

Learning Outcomes Curriculum Map – A. S. Biology

27-March-18

	BIO 111	BIO 112	BIO 215	BIO 230	*BIO ELEC	CHM 121	CHM 122	CHM 221	CHM 222	MAT 125	MAT 171	MAT 251	MAT 252
Compare and contrast the characteristics of prokaryotic and eukaryotic cells and their life cycles	I			E	R								
Explain the importance of different biological macromolecules, including the mechanism of their synthesis, and their roles in the cells of all organisms	I			R	R								
Summarize how cells acquire, store and release energy through metabolic pathways	I			R	R								
Describe the processes (including genetic manipulation technologies) by which heritable material is passed on to the next generation	I			R	R								
Compare and contrast the characteristics of life, including homeostatic and reproductive strategies, of different organisms across the kingdoms of life		I			R								
Recognize and explain the causes of large evolutionary trends in biodiversity, and how cladistics inform phylogeny		I			R								
Explain the processes and outcomes of macro and microevolution, including mutations		I			R								
Explain organismal interactions at the levels of populations, communities, ecosystems, and biosphere		I	R		R								
Demonstrate competency with the scientific techniques used in the exploration of introductory biology (examples include careful observation, sketching, microscopy, volumetric measurements, dissection, micropipetting, spectrophotometry, and/or modeling)	I	R	R	R	R								
Using the scientific method to design controlled experiments with testable hypotheses	I	R	E		R	I	R	E	E	R			

Collect data and create graphs or other visual representations in a clear and logical fashion that may include statistics	I	R	E	R	R	I	R	E	E	R			
Interpret the meaning of experimental results in a broader scientific context	I	R	E	R	R	I	R	E	E				
Communicate the results of lab experiments, applying broad scientific context (primary literature), utilizing clear and effective written and verbal skills	I	R	E	R	R	I	R	E	E				
<i>Research existing information and data regarding a topic of inquiry</i>	I	R	R	R	R	I	R	E	E	R			
<i>Evaluate data relevant to a topic of inquiry both quantitatively and qualitatively</i>	I	R	E	R	R	I	R	E	E	R			
<i>Formally develop an appropriate hypothesis or thesis by applying logical, scientific or quantitative reasoning</i>	I	R	E		R	I	R	E	E	R			
<i>Evaluate the validity and limitations of scientific claims in news reports and magazines</i>	I	R	R	R	R	I	R	E	E	R			
<i>Demonstrate the ability to distinguish between peer-reviewed literature from reports on science in the popular/specialty media</i>	I	R	R	R	R	I	R	E	E				
<i>Produce clear and well organized writing that responds appropriately to an assignment using standard American English</i>					R	I	R	E	E				
<i>Produce clear and well organized oral reports that respond appropriately to an assignment using standard American English</i>	I	R	E	R	R			E					
<i>Demonstrate fluency in the language of the discipline</i>	I	R	R	R	R	I	R	R	R	R	R	R	R
<i>Use appropriate software to produce written reports and to develop classroom presentations</i>	I	R	R	R	R			R	R	R	R	R	R
<i>Apply the technology of the Internet, the Web, and online databases to research biological topics and evaluate the material retrieved being mindful of ethical, legal, and security issues</i>	I	R	R	R	R					R	R		
<i>Demonstrate the ability to use computer-interfaced scientific equipment</i>	I	R	R	R	R	R	R	R	R				
<i>Use appropriate software to perform basic statistical analysis of experimental data</i>	I	R	E	R	R					R			
<i>Design and perform scientific experiments to test hypotheses using current methodology</i>	I	R	E	R	R	I	R	E	E	R			
<i>Collect, analyze, and interpret data from laboratory experiments both quantitatively and qualitatively</i>	I	R	E	R	R	R	R	R	R				
<i>Present experimental results both quantitatively and qualitatively</i>	I	R	E	R	R	R	R	R	R				

<i>Describe the physical and chemical structure of each component of the cell and explain how each component is integrated to support the cell</i>	I			R	R								
<i>Summarize how the theory of evolution can be used to explain the adaptations and diversity of multicellular organisms</i>		I	R		R								
<i>Describe the roles of organisms in the environment</i>		I	E		R								
<i>Describe the influence of people on the environment including biodiversity</i>	I	R	R		R								
<i>Use information from the fields of chemistry and physics to facilitate understanding of biological phenomena</i>	I	R		R	R	R	R	R	R				
<i>Use methods and scientific tools from the fields of chemistry, physics and mathematics in biological experiments</i>	I	R	E	R	R	R	R	R	R	I	R	I	R
<i>Apply mathematical reasoning and techniques to enhance understanding of biological processes</i>	I	R	E	R	R					I	R	I	R

* This elective includes one of the following seven courses: BIO 108, BIO 117, BIO 121, BIO 122, BIO 220, BIO 280, SCI 200. This single course program requirement will address only some of the learning outcomes indicated.