

BIO 178: MOLECULAR ECOLOGY

In Workflow

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Approval Path

1. 2026-09-15T17:24:55Z
Jonathan Gilkerson (gilkerson): Approved for BIO Committee Chair
2. 2026-09-16T16:07:53Z
Thomas Peavy (trpeavy): Approved for BIO Chair
3. 2026-09-17T18:15:09Z
Mikkel Jensen (mikkel.jensen): Approved for NSM College Committee Chair
4. 2026-09-17T18:50:10Z
Chris Taylor (ctaylor): Approved for NSM Dean

History

1. Jul 4, 2024 by Rob Crawford (robert.crawford)

Date Submitted: 2026-05-01T21:03:40Z

Viewing: BIO 178 : Molecular Ecology

Last approved: Thu, 04 Jul 2024 14:00:48 GMT

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Changes proposed by: Lani Gleason (219665486)

Contact(s):

Name (First Last)	Email	Phone 999-999-9999
Lani Gleason	lani.gleason@csus.edu	916-278-6152

Catalog Title:

Molecular Ecology

Class Schedule Title:

Molecular Ecology

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:

Fall 2027 (2027/2028 Catalog)

Subject Area: (prefix)

BIO - Biological Sciences

Catalog Number: (course number)

178

Course ID: (For administrative use only.)

202393

Units:

4

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

No

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

Fall term only

Does this course require a room for its final exam?

Yes, final exam requires a room

This course complies with the credit hour policy:

Yes

Justification for course proposal:

The current BIO 178 course description does not specify the modality or time commitment of lecture and lab components for BIO 178. We propose updating the course description to specify that lecture (three hours) will be offered either online or in-person, and that lab (three hours) will be offered in-person. BIO 178 has been taught with an online lecture since Fall 2020 to facilitate increased performance for historically excluded students (Gavassa et al 2019), provide flexibility for working students (Vaughn 2007), and increased accessibility for students with disabilities (Fabula 2023). Every previous semester the course schedule has correctly indicated that students are signing up for an online lecture and an in-person lab, but also specifying the course modality in the course description will provide further clarification for students as they plan out their degrees in the Biological Sciences. This change has been discussed with the Biological Sciences Department Curriculum & Assessment Committee and is being made per their request.

Previous catalog versions stated that BIO 178 does not require safety training or personal protective equipment (PPE), but that is not accurate. BIO 178 students are required to wear long pants and closed-toed shoes and to wear provided gloves during lab, and they receive documented safety training on the first day of lab. We have now added a Course Note stating that both in-class safety training and personal protective equipment (PPE) are required.

Lastly, we propose changing BIO 188 from a corequisite to a “prerequisite, may be taken concurrently” for BIO 178. Because BIO 188 is currently listed as a corequisite, some students wait to enroll in it until their last semester (when they are often taking BIO 178), which can delay their graduation. There is no pedagogical reason why students can’t take BIO188 as a prerequisite before taking BIO 178 – making this official change in the catalog to allow BIO 188 as a pre or corequisite will facilitate students’ timely completion of their degrees. This change has been discussed with the Biological Sciences Department Chair and is being made per her request, in consultation with the Biological Sciences Department Curriculum & Assessment Committee.

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

A survey of the use of molecular tools to understand ecological questions. Online or in-person lecture (three hours) will focus on the background and history of the use of molecular tools in ecological settings, including application of molecular tools to conservation of natural resources. In-person laboratory (three hours) will include techniques for both wet lab and analysis of molecular data, including interpretation of results. Students will complete a capstone-style project that will culminate in the production of a research poster.

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?

Yes

Does this course require personal protective equipment (PPE)?

Yes

Course Note: (Note must be a single sentence; do not include field trip or fee course notations.)

This course requires in-class safety training and personal protective equipment (PPE).

Does this course have prerequisites?

Yes

Prerequisite:

BIO 184 and BIO 188; BIO 188 may be taken concurrently.

Prerequisites Enforced at Registration?

Yes

Does this course have corequisites?

No

Graded:

Letter

Approval required for enrollment?

No Approval Required

Course Component(s) and Classification(s):

Laboratory

Lecture

Laboratory Classification

CS#16 - Science Laboratory (K-factor=2 WTU per unit)

Laboratory Units

1

Lecture Classification

CS#04 - Lecture /Recitation (K-factor=1 WTU 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	Analyze and interpret molecular ecology data and use this information to evaluate scientific hypotheses.	lab research project, lecture quizzes, lab reports
2	Read a scientific paper in the field of molecular ecology, explain the main points, critically evaluate the main conclusions, and propose future directions for the work.	lecture research proposal, lab research project
3	Identify the phenotypic and genetic consequences of natural selection and explain how this process leads to local adaptation.	lecture quizzes

4	Compare and contrast the effects of natural selection, gene flow, and drift on natural populations.	lecture quizzes
5	Select which type of genetic marker would be best to address a given scientific question in the field of molecular ecology and defend why this choice is better than the alternatives.	lecture quizzes, lecture research proposal
6	Determine what types of molecular ecology data are needed to make informed policy decisions and recommend evidence-based actions to facilitate conservation, etc. in our changing world.	lecture research proposal, lecture quizzes
7	Employ critical thinking and communication skills to collaboratively solve scientific problems with your peers.	lab research project
8	Create and explain a scientific research poster.	lab research project, class poster session
9	Compose a National Science Foundation (NSF) Graduate Research Fellowship (GRFP)-style research proposal.	conferences with students, lecture research proposal

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

Reading List for BIO178.pdf

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

Yes

Has a corresponding Program Change been submitted to Workflow?

No

Identify the program(s) in which this course is required:**Programs:**

BS in Biological Science (Ecology, Evolution, and Conservation)

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
 Knowledge of human cultures and the physical and natural world
 Intellectual and practical skills
 Personal and social responsibility
 Integrative learning

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?**

No

Please attach any additional files not requested above:

BIO178_syllabus_forFormA.pdf

Key: 463