

Department of Biology

Plan for Writing Across the Curriculum

(For: Biology BA, Biology BS, Zoology BA and Zoology BS)

Goals: At the completion of degree requirements in Biology or Zoology, a graduate will be able to

- **Summarize** in their own words literature that they have read.
- **Synthesize information** from a number of sources, make judgements about points of agreement and disagreement, and develop hypotheses regarding apparent trends and/or contradictions.
- Understand the **vocabulary of science** (e.g. scientific notation, taxonomic terms, terms for processes, and descriptive adjectives and adverbs for scientific terms) and to use that vocabulary appropriately.
- Write a **detailed protocol**, such as technical instructions for performing an experiment.
- Take accurate and sufficient **field or laboratory notes** on observations in the field or on a planned laboratory sequence such as an experiment.
- Write a **lab report**, or **technical report**, detailing the **purpose** of an experiment or experiments, the **procedures**, the **results**, and the **conclusions** that can be drawn from the experiment.
- **Present data in graphical form** (photographs, tables, graphs, charts, diagrams, models) and correlate the graphical presentation with a narrative discussion of the data, to include comparisons, trends, and processes.
- **Formulate testable hypotheses** regarding biological processes
- Write a **substantive essay** supporting a particular position or point of view, using scientific facts.
- **Document sources of information** appropriately, including citation of authors of ideas, techniques, and verbal quotes.
- **Assess the scientific value** of articles in newspapers, magazines, books and scientific journals.

Objectives: Each student in the Biology or Zoology major will write frequently as part of their Biology or Zoology coursework, and will receive constructive criticism of their writing, with some opportunity for rewriting earlier drafts.

A. Behavior: Specific Writing Experiences

Each student will engage in a variety of writing experiences that include, but are not limited to, journal writing, writing reports, taking field notes, writing a review article in which they synthesize information from a number of sources, writing a research article reporting on experiments or research they have carried out, and writing essays in which they present an argument substantiated by scientific evidence.

B. Conditions: Students should be provided with examples of the kind of writing expected, such as review articles and research papers and style books or specific instructions for each kind of writing assignment.

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C. Criteria for Writing Experiences: Each student must take five courses that have a substantive writing component. Each of the five courses must be included in one of the following three types (introductory, writing to learn, and advanced). The total must include one course of type 1 and one of type 3. The remaining courses may be of either type 2 or type 3. At least three courses must be chosen from the list of approved writing courses taught in the Department of Biology (approved courses listed below). The other two may be chosen from the lists of approved writing courses taught in other departments.

1. **Introductory Writing Course:** In this course, students review the basic elements of writing: e. g., sentence structure, subject, verb, independent and dependent clauses. This material might be taught in a Critical Thinking course, in which logic and critical reading, listening and viewing are emphasized. Students are required to write essays that are critiqued by the instructor and returned with extensive feedback and an opportunity to rewrite for evaluation. The introductory course in the Department of Biology (Biology 111) currently addresses critical thinking skills in lecture, and students are required to hand in weekly lab reports which introduce and train students in each of the types of writing listed in Goals (above).
2. **Courses Emphasizing Writing to Learn:** These are courses in the major in which students are required to write journals, essays, lab reports, papers and/or argumentative essays, and in which 25% or more of their mastery of the course content is evaluated in terms of their ability to present their knowledge of the material learned in their own written words. The remainder of the evaluation for these courses may be by other means, such as objective exams.
3. **Advanced Level Course:** In this course, students are required to write one of the following: a) a term paper including an extensive critical review of the recent literature on a topic (with appropriate citation) or b) a research paper based on the student's own research, in which the literature is critically reviewed, a hypothesis is generated, the student describes materials and methods employed in their research, results (including graphical representation and statistical analysis of their findings if appropriate), discussion of their results, and conclusions. Students are required to write a first draft of their paper that is critiqued by the instructor and returned with extensive feedback and an opportunity to rewrite for a higher grade.

III. Courses: Specific courses that would fulfill the writing requirement for the department of Biology would fall under three categories:

- A. Introductory:** a Critical Thinking course with a strong writing component
[1 required (or evidence of similar experience at a previous college for transfer students, or at another college, with off-campus approval)]

Biology 111 - College Biology I

Biology 204 - Writing in the Biological Sciences

- B. Writing to Learn:** Courses in which writing to learn is a substantial component (as described in #2 above), but not necessarily including a term paper: [intermediate level writing courses may also be satisfied by courses with a substantial writing requirement from other departments for any student or from a previous college for transfer students].

Biology 200 - Environmental and Population Biology (For non-science majors only)
 Biology 301 - Topics in Biology
 Biology 310 - Microbiology
 Biology 340 - The Plant Kingdom
 Biology 341 - Plants and Society
 Biology 357 - Plant Systematics
 Biology 370 - Animal Kingdom
 Biology 377 - Marine Biology
 Biology 400 - Current Issues in Environmental and Population Biology
 Biology 425 - Organic Evolution
 Biology 440 - Developmental Biology of Plants
 Biology 458 - Plant Ecology
 Zoology 340 - Vertebrate Zoology
 Zoology 330 - Invertebrate Zoology
 Zoology 373 - Embryology
 Zoology 384 - Mammalogy
 Zoology 405 - Limnology
 Zoology 440 - Ichthyology

- C. Intensive Writing:** At least one course in which students are required to write a term paper of 10 or more pages, based on either a review of the scientific literature on a subject, a research project of the student's own design, or both.

Biology 392 - Problems in Biology
 Biology 399 - Independent Study
 Biology 400 - Current Issues in Environmental Population Biology
 Biology 492 - Problems in Biology
 Biology 497 - Senior Honors Thesis
 Biology 498 - Internship in Biology (must include a substantial paper)
 Biology 499 - Independent Study in Biology
 Zoology 399 - Independent Study in Zoology
 Zoology 490 - Seminar
 Zoology 497 - Problems in Zoology
 Zoology 498 - Internship in Zoology