

BIOLOGY – Matrix of Program Learning Outcomes 2022

- **LO#1** Design and/or conduct investigations to test hypotheses by applying the scientific method
- **LO#2** Critically review and communicate scientific data in a quantitative and qualitative manner via oral and written formats
- **LO#3** Prepare, identify and analyze biological specimens by anatomical and dissection analyses, histology, microscopy, biochemical and molecular techniques
- **LO#4** Analyze cell structure and function, molecular and biochemical processes and interactions
- **LO#5** Analyze structure-function relationships and distribution of organisms by applying the theory and principles of evolution
- **LO#6** Analyze and explain the flow of genetic information, basic principles on inheritance, recombination and genetic regulation
- **LO#7** Evaluate both anatomical and physiological factors and their contribution to overall health and pathology

	LO #1	LO #2	LO #3	LO #4	LO #5	LO #6	LO #6
BIOL 110/150 General Biology			X	X	X	X	
BIOL 210 Human Gross Anatomy			X	X			X
BIOL 233 Genetics		X		X		X	X
BIOL 235 Microbiology			X				
BIOL 250 Biostatistics							
BIOL 310 Physiology			X	X			
BIOL 325 Evolutionary Biol.					X	X	
BIOL 340 Biochemistry				X			
BIOL 395 Int. Res. Lit.		X					
BIOL 432 Cell Biology		X					
BIOL/CHEM 48X Research Project	X	X					

Chemistry – Matrix of Program Learning Outcomes 2022

- **LO#1** Design and/or conduct investigations to test hypotheses by applying the scientific method
- **LO#2** Critically review and communicate scientific data in a quantitative and qualitative manner via oral and written formats
- **LO#3** Synthesize, isolate, separate, identify, quantify and characterize molecules.
- **LO#4** Apply the principles and techniques of analytical, inorganic, organic, biochemistry, and physical chemistry
- **LO#5** Interpret data by applying principles of instrumental and statistical analysis
- **LO#6** Apply molecular modeling to stereochemistry, thermodynamics, kinetics and spectroscopy

	LO #1	LO #2	LO #3	LO #4	LO #5	LO #6
CHEM 110/150 General Chemistry	X					
CHEM 210/250 Organic Chemistry	X		X	X		
CHEM 310 Quantitative Analysis		X		X	X	
CHEM 350 Instrumental Analysis		X			X	
BIOL 340 Biochemistry				X		
CHEM 395 Int. Res. Design	X	X			X	
CHEM 410/450 Physical Chemistry		X				X
CHEM 470 Inorganic Chemistry				X		
BIOL/CHEM 48X Research Project	X	X	X	X	X	

Biotechnology – Matrix of Program Learning Outcomes 2022

- **LO#1** Design and/or conduct investigations to test hypotheses by applying the scientific method
- **LO#2** Critically review and communicate scientific data in a quantitative and qualitative manner via oral and written formats
- **LO#3** Analyze DNA and protein function via instrumentation and recombinant technology
- **LO#4** Analyze and explain the principles of bioprocessing for the production of recombinant DNA-based pharmaceuticals and therapeutics
- **LO#5** Evaluate the principles of genetic engineering for the production and applications of transgenic plants and animals
- **LO#6** Evaluate the ethical, legal, regulatory and societal impact of Biotechnology

	LO #1	LO #2	LO #3	LO #4	LO #5	LO #6
BIOL 110/150						
BIOL 233		X			X	
BIOL 235						
BIOL 238						X
BIOL 250						
BIOL 337						
BIOL 340						
BIOL 341				X	X	X
BIOL 350						
BIOL 395	X	X				
BIOL 432		X				
BIOL 442				X		
BIOL/CHEM 48X	X	X	X			
CHEM 110/150	X					
CHEM 210/250	X					
CHEM 420				X		
CHEM 440						