

SEMESTER I & II
LSM2104/LSM2241 – INTRODUCTORY BIOINFORMATICS

Prerequisite: LSM1101 or LSM1401

Workload: 24 lecture hours + 24 laboratory hours with MiniProject + 2CA hours

This course provides introduction to biological databases and bioinformatics software, such as tools for sequence analysis, molecular phylogenetics, and biomolecular 3D structure analysis and modeling. Students will be introduced to bioinformatics theory, tools, and techniques through lectures, tutorials, practical sessions, continual assessment and a miniproject applying what they have learnt on a real-life example.

S/N	Topics	Lecture hours
1.	Introduction, Biological Databases and Bioinformatics Software Why Bioinformatics? A survey of biological databases. Bioinformatics tools and techniques	6
2.	Biological Sequence Comparison, Alignments, Patterns, and Motifs: Theory, Tools and Algorithms Principles of sequence alignment. Fundamentals of sequence comparisons. Basics of BLAST database search	6
3.	Exploring genomes	2
4.	Molecular Phylogenetics Principles of molecular evolution. Techniques in phylogenetic inference	4
5.	Principles of Structural Biology, Biomolecular visualization and Structure Prediction Basics of structural biology. Modelling bio-molecular structure from sequence.	4
6.	Latest Developments in Bioinformatics Modelling biological systems and pathways: the future of bioinformatics	2
Total Lectures:		24 h
CA1:		2h
Practicals/Tutorials:		2x12=24h
Total hours:		50h

TEXT BOOK (Reference books):

Introduction to Bioinformatics. Arthur M. Lesk. 2002. Oxford University Press; ISBN: 0199251967

MODE OF ASSESSMENT:

CA1: 15% (MCQ + Short Answer Questions)

CA2 (MiniProject): 30% (25% Miniproject Report + 5% Peer Review + 5% practical attendance)

Final Exam: 50% (MCQ + Problem-Based Essays)

MODULE CO-ORDINATOR:

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LECTURERS:

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