

Semester:	08		
Course Code:	ZOOL 42932		
Course Name:	Bioinformatics		
Credit Value:	02		
Status:	Optional		
Pre-requisite:	ZOOL 42784		
Co-requisite:	None		
Hourly Breakdown:	Theory	Practical	Independent Learning
	20	30	50

Intended Learning Outcomes:

After completion of this course unit, the student will be able to:

1. explain the concepts and algorithms in bioinformatics,
2. describe relevant databases and tools in molecular biology,
3. browse, retrieve and analyze molecular biological data using appropriate bioinformatics tools,
4. discuss the importance of bioinformatics and computational biology in contemporary sciences, and
5. demonstrate competencies in constructing phylogenetic trees with molecular data and interpret relationships.

Course Content:

Introduction to bioinformatics and molecular databases. Basic bioinformatics algorithms and computational biology. DNA sequence analysis. Sequence alignment: pair wise alignment, multiple sequence alignment. DNA barcoding. Phylogenetics: Phylogenetic tree construction, analysis and evolutionary alignments. Amino acid sequences and protein structure prediction. DNA microarrays and heat maps. Current topics and future challenges in bioinformatics and computational biology.

Laboratory sessions on retrieval and analysis of biological data using appropriate software and tools, DNA barcoding, phylogenetic tree constructions, bootstrapping, evolutionary alignments, structure predictions and motif identification .

Teaching /Learning Methods:

A combination of lectures and laboratory sessions, computer-based learning.

Assessment Strategy:

Continuous assessment and end of semester examination. Percentage given for each sub-component indicates the percent contribution to the final marks.

Continuous Assessment 40 %		Final Assessment 60 %		
Details:		Theory	Practical	Other
Assignments	20 %	50%	10%	-
Laboratory reports	20 %			

Recommended Readings:

1. Lesk, A.M. (2019) Introduction to Bioinformatics, 5th Edition. Oxford University Press.
2. Baxevanis, A.D., G.D. Bader & D.S. Wishart (2020). Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins. 4th Edition, John Wiley & Sons.
3. Pevsner, J. (2015) Bioinformatics and Fundamental Genomics, 3rd Edition. Willey Blackwell.
4. Selected scholarly review and research articles on bioinformatics and computational biology.