

Tompkins Cortland Community College

Master Course Syllabus

Course Discipline and Number: BIOL125

Year: 2023-2024

Course Title: Biology and Earth Science for Teachers

Credit Hours: 4

I. Course Description: This course is designed for students intending to pursue a degree program in early childhood and/or childhood education. Basic concepts in earth science and biology are covered with an emphasis on topics necessary for informed decision-making in our modern society. Students will participate in field and laboratory activities and invite guest speakers to class or visit them at sites of interest. Emphasis is on a student-driven agenda with student-planned activities. Student presentations will result in some variability in our agenda from semester to semester. (This course is cross-listed as GEOL 125). BIOL/GEOL 125 fulfills the SUNY General Education Natural Sciences requirement. Prerequisites: MATH 090 if required by placement; prior completion of, or concurrent enrollment in, RDNG 116 and ENGL 100 if required by placement testing. 4 Cr. (3 Lec., 3 Lab.) Spring semesters.

II. Additional Course Information:

1. Lab activities will include: atoms, molecules, and water; organic molecules; microscopy; enzymes; pond ecosystems; photosynthesis; mitosis and meiosis; genetics; stream morphology; and DNA extraction.
2. Field trips may include: Taughannock Gorge; the Chicago Bog; the Cornell Lab of Ornithology; the Museum of the Earth; the Finger Lakes Trail; Dryden Lake; and Yellow Barn State Forest.
3. Modes of travel may include: on foot, van, bicycle, snowshoes, and horse-drawn wagon.
4. Virtual field trips include: The Outer Banks; the Great South Bay; and the Lower Mississippi River.
5. This course requires a minimum of 3 hours of lecture and 3 hours of lab per week for a 15-week semester.

III. Student Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Describe the location of the earth relative to the rest of our solar system, and how the movements of the earth affect organisms living on earth.
2. Explain how genetics and the environment drive evolution through the process of natural selection.
3. Describe how the local landscape has been shaped by geological events.
4. Develop activities, using the scientific method, to explore natural phenomena relating to earth and biological sciences using simple measurement devices, with both English and metric units.
5. Apply the skills necessary to understand science-related issues for making personal decisions and to serve our society as an informed citizen, parent, and perhaps teacher.

IV. Tompkins Cortland General Education & SUNY Competency Goals

☒ Critical thinking (Tompkins Cortland GE Goal; SUNY Competency)

Students will plan and complete activities to explore course topics and will apply acquired knowledge to research and create solutions to environmental and ecological problems. These activities include, but are not limited to, creating simulations, inviting guest speakers, field activities, virtual trips, laboratory activities, films, and selected readings.

☒ **Social/Global Awareness**

Students will complete projects that illustrate ways in which humans have changed their environment, the effects of those changes on life on earth, and solutions to address negative outcomes. This course trains students to be science literate and to serve our society as informed citizens and parents, and to help and encourage others to do so.

☐ **Information Management**

☐ This course does not address either of these Tompkins Cortland or SUNY General Education Goals.

V. Essential Topics/Themes

1. The scientific method
2. Ecosystems and the flow of energy through and cycling of nutrients and matter within earth systems, with emphasis on the hydrologic cycle and the carbon cycle
3. How living things are similar to, yet different from, each other
4. Simple genetics
5. Adaptation and evolution of organisms
6. The life cycle of animals and flowering plants
7. Basic life function and factors necessary for the maintenance of a healthy body
8. How plants and animals, including humans, depend on each other and on their environment for survival, and how the entire planet depends on the sun as a source of energy
9. Ways in which humans have changed their environment, and the effects of those changes
10. Factors which shape an area's climate, and how local weather impacts organisms
11. Local geological history, including the types of rocks commonly found, and the types of fossils they may contain

VI. Methods of Assessment/Evaluation

Method	% Course Grade
1. Attendance	20-30%
2. Quizzes	20-30%
3. Exams	20-30%
4. Labs	20-30%

VII. Texts – ☒ **Required** ☐ **Recommended** ☐ **Used for more than one course (list courses)**

1. <i>Life</i> . Postlethwait, John, and Janet Hopson. 2011, Cengage Learning. ISBN 13.978.0-538.74134.7
2. <i>Earth</i> . Thompson, Graham, and Jonathan Turk. 2011, Cengage Learning. ISBN 13.978.0-538.74099.9

Editions listed are current as of date of syllabus. More recent editions may be used.

VIII. Bibliography of Supplemental Materials

1. <i>The Tragedy of the Commons</i> . Garret Hardin (essay)
2. <i>The Twin Sheds Management Plan</i> . NYSDEC. Available on the NYSDEC website.

Editions listed are current as of date of syllabus. More recent editions may be used.

IX. Other Learning Resources

Audiovisual: None specified
Electronic: None specified
Other: None specified

Attendance Policy: *To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161, Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.*

Services for Students with Disabilities: *It is the College's policy to provide, on an individual basis, appropriate academic adjustments for students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for academic adjustments. All course materials are available in alternate formats upon request.*

Academic Integrity: *Every student at Tompkins Cortland Community College is expected to act in an academically honest fashion in all aspects of his or her academic work: in writing papers and reports, in taking examinations, in performing laboratory experiments and reporting the results, in clinical and cooperative learning experiences, and in attending to paperwork such as registration forms.*

Any written work submitted by a student must be his or her own. If the student uses the words or ideas of someone else, he or she must cite the source by such means as a footnote. Our guiding principle is that any honest evaluation of a student's performance must be based on that student's work. Any action taken by a student that would result in misrepresentation of someone else's work or actions as the student's own — such as cheating on a test, submitting for credit a paper written by another person, or forging an advisor's signature — is intellectually dishonest and deserving of censure.

Several degree programs offer student learning opportunities (such as internships, field work, and clinical experiences) outside the standard classroom setting. As part of the learning process, students must understand and engage in conduct that adheres to principles guiding employment within the professional workplace. These behaviors include, but are not limited to, academic integrity, accountability, reliability, respect, use of appropriate language and dress, civility, professional ethics, honesty, and trustworthiness. Disciplinary action may be initiated for inappropriate conduct occurring while participating in any course-related project or event.