MOLECULAR BIOLOGY SYLLABUS

OMICCS 2021

Module description:

The OMICCS Molecular Biology module covers the fundamental concepts of Molecular Biology required to conduct research in the field of Bioinformatics. Paired with the other modules in the OMICCS course, students will have a solid foundation not only in the field of Molecular Biology, but Bioinformatics as a whole.

Module duration:

4 weeks, average 2.5 hours per week

Module Outline:

Week 1	Topics Covered	1. Introduction to Biology 2. Macromolecules: DNA, RNA, Lipids, Proteins 3. DNA: Replication, Transcription, Translation 4. Introduction to Proteins and Amino Acids 5. Cell division 6. DNA Replication: Leading and lagging strands, molecular mechanism, speed and precision
	Learning Activities	• Online lecture videos • Lectures with invited speakers (language of instruction: Armenian)
	Estimated duration	2 hours
Week 2	Topics Covered	1. DNA Proofreading and repair 2. Telomeres and Telomerase 3. Genes: Alleles, gene expression, the genetic code 4. Transcription and mRNA processing 5. mRNA to protein translation
	Learning Activities	• Online lecture videos • Lectures with invited speakers (language of instruction: Armenian)
	Estimated duration	3 hours
Week 3	Topics Covered	1. tRNAs and ribosomes 2. Stages of translation: Protein targeting 3. Heredity: Punnett squares 4. The law of segregation 5. The law of independent assortment 6. Probabilities in genetics 7. Incomplete dominance and codominance
	Learning Activities	• Online lecture videos
	Estimated duration	3.5 hours

Week 4	Topics Covered	1. Pleiotropy and lethal alleles 2. Genetical linkage and mapping 3. Phenotypic plasticity 4. Variation in a species
	Learning Activities	• Online lecture videos
	Estimated duration	2 hours