

Lecture Plan		
Name of the College: Government College of Arts, Science and Commerce. Sanquelim - Goa		
Name of Faculty: Mrs. Preethi M. Pednekar	Subject: Zoology	
Paper code: ZOO 300 Molecular Biology	Program: T.Y. BSc	Division: A
Academic year: 26-27	Semester: V	Total Lectures: 45
Course Objectives: . Acquaint students with basic molecular biology knowledge. 2. Provide the learners with the process of replication of DNA. 3. Understand the processes of transcription and translation in eukaryotes and prokaryotes. 4. Provide the learners with basic skills in molecular biology and handling DNA. Content: MODULE I: Nucleic Acids and Replication		

Discovery of nucleic acids.

**Nucleic acids (DNA, RNA
and**

**Expected Course Outcome: At the end of
this course, students will be able to:**

- 1. Understand the role of Molecular
Biology in modern times.**
- 2. Appreciate the role of the genetic
material in cells.**
- 3. Explain the various steps of replication,
transcription and
translation.**
- 4. Perform the basic techniques in
molecular biology**

**Student Learning Outcome: At the end of
this course, students will be able to:**

- 1. Understand the role of Molecular
Biology in modern times.**
- 2. Appreciate the role of the genetic
material in cells.**
- 3. Explain the various steps of replication,
transcription and
translation.**
- 4. Perform the basic techniques in
molecular biology**

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
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June 2025	22/6/26	27/6/26	3	Discovery of nucleic acids. Nucleic acids (DNA, RNA and their components)	Power point presentation	. B. Alberts, R. Heald, A. Johnson, D. Morgan, M. Raff, K. Roberts, and P. Walter, Molecular Biology of the Cell, 7th Edition, WW Norton & Co, 2022. 2. H. Lodish, A. Berk, C. A. Kaiser, M. Krieger, A. Bretscher, H. Ploegh, M. Kelsey, K. C. Martin, M. Yaffe, and A. Amon. Molecular Cell Biology, 9th Edition, W. H. Freeman, 2020. 3. P. S. Verma, Cell Biology, Genetics, Molecular Biology, Evolution and Ecology, S. Chand Limited, 2004. 4. R. C. Dubey, A textbook of Biotechnology, 5th Ed. S. Chand & Co. Pvt.
				B- DNA, A-DNA, Z- DNA		

							Ltd. New Delhi, 2014. 5. R. C. Dubey, and D. K. Maheswari, Practical Microbiology, S. Chand & Co. Ltd, 2007. 6. S. B. Primrose, and R. M. Twyman, Principles of Gene Manipulation and Genomics - 7 th Edition. Blackwell Publishing Company, 2006.
July	29/6/26	4/7/26	3	Mechanism of Eukaryotic DNA replication— Initiation, elongation and termination			
	6/7/26	11/7/26	3	Concepts of semi- conservative, bi- directional and semidiscontinuous replication.			
	13/7/26	18/7/26	3	End replication problems and the role of telomerases, overview of DNA repair mechanisms.			

	20/7/26	25/7/26	3	Differences between prokaryotic and eukaryotic DNA replication. Mechanism of transcription in Eukaryotes—initiation			
	27/7/26	1/8/26	3	elongation and termination, steps in the synthesis of the primary messenger RNA transcript			
Aug	3/8/26	8/8/26	3	. Eukaryotic RNA Polymerases and their role in rRNA and tRNA synthesis. Differences between prokaryotic and eukaryotic DNA transcription.			
	10/8/26	14/8/26	3	Post transcriptional modifications and processing of eukaryotic RNA-split genes, splicing mechanisms, RNA editing			
	17/8/26	22/8/26	3	Genetic code (coding dictionary,			

				degeneracy of code and Wobble hypothesis). Ribosome in Prokaryotes and Eukaryotes.			
	24/8/26	29/8/26	3	Aminoacyl tRNA synthetases and charging of tRNA. Translation steps of initiation			
	31/8/26	5/9/26	3	elongation and termination in eukaryotes			
	7/9/26	12/9/26	3	Differences between prokaryotic and eukaryotic translation			
	21/9/26	26/9/26	3	Transcription regulation in prokaryotes—principles with examples of lac operon and trp operon.			
Oct	28/9/26	3/10/26	3	Transcription regulation in eukaryotes—activators, repressors, enhancers, silencer elements			

				Genomic methylation, acetylation.			
	5/10/26	10/10/26	3				
	12/10/25	14/10/25	2	Revision			

*** Assessment Rubrics**

Component	Max Marks
ISA 1	7.5
ISA 2	7.5
Practical	25
Project	--
Semester End Exam	60