

BIO 8: CRITICAL THINKING IN BIOLOGY

In Workflow

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Approval Path

1. Mon, 03 Mar 2025 23:43:06 GMT
Evangeline Ballerini (ballerini): Approved for BIO Committee Chair
2. Tue, 04 Mar 2025 00:05:35 GMT
Susanne Lindgren (lindgren): Approved for BIO Chair
3. Thu, 06 Mar 2025 23:04:34 GMT
Mikkel Jensen (mikkel.jensen): Approved for NSM College Committee Chair
4. Thu, 06 Mar 2025 23:25:29 GMT
Chris Taylor (ctaylor): Approved for NSM Dean

New Course Proposal

Date Submitted: Mon, 03 Mar 2025 23:42:13 GMT

Viewing: BIO 8 : Critical Thinking in Biology

Last edit: Thu, 06 Mar 2025 23:03:39 GMT

Changes proposed by: Arik Davidyan (219720619)

Contact(s):

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Catalog Title:

Critical Thinking in Biology

Class Schedule Title:

Critical Thinking in Biology

Academic Group: (College)

NSM - Natural Sciences & Mathematics

Academic Organization: (Department)

Biological Sciences

Will this course be offered through the College of Continuing Education (CCE)?

No

Catalog Year Effective:

Spring 2026 (2026/2027 Catalog)

Subject Area: (prefix)

BIO - Biological Sciences

Catalog Number: (course number)

8

Course ID: (For administrative use only.)

TBD

Units:

3

Is the ONLY purpose of this change to update the term typically offered or the enforcement of existing requisites at registration?

No

In what term(s) will this course typically be offered?

Fall, Spring

Does this course require a room for its final exam?

Yes, final exam requires a room

Does this course replace an existing experimental course?

No

This course complies with the credit hour policy:

Yes

Justification for course proposal:

There is currently no GEN1-1B: Critical Thinking course that provides dedicated training in critical thinking focusing on the field of biology. This course will fill that gap, providing essential skills for both Biological Sciences majors and non-majors alike.

For Biological Sciences students, many of whom will become healthcare providers, researchers, and science advocates, critical thinking in biology is an essential skill. In their future roles, they will frequently engage with the public and encounter a wide range of scientific claims—many of which are misleading or outright false. A structured course in critical thinking and biological reasoning will prepare them to assess evidence critically, engage in effective science communication, and advocate for scientifically sound decision-making.

For all students at Sacramento State, the ability to critically evaluate biological information is increasingly important. Many of the most pressing issues of our time—including viral evolution, vaccine efficacy, and climate change, to name just a few relevant biological examples—require both a biological framework and critical reasoning skills to navigate effectively. Throughout their lives, students will need to make informed decisions about their health, their family member's health, the environment, and scientific policies, making this training invaluable regardless of career path.

The rise of social media, AI-generated misinformation, and pseudoscientific health trends has only increased the urgency for this type of education. Students, like the broader public, are frequently exposed to misleading or false biological claims, making it crucial for them to develop the ability to discern credible scientific evidence from misinformation. This course will empower them with the tools needed to navigate these challenges effectively, making them more discerning consumers of information, better-informed citizens, and more ethical scientists and healthcare professionals.

By offering a Critical Thinking in Biology course, Sacramento State will bridge an educational gap, equipping students with vital reasoning skills that will enhance their academic success, career readiness, and ability to engage with scientific issues in their personal and professional lives.

Course Description: (Not to exceed 90 words and language should conform to catalog copy.)

Examination of the methodology of science within a biological context. This course emphasizes how scientific knowledge is generated and validated, comparing well supported investigations with others that do not meet accepted scientific standards, including poorly conducted science, illegitimate scientific claims, and misinformation. Examples will be drawn primarily from biological sciences. Analyses will require study of basic skills of reasoning, types of logical argument, structure and validity of arguments, the identification of common reasoning fallacies, comprehensive evaluation of evidence, and a deeper understanding of the scientific thinking process.

Are one or more field trips required with this course?

No

Fee Course?

No

Is this course designated as Service Learning?

No

Is this course designated as Curricular Community Engaged Learning?

No

Does this course require safety training?

No

Does this course require personal protective equipment (PPE)?

No

Does this course have prerequisites?

No

Does this course have corequisites?

No

Graded:

Letter

Approval required for enrollment?

No Approval Required

Course Component(s) and Classification(s):

Lecture

Lecture Classification

CS#02 - Lecture/Discussion (K-factor=1WTU per unit)

Lecture Units

3

Is this a paired course?

No

Is this course crosslisted?

No

Can this course be repeated for credit?

No

Can the course be taken for credit more than once during the same term?

No

Description of the Expected Learning Outcomes and Assessment Strategies:

List the Expected Learning Outcomes and their accompanying Assessment Strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers). Click the plus sign to add a new row.

	Expected Learning Outcome	Assessment Strategies
1	Identify and apply the elements of sound logical reasoning to compose and critique deductive and inductive arguments.	Exams, Homework, Case studies
2	Identify and critique fallacies, biases, and errors in reasoning.	Exams, Homework, Case studies
3	Identify and evaluate the use of facts and opinions as evidence in the construction of arguments.	Exams, Essay, Case studies
4	Identify and evaluate methods and reasoning appropriate to the discipline associated with the course.	Exams, Homework, Case studies
5	Analyze, interpret, and evaluate diverse biological claims using evidence-based reasoning.	Homework, Group presentation, Case studies
6	Critically assess biases, fallacies, and errors in arguments related to biological issues.	Exams, Essay, Case studies
7	Appraise the credibility and validity of science information and data.	Homework, Group presentation, Case studies
8	Create coherent, well-supported arguments on topics such as climate change, genetically modified organisms (GMOs), evolution, and vaccination	Homework, Essay, Group presentation

Attach a list of the required/recommended course readings and activities:

Required Readings_BIO 8.docx

For whom is this course being developed?

General Education

Is this course required in a degree program (major, minor, graduate degree, certificate?)

No

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?

No

Will there be any departments affected by this proposed course?

No

I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.

I/we agree

University Learning Goals

Undergraduate Learning Goals:

Competence in the disciplines
Intellectual and practical skills
Personal and social responsibility

Is this course required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

GE Course and GE Goal(s)

Is this a General Education (GE) course or is it being considered for GE?

Yes

In which GE area(s) does this apply?

1B. Critical Thinking and Composition

Which GE objective(s) does this course satisfy?

Construct a non-fallacious verbal argument, recognize fallacious arguments, and follow the verbal arguments of others.
Find and use common information resources, engage in specialized library research, use computers and seek out appropriate expert opinion and advice.

Attach Course Syllabus with Detailed Outline of Weekly Topics:

BIO8_syllabus-2.pdf

Syllabi must include: GE area outcomes listed verbatim; catalog description of the course; prerequisites, if any; student learning objectives; assignments; texts; reading lists; materials; grading system; exams and other methods of evaluation.

Will more than one section of this course be offered?

No

Key: 15319