OUTCOMES BASED LEARNING MATRIX

Course: BIOL 119 Introduction to Evolutionary Biology **Department:** Biology

Course Description; This course is an introduction to biological evolution and to the concept of evolution as the unifying theme of biology. It will include such topics as evolutionary theories, fossils, phylogeny, biodiversity, mutations, drift, selection, adaptations, and extinctions. The course will also address the evolution of sex, family, and behavior. Emphasis will be placed on the biology of evolution with emphasis on DNA, mutations, and the process of natural selection. This course is designed for the non-science major.

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 and the assessment tools.

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
Define evolution and describe the mechanism of natural selection as the primary mode of evolutionary change in populations.	• Read text (CT,R) • Attend discussion (W,OC,CT) • Do study guide (R,W,CT) • Write short essays or reports (R,W) • Oral/Poster presentations (R,W,CT,OC,TS) • Read selections from Darwin's "Origin of Species"	• Quizzes and exams (CT,R,W) • Short papers (CT,R,W, TS) • Oral/Poster presentations and/or projects (CT,R,OC,W)
Identify and discuss early theories of life up to and including natural selection.	• Read text (CT,R) • Attend discussion (W,OC,CT) • Do study guide (R,W,CT)	• Quizzes and exams (CT,R,W) • Oral/Poster presentations (CT,R,OC,W) • Article reviews (CT,R,W, TS)
Identify the evolutionary relationships between organisms (phylogeny).	• Read text (CT,R) • Attend discussion (W,OC,CT)	• Quizzes and exams (CT,R,W) • Short papers (CT,R,W, TS)

	• Do study guide (R,W,CT) • Write short essays or reports (R,W) • Oral/Poster presentations detailing a specific phylogenetic tree(R,W, CT, OC, TS)	• Oral/Poster presentations (CT,R,OC,W)
Describe the roles of DNA, RNA, proteins, and the path from genotype to phenotype.	• Read text (CT,R) • Attend discussion (W,OC,CT) • Do study guide (R,W,CT) • Write short essays or reports (R,W) • Oral/Poster presentations (R,W,CT,OC,TS) • Complete gene expression animation or activity (R,W,CT,TS,QS)	• Quizzes and exams (CT,R,W) • Short papers (CT,R,W, TS) • Oral/Poster presentations (CT,R,OC,W)
Explain the role of mutations as the underlying mechanism of biological change. Describe the Hardy Weinberg model of population equilibrium.	• Read text (CT,R) • Attend discussion (W,OC,CT) • Do study guide (R,W,CT) • Write short essays or reports (R,W) • Oral/Poster presentations (R,W,CT,OC,TS) • Complete gene expression animation or activity (R,W,CT,TS,QS)	• Quizzes and exams (CT,R,W) • Short papers (CT,R,W, TS) • Oral/Poster presentations (CT,R,OC,W)
Explain the roles of variation, gene flow, genetic drift, adaptive fitness, and selection as modifications and extensions of natural selection.	• Read text (CT,R) • Attend discussion (W,OC,CT) • Do study guide (R,W,CT) • Write short essays or reports (R,W) • Oral/Poster presentations (R,W,CT,OC,TS)	• Quizzes and exams (CT,R,W) • Short papers (CT,R,W, TS) • Oral/Poster presentations (CT,R,OC,W)
Discuss ways in which evolutionary biologists go about gathering data to refute or support hypotheses derived from theory: fossils, comparative anatomy, DNA evidence, etc.	• Read text (CT,R) • Attend discussion (W,OC,CT) • Do study guide (R,W,CT) • Write short essays or reports (R,W) • Construct posters (R,W, CT, OC) • Prepare a PowerPoint presentation (R,W, CT, TS, OC) • Detail a known evolutionary pathway explaining all of the scientific data. (R,W,CT,OC,TS)	• Quizzes and exams (CT,R,W) • Short papers (CT,R,W, TS) • Oral/Poster presentations (CT,R,OC,W) • Article reviews (CT,R,W, TS)

Illustrate the evolution of sex, cooperation, and behavior in families.	• Read text (CT,R) • Attend discussion (W,OC,CT) • Do study guide (R,W,CT) • Write short essays or reports (R,W)	• Quizzes and exams (CT,R,W) • Short papers (CT,R,W,TS) • Oral/Poster presentations (CT,R,OC,W)
Distinguish the facts from the theories regarding evolution. Be able to pinpoint misconceptions often described by opponents of evolutionary biology.	• Read text (CT,R) • Attend discussion (W,OC,CT) • Do study guide (R,W,CT) • Write short essays or reports (R,W) • Read and contradict information given in various Creationist writings and an certain websites. (R, W, CT)	• Quizzes and exams (CT,R,W) • Short papers (CT,R,W,TS) • Article reviews (CT,R,W, TS)
Develop critical thinking skills as well as written and presentation skills, through the reading, analysis and discussion of primary scientific literature.	• Write short essays or reports (R,W) • Oral presentations of scientific terms and writings (R, OC) • Construct posters (R,W,CT,OC) • Prepare a PowerPoint presentation (R,W, CT, TS, OC)	• Quizzes and exams (CT,R,W) • Short papers (CT,R,W,TS) • Oral/Poster presentations (CT,R,OC,W) • Article reviews (CT,R,W, TS)
Recognize the relevance and importance of evolutionary theory in society, especially regarding: infectious disease, human behavior, genetic engineering, general education and religion.	• Write short essays or reports (R,W) • Oral presentations of scientific terms and writings (R, OC) • Construct poster, project or PowerPoint presentation (R,W, CT, TS, OC)	• Quizzes and exams (CT,R,W) • Short papers (CT,R,W,TS) • Oral/Poster presentations (CT,R,OC,W) • Article reviews (CT,R,W, TS)
To strengthen Core Competencies in order to increase success in this and other courses and in the workplace.	Referenced above	Referenced above.