

Scientific Reasoning in Biology

Biology 1109



BBC Radio 4

Professor Barry Logan
Laboratory Instructor: Pamela Bryer

Lecture: MWF: 9:05-10:00am

Hatch 214

Barry Logan
Druckenmiller 220A
blogan@bowdoin.edu

O.H.: Mon: 10:15-11:15am
Tu: 9:00-10:00am

Laboratory¹: Various

Hatch 206

Pamela Bryer
Hatch 206B
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O.H.: See lab syllabus

Course Description

Lectures examine fundamental biological principles. From the sub-cellular to the ecosystem level with an emphasis on critical thinking and the scientific method. Laboratory sessions will help develop deeper understanding of the techniques and methods used in biological science by requiring students to design and conduct their own experiments.

Biology Department Learning Goals: <https://www.bowdoin.edu/biology/requirements/learning-goals.html>

Participation, Engagement & Attentiveness

Instruction is in person. We build and nurture a learning community through our semester together. I expect attendance, engagement, and a readiness to participate during each class period. Please feel free to wear a face covering (*i.e.*, a mask) if you feel the need. I expect you to read your Bowdoin email at least daily. You may use an iPad in class for notetaking only. I am sensitive to the challenges brought on by in-person instruction after a significant block of online learning and to a return to forms of accountability that were at times relaxed (for good reason) during the peak of the pandemic. Please stay in touch with me if your schoolwork begins to overwhelm you.

¹ The Laboratory Syllabus, disseminated in lab, contains all relevant information about the lab portion of Biology 1109.

Grading²: Your overall grade will be determined based upon the following:

Homework/Assignments	5%
Quizzes	5%
Waypoints	35%
News & Views article	10%
Final Exam	20%
Lab	25%

Homework/Assignments: Approximately weekly, I'll share a few homework questions for your consideration. You earn full credit for each homework simply by turning it in by the stated due date. I will review, but not grade homework. Instead, I'll provide you an answer key. Likewise, I will occasionally solicit assignments from you. Same deal; turn it in on time and earn full credit. I will drop one missed homework/assignment from your tally for this contribution to your overall grade.

Quizzes: On the Friday of any week without a waypoint (see below), I will share a one-question quiz to complete at the start of our class meeting. Quizzes will cover material of the preceding three class periods (unless I instruct you otherwise). I will drop your lowest (or a missed) quiz from your tally for this contribution to your overall grade.

Waypoint: On five Wednesdays over the course of the semester, I will share a waypoint for your completion in class. It will demand more time than a quiz, but is not as weighty as a mid-term exam might be. Each waypoint will cover material since the waypoint before it. Waypoints must be completed in person as scheduled.

News & Views Paper: You will each write a ~500 word article summarizing an original research article, using as your guide the *News & Views* front matter of the journal *Nature* (or the *Latest News* front matter of the journal *Science*). Choose an original research article from among the Bowdoin Biology faculty articles I have compiled as options. You will have the opportunity to revise.

Final Exam: The final exam will be cumulative and must be completed in person as scheduled. Our final exam will be *Monday, Dec. 13 (8:30-11:30am)*. Please arrange your end-of-semester travel accordingly.

Laboratory: See Laboratory Syllabus for details. Lab attendance is mandatory and you must attend the section for which you are scheduled. If unusual circumstances prevent you from attending lab on your scheduled day during a particular week, please see Pam Bryer to arrange for another lab time for that week only. Please be prompt so that you do not delay the start of the lab. Labs last approximately three hours depending on the experiment and student preparedness. Be sure to read the lab handout before coming to lab.

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A word on academic integrity: You may work in groups on homework, but the work you turn in should be yours (*i.e.*, from your own mind/hand and not copied from another, electronically or otherwise). You are allowed no outside help as you complete the final exam, waypoints or quizzes (from materials or people). I include the *News & Views* assignment in our semester to offer you an opportunity to further refine your writing (with my input) and to provide you an opportunity to acquaint yourself with the work of a Biology faculty member. Your *News & Views* should be your own writing. I expect you to write it without the assistance of generative AI writing tools. Such AI tools will forever be a part of our lives. They have their place, but I prohibit their use on this assignment because I believe that doing so makes your *News & Views* a more meaningful learning experience for you. I will strictly uphold Bowdoin's Academic Honor Code.

A word on scheduling conflicts: I expect you to discuss any foreseeable conflicts with course obligations well in advance (think/look ahead). I expect you to reach out to me as soon as reasonable if you fall ill or experience an unforeseeable conflict with a course obligation. *Do not come to class if you are ill.*

² I will not keep grades on Canvas. You should feel free to check in with me about grades, if you like.

Biology 1109 Lecture Schedule

Week Beginning	Topic
Aug. 28	Macromolecules & Cell Structure
Sept. 4	The Central Dogma Control of Gene Expression
Sept. 11	The Cell Cycle Cancer [Waypoint Sept. 13]
Sept. 18	Cancer Bioenergetics
Sept. 25	Bioenergetics Neuronal Communication
Oct. 2	Neuronal Communication [Waypoint Oct. 4]
Oct. 9	Muscle Contraction
Oct. 16	Muscle Contraction Athletic Performance: Training & Talent
Oct. 23	Evolution [Waypoint Oct. 25]
Oct. 30	Evolution Sexual Selection
Nov. 6	Population/Community Ecology Hantavirus
Nov. 13	Ecosystem Ecology [Waypoint Nov. 15]
Nov. 20	Ecosystem Ecology Global Change
Nov. 27	Coupled Human-Natural Systems of Western North America
Dec. 4	CRISPR Gene Drive and the Ethics of Altering Wild Organisms [Waypoint Dec. 6]