Biology 831: Biological Research (A-F)  
Spring 2013

Instructor of Record

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About the Course

Six credit hours of Biological Research are required of all non-thesis master’s degree students. Students are expected to have completed Biology 820, Introduction to Graduate Studies, prior to enrollment. Each student will be paired with a UNK faculty member whose research interests most closely match the student’s project.

Course Objectives

The goal of this course is to acquaint the student with research associated with the biological sciences. After completing BIOL 831 course sequence, the student will have developed testable hypotheses, designed a novel set of experiments, completed a thorough literature review, collected and analyzed data, and written a final report in a format agreed upon by the student and his or her research mentor. Biology 831 is offered every semester as 6 individual courses A-F, and each course corresponds to a different aspect of the research process. It is strongly recommended that students not take more than 3 credits of Biology 831 in a given semester. The requirements for a given credit of research must be completed during that semester. Grades of “Incomplete” are appropriate only when circumstances beyond the student’s control prevent completion of the project (see below).

Six Credits, One Project

The work done for each of the BIOL 831 courses are to be part of a single cohesive project. That is, the write up in BIOL 831F must regard the hypotheses developed in BIOL 831A. The courses are to be done in order. If a student taking more than one course in a given semester, the student must submit and have each course approved in order because subsequent courses are dependent upon previous courses. For example, if a student has signed up to take BIOL 831A and BIOL 831B the same semester, that student must have BIOL 831A (hypotheses) approved by his or her mentor before starting on BIOL 831B (methods) because the methods are obviously dependent upon the hypotheses. That means the student needs to have BIOL 831A completed and approved by (approximately) the midpoint of the semester. Students are required to take BIOL 831B and BIOL 831C simultaneously, but completing BIOL 831C (annotated bibliography) is not dependent on being finished with BIOL 831B. This is the only exception to the rule that students must have work for a course approved by their mentor before going on to the next course. Students should be working on their annotated bibliography during BIOL 831A and BIOL 831B. Obviously students cannot start on statistical analysis (BIOL 831E) prior to completing data collection (BIOL 831D), and the final paper (BIOL 831F) cannot be written without having the statistical analyses (BIOL 831E) approved by the mentor.
**Recommended Timeline**

Because of the difficulties often encountered in defining solid research hypotheses and uncertainties involved in data collection, the following timeline is recommended:

Semester 1:  BIOL 831A

Semester 2:  BIOL 831B and BIOL 831C (must take simultaneously)

Semester 3:  BIOL 831D (enroll in this credit the term you will finish data collection)

Semester 4:  BIOL 831E and BIOL 831F

**Summary of Each Credit**

By the end of:

- **BIOL 831A**: Students will identify a project to investigate, have the project approved by the most appropriate faculty member (hereafter referred to as the student’s “research mentor”), develop testable hypotheses (null and alternative hypotheses), and write a referenced justification for the research. There is no set length or number of references required but the document must be thorough and referenced as necessary. References should be from primary, peer-reviewed sources.

- **BIOL 831B**: Students will develop detailed methodology to investigate their chosen hypotheses. Methods should be referenced as necessary. Students should work with their research mentor to identify the source of all materials necessary to complete the project. If possible, students should conduct preliminary trials to identify potential problems. If necessary, Research Services Council (RSC) grant applications to support the project should be completed at this time. If required, students will begin the IRB (human subjects) or IACUC (animal subjects) approval process. Statistical analyses of data should also be outlined in this submission. *Students are required to be simultaneously enrolled in BIOL 831C.*

- **BIOL 831C**: Students will conduct a complete literature review (annotated bibliography) of their topic and obtain a minimum of 50 peer-reviewed references related to their research topic. Students may need to obtain resources through interlibrary loan and will arrange them in a style appropriate for their final paper. *Students are required to be simultaneously enrolled in BIOL 831B.*

- **BIOL 831D**: Students will conduct research as appropriate following their approved materials and methods. If IRB or IACUC approval is required, students cannot start conducting research without approval. Students will document their results using a laboratory notebook and photographs. Data collected during the study should be submitted in the form of spreadsheets or field notebooks as appropriate.

- **BIOL 831E**: Students will use appropriate statistics to analyze their results, construct appropriate tables and figures to visually present the results, and use text to verbally describe the results. Students will evaluate their results in the framework of their hypotheses and propose future studies.

- **BIOL 831F**: Students will submit a final report consisting of their findings and discussion of their results with respect to the literature. In most cases the research mentor will be included as the second author. The write up for this credit should pertain to the same project outlined for BIOL 831A.
**Submissions and Deadlines**

It is highly recommended that students regularly consult with their mentors throughout the semester. While rough drafts can be submitted at any time during the term, drafts must be received by Friday, April 5. The mentor will then review the submissions and work with the student to revise the material until the mentor deems it acceptable. If a student does not submit a rough draft by April 5, the mentor may not have time to provide feedback and final grade may be based on the quality of the unrevised material. Unrevised submissions are likely to receive lower grades than those that have been revised based on mentor’s comments.

When the mentor and student have agreed on a final copy of the work, the student must submit that copy to the instructor of record (myself) for Biology 831. As instructor of record I will then contact the your mentor and request your mentor to recommend a grade for your work. **As instructor of record I must receive your final copy no later than 5 PM Friday, April 26.**

It is perfectly acceptable (and encouraged) to submit materials early. For example, some students may be completely finished with the requirements for a particular credit by the mid-point of the semester. There is no reason to wait until the deadline to submit materials. If you are taking multiple credits, however, you must work on and submit them in order. That is, there is really no way you can effectively work on methodology (BIOL 831B), without approved hypotheses (BIOL 831A). Similarly, there is no way you can write up your final paper (BIOL 831F) without having your data analysis (BIOL 831E) approved by your mentor.

Please save and look over this syllabus before asking questions to which the answer can be found in this syllabus. If the answer to your question can be found in the syllabus, I will simply ask you to read the syllabus. For example, students commonly ask about submission deadlines and those deadlines are clearly listed above.

**Incomplete Grades**

A grade of “incomplete” will be considered only if circumstances completely beyond the student’s control prevent the student from finishing the required work on time. For example, the weather was simply too wet to perform a prescribed burn prior to the end of the term so the student cannot complete his or her data collection for BIOL 831D. If a grade of “incomplete” is granted, the student will be required to sign a contract and must rectify the “incomplete” grade before permission will be granted to enroll in additional BIOL 831 credits. The contract will specify the length of time the student has to rectify the incomplete grade, and this period of time can be no more than 1 year as dictated by the registrar’s office.

**Students with Disabilities**

Students with disabilities are encouraged to contact me for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska at Kearney to provide flexible and individualized reasonable accommodation to students with documented disabilities. To receive accommodation services, students must be registered with UNK Disabilities Services Coordinator, David Brandt, in the Academic Success Office, 308-865-8214 or by email brandtdl@unk.edu.