

Course: MICROBIOLOGY PG

Semester	2
Paper Number	MMCB4212
Paper Title	MOLECULAR BIOLOGY & RECOMBINANT DNA TECHNOLOGY
No of credits	6
Non composite/composite	Composite
No. of periods assigned	6
Course description/objective	<ul style="list-style-type: none"> • To know the basic processes of replication, transcription and translation • To know the principles and methods of recombinant DNA technology • To know the techniques of recombinant DNA technologies
Reference List	<p>Benjamin Lewin (2013) Genes IX . Jones and Bartlett publishers Watson,J.D., Hopkins,N .H ., Roberts, J.W., Steitz,J.A and Weiner,A.M(1987). Molecular Biology of the Gene . Benjamin-Cummings, Menlo Park California. Molecular Biology: Robert Weaver Molecular Biology :David Clark Lehninger Principles of Biochemistry - Cox & Nelson Biochemistry - Voet and Voet. Biochemistry Berg – Tymoczko&Stryer Principles of Gene Manipulation & Genomics-Primrose &Twyman. Glick,B.R., Pasternak, J.J.(2003) Molecular biotechnology 3 rd edition.ASM Press Brown T.A.(2010) Gene Cloning & DNA Analysis 6 th edition. Wiley-Blackwell Publishers 4. Sambrook, J and Russell,D.W.(2001) Molecular Cloning : a laboratory manual 3 rd edition. Cold Spring Harbor laboratory Press</p>
Evaluation	<p>Theory: 70 (60 End sem + 10 CIA) Practical: 30 (10 End sem + 20 CIA) Question Paper format: <u>Theory: End sem 60 marks</u> Module 1: 30 marks 3 questions form 5 (10x3=30) Module 2: 30 marks 3 questions form 5 (10x3=30) Viva: End sem 10 marks</p>

MOLECULAR BIOLOGY AND RECOMBINANT DNA TECHNOLOGY

THEORY 70

❖ **Module 1: Molecular Biology(35 MARKS)**

Replication: Basic Features of Prokaryotic DNA Replication, Comparison with the Eukaryotic Counterpart.

Transcription - RNA polymerases in prokaryotes and eukaryotes, Transcription signals, Promoters and Enhancers, Initiation and Elongation of RNA synthesis, Rho dependent and Rho independent termination, Transcription factors in Eukaryotes, Prokaryotic and Eukaryotic Transcription. Experiments in support of the events .Major shifts in Bacterial Transcription

Translation: Basic Features of Prokaryotic Translation, Comparison with the Eukaryotic Counterpart.

❖ **Module 2: Recombinant DNA Technology (RDT) (35 MARKS)**

Principles and methods of recombinant DNA technology- hybridization, cloning, sequencing, polymerase chain reaction, genome projects; gene manipulations; cloning in *E.coli*, plasmids,

Yeast two hybrid system, Mammalian Expression vectors. Construction and comparison of genomic and cDNA library, reverse transcription, Genome mapping, DNA fingerprinting, Phage display.

PRACTICAL: 30 MARKS

1. Isolation of bacterial genome and plasmid DNA,
2. restriction enzyme digestion,
3. restriction mapping and
4. cloning

Reference:

1. Benjamin Lewin (2013) Genes IX . Jones and Bartlett publishers
2. Watson, J.D., Hopkins, N .H ., Roberts, J.W., Steitz, J.A and Weiner, A.M(1987). Molecular Biology of the Gene . Benjamin-Cummings, Menlo Park California.
3. Molecular Biology: Robert Weaver
4. Molecular Biology :David Clark
5. Lehninger Principles of Biochemistry - Cox & Nelson
6. Biochemistry - Voet and Voet.
7. Biochemistry Berg – Tymoczko&Stryer
8. Principles of Gene Manipulation & Genomics-Primrose & Twyman.
9. Glick, B.R., Pasternak, J.J.(2003) Molecular biotechnology 3 rd edition. ASM Press
10. Brown T.A.(2010) Gene Cloning & DNA Analysis 6 th edition. Wiley-Blackwell Publishers 4. Sambrook, J and Russell, D.W.(2001)
11. Molecular Cloning : a laboratory manual 3 rd edition. Cold Spring Harbor laboratory Press
12. Molecular Biology of the Gene by Watson et al