

**Annai College of Arts & Science**  
Quality Education for Today & Tomorrow  
Kovilacheri, Kumbakonam. 612 503. Ph: 0435 2453007  
Accredited by NAAC with 'B' Grade & Recognized by UGC under Section 2(f) & 12(B)  
Affiliated to Bharathidasan University, Tiruchirappalli. E-Mail: [acadsmn@gmail.com](mailto:acadsmn@gmail.com)

## DEPARTMENT OF BIOCHEMISTRY

Attainment of Programme outcome,  
Programme Specific outcome with  
Course outcome

  
**HEAD,  
HOD**

Department of Biotechnology,  
Annai College of Arts and Science,  
Kovilacheri, Kumbakonam - 612 503

  
**IQAC**

**Coordinator**

**IQAC Co-ordinator,**  
Annai College of Arts & Science  
Kovilacheri, Kumbakonam-612 503

  
**PRINCIPAL**

**Principal**  
Annai College of Arts & Science  
Kovilacheri, Kumbakonam-612 503



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### Mapping of Programme outcome, Programme Specific outcome with Course outcome

#### Programme outcome:

- PO1:** Students are able to understand the synthesis of proteins, lipids, nucleic acids and carbohydrates and their role in metabolic pathways.
- PO2:** Ability to apply the fundamental knowledge of Biomolecules, protein, biochemical techniques in the area of biochemistry.
- PO3:** ability to identify, formulate and solve the problems in the area of biochemistry.
- PO4:**In-depth and detailed functional knowledge of the fundamental theoretical concepts and experimental methods of Biochemistry.
- PO5:**Apply/implement interface between, on the one hand, the history of Biochemistry and natural science and, on the other hand, issues pertaining to the areas of modern technology, health, and environment.
- PO6:**Skills in planning and conducting advanced chemical experiments and applying structural-chemical characterization techniques.
- PO7:** Skill in examining specific phenomena theoretically and/or experimentally.
- PO8:**Generation of new scientific insights or to the innovation of new applications of Biochemistry research.
- PO9:** knowledge of contemporary issues in the area of biochemistry.



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### Programme Specific outcome:

- PSO1:** Application of the principles of thermodynamics and chemical kinetics in chemical reactions.
- PSO2:** Ability to analyze the various biological components through analytical tools in living cells and molecular machinery.
- PSO3:** Acquire practical skills that will prepare for a future career in the interdisciplinary subjects.
- PSO4:** Understanding of the applications of Biochemistry in various fields such as Clinical Biochemistry, Genetic Engineering, Molecular biology & Biotechnology.
- PSO5:** Understanding of the scientific basis of life process and orientation towards the application of knowledge acquired in solving clinical problem.
- PSO6:** Students shall be able to identify, formulate and solve the problems of endocrine disorders in the area of hormone biochemistry.
- PSO7:** Students shall be able to conduct the clinical biochemistry, Diagnostic biochemistry experiments as well as to analyze and interpret the results



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 Kovilpattur, P.O. with Post Office, Main Road, 612 503 P.O. (438 2741 5037)  
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 Anna University, Tiruchirappalli, E-Mail: aacadmtn@annauniv.edu

## DEPARTMENT OF BIOCHEMISTRY

### BIOMOLECULES, I6SCBCI

Course outcome	Programme outcome										Programme Specific outcome									
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	
CO1: To list out the structure and functions of biological macromolecules	✓																			
CO2: To learn the metabolism and integration of biomolecules that takes place in human system	✓																			
CO3: Integrate the various aspects of metabolism and their regulatory pathways.	✓																			
CO4: Students can understand the fundamental energetic of biochemical processes.			✓																	
CO5: To elaborate the relation between biochemical defects and metabolic disorders		✓																		
CO6: To enumerate the organization of signaling pathways		✓																		
CO7: To explain the role of membrane processes in metabolism		✓																		
CO8: Overall, To grasp the processes of metabolic transformation at the molecular level and how these processes are studied					✓									✓						













<p><b>CO4:</b> Substitutions in thiophene and pyridine – Quantitative treatment of the structural effects on reactivity – substituents effect – Origins of Hammett equation – Principles of Hammett correlation – Effect of structure on reaction mechanisms Hammett parameters and modified forms of Hammett equation – Taft Equation. Aliphatic electrophilic substitution: S<sub>E</sub>1, S<sub>E</sub>2, S<sub>E</sub>i mechanisms.</p>						✓																
<p><b>CO5:</b> Oxidation – Sharpless asymmetric epoxidation and ozonolysis. Addition to carbonyl and conjugated carbonyl systems – Mechanism – Grignard reagents – 1,2 and 1,4-additions (dimethyl lithium cuprate type).</p>					✓																	





<p><b>O5:</b> Students can understand to compare and contrast the historical uses of enzyme technology with current applications in a diverse range of industries</p>							✓																	
<p><b>CO6:</b> At the end of the course students will be explored to understand the use of enzymes in medicine, food, organic synthesis, genetics and other areas sectors that favor a wide reach for them</p>			✓									✓												
<p><b>CO7:</b> To integrate the practical aspects of enzymology with the kinetic theories to provide a mechanistic overview of enzyme activity and regulation in cells</p>		✓									✓													
<p><b>CO8:</b> It is important to study enzymes, the rate limiting molecule of all the chemical reactions and understanding enzymes could pave research ideas</p>			✓																					



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### DEPARTMENT OF BIOCHEMISTRY

#### BIOENERGETICS AND METABOLISM / 16SCCB5:

Course outcome	Programme outcome										Programme Specific outcome									
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	
CO1: Understand the differences between anabolic and catabolic processes in metabolism													✓							
CO2: Understand that reaction coordinate diagrams are useful for thermodynamics of coupling anabolic and catabolic processes in metabolism.									✓					✓						

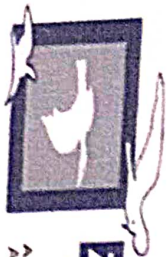


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## DEPARTMENT OF BIOCHEMISTRY

**CELL AND MOLECULAR BIOLOGY / 16SCBC6:**

Course outcome	Programme outcome										Programme Specific outcome											
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9			
	<p><b>CO1:</b> To have a basic understanding about the morphology of cell &amp; cell organelles and its function in detail.</p> <p><b>CO2:</b> To learn the structure, function and molecular mechanism of the genetic material</p> <p><b>CO3:</b> Students could able to describe the general principles of gene organization and expression in both prokaryotic and eukaryotic organisms</p> <p><b>CO1:</b> To learn how to Interpret the outcome of experiments that involves the use of recombinant DNA technology and other common gene analysis techniques</p>	✓													✓							
			✓											✓								
									✓						✓							



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## DEPARTMENT OF BIOCHEMISTRY

### MICROBIOLOGY, 16SCBC7:

Course outcome	Programme outcome										Programme Specific outcome									
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	
<b>CO1:</b> Students will acquire and demonstrate competency in laboratory safety and in routine and specialized microbiological laboratory skills applicable to microbiological research or clinical methods, including accurately reporting observations and analysis.	✓																			
<b>CO2:</b> Students will communicate scientific concepts, experimental results and analytical arguments clearly and concisely, both verbally and in writing.		✓																		
<b>CO3:</b> To understand how to relate properties of cancerous cells to mutational changes in gene function.						✓													✓	









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## DEPARTMENT OF BIOCHEMISTRY

**IMMUNOLOGY, 16SCBC8;**

Course outcome	Programme outcome										Programme Specific outcome									
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	
<b>CO1:</b> Describe the basic mechanisms distinctions and functional interplay of innate and adaptive immunity		✓																		
<b>CO2:</b> Define the cellular/molecular pathways of humoral/cell-mediated adaptive responses	✓																			
<b>CO3:</b> Define the basic mechanisms that regulate immune responses and maintain tolerance																				
<b>CO4:</b> To demonstrate the molecular basis of complex, cellular processes involved in inflammation and immunity, in states of health and disease												✓								
<b>CO5:</b> Integrate knowledge of each subsystem to see their contribution to the functioning of higher-level systems in health and disease.						✓									✓					





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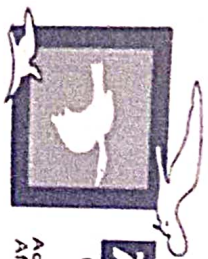
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**CLINICAL BIOCHEMISTRY, 16SCCB09:**

Course outcome	Programme outcome										Programme Specific outcome									
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	
<b>CO1:</b> An advanced understanding and applied knowledge of the theory and practice of clinical biochemistry.					✓										✓					
<b>CO2:</b> The student will be able to describe the structure, function and metabolic pathways for carbohydrates, amino acids and lipids															✓					
<b>CO3:</b> To learn the alterations in lipid and carbohydrate metabolism that occurs as a result of diabetes				✓																
<b>CO4:</b> Explain the metabolism of lipoproteins, medical problems associated with abnormal lipoprotein							✓									✓				





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**ENDOCRINOLOGY, 16SMBEBBC2:**

Course outcome	Programme outcome										Programme Specific outcome									
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	
<b>CO1:</b> Students will be expected to gain knowledge and understanding of the structure and function of mammalian endocrine tissues						✓														
<b>CO2:</b> The manner in which the regulatory control and actions of individual endocrine tissues are integrated to maintain appropriate physiological and metabolic responses to changes in the internal and external environment							✓								✓					