

SIXTEEN WEEK TEACHING PLAN

Course & Course Code	Introduction to Bioinformatics Lab BIOI-2201
Credit Hours	1
Department	Bioscience & Technology
Course Type:	
Theory/Lab	Lab
Program/semester/section	BS-ZOOL-8 th , BS-MLT 5 th , BS-BOCH 7 th , BS-BIOT 6 th , BS-FDST 3 rd , BS-HND 3 rd
Semester	8. 5. 7, 6, 3,3
Course Instructor name/Designation	Asma Taj/ Visiting lecturer
Office	
Office Hours / Counseling hours for students	9am to 12pm 12pm to 4:30pm 12pm to 4:30pm
Email ID:	Tajasma73@gmail.com

Note: For practical/lab work, a separate teaching plan can be prepared.

Week 1	
Objectives / Learning Outcome	Students should understand the importance of Bioinformatics in modern era by the use of bioinformatics databases, Tools and Software's.
Contents / Sub Contents	History and Importance of bioinformatics
Appropriate Teaching Strategies / Methods	Lectures\ performances on laptop
Learning Material	Notes/Sides/Web links
Appropriate Assessment Tools	Class discussion/Quiz/performances/ Presentations
Assessment Schedule	Last 15 min of lecture
Others	
Week 2	
Objectives / Learning Outcome	Students should understand the importance of Bioinformatics in modern era by the use of bioinformatics databases, Tools and Software's.
Contents / Sub Contents	Overview of NCBI ,EMBL,DDBJ(students will learn to use these databases)

Appropriate Teaching Strategies / Methods	Lectures/performances on laptop
Learning Material	Notes/Slides/Web links/performance videos
Appropriate Assessment Tools	Class discussion/Quiz/Assignments/ Presentations
Assessment Schedule	Last 15 min of lecture
Others	
Week 3	
Objectives / Learning Outcome	Students should understand the importance of Bioinformatics in modern era by the use of bioinformatics databases, Tools and Software's.
Contents / Sub Contents	BLAST and its types, importance of BLAST ,
Appropriate Teaching Strategies / Methods	Lectures\ performances on laptop
Learning Material	Notes/Slides/Web links
Appropriate Assessment Tools	Class discussion/Quiz/Assignments/ Presentations
Assessment Schedule	Last 15 min of lecture
Others	
Week 4	
Objectives / Learning Outcome	PDB Protein Data Bank
Contents / Sub Contents	Intro PDB and its importance
Appropriate Teaching Strategies / Methods	Lectures\ performance on laptop
Learning Material	Notes/Slides/Web links
Appropriate Assessment Tools	Class discussion/Quiz/Assignments/ Presentations
Assessment Schedule	Last 15 min of lecture
Others	
Week 5	
Objectives / Learning Outcome	Uniprot
Contents / Sub Contents	Intro of Uniprot and its importance
Appropriate Teaching Strategies / Methods	Lectures\ performance on laptop
Learning Material	Notes/Slides/Web links
Appropriate Assessment Tools	Class discussion/Quiz/Assignments/ Presentations
Assessment Schedule	Last 15 min of lecture

Others	
Week 6	
Objectives / Learning Outcome	Phylogenetic analysis by Clustal W
Contents / Sub Contents	What is Phylogenetic analysis, intro of ClustalW Tool
Appropriate Teaching Strategies / Methods	Lectures\ performance on laptop
Learning Material	Notes/Slides/Web links
Appropriate Assessment Tools	Class discussion/Quiz/Assignments/ Presentations
Assessment Schedule	Last 15 min of lecture
Others	
Week 7	
Objectives / Learning Outcome	Phylogenetic analysis by Clustal Omega
Contents / Sub Contents	Students will learn and perform Phylogenetic analysis by Clustalomega
Appropriate Teaching Strategies / Methods	Lectures\ performance on laptop
Learning Material	Notes/Slides/Web links
Appropriate Assessment Tools	Class discussion/Quiz/Assignments/ Presentations
Assessment Schedule	Last 15 min of lecture
Others	
Week 8	
Objectives / Learning Outcome	In-silico Gel Electrophoresis /Gel simulation/Snap Gene
Contents / Sub Contents	Intro of In-silico Gel Electrophoresis and Snap Gene Tool
Appropriate Teaching Strategies / Methods	Lectures\ performance on laptop
Learning Material	Notes/Slides/Web links
Appropriate Assessment Tools	Class discussion/Quiz/Assignments/Presentations
Assessment Schedule	Last 15 min of lecture
Others	
Week 9	
Objectives / Learning Outcome	Pubchem.
Contents / Sub Contents	Intro of Pubchem and its importance
Appropriate Teaching	Lectures\ performance on laptop

Strategies / Methods	
Learning Material	Notes/Slides/Web links
Appropriate Assessment Tools	Class discussion/Quiz/Assignments/ Presentations
Assessment Schedule	Last 15 min of lecture
Others	
Week 10	
Objectives / Learning Outcome	Predict the primary and secondary structures of protein sequences.
Contents / Sub Contents	Predict the primary of protein sequences by Swissprot
Appropriate Teaching Strategies / Methods	Lectures\ performance on laptop
Learning Material	Notes/Slides/Web links
Appropriate Assessment Tools	Class discussion/Quiz/Assignments/ Presentations
Assessment Schedule	Last 15 min of lecture
Others	
Week 11	
Objectives / Learning Outcome	Predict the primary and secondary structures of protein sequences.
Contents / Sub Contents	Predict the secondrystructure of protein sequences by PDBsum.
Appropriate Teaching Strategies / Methods	Lectures\ performance on laptop
Learning Material	Notes/Slides/Web links
Appropriate Assessment Tools	Class discussion/Quiz/Assignments/ Presentations
Assessment Schedule	Last 15 min of lecture
Others	
Week 12	
Objectives / Learning Outcome	Primer designing /primer specifications or primer requirements, Manual primer designing
Contents / Sub Contents	Intro of primer, why we do primer designing, intro and performance of Manual primer designing(by using ClustalW and oligoclculator)
Appropriate Teaching Strategies / Methods	Lectures
Learning Material	Notes/Slides/Web links
Appropriate Assessment Tools	Class discussion/Quiz/Assignments/ Presentations
Assessment Schedule	Last 15 min of lecture
Others	

Week 13	
Objectives / Learning Outcome	Primer designing /primer specifications or primer requirements, Automated method
Contents / Sub Contents	What is Automated primer designing, intro of PRIMER 3
Appropriate Teaching Strategies / Methods	Lectures\ performance on laptop
Learning Material	Notes/Slides/Web links
Appropriate Assessment Tools	Class discussion/Quiz/Assignments/ Presentations
Assessment Schedule	Last 15 min of lecture
Others	
Week 14	
Objectives / Learning Outcome	Pepdraw
Contents / Sub Contents	How to draw peptide structure using pepdraw.
Appropriate Teaching Strategies / Methods	Lectures\ performance on laptop
Learning Material	Notes/Slides/Web links
Appropriate Assessment Tools	Class discussion/Quiz/Assignments/ Presentations
Assessment Schedule	Last 15 min of lecture
Others	
Week 15	
Objectives / Learning Outcome	Mutation prediction (identification and naming of mutation by Blast X
Contents / Sub Contents	What is mutation, intro of Blast X
Appropriate Teaching Strategies / Methods	Lectures\ performance on laptop
Learning Material	Notes/Slides/Web links
Appropriate Assessment Tools	Class discussion/Quiz/Assignments/ Presentations
Assessment Schedule	Last 15 min of lecture
Others	
Week 16	
Objectives / Learning Outcome	Mutation prediction (identification and naming of mutation by Blast X.
Contents / Sub Contents	Practical performance of Mutation prediction by using Blast X.
Appropriate Teaching Strategies / Methods	Lectures\ performance on laptop
Learning Material	Notes/Slides/Web links

Appropriate Assessment Tools	Class discussion/Quiz/Assignments/ Presentations
Assessment Schedule	Last 15 min of lecture
Others	

Curriculum Contents:

Bioinformatics Lab: Overview of NCBI, EMBL, DDBJ (students will learn to use these databases), Online Tools BLAST, BLAT and FASTA, PDB File Structure. Overview and Introduction to Protein Structure, Sequence -Sequence Alignment Methods, Sequence Based Secondary Structure Prediction, Mutation prediction (identification and naming of mutation by BLASTx), Phylogenetic analysis by MEGA, In-silico Gel Electrophoresis /Gel simulation/Snap Gene.