

OUTCOMES BASED LEARNING MATRIX

Course: BIOL 140: Introduction to Biology

Department: Biology

Course Description;

This course is not intended for students planning to major in science or allied health. It is an issues based course including topics of current interest in today's society. It will include aspects of human biology, biotechnology, environmental science, and other topics, all while focusing on science as a process. This course is intended to further develop student abilities in the core competencies: critical thinking, oral communication, quantitative skills, reading, technology skills, and writing.

Prerequisites: Preparing for College Reading II (ENGL092), Introductory Writing (ENGL 099), and Fundamentals of Mathematics (MATH 010), or waiver by placement testing results, or Departmental Approval.

The individual outcomes listed in the first column answer the question: **What must the learner know and be able to do at the end of the course?** Items in the third column should answer the question: **How do we know?** The second column is where teachers can be most creative; it's for pedagogy. Each rectangle in column one contains just one outcome; the corresponding rectangles in columns two and three, however, may contain more than one item.

The code indicates the core competencies being strengthened by the outcomes activities and the assessment tools. Critical Thinking (CT); technology skills (TS); oral communications (OC); quantitative skills (QS); reading (R); writing (W).

COURSE OUTCOMES	OUTCOMES ACTIVITIES	ASSESSMENT TOOLS
Describe the general steps of the scientific method and use these steps in solving problems, in order to understand how scientists think, distinguish between pseudoscience and real science, and evaluate scientific information in the popular press.	<ul style="list-style-type: none"> • Read text (CT,R) • Attend lecture/discussion (W,OC,CT) • Do study guide (R,W,CT) • Read articles in Time, Newsweek etc. and evaluate (R,W,CT) • Discuss the characteristics of pseudoscience vs. real science and bad science vs. good science (CT, OC) 	<ul style="list-style-type: none"> • Quizzes and exams (CT,R,W) • Short essays or papers (CT,R,W,TS) • Primary versus Secondary Literature review (CT, R, W)

COURSE OUTCOMES	OUTCOMES ACTIVITIES	ASSESSMENT TOOLS
<p>Demonstrate knowledge of the basic chemicals that are important to life in order to understand their role in human biology, biotechnology, and/or environmental issues.</p>	<ul style="list-style-type: none"> • Read text (CT,R) • Attend lecture/discussion (W,OC,CT) • Do study guide (R,W,CT) • Discuss prions and Mad Cow disease (R, W, OC, CT) • Discuss biologically important molecules in common foods. (CT, OC,R,W) • Describe the cell in terms of the molecular structure – draw a cell and label accordingly (cell membrane – phospholipids and proteins etc.) (CT,W,R) • Demonstrate protein folding and the relationship between structure and function (CT, OC) • Dietary Analysis Activity (CT, R, TS, QS) • Carbon Footprint Activity (R, CT, TS, QS) • Describe DNA fingerprinting and the role of biology in forensic science (R, W, CT, OC) • Discuss genetic engineering and its social implications (CT, OC,R,W) 	<ul style="list-style-type: none"> • Quizzes and exams (CT,R,W) • Short essays or papers (CT,R,W,TS) • Chemistry worksheet (CT, R, W) • Biologically Important Molecules Worksheet (CT, R, W) • Diet Analysis Worksheet (CT, R, W, QS) • Carbon Footprint Worksheet (R, CT, TS, Q) • Global Warming Poster (R, TS, CT, OC) • DNA Worksheet (CT, R, W) • Gene Control Worksheet (CT, R, W) • DNA Technology Worksheet (CT, R, W) • Biology & Society paper (R, W, CT, TS)
<p>Distinguish between eukaryotic and prokaryotic cells, and identify and describe the structure and function of their components in order to understand the role of cell structure in human biology, biotechnology, and/or environmental issues.</p>	<ul style="list-style-type: none"> • Read text (CT,R) • Attend lecture/discussion (W,OC,CT) • Do study guide (R,W,CT) • Discuss emergent infectious diseases and bioterrorism. (R, W, CT, OC) • Draw and label stages of mitosis and meiosis in diagrams(CT, W,TS,QS,R) • Draw and be able to explain the cell cycle (CT,OC,W) • Discuss cancer and new treatments for cancer (CT, OC,R,W) • Discuss cloning and stem cell research and their social implications (CT, OC,R,W) 	<ul style="list-style-type: none"> • Quizzes and exams (CT,R,W) • Short essays (CT,R,W,TS) • Cell Worksheet (CT, R, W) • Cell Reproduction Worksheet (CT, R, W) • Cancer Worksheet (CT, R, W) • Biology & Society papers (R, W, CT, TS)

COURSE OUTCOMES	OUTCOMES ACTIVITIES	ASSESSMENT TOOLS
<p>Explain why evolution is the central theme in biology and describe the evidence biologists use to support evolution in order to understand the unity and diversity of life.</p>	<ul style="list-style-type: none"> • Read text (CT,R) • Attend lecture/discussion (W,OC,CT) • Do study guide (R,W,CT) • Discuss concept of race and genetic variation (R, W, CT, OC, QS) 	<ul style="list-style-type: none"> • Quizzes and exams (CT,R,W) • Short essays (CT,R,W,TS) • Evolution Worksheet (CT, R, W) • Diversity Worksheet (CT, R, W) • Biology & Society paper (R, W, CT, TS)
<p>Describe how organisms interact with each other and the environment in order to understand the impact of human activity on communities, ecosystems, and biodiversity.</p>	<ul style="list-style-type: none"> • Read text (CT,R) • Attend lecture/discussion (W,OC,CT) • Do study guide (R,W,CT) • Discuss human impact on communities, ecosystems, and biodiversity (CT, OC, R, W) 	<ul style="list-style-type: none"> • Quizzes and exams (CT,R,W) • Short essays (CT,R,W,TS) • Ecology Worksheet (CT, R, W) • Biology & Society paper (R, W, CT, TS)
<p>Use the vocabulary associated with the study of biology correctly in order to be able to read and understand the literature and communicate effectively both in writing and orally in a professional setting.</p>	<ul style="list-style-type: none"> • Write short essays or reports (R,W) • Oral presentations/discussions using models, figures, or other materials (R,OC) 	<ul style="list-style-type: none"> • Quizzes and exams (CT,R,W) • Short essays (CT,R,W,TS) • Worksheets (CT, R, W) • Biology & Society papers (R, W, CT, TS)
<p>To strengthen Core Competencies in order to increase success in this and other courses and in the workplace.</p>	<p>Referenced above</p>	<p>Referenced above.</p>