CORE IV

MOLECULAR BIOLOGY

Semester	Subject	Categor	Lecture		Theory		Practical		Credi
	Code	У	Tota	Hrs/	Tota	Hrs	Tot	Hrs/	t
			l hrs	wee	l hrs	1	al	wee	
				k		wee	hrs	k	
						k			
IV		Core	60	4	60	4	0	0	4

COURSE OBJECTIVES

To enable the students to understand the basics of Molecular biology

COURSE OUTCOMES

On the successful completion of the course, students will be able understand the concept of genetic material and the importance of central dogma in process of evolution.

CO	CO Statement	Knowledge Level
Number		(K1-K4)
CO1	To understand about the evidence for	K2
	genetic material and its structure.	
CO2	To understand about the process of	K2
	replication and repair mechanism.	
CO3	To understand about the detailed process of	K2
	synthesis of RNA from DNA.	
CO4	To understand about the synthesis of	K2
	protein from RNA.	
CO5	To understand about the genetic code and	K2
	mechanism of gene expression and its	
	control.	

MAPPING WITH PROGRAMME OUTCOMES:

COS	PO1	PO2	PO3	PO4	PO5	P06	
CO1	S	S	S	S	S	S	
CO2	М	Μ	М	Μ	М	М	
CO3	S	Μ	S	S	S	S	
CO4	М	S	S	Μ	S	S	
CO5	S	S	S	S	S	S	
S- Strong;		•	M- Medium;		L- Low		

Unit-I: Introduction to Molecular biology hrs

History of Molecular biology, Structure of Nucleic acids – types and forms. Physical and Chemical properties of DNA. Proof for DNA as genetic material (Griffith experiment, Avery experiment, Hershey and Chase experiments).

Unit- II: DNA replication and repair mechanism 12 hrs

DNA Replication – Enzymology – mechanism of prokaryotic replication. Differences in prokaryotic and eukaryotic replication. DNA repair – mechanism of base excision repair, nucleotide repair, SOS repair and mismatch repair.

Unit -III: Transcription hrs

RNA Polymerases – Structure and function - Process of transcription – initiation, elongation – termination - rho dependent and rho independent.

Unit- IV: Translation hrs

Genetic code, Translation system – Ribosomes, Transfer RNA, Amino acyl

12

12

12

tRNA synthetases and translation factors. Process of translation – initiation, elongation and termination.

Unit -V: Regulation of gene expression

12

hrs

Regulation of gene expression - Operon concept – Inducible and repressible - lac and trp operons – Structural genes, promoters, operators and repressors.

DISTRIBUTION OF MARKS: Theory - 100% and Problems – Nil

TEACHING METHODOLOGY:

- * Lectures
- Power point presentation
- * Charts
- * Models
- ***** Group discussion
- * Group assignments

TEXT BOOKS:

Sl no:	Book name	Author	Publisher	Year of publication
1	Microbial	Stanley R, Maloy,	2 nd Edition. Jones	2012
	Genetics	John E, Cronan,	and Barlett	
		JR, David Freifelder	Publishers,	
			London	
			2th edition New	
			delhi : Narosa	
			publishing house	
2	Genetics	Peter J Russell	Benjamin	2002
			Cummings	

3	Principles	of	Peter Snustard	D,	Eight	Edition,	2006
	Genetics		Michael	J.	John V	Wiley &	
			Simmons		Sons. Inc	с.	
4	Principles	of	Robert H Tamari	n	7 th Editi	ion, Tata	2017
	Genetics				McGraw	Hill	
					Publicatio	on, New	
					Delhi		
5	Cell	and	Gerald Karp		9 th Editio	on. John	2019
	Molecular		_		Wiley & S	Sons, Inc	
	Biology						

REFERENCE BOOKS:

S1	Book name	Author	Publisher	Year of
No:				publication
1	DNA repair and	Friedberg EC,	ASM press	1995
	mutagenesis	Walter GC, Sied. W		
2	Genetics	Ahluwalia K B	New Age	2009
			International Pvt.,	
			Ltd	
3	Principles of	Peter Snustard D,	Eight Edition,	2006
	Genetics	Michael J.	John Wiley &	
		Simmons	Sons. Inc.	
4	Principles of	Robert H Tamarin	7 th Edition, Tata	2017
	Genetics		McGraw Hill	
			Publication, New	
			Delhi	
5	Cell and	Gerald Karp	9 th Edition. John	2019
	Molecular Biology	-	Wiley & Sons, Inc	

WEB SOURCES:

http://www.molgen.mpg.de/

http://www.cellbio.com/

http://restools.sdsc.edu/

http://www.mcb.harvard.edu/biolinks.html

http://www.horizonpress.com/gateway

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