

**Semester- 5<sup>th</sup> SEM Honours, Department of Zoology, Basirhat College**  
**Session- 2020-2021**

**Lesson Plan for Course: Molecular Biology**

**Code: ZOOACOR11T**

**Credit: 4**

**Course coordinator:** Chinmoy Ghosh

**Course Outcome**

After successful completion of the course students can:

1. *Describe and explain* the basic mechanism of core molecular biological process of information transfer in a cell i.e. replication, transcription and translation.
2. *Compare* the process of replication, transcription and translation in prokaryotic and eukaryotic system.
3. Elucidate post transcriptional processing and modification of RNAs which includes capping, polyadenylation, splicing and editing.
4. Recognize the roll of RNA and other proteins in prokaryotic regulation of gene expression.
5. Describe different repair mechanism of DNA and can link it to the other cellular process
6. Understand the underlying principle of molecular biological techniques for amplifying, identifying and sequencing nucleic acids.
7. Apply the knowledge to decode genetic sequence to corresponding amino acid sequence
8. Appreciate the underlying uniformity of molecular biological system throughout animal world.

**Course planner**

**Online Platform Used: Google Classroom**

Google Classroom joining code: *5jkwgr4*

Month	Weeks	Course Topic	Teacher	Class-hour	Remarks*
Jul	wk1	Class suspended for Pandemic		0	
	wk2	Class suspended for Pandemic		0	
	wk3	Class suspended for Pandemic		0	
	wk4	Class suspended for Pandemic		0	
Aug	wk5	Salient features of DNA and RNA Watson and Crick Model of DNA	CG	2	Online class, slide presentation
	wk6	DNA replication: Semi-conservative, bidirectional and discontinuous Replication	CG	3	Online class, slide presentation
	wk7	Mechanism of DNA Replication in Prokaryotes, RNA priming, Replication of telomeres	CG	3	Online class, slide presentation
	wk8	Mechanism of Transcription in prokaryotes: Initiation, elongation, termination. Mechanism of Transcription in eukaryotes.	CG	3	Online class, slide presentation, Assignments
	wk9	Mechanism of Transcription in eukaryotes... contd. Transcription factors, Difference between prokaryotic and eukaryotic transcription.	CG	2	Online class, slide presentation, Video presentaion

## Lesson Plan for CC11

Month	Wk	Course Topic	Teacher	Class-hour	Remarks*
	Wk9	<b>Assesment test</b>		1	Self-grading online quiz
Sep	wk10	Genetic code, Degeneracy of the genetic code and Wobble Hypothesis; Ribosome structure and assembly in prokaryotes, aminoacyl tRNA synthetases and charging of tRNA; Proteins involved in initiation of translation.	CG	3	Online class, slide presentation
	wk11	Elongation and termination of polypeptide chain; fidelity of protein synthesis, Difference between prokaryotic and eukaryotic translation, Inhibitors of protein synthesis;	CG	3	Online class, slide presentation
	wk12	Capping and Poly A tail formation in mRNA; Split genes: concept of introns and exons, splicing mechanism,	CG	2	Online class, slide presentation
	wk13	Alternative splicing, exon shuffling, and RNA editing, Processing of tRNA	CG	3	Online class, slide presentation
Oct	wk14	Regulation of Transcription in prokaryotes: lac operon and trp operon;	CG	2	Online class, slide presentation
	wk15	Regulation of Transcription in eukaryotes: Activators, enhancers, silencer, repressors, miRNA mediated gene silencing, Genetic imprinting	CG	3	Online class, slide presentation, video presentation
	wk16	Doubt Clearing class.	CG	2	Peer study, Group discussion
	wk17	<b>Mid term examination</b>		0	Online Assignment
Nov	wk18	<b>Puja Vacation</b>		0	
	wk19	<b>Puja Vacation</b>		0	
	wk20	<b>Puja Vacation</b>		0	
	wk21	Recapitulation of previous topics. Types of DNA repair mechanisms,	CG	1	Online class, slide presentation
	wk22	RecBCD model in prokaryotes,	CG	1	Online class, slide presentation
Dec	wk23	Nucleotide and base excision repair, SOS repair	CG	2	Online class, slide presentation
	wk24	PCR, Western and Southern blot, Northern Blot,	CG	3	Online class, slide presentation
	wk25	Sanger DNA sequencing , cDNA technology	CG	3	Online class, slide presentation
	wk26	<b>End term exam</b>		0	
	wk27	Winter recess		0	
		<b>Total Class Hour</b>		42	

**Resources :****Recommended Online resources:**

- Online Study material given in Google Classroom
- Referred You tube videos as advised in Google classroom
- e-pgPathshala: <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=2>
- iBiology online resources: <https://www.ibiology.org/research-talks/genetics-and-gene-regulation/>
- **Text Book:**
  1. 1. Campbell's Biology, 11th Edition by Lisa A. Urry, Michael L. Cain, Steven A. Wasserman, Peter V.
  2. Minorsky, Jane B. Reece , Published by Pearson Copyright © 2017.
  3. Molecular Biology of The Gene by Watson. 7th Edition. Pearson.
- **Reference Books:**
  4. Molecular Cell Biology by Harvey Lodish. 7th Edition. W.H. Freeman.
  5. **iGenetics: A Molecular Approach by Peter. J. Russell.** 3rd edition. Pearson Benjamin Cummings.
  6. Principles and Techniques of Biochemistry and Molecular Biology by Keith Wilson and John Walker, Cambridge Univ. Press, Paperback
  7. Walker, Cambridge Univ. Press, Paperback