

Course Type	Course Code	Name of Course	L	T	P	Credit
DE	NMCD504	Bioinformatics	3	0	0	3

Course Objective
• This course will provide knowledge on Bioinformatics.
Learning Outcomes
• Students will learn about the application of Bioinformatics in Data Analytics.

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
1	Biological Databases: Organisation, searching and retrieval of information, accessing global bioinformatics resources using internet links.	3	This unit will help students to understand how to Organize searching and retrieval of information, from Biological Database.
2	Nucleic acids sequence assembly, restriction mapping, finding simple sites and transcriptional signals, coding region identification, RNA secondary structure prediction.	10	This unit will help students to understand about Nucleic acids sequence assembly, restriction mapping, finding simple sites and transcriptional signals, coding region identification, RNA secondary structure prediction.
3	Similarity and Homology, dotmatrix methods, dynamic programming methods, scoring systems, multiple sequence alignments, evolutionary relationships, genome analysis.	10	This unit will help students understand the concept of evolutionary relationships, genome analysis.
4	Phylogeny Reconstruction: Character-Based Phylogeny Reconstruction Algorithm, Distance-Based Phylogeny Reconstruction Algorithm, Bootstrapping	9	This unit help students understand the construction of phylogenetic diagram which shows the evolutionary relationship among different taxa.
5.	Protein physical properties, structural properties – secondary structure prediction, hydrophobicity patterns, detection of motifs, structural database (PDB). Genome databases, Cambridge structure database, data mining tools and techniques, Structural Bioinformatics	10	This unit will help students understand the concept of detection and prediction of different Protein Database and Genome Database.
Total		42	

Text Books:

1. Gribkov, M., and Devereux, J. (Eds), Sequence Analysis Primer, Stockton Press, 1991.

Reference Books:

1. Mount, D.W., Bioinformatics: Sequence and Genome Analysis, Cold. Spring Harbor Laboratory Press, 2001.
2. Baxevanis, A.D., and Ouellette, B.F.F. (Eds), Bioinformatics: A practical guide to the analysis of the genes and proteins, Wiley-Interscience, 1998.