

Request for Courses in the Core Curriculum

Originating Department or College: Department of Biology and Chemistry, College of Arts and Sciences

Person Making Request: Monica Mendez

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Course Number and Title: BIOL 1106 - Principles of Biology I Lab (Cell and Molecular Biology)

Please attach in separate documents:

Completed Catalog Add/Change Form

Syllabus

List the student learning outcomes for the course (Statements of what students will know and/or be able to do as a result of taking this course. See appended hints for constructing these statements.)

Student Learning Outcomes: Upon the successful completion of this course students will:

1. Be able to design and implement a scientific experiment to test a specific hypothesis.
2. Be able to communicate scientific information both verbally and through written reports.
3. Be able to perform the following key laboratory techniques in the field of biology: use a light microscope, quantify of biological data, maintain a laboratory notebook and perform statistical analysis on a data set.
4. Understand the elements of writing an effective report on a scientific experiment.
5. Understand and follow standard laboratory safety practices.
6. Be able to demonstrate an understanding of the basic biochemical processes and structures common to all living organisms.

**Core-Curriculum Learning Outcomes:**

1. Critical Thinking: includes creative thinking, innovation, inquiry and analysis, evaluation, and synthesis of information. (SLOs: 1, 3)
2. Communication Skills: Students will demonstrate their ability to communicate effectively by using visual communication. (SLOs: 2, 4)
3. Empirical and Quantitative Skills: includes the manipulation and analysis of numerical data or observable facts resulting in informed conclusions. (SLOs: 3)

Component Area for which the course is being proposed (check one):

Communication

American History

Mathematics

Government/Political Science

Language, Philosophy, & Culture

Social & Behavioral Science

Creative Arts

Component Area Option

Life & Physical Sciences

Competency areas addressed by the course (refer to the appended chart for competencies that are required and optional in each component area):

Critical Thinking

Teamwork

Communication Skills

Personal Responsibility

Written Communication

Social Responsibility

Oral Communication

Visual Communication

Empirical & Quantitative Skills

Because we will be assessing student learning outcomes across multiple core courses, assessment assigned in your course must include assessment of the core competencies. For each competency checked above, indicate the specific course assignment(s) which, when completed by students, will provide evidence of the competency. Provide detailed information, such as copies of the paper or project assignment, copies of individual test items, etc. A single assignment may be used to provide data for multiple competencies.

**Critical Thinking:**

Students are assigned a "Diversity Lab" project in which they work in groups of 4 to design and implement an experiment to evaluate the effect of environmental conditions on species diversity. The students must use critical thinking to decide which environmental variables they want to examine, construct a testable hypothesis and draw a conclusion supported by the collected data. A critical thinking rubric with domains for creative thinking, depth of inquiry, evaluation of importance and synthesis of information can be scored by the instructor from the lab report, or the written lab report can be up loaded for evaluation by the Core Curriculum Assessment Committee.

**Communication Skills:**

At the conclusion of the "Diversity Lab," students will present their findings in a ten page written lab report in the format of a scientific paper. The written report will include an introduction of their study, the methods used during the experiment, a presentation of the findings, including graphs and tables representing the data collected and a discussion of the significance of the results. The instructor can score the written lab report for organization, focus, style and grammar using a modified WIN rubric, or the report can be up loaded for evaluation by the Core Curriculum Assessment Committee.

**Empirical & Quantitative Skills:**

During the "Diversity Lab" project, students will perform transects across environmental conditions and quantify plant and insect species richness and abundance. They will calculate mean, standard deviation and standard error for each group of replicate transects (by environmental condition) and calculate a Shannon's Diversity Index for each individual location. The students will also compare mean species richness across environmental conditions by calculating the analysis of variance (ANOVA). The instructor can assess the logical reasoning behind the calculations and the appropriateness of the statistical analysis, or the written project report can be up loaded for evaluation by the Core Curriculum Assessment Committee.

Teamwork: N/A

Personal Responsibility: N/A

Social Responsibility: N/A

Will the syllabus vary across multiple sections of the course?     Yes                             No

If yes, list the assignments that will be constant across the sections:

In each section, the first 4 student learning outcomes and the assignments described for assessment will be consistent across sections.

Inclusion in the core is contingent upon the course being offered and taught at least once every other academic year. Courses will be reviewed for renewal every five (5) years.

The department understands that instructors will be expected to provide student work and to participate in university-wide assessments of student work. This could include, but may not be limited to, designing instruments such as rubrics, and scoring work by students in this or other courses. In addition, instructors of core courses may be asked to include brief assessment activities in their courses.

Reviewed and approved by the Core Curriculum Committee on February 13, 2013.