

BIT11074	Bioinformatics	L	T	P	C
Version 1.0	Contact Hours - 45	3	0	0	3
Pre-requisites/Exposure	Plus two level science				
Co-requisites	--				

Course Objectives:

- To provide those students with apt the knowledge to bioinformatics
- It will also provide in depth knowledge of the general database, and biological databases.
- Elaborating the alignment techniques
- Explore the knowledge of the applications of bioinformatics Course Outcomes
- On completion of this course, the students will be able to
- CO1. explain basic of bioinformatics and its techniques and tools.
- CO2. demonstrate the biological database and their role in bioinformatics.CO3. interpret the knowledge of sequence alignments techniques
- CO4. explain protein structure and functional analysis
- CO5. demonstrate the applications of bioinformatics and current research activities in the field of bioinformatics

Course Description:

The core- ductory level knowledge to

bioinformatics tools, biological database, sequence alignments. This course is an beginning to the bioinformatics, the application of different bioinformatics methods to biological data analysis, and some current research activities in the field of bioinformatics. Furthermore, the possible applications of bioinformatics would also be illuminated. All the lectures will be devoted on discussions of basic theories and advanced topics, focusing on practical implementation of knowledge. Classes will be conducted by lecture as well as power point presentation, audio visual virtual lab session as per requirement. The tutorials will enable the students with problem-solving ability led by the course coordinator. Students will perceive the basic concepts of the subject via exercise and discussions with the coordinator.

Course Content:

Units	Lecture Hours
Unit-I: (Contact Hours 9) Introduction & NCBI:	
Unit-II: (Contact Hours 9) Biological databases: Biological databases; primary sequence databases; Composite sequence databases; Secondary databases; composite protein pattern databases; structure classification databases;	

Units	Lecture Hours
Genome Information Resources; DNA sequence databases; specialized genomic resources.	
Unit-III: (Contact Hours 9) Alignment techniques: Pairwise Alignment Technique; Database searching; algorithms & programs; comparing two sequences; identity & similarity; global & local alignments; pairwise database searching; Multiple sequence Alignment; computational Complexity; Manual methods; Simultaneous methods; Progressive methods; Databases of multiple alignment; Secondary database searching; Analysis packages.	
Unit-IV: (Contact Hours 9) Protein analysis: Protein identity based on composition, Motifs & patterns; secondary structure prediction; specialized secondary structures; tertiary structures.	
Unit-V: (Contact Hours 9) Introduction to perl: Using PERL to facilitate biological analysis; Strings, numbers, variables; Basic input and output; Filehandles; Conditional Blocks and loops; Pattern matching; Arrays-Hashes.. SUGGESTED BOOKS: T K Attwood and D J Parry-edition, 2005.	

Relationship between Course Outcomes (COs) and Program Outcomes (POs):

Course Code	Course Name	COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
BIT11 074	Bioinformatics	CO110 74.1	3	3	3	2	2	3	1	-	2	-	-	3	1	2	2
BIT11 074	Bioinformatics	CO110 74.2	2	3	3	2	3	2	3	-	3	-	-	2	2	1	3

		CO110 74.3	2	2	3	2	1	3	1	-	3	-	-	3	1	2	1
		CO110 74.4	1	1	2	1	3	2	3	-	1	-	-	3	2	3	2
		CO110 74.5	3	3	3	2	3	3	1	2	2	-	-	3	1	3	2
		CO110 74	2.2	2.4	2.8	1.8	2.4	2.6	1.8	2.0	2.2	-	-	2.8	1.4	2.2	2.0