

BME355 Genomic Sequence Analysis

Level: 3

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JULY

Synopsis:

This course covers a core subject in computational biology where revolution in molecular biology and computer science has enabled high throughput analysis of tons of the genomic sequences generated from sequencing projects. Topics include the computational methods and algorithms for analysing and disseminating genomic information.

Topics:

- Introduction to Molecular Genetics
- Molecular Genetics and Databases
- Pairwise Sequence Alignment
- Database Searching with BLAST and FASTA
- Advanced BLAST Searching
- Multiple Sequence Alignment

Textbooks:

by Jonathan Pevsner.: Bioinformatics and Functional Genomics (eTextbook) 3/E John-Wiley Blackwell.

ISBN-13: 9781118581728

Learning Outcome:

- Demonstrate competence in the basic concepts of molecular genetics and computational biology.
- Discuss the genomic sequence organization and select specific genomic sequence data using GenBank, Ensembl, etc.
- Examine the various scoring matrices used for protein/DNA alignment and evaluate global vs. local sequence alignment tools used in studying evolution.
- Assemble the target sequences in genomic databases using the homology score matrices and the heuristic search tools.
- Evaluate various types of multiple sequence alignment algorithms & global genomic analysis tools to formulate a solution for a research problem using these tools
- Solve problems using multiple genomic tools (online) introduced in this course to answer a complex research question

Assessment Strategies (Evening Class):

Components	Description	Weightage Allocation (%)
Overall Continuous Assessment	QUIZ 1	15
	QUIZ 2	15
Overall Examinable Components	ECA	70
Total		100