COURSE OUTLINE

Course Code: CSE 463

Course Title: Introduction to Bioinformatics

Academic Session: January 2021 Term

Class hours:

- **Saturday, 12 pm – 1 pm**
- **Sunday, 12 pm – 1 pm**
- **Monday, 12 pm – 1 pm**

Course Page: https://moodle.cse.buet.ac.bd/course/view.php?id=581

Online Classroom Link: https://bdren.zoom.us/j/64680770591?pwd=d0NOeDNVNjJycmMxblExYi9PQjVJdz09

Course Teacher(s):

Name:	Office/Room:	E-mail and Telephone: (optional)
Dr. Mohammad Saifur Rahman (MDSR) (Associate Professor)	ECE/CSE/218	saifur80@gmail.com 01715-010010
Dr. Md. Shamsuzzoha Bayzid (Associate Professor)	ECE/CSE/521	shams_bayzid@cse.buet.ac.bd

Course Outline: (To be filled from the course handbook)

Molecular biology basics: DNA, RNA, genes, and proteins; Genome rearrangements; DNA sequence alignments; Gene prediction; Dynamic Programming, Local and Global Alignment; DNA sequencing, genome sequencing, protein sequencing, spectrum graphs; Combinatorial pattern matching: Database Search, Rapid String Matching, BLAST, FASTA; Genome Assembly: Consensus-alignment-overlap, Graph-based assembly; Expression Analysis, Clustering and classification; Evolutionary trees and Phylogenetics; Statistical and machine Learning Methods in Bioinformatics.

Assessment

Task	Marks (%)
Attendance	10
Class test	20
Final exam	70
Total	100

Text and Reference books:

1. An Introduction to Bioinformatics Algorithms
   Neil C. Jones and Pavel A. Pevzner
2. Bioinformatics Algorithms An Active Learning Approach (2nd Edition)
   Phillip Compeau & Pavel Pevzner
3. Fundamentals of Molecular Evolution (2nd Edition)
   Dan Graur and Wen-Hsiung Li

Weekly schedule: (20 classes in total)

Week#	Date	Topic
1	14/05/2022 ~~15/05/2022~~ 16/05/2022	Molecular biology basics: DNA, RNA, genes, and proteins
2	21/05/2022 22/05/2022 23/05/2022	Genome rearrangements
3	29/05/2022 30/05/2022 31/05/2022	Hidden Markov model (Protein family classification)
4	04/06/2022 05/06/2022 06/06/2022	Combinatorial pattern matching
5	11/06/2022 12/06/2022 13/06/2022	Protein sequencing, spectrum graphs, sequencing antibiotics
6	18/06/2022 19/06/2022 20/06/2022	Motif finding, Expression Analysis, Clustering and classification;
7	25/06/2022 26/06/2022 27/06/2022	Genome Assembly: Consensus-alignment-overlap, Graph-based assembly

Class Test #	Date	Syllabus
1	TBD	Molecular biology basics, Genome rearrangement
2	TBD	Genome Assembly, HMM, Combinatorial pattern matching