total	25

Internal Component (Practical)

Component	Marks
Record Note	10
Continuous Performancein Practical(Attendance and Observation)	15
CIA	15
	40

Question Paper Pattern for different courses+

Semester: I	Internal Marks : 25		External Marks : 75	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs./ Week**	**CREDITS**
23UMB1CC1	**FUNDAMENTALS OF MICROBIOLOGY AND MICROBIAL DIVERSITY**	**CORE**	**5**	**5**

Course Objective

- This subject aims to introduce the history and development of Microbiology. The contents of this course will help students understand history, biology of microorganisms, growth and control of microbes.
- Thus, the beginners are rightly exposed to foundation of Microbiology which would lead them towards progressive advancement of the subject.

Course Outcome and Cognitive level Mapping

CO Number	CO Statement	Cognitive level
CO 1	Remember and understand the Development of Microbiology	K1, K2
CO 2	Analyze the Size and Shape of Microorganisms using Microscope	K3
CO 3	Evaluate the knowledge about Bacteria and Viruses	K4
CO 4	Compare the various Preservation Methods for preserving Microbes.	K5
CO 5	Summarize various modes of classification of microbes	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	2	3	3	3	3	2	3
CO2	3	2	3	3	2	2	3	2	3	3
CO3	3	2	2	3	3	3	2	3	3	2
CO4	2	3	3	2	3	3	3	2	3	2
CO5	3	3	2	3	2	3	3	3	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	History and scope of Microbiology - Contributions of Anton von Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Alexander Flemming. Role of microorganisms in fermentation, Germ theory of disease, Development of variousmicrobiological techniques and golden era of microbiology. Microscopy: Principles and applications of bright field, dark field, phase contrast, fluorescent SEM and TEM.	15	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
II	General characteristics of cellular microorganisms (Bacteria, Algae, Fungi and Protozoa) and acellular microorganisms - (Viruses, Viroids, Prions), Differences between prokaryotic and eukaryotic microorganisms. Structure of Bacterial cell wall, cell membrane, capsule, flagella, pili, mesosomes, spores, and gas vesicles.	15	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
III	Sterilization: Principles and methods – physical methods- moist heat, dry heat, filtration and media preparation. Cultivation of microbes- Types of culture media-Stab, slant, broth, semisolid, solid media. Aerobic and Anaerobic culture techniques- Pure culture techniques – Maintenance and preservation of microbes. Principles and types of staining– Simple, differential, Capsule staining.	15	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
IV	Introduction to microbial biodiversity- Classification – Three kingdom, five kingdom, six kingdom and eight kingdom. Ecological niche. Basic concepts of Eubacteria, Archaebacteria and Eucarya. Conservation biodiversity	15	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
V	International codes of nomenclature. Binomial nomenclature – species concept – Kingdom, division, class, order, family, and genus. Principles of classification – morphological, physiological biochemical basis of classification. Molecular basis of classification – chemotaxonomy & numerical taxonomy.	15	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.

VI	**Self Study for Enrichment (Not to be included for External Examination)** Microscopic operations, Criteria for Classification of Microorganisms, cellular organizations, Isolation and identification of Microorganisms,	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Dubey RC and Maheswari DK. (2015). *A Text Book of Microbiology*. 5th Edition. SChand, NewDelhi.
2. Ananthanarayan Paniker (2020). *A Text book of Microbiology*. 11th Edition.University Press.Singapore.
3. Madigan MT, Martinko JM, and Parker J. (2019). *Biology of Microorganisms*.12th Edition,MacMillan Press.England.
4. Pelczar MJ, Chan ECS and Kreig NR. (2015). *Microbiology*, 5th edition.McGraw-Hill. BookCo. Singapore.
5. Atlas RA and Bartha R. (2019). *Microbial Ecology. Fundamentals and Application*. 4th edition Benjamin Cummings, New York.

Reference Books

1. Prescott L. M, Harley, J.P. and Helin, D.A. (2017). *Microbiology,* 5th Edition**.** McGraw Hill.
2. Tortora GJ, Funke BR and Case CL. (2020). *Microbiology: An Introduction*. 9th Edition, Pearson Education, Singapore.
3. Black JG. (2018). *Microbiology-principles and explorations*, 6th edition. John Wiley andSons, Inc. New York.
4. Moselio Schaechter and Joshua Leaderberg (2019). *The Desk encyclopedia ofMicrobiology*.2nd edition. Elseiver Academic press, California.
5. Madigan MT, Martinko JM, and Parker J. (2019). *Biology of Microorganisms*, 12th Edition. MacMillan Press, England.

Web Reference

1. https://microbenotes.com/history-of-microbiology/
2. https://byjus.com/biology/prokaryotic-and-eukaryotic-cells/
3. https://byjus.com/biology/archaebacteria/
4. https://thebiologynotes.com/sterilization-physical-and- chemical-methods/
5. https://microbenotes.com/microbiology-of-extreme-environments/

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designer

Dr.P.Bhuvaneswari

Semester : I	Internal Marks: 40		External Marks: 60	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS/WEEK**	**CREDITS**
23UMB1CC1P	**FUNDAMENTALS OF MICROBIOLOGY AND MICROBIAL DIVERSITY (P)**	**CORE PRACTICAL**	**3**	**3**

Course Objective

- To understand the rules and procedures to be observed in a laboratory.
- To know and familiarize with equipment and apparatus used in microbiology practical exercises.
- To familiarize and understand the parts and use of microscopes.
- To appreciate the abundance and diversity of microorganisms in different habitats

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Recall the safety practice in microbiological laboratory	K1
CO2	Demonstrate the pure culture technique	K2
CO3	Develop the microscopic techniques and staining methods	K3
CO4	Determine about preparation of different media	K4
CO5	Discuss different microorganisms in different media	K6

Mapping of CO with PO and PSO

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

"1"–Slight (Low) Correlation "2" – Moderate(Medium) Correlation

"3"–Substantial (High) Correlation "-"indicates there is no correlation

Syllabus

1. Cleaning of glass wares, Microbiological good laboratory practice and safety. Sterilization and assessment of sterility – Autoclave, hot air oven, and membrane filtration.
2. Media preparation: liquid media, solid media, semi-solid media, agar slants and agar plates.
3. Preparation of basal, differential, enriched, enrichment, transport, and selective media preparation-quality control of media, growth supporting properties, sterility check of media.
4. Pure culture techniques: Spread plate, streak plate and pour plate, decimal dilution.
5. Culture characteristics of microorganisms: growth on different media, growth characteristics, and description. Demonstration of pigment production.
6. Microscopy: light microscopy and bright field microscopy.
7. Staining techniques: smear preparation, simple staining, Gram's staining and endospore staining.
8. Study on Microbial Diversity using Hay Infusion Broth-Wet mount to show different types of microbes, hanging drop method.

Text Books

1. Saha, R (2022).Microbiology Practical Manual (2nd edition) CBS Publishers & Distributors Pvt. Ltd. India.
2. Das, S (2020).Microbiology Practical Manual (1st edition) CBS Publishers & Distributors Pvt. Ltd. India.
3. Gunasekaran, P. (2018). Laboratory manual in Microbiology. New Age International Ld., Publishers, New Delhi.
4. R C Dubey and D K Maheswari (2010). Practical Microbiology. S. Chand Publishing.
5. James G Cappucino and N. Sherman MB(2013). A lab manual Benjamin Cummins, New York.

Reference Books

1. Atlas.R (1997). Principles of Microbiology, 2nd Edition, Wm.C. Brown publishers.
2. Amita J, Jyotsna A and Vimala V (2018). Microbiology Practical Manual. (1st Edition). Elsevier India
3. Talib VH (2019). Handbook Medical Laboratory Technology. (2nd Edition). CBS
4. Wheelis M, (2010). Principles of Modern Microbiology, 1st Edition. Jones and BartlettPublication.
5. Lim D. (1998). Microbiology, 2nd Edition, WCB McGraw Hill Publications.

Web References

1. http://www.biologydiscussion.com/micro-biology/sterilisation-and-disinfection-methods-and-principles-microbiology/24403.
2. https://www.ebooks.cambridge.org/ebook.jsf?bid=CBO9781139170635
3. https://www.grsmu.by/files/file/university/cafedry//files/essential_microbiology.pdf
4. https://microbiologyinfo.com/top-and-best-microbiology-books/

Pedagogy

Chalk and talk, Power Point Presentation and Group Discussions

Course Designer

Dr. E.Priya

Semester : I	Internal Marks:25		External Marks:75	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS/WEEK**	**CREDITS**
23UMB1AC1	**BIOCHEMISTRY I**	**FIRST ALLIED COURSE - I**	**4**	**3**

Course Objective

- To understand the structure, functions of various biomolecules and consequences of deviation from normal

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive level
CO1	Remember and understand the concept of macromolecules	K1,K2
CO2	Illustrate an idea about structure and function macromolecules	K2,K3
CO3	Categorize the sources of macromolecules	K4
CO4	Classify and relate properties o macromolecules	K3,K4
CO5	Recommend the daily allowances of vitamins and its Significance	K5

Mapping of CO with PO and PSO

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

"1"–Slight (Low) Correlation "2" – Moderate(Medium) Correlation

"3"–Substantial (High) Correlation "-"indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIV ELEVEL
I	**Carbohydrates**: Definition, sources, classification-monosaccharide, disaccharide,oligosaccharide and Polysaccharide, biological significance, digestion and absorption of carbohydrates	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4
II	**Proteins**: Definition, sources, classification and structure of proteins - structural and nonstructural proteins, Amino acids–structure classification - essential and nonessential, protein and non-protein amino acids.Biological Significance of Proteins.	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4
III	**Lipids:** Definition, Properties, Sources, Classification of lipids and fatty acids- saturated, unsaturated and polyunsaturated. Compound lipids - Structure and functions of phospholipids and glycolipids. Biological significance of lipids	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4
IV	**Vitamins:** Definition, sources and functionsof Fat soluble vitamins (A, D, E and K) andWater soluble vitamins (B complex and C).	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4
V	**Disorders of Metabolism:** Disorders of carbohydrate metabolism: diabetes mellitus, hypoglycemia, Disorders of amino acid metabolism: alkaptonuria, phenylketonuria, Disorders of lipid metabolism: hyperlipidemia, hyperlipoproteinemia and hypercholesterolemia. Disorders of vitamin metabolism – Night blindness, Ricketts,Scurvy, sterility, beriberi and anemia	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	**Self Study for Enrichment** **(Not to be included for External Examination)** Lactose intolerance - Inborn errors in aminoacid metabolism- Atherosclerosis – Myocardial infarction	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Ambika Shanmugam **(**2016**).** Fundamentals of Biochemistry for Medical students.8th Edition, Wolters Kluwer (India) Pvt Ltd.
2. Rafi MD, (2014) Textbook of Biochemistry for medical students,2nd edition, Universities Press, (India) Pvt. Ltd, Hyderabad, India.
3. Charlotte W Prattand Sathya narayana U and Chakrapani U (2013) Biochemistry, 4th edition, Elsevier publishers.
4. DebAC (2011). Fundamentals of Biochemistry,10th edition, New Central Book Agency (p) ltd, London
5. Rajagopal G (2010). Concise textbookofbiochemistry,2ndedition, Ahuja Publishing House.

Reference Books

1. Lubert Stryer; Jeremy Berg; John Tymoczko; Gregory Gatto (2019). *Biochemistry*, 9th Edition. Macmillon Publication.
2. Denise R Ferrier, (2013) *Biochemistry*,6th edition, LWW publishers.
3. Reginald H Garrett and Charles M Grisham (2012). *Biochemistry*, 5th edition. Brooks Colepublishers.
4. Albert L Lehninger, David L Nelson and Michael MCox, (2010). *Lehninger Principles of Biochemistry,* 2nd edition, Wiley publisher

Web References

1. https://www.slideshare.net/namarta28/monosaccharides
2. https://www.tuscany- diet.net/proteins/classification/#: ~:text=egg%20yolk%20phosvitin.
3. http://www.Protein%20classification%20based%20on%20shape,two%20classes%3A%20f ibrous%20and%20globular.
4. https://byjus.com/biology/lipids/#:~:text=There%20are%20two%20major%20types, than % 20alcohol%20and%20fatty%20acids.
5. https://www.thoughtco.com/dna-versus-rna-608191

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Dr.B.Thamilmaraiselvi

Semester I	Internal mark:40		External mark:60	
COURSECODE	**COURSE TITLE**	**CATEGORY**	**HRS/WEEKS**	**CREDITS**
23UMB1AC1P	**BIOCHEMISTRY I (P)**	**ALLIED**	**4**	**3**

Course Objective

• This course enables the students to explore the basic biochemistry practical skills.

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	Cognitive Level
CO 1	Acquire knowledge about preparation of Buffer, principle of colorimeter	K4
CO 2	Analyse the constituents of carbohydrates and proteins	K1
CO 3	Analyse the constituents of lipids, Titrimetric estimation of Glucose	K6
CO 4	Titrimetric estimation Ascorbic acid and colorimetric estimation of DNA	K6
CO 5	Determination of Amino acids by Paper chromatography & Thin layer chromatography	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO 1	3	3	3	3	3	3	3	3	3	3
CO 2	3	3	3	3	2	1	3	3	3	3
CO 3	3	3	1	3	3	3	2	2	2	3
CO 4	3	3	2	3	3	3	3	1	3	2
CO 5	3	3	3	2	2	3	3	2	2	3

"1" – Slight (Low) Correlation

"2" – Moderate (Medium) Correlation

"3" – Substantial (High) Correlation

"-" indicates there is no correlation

Syllabus

1. Preparation of Buffer & estimation of pH
2. Verification of Beer Lambert's Law
3. Qualitative Analysis of Carbohydrates
4. Qualitative Analysis of Proteins
5. Qualitative Analysis of Lipids
6. Quantitative estimation of Glucose by Benedict's method
7. Quantitative estimation of Ascorbic acid
8. Qualitative estimation of DNA by Diphenyl amine method
9. Separation of Amino acids by paper chromatography (Demonstration)
10. Separation of Amino acids by Thin layer chromatography (Demonstration)

Text Books

1. Vasudevan and Sabir Kumar Doss (2022). Practical Text book of Biochemistry for Medical students.
2. Damodaran Geetha K.(2016), Practical Biochemistry, JB brother medical publisher.
3. Ranjna Chawla. (2014). Practical clinical Biochemistry, JB brother medical publisher.
4. Manipal manual of clinical Biochemistry.(2013), JB brother medical publisher.
5. Shawn O' Farrell and Ryan T Ranallo (2006). Experiments in Biochemistry: A Hands on Approach-A manual for the undergraduate laboratory, Thomson Learning, Inc., Australia.

Reference Books

1. Vasudevan and Sabir Kumar Doss (2022). Practical Text book of Biochemistry for Medical students.
2. Damodaran Geetha K.(2016), Practical Biochemistry, JB brother medical publisher.
3. Ranjna Chawla.(2014). Practical clinical Biochemistry, JB brother medical publisher.
4. Manipal manual of clinical Biochemistry.(2013), JB brother medical publisher.
5. Shawn O' Farrell and Ryan T Ranallo (2006). Experiments in Biochemistry: A Hands on Approach-A manual for the undergraduate laboratory, Thomson Learning, Inc., Australia.

Web References

1. https://www.youtube.com/watch?v=wmhmAESv72E
2. https://www.youtube.com/watch?v=VzYDk4t97Ok
3. https://www.youtube.com/watch?v=JdXbTWfOc18
4. https://www.youtube.com/watch?v=2LiA_yNMIVs

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Dr. N.Pushpa