

B.Tech. Biotechnology: Semester-IV
BBT 401: MOLECULAR BIOLOGY

Teaching Scheme	Examination Scheme
Lectures: 3 hrs/Week	Class Test -12 Marks
Tutorials: 1 hr/Week	Teachers Assessment – 6 Marks
Credits: 4	Attendance – 12 Marks
	End Semester Exam – 70 marks

Course Objective

To understand storage of genetic information and its translation at molecular level in prokaryotic and eukaryotic systems. The course also aims to make Students understand intricate molecular mechanisms of carcinogenesis and apoptosis and their applications.

Course Learning Outcomes

After completing the course, the student shall be able to:

- CO1: Explain the properties of genetic materials and storage and processing of genetic information.
- CO2: Apply mechanisms of DNA replication, damage and repair in applied molecular genetics.
- CO3: Explain mechanisms involved in gene expression.
- CO4: Explain molecular basis of complex metabolic diseases.

Unit 1: DNA Replication and repair

Mechanism of Prokaryotic and Eukaryotic DNA replication, Enzymes and accessory proteins involved in DNA replication, DNA repair Mechanism

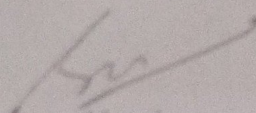
Transcription: Prokaryotic transcription, Eukaryotic transcription, RNA polymerase, General and specific transcription factors, Regulatory elements.

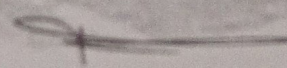
Unit 2: Modifications in RNA

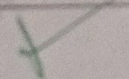
5'-cap formation, transcription termination, 3'-end processing and polyadenylation, Splicing, Editing, Nuclear export of mRNA and mRNA stability.

Translation: Prokaryotic and Eukaryotic translation, the translation Machinery; Mechanisms of initiation, elongation and termination, regulation of translation, co- and post-translational modifications of proteins

Unit 3: Regulation of Gene Expression in prokaryotic and eukaryotic systems


 Head
 Department of Biotechnology
 Invertis University, Bareilly (U.T.)


 Dean
 Faculty of Science
 Invertis University, Bareilly


 Registrar
 Invertis University
 Bareilly




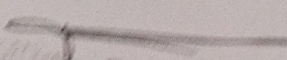
CBSB Course Curriculum (Effective from Session 2012-13) (Bachelor of Technology (B.Tech. Biotechnology))


lac operon, lac operon, regulation in E. coli
Antisense and Ribozyme technology; Molecular mechanism of antibiotic resistance, inhibition of protein synthesis and translation, conjugation of DNA molecules into plasmids, Recombinase of Phage; Hammerhead, hairpin and other ribozymes, strategies for cloning, expression, applications of antisense and ribozyme technologies.

Suggested Readings

- Concepts of Genetics, W.S. Klug, and M.R. Cummings 2004, Pearson Education
- Genome, T.A. Brown, John Wiley & Sons Inc.
- Molecular Biology of the Cell, B. Alberts, D. Bray, J. Lewis, M. Raff, K. Roberts and J.D. Watson, Garland Publishing
- Gene VIII, Benjamin Lewin 2005, Oxford University Press
- Molecular Cell Biology, H. Lodish, A. Berk, S. Zipursky, P. Matsudaira, D. Baltimore and J.E. Bernell, W.H. Freeman and Company.
- Molecular Cloning: A Laboratory Manual (3-Volume set), J. Sambrook, E.F. Fritsch and T. Maniatis, Cold Spring Harbor Laboratory Press.
- Molecular Biology of the Gene, J.D. Watson, F.M. Howes and M.M. Hopkins, Addison-Wesley Publishing.


Head
Department of Biotechnology
Invertis University, Bapatla (A.P.)


Dean
Faculty of Science
Invertis University, Bapatla (A.P.)


Registrar
Invertis University
Bapatla