

BIOL 4010—Research and Technical Writing in Biology—Spring 2020

Times/Room: Wednesday 6:00-7:40 p.m. (lecture) N201 (or N206)
Friday 1:00-3:50 p.m. (lab.) N201

Instructor: Dr. Patrick Kelly, Professor of Vertebrate Ecology / Conservation Biology

Office Hrs: N277—Mondays and Fridays 9-10, or by appointment.

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Email is the best way to reach me. I usually respond quickly. To flag your emails, type B4010 at the start of the subject line. Also, include your full name in the email.

Communication: Please check your email and Blackboard every day. You can set up your Stan State email to forward emails to an address that you check more frequently

Initial Class Meeting: Wednesday, January 29th, 2020 at 6:00 PM in N201

Course Description—This course introduces bibliographic research, design and interpretation of experiments, including understanding statistical references and writing about the testing of results (‘writing about statistics’), and the preparation of various technical communications in biology. It is designed to enhance the skills of biology majors by focusing on those elements of research, interpretation, and written presentation that typically require considerable practice. It satisfies the upper-division writing proficiency (WP) requirement.

Prerequisites—Completion of the Writing Proficiency Screening Test (WPST) with a passing score, BIOL 3310 and BIOL 3350 (with grades of C- or higher), ENGL 1001, ENGL 1002, or ENGL 1005, and junior standing or consent of instructor, or already have taken and passed with a C or better a writing proficiency course or be classified as a graduate student. It also helps to have taken UD biology classes that deal with primary literature, writing, and statistics, and to know how to use MS Office applications.

Course Questions & Learning Objectives:

- a. What makes scientific information reliable?
- b. How do you find scientific information?
- c. How are scientific ideas conveyed to fellow scientists and to the public?
- d. How do you effectively and efficiently read scientific publications?
- e. What aspects of style and composition are unique to science writing?
- f. How can we write in a way that convinces readers of the validity of our ideas?
- g. What forms of criticism are most helpful for improving writing?
- h. How can we effectively be our own best editor?

After completing this course, you should be able to:

1. Critically analyze and understand written scientific communications.
2. Identify aspects of writing style, composition, and data presentations that effectively communicate scientific ideas and information.
3. Use bibliographic databases to find published scientific information.
4. Synthesize scientific information from multiple sources and develop novel research questions.
5. Distill a scientific paper into an abstract that meets professional standards.
6. Write a short scientific review paper that also meets professional standards.
7. Know how to give a poster or oral presentation.
8. Work effectively with other students (small team) to develop a grant proposal.
9. Formally present the proposal to the class (usually with PowerPoint).
10. Know how to prepare an application for a job or graduate/professional school.

Assignments & Grades

Various assignments total 400 points:

1. Using bibliographic tools in the library (10 pts);
2. Paraphrasing and abstracting (30 pts);
3. Midterm exams (2) on fundamentals of scientific writing (40 pts);
4. Data and visuals—statistically summarize and test data; display summaries in tables and figures (40 pts);
5. Write an original review paper (150 pts);
6. Student teams will write and present a research proposal (100 pts);
7. Final exam (30 pts)

Review Paper. Item #5, the original review paper, will be in the form of a journal review article on a specific topic in the general areas of ecology (plant or animal), behavioral ecology, animal behavior, or conservation biology. This important individual assignment (38% of the course grade) will involve work on 12 of the 16 weeks of the semester. Topics have to be approved in advance and no more than one student can write about any particular topic. The paper must be completely original (see note on plagiarism). It cannot be submitted to any other class, and no paper from any other class can be used for BIOL 4010. Emphasis is on writing quality rather than quantity, so the required number of pages is low. The narrative (double-spaced) cannot be less than 8 pages or more than 10 pages. In addition, the paper should have at least 20 citations from the primary research literature.

Research Proposal. Instructions on the research proposal will be provided in the coming weeks. Randomly selected teams will submit a short list of topics for approval. On the last day of class, each team will formally present its proposal before the class in a symposium format. The presentations will be judged by the entire class. This important group assignment (25% of the course grade) of necessity has a mandatory peer evaluation component at the conclusion of the course.

Exams and other Assignments: Exams, 2 midterms on the fundamentals of scientific writing and a more comprehensive final, are important but de-emphasized parts of the course (~18%). Neatness, grammar, spelling, clarity, accuracy, precision, organization, conciseness of writing, and how well results are tested, interpreted, presented, and discussed all count in grading of other assignments (~19%).

Attendance: It is very important to attend all class lectures and labs, so attendance will be noted. Unexcused absences during lab assignments/exams will receive no points.

Grading Scale (%)	
90-100	A
80 - 89	B
70 - 79	C
60 - 69	D
0 - 59	F

Final grades will be based on overall performance in all assignments and overall class participation. Note that a grade of C or better is required to pass a WP class.

Except for designated collaborative activities, all writing and other work you present for credit must be entirely your own.

Expectations

1. You are expected to treat everyone in class with respect and kindness. In order to create a thriving learning community, it is important that we encourage one another to do our best and to not put anyone down.
2. To avoid distracting yourself and others, please do not phone, text, email, social network, surf the web, or do work for other classes during class. **All electronic devices (phones, tablets, music players, etc.) must be turned off and kept in your bag during class.** Class time is not to be used for social networking (Facebook, etc.) or listening to personal audio (ear buds). If you must respond to a voice mail or text (e.g., a family matter), please step out of the room to respond, preferably after I am done lecturing so that you do not distract others.
3. You will be required to use the computers in N201 for many lab activities, but in certain instances personal laptops may be used for some lab activities.
4. I strongly discourage the use of laptops for note-taking during lectures and presentations. This is because there is now more than ample evidence that students who take notes by hand *remember conceptual information better than those who take notes on a computer*¹. That said, some of the new electronic writing tablets are excellent—apart from the price. A simple spiral notepad works. It is very important to take good notes on the materials I cover. There is no substitute for good notes.
5. Come to class properly prepared by doing any assigned readings prior to class. Engage the material deeply and critically. Treat your education as if it is helping to prepare you to change the world (which hopefully it is).
6. Attend every class session, be on time, and participate fully.
7. You are required to work independently during in-class assignments and on take-home assignments, unless instructed otherwise. Turn in assignments on time.
8. Maintain the highest standards of academic integrity. All work that you submit must be your own. Plagiarism—taking direct quotes or ideas from other sources without attribution—is cheating, and will not be tolerated. Reports and other assignments with plagiarized material will receive a zero. A second incident of plagiarism by a student will result in an F for the course grade and a report to the Department and Dean. I am very good at detecting plagiarism and you should note that *Turnitin* is used for major assignments in this class. Do not take the risk. If you have questions about what is acceptable, please ask me.
9. Take the initiative to use course and campus resources (my office hours, web sites, readings, the Writing Center, Library) to get the most out of the course.
10. Lecture time slots will be used also for labs, especially during the 2nd half of the semester. For the last few weeks of the semester, some lab time may be done on your own or in small groups (e.g., grant-writing teams) in the library or elsewhere (for library research and writing).
11. Please be neat and clean up the lab after yourself.

¹ Holstead, C.E. 2015. The benefits of no-tech note taking. *Chronicle of Higher Ed.* (March 4, 2015)

Your instructor will do the following: do his best to provide you with a stimulating, useful, and fun course; treat you with respect; assign grades impartially; be available to help during office hours and via email; do his best to return assignments and post grades in a timely manner.

Assignments are due on the day stated

Points will be deducted for assigned materials that are turned in late (10% per day).

Format and length of writing assignments

Written assignments are evaluated as objectively as possible. The following components and their maximum points (%) make up the evaluation:

Length	15
Spelling & Grammar	10
Style & Format (adherence to instructions)	10
Organization	10
Clarity of Expression	25
Completeness of Topic Coverage (not length)	10
Originality	20

Length of all papers is based on the following format:

1. 1-inch top and bottom margins (headers and footers, if any at 0.5 inches)
2. 1.25-inch left and 1-inch right margins
3. Use 12-point Arial for body text (headings can be 14-pt, with titles even larger).
4. Double spacing (*except for your name and date, top left corner of the front page*)

Points will be deducted for papers that do not meet the minimum specified length, and the greater the deficit, the greater the deduction. It is wise therefore to shoot for a draft that is 25% longer than the required minimum; e.g., shoot for a 10-page draft. This will allow you to refine your writing, and in so doing, shorten the paper.

Written materials and electronic submission

MS Office applications are standard in the professional work place all across the world, be it in business, government, or academia. Accordingly, assignments for this class must be submitted in MS Word, and when necessary, in MS. Excel.

Always keep copies of assignments before turning them in. Damage, failure, or theft of your computer files or equipment is not an acceptable excuse. Hard copies (single-sided) and electronic copies (usually submitted via Blackboard) must be turned in on the due date. Students are required to follow specific instructions on file naming.

In emails to me, please use your university email, identify yourself clearly in the body of the email, and provide identifying keywords, or the required file name, in the subject line. Again, so that your communication gets the timely attention it deserves, it is important to start all email subject lines with “B4010.” Remember, careful and courteous email correspondence is increasingly important in today’s professional workplace; I do not respond to discourteous communications. I may keep originals of some submitted hard copy materials. If so, you will have an opportunity to examine and copy such material, and feedback will be provided.

Reference materials and sources

The assigned text for the course is Angelika H. Hofmann's *Writing in the Biological Sciences: A Comprehensive Resource for Scientific Communication* (3rd edition, 2019, Oxford University Press, New York).

Other useful texts are Jan Pechenik's *A Short Guide to Writing About Biology* (9th edition, 2016, Pearson), Victoria McMillan's *Writing Papers in the Biological Sciences* (6th edition, 2016; Bedford/St. Martin's Press), Karin Knisely's *A Student Handbook for Writing in Biology* (5th edition, 2017, W.H. Freeman), *Chicago Manual of Style* (16th Edition), and an old favorite, Strunk & White's *The Elements of Style*. The authoritative reference for scientific writing however is *Scientific Style and Format* (CSE Manual for Authors, Editors, and Publishers, 8th Edition; \$75).
<http://press.uchicago.edu/ucp/books/book/chicago/S/bo13231737.html>

Ordinarily, handouts will be provided in electronic form only (PDFs for download from Blackboard). Please bring them to class—hard copy or on your laptops.

On Friday, Jan. 31st (at 1:00 p.m.), we will meet at the Library Annex (LX27), where you will get an overview of the latest bibliographic and electronic search tools from Mr. Tim Held, Reference and Instruction Librarian.

In Conclusion

Writing is one of the most essential tools that you will develop in college and use throughout your life. It is the most important and trusted way that scientific information is shared. Without effective writing, even the best scientific research serves no purpose. Additionally, the quality of your writing is often the most important factor that is used by others, including employers, to judge the quality of your work, as well as your potential as a scientist and professional. With effective writing, your ideas and arguments gain meaning and can be critically examined.

Accordingly, you should fully engage with the in-class activities during the course. Many of your activities, especially peer-review and group projects, can only succeed if each and every student contributes fully. It is important that you are fully committed to the class and to staying on-task for in-class assignments, especially for group or collaborative assignments, and there will be a number of those in lab. Showing up late, leaving early, not contributing, or distracting others will be noted.

You are ultimately responsible for all aspects of your reports and articles. It is important to note that I do not mark (or notice) all errors and style faults in your draft papers, especially if they are full of problems. The same errors, repeated throughout a paper are typically marked only once or a few times, then ignored, but you are expected to correct all occurrences. Some errors, faults, or alternate wording to increase clarity or reduce verbiage may be marked in a final draft, but not the review draft. This occurs unintentionally because I may have been distracted by other problems in the same passage. This is neither my fault nor that of someone who reviewed your paper. It is very important to have others evaluate your work prior to submission. You must learn to be your own best writing critic.

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Wk	D	Date	Time	Schedule, Topics, and Assignments
1	W	29 Jan	6:00-7:40	Course introduction; scientific method; documenting a paper. (Ch. 1, 7)
	F	31 Jan	1:00-3:50	Finding research literature (Ch.1, 4); library tour. Ex. 1 (Biblio. Tools)
2	W	5 Feb	6:00-7:40	Rev. Article (RA ; Ch. 11); Ethics (Ch. 4); Sci. Writing Principles (Ch. 2)
	F	7 Feb	1:00-3:50	Style (cont.); reading & note-taking (Ch. 12). RA topic short list due
3	W	12 Feb	6:00-7:40	Sci. Writing Principles (Ch. 3); paraphrasing & abstracts. (Ch. 10) Ex. 2
	F	14 Feb	1:00-3:50	Review Articles; writing lab (paraphrasing & abstracts). 3 RA refs due
4	W	19 Feb	6:00-7:40	Sci. Writing Principles— Exam 1
	F	21 Feb	1:00-3:50	Return to Library—for RA research RA outline due
5	W	26 Feb	6:00-7:40	Data, Figures, Tables, & Statistics (Ch. 5, 6)
	F	28 Feb	1:00-3:50	Figures, Tables, & Statistics Lab Ex. 2 due
6	W	4 Mar	6:00-7:40	Research Proposals (RP ; Ch. 15)
	F	6 Mar	1:00-3:50	Drafting a research/grant proposal; Sci. Writing Principles— Exam 2 ; RA draft introduction due
7	W	11 Mar	6:00-7:40	<u>Individual appointments</u> (review RA intro. drafts); students work in lab.
	F	13 Mar	1:00-3:50	<u>Individual appointments (cont.)</u> Ex. 3 (Figures, Tables, Statistics)
8	W	18 Mar	6:00-7:40	Revising & editing (Ch. 8, 9); Punctuation.
	F	20 Mar	1:00-3:50	Work on review articles with emphasis on peer-review.
9	W	25 Mar	6:00-7:40	SPRING BREAK
	F	27 Mar	1:00-3:50	SPRING BREAK
10	W	1 Apr	6:00-7:40	Work on review articles; teams work together. Draft analysis due
	F	3 Apr	1:00-3:50	Students work in lab on review articles Ex. 3 due
11	W	8 Apr	6:00-7:40	Grant teams work together
	F	10 Apr	1:00-3:50	Grant teams work together
12	W	15 Apr	6:00-7:40	Document formatting; students work in lab on final drafts
	F	17 Apr	1:00-3:50	Students continue work on papers (peer-review!); work on proposals.
13	W	22 Apr	6:00-7:40	Finalize/submit papers; teams work on proposals. RA final draft due
	F	24 Apr	1:00-3:50	Presentations (Ch. 13, 14); teams work on proposals (remaining time)
14	W	29 Apr	6:00-7:40	Research Proposal (RP) rough drafts reviewed in lab.
	F	1 May	1:00-3:50	Job applications and interviews (Ch. 16); teams work on proposals
15	W	6 May	6:00-7:40	Teams work on proposals and presentations (incl. practice)
	F	8 May	1:00-3:50	NO CLASS—Warrior Day
16	W	13 May	6:00-7:40	Teams work on proposals and presentations (incl. practice)
	F	15 May	1:00-3:50	RP —team presentations and turn in proposals; Pizza Time!
FW	W	20 May	6:00-8:00	Final Exam