Sr. No	Lecture Title	Description	Category	Duration
	Segment 2: Protein Sequence Alignment & Analysis			
1	NEEDLE: Pairwise Global Sequecne Alignment	• Introduction to EMBOSS Needle, a pairwise alignment tool. • Procedure to perform and analyse global alignment and track the optimum seqeunce.	Pairwise Sequence Alignment	20:02
2	WATER: Pairwise Local Sequence Alignment	• Introduction to EMBOSS Needle, a pairwise alignment tool. • Procedure to perform and analyse local alignment and how Needleman-Wunsch algorithm works.	Pairwise Sequence Alignment	9:10
3	UniProt Align & Alignment of 2 Proteins	• Description of UniProt Align tool hosted by UniProt Database. • Aligning multiple sequences using UniProt Align tool. • Annotation of alignment results.	Pairwise Sequence Alignment	3:47
4	Alignment Between Two PDB Sequences & Structures	• Alignment of biomolecular structures and sequeces through a PDB tool; sequence & structure alignment. • Defines parameters to align two query molecules and it's analysis.	Pairwise Sequence & Structure Alignment	6:07
5	Clustal Omega: Multiple Sequence Alignment	• Introduction to Clustal Omega, a multiple seqeunce alignment tool. • Procedure to align multiple sequence using Clustal Omega. • Interpretation of the output final alignment.	Multiple Sequence Alignment	19:18
6	Aln2Plot: Prediction of Hydrophobocity Between Two Proteins	• Introduction to Aln2Plot tool. • Generates graphical plots of hydrophobicity and side chain volumes for two or more query proteins using the Aln2Plot tool.	Protein Analysis	2:30

7	REPPER: Prediction of Gapless Repeats in Protein Sequences	• Introduction to REPPER to analyses regions with short gapless REPeats in protein sequences. • Analysis of output that is complemented by coiled coil prediction (COILS) and optionally by secondary structure prediction (PSIPRED).	Protein Analysis	2:25
8	SignalP: Prediction of Signal Peptide in Proteins	• Introduction of SignalP tool. • Predicton of signal peptide from protein sequence.	Protein Analysis	7:57
9	TargetP: Prediction of Protein Localization	• Introduction to TargetP server. • Prediction and detailed analysis of Mitochondrial transfer peptide through TargetP.	Protein Analysis	9:21
10	ScanProsite: Prediciton of Important Functional Sites in Proteins Using Profiles	• Establishment of ScanProssite, an improved version of the web-based tool provided by PROSITE. • Scan proteins for matches against the PROSITE collection of motifs as well as against your own patterns.	Motif & Domain Analysis	7:36
11	HMMER: Prediction of Import Functional Sites in Proteins Using Hidden Markov Models	• Introduction of HMMER; hidden Markov model based database for protein profiling. • Retrieve the sequence homologs of the query protein using the HMM profile method and it's elaborated analysis.	Motif & Domain Analysis	13:16
12	SMART: Finding Domains in Proteins	• Introduction of SMART; Simple Modular Architecture Research Tool for the identification and analysis of protein domains. • Detection of protein domains from the multiple sequence alignments of proteins.	Protein Analysis	6:44
13	Ali2D	• Use of Ali2D tool for secondary structure prediction. • Detailed analysis of the secondary structure prediction results.	Secondary Structure Prediction	4:09

14	Quick2D	• Use of Quick2D tool for secondary structure prediction. • Detailed analysis and information retrieval of the secondary structure features like alpha-helices, extended beta-sheets, transmembrane helices and disorder regions of the query protein.	Secondary Structure Prediction	4:33
15	HHrepID: Prediction Secondary Structure of Proteins	• Introduction to HHrepID, a web-based tool for the prediction of secondary structures of the protein. • Find repetitive regions within a query protein sequence using the HHrepID tool.	Secondary Structure Prediction	5:15
16	DeepCoil: Prediction of the Coiled-coil Domain Regions	• Introduction to a web based tool, DeepCoil. • Prediction of the coiled coil domain regions within a query protein sequence.	Secondary Structure Prediction	3:22
17	MARCOIL: Analysis of Coiled-coil Domains of Proteins	• Introduction to Marcoil, an HMM for the recognition of proteins with a CCD. • Analysis and prediction of potential coiled-coil domains in protein sequences.	Secondary Structure Prediction	4:05
18	Jpred: Prediction Secondary Structure of the Proteins	• Use of Jpred server for secondary structure prediction. • A detailed analysis of secondary structure features' information of the query protein sequence.	Secondary Structure Prediction	4:54