

# Course Competency

## BSC 1005L GENERAL EDUCATION BIOLOGY LABORATORY

### Course Description

An optional one-credit lab to provide students with experience in the scientific process. Laboratory fee.

(2 hr. lab)

Course Competency	Learning Outcomes
<p><b>Competency 1:</b> The student will understand how scientists apply the Scientific Method to gain knowledge of the natural world by:</p>	<ol style="list-style-type: none"> <li>1. Numbers / Data</li> <li>2. Critical thinking</li> </ol>
<ol style="list-style-type: none"> <li>1. Explaining how to design hypothesis-driven experiments and be able to differentiate between hypotheses, theories, pseudoscience, and facts.</li> <li>2. Gaining experience on interpreting graphs.</li> <li>3. Applying how the Scientific Method could be used in day-to-day life to make informed decisions.</li> </ol>	
<p><b>Competency 2:</b> The student will have an understanding of the basic structure and function of important biomolecules by:</p>	<ol style="list-style-type: none"> <li>1. Critical thinking</li> </ol>
<ol style="list-style-type: none"> <li>1. Identifying the four major groups of biological molecules and their functions in living systems and how it relates to human health.</li> <li>2. Contrasting acids and bases and explaining how they are involved in determining the pH of a solution.</li> </ol>	
<p><b>Competency 3:</b> The student will be able to demonstrate microscopy competency by:</p>	<ol style="list-style-type: none"> <li>1. Numbers / Data</li> <li>2. Critical thinking</li> <li>3. Computer / Technology Usage</li> </ol>

<ol style="list-style-type: none"> <li>1. Demonstrating knowledge of the basic parts of the compound light microscope.</li> <li>2. Demonstrating ability of the correct use of the compound light microscope, including care and storage, as well as focusing, determining total magnification, and estimating the size of objects.</li> <li>3. Demonstrating knowledge of the parts of the stereoscope.</li> <li>4. Demonstrating ability of the correct use of the stereoscope.</li> </ol>	
<p><b>Competency 4:</b> The student will understand the differences between various cell types such as plant and animal cells, to recognize cellular organelles, and differentiate between prokaryotic and eukaryotic cells by:</p>	<ol style="list-style-type: none"> <li>1. Critical thinking</li> </ol>
<ol style="list-style-type: none"> <li>1. Comparing the basic characteristics of prokaryotic and eukaryotic cells.</li> <li>2. Explaining how substances move into and out of cells, highlighting diffusion and osmosis.</li> <li>3. Identifying the stages of cellular division in mitosis and meiosis.</li> <li>4. Comparing sexual and asexual reproduction.</li> <li>5. Communicating how errors in mitosis and meiosis can lead to abnormal conditions, highlighting cancer.</li> </ol>	
<p><b>Competency 5:</b> The student will have an overview of ecology and of major plant and animal phyla by:</p>	<ol style="list-style-type: none"> <li>1. Critical thinking</li> <li>2. Environmental Responsibility</li> </ol>
<ol style="list-style-type: none"> <li>1. Describing the characteristics of Dicots and Monocots, including knowledge of the structure and function of the parts of the flowering plants.</li> <li>2. Evaluating the importance of local, native, and exotic species.</li> <li>3. Analyzing the need to control invasive species.</li> <li>4. Describing the major groups of animals.</li> <li>5. Evaluating the relevancy of selected plant</li> </ol>	

<p>and animal adaptations.</p> <ol style="list-style-type: none"> <li>Evaluating the interdependence of species.</li> <li>Analyzing the importance of protecting biodiversity and the impact of humans on the environment.</li> </ol>	
<p><b>Competency 6:</b> The student will be able to understand the energy flow in living systems and ecosystems by:</p>	<ol style="list-style-type: none"> <li>Numbers / Data</li> <li>Critical thinking</li> <li>Environmental Responsibility</li> </ol>
<ol style="list-style-type: none"> <li>Analyzing the role of the chloroplast, chlorophyll, and other pigments in the process of photosynthesis.</li> <li>Performing fermentation experiments to understand how yeast extracts energy from organic molecules.</li> <li>Performing separation of pigments using paper chromatography.</li> <li>Defining the electromagnetic spectrum.</li> <li>Distinguishing how cellular respiration and photosynthesis are interrelated.</li> </ol>	
<p><b>Competency 7:</b> The student will be able to understand basic principles of inheritance, and their application by:</p>	<ol style="list-style-type: none"> <li>Numbers / Data</li> <li>Critical thinking</li> <li>Social Responsibility</li> </ol>
<ol style="list-style-type: none"> <li>Applying how Punnett Squares are used to predict the possible outcomes of crosses.</li> <li>Explaining other patterns of inheritance such as sex-linkage.</li> <li>Interpreting pedigrees.</li> <li>Extracting DNA and understanding DNA's structure and function.</li> </ol>	

Updated: FALL TERM 2022