



C. U. SHAH UNIVERSITY

Wadhwan City

FACULTY OF:-Computer Science

DEPARTMENT OF:-Master of Computer Application

SEMESTER:- V

CODE: - 5CS05MBI1

NAME: FUNDAMENTALS OF BIOINFORMATICS (BIO)

Teaching and Evaluation Scheme

Subject Code	Name of the Subject	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
		Th	Tu	Pr	Total		Theory				Practical (Marks)			Total
							Sessional Exam		University Exam		Internal		University	
							Marks	Hours	Marks	Hours	Pr/Viva	TW	Pr	
5CS05 MBI1	FUNDAMENTALS OF BIOINFORMATICS (BIO)	4	0	0	4	4	30	1.5	70	3	----	---	---	100

Objectives:

- Introduce students to the current bioinformatics concepts and their implementations.
- Introduce students to the basics of working knowledge about how to use computer system for bioinformatics problems. Teach and train the students with the skills necessary to select relevant tools, optimize their settings, and solve the set problem.

Prerequisites:

- Basic knowledge of working with computer.

Course outline:-

Sr. No.	Course content	No. of Hours
1	Introduction Biology in the computer age, computing changes in biology, Bioinformatics just about building database, Meaning of informatics to biologists, challenges offered by biology to computer scientists, skills required for this field, Available information & software for this domain.	10
2	Tools for Bioinformatics Biological Research on the web, Using search engines, finding scientific articles. Public biological databases, Searching biological databases, Depositing data into the public databases, finding software, Judging the quality of information.	10
3	Sequence Analysis Chemical composition of bio-molecules, Composition of DNA & RNA, Development of DNA sequencing methods, Gene finders & feature detection in DNA, DNA translation.	10
4	Pair-wise alignment techniques & Database searching Database searching, Alphabets and complexity, Algorithm and programs, Comparing two sequences, sub-sequences, Identity and similarity, The Dotplot, Local and global similarity, different alignment techniques, Dynamic Programming, Pair wise database searching.	10



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5	Secondary database searching Importance and need of secondary database searches, secondary database structure and building a sequence search protocol .	08
	Total	48

Learning Outcomes:

- To familiarize the students with fundamental concepts of bioinformatics.
- To give overview of various tools available.
- Provides the foundation for sequence analysis.
- To familiarize the students with database searching techniques.

Teaching & Learning Methodology:

- Class room and laboratory teaching using teaching and learning tools like multimedia projector, overhead projectors etc.

Books Recommended:

- Developing Bio-informatics computer skills, **Cynthia Gibas & Per Jambeck**, O'REILLY.
- Introduction to Bioinformatics, **T K Attwood D J Parry-Smith**, Pearson Education
- Bioinformatics Computing, **Bryan Bergeron M.D.**, Prentice-Hall of India
- Bioinformatics- A Beginner's Guide , **Jean-Michel Claveriw, Cerdric Notredame**, WILEY dreamlech India Pvt. Ltd

Additional Reference Book(s)

- Introduction to Bioinformatics, **M.Lesk**, OXFORD publishers (Indian Edition)