

PHYS 172: BIOLOGICAL PHYSICS

In Workflow

1. PHYS Committee Chair (mikkel.jensen@csus.edu)
2. PHYS Chair (degraff@csus.edu)
3. NSM College Committee Chair (mikkel.jensen@csus.edu)
4. NSM Dean (datwyler@csus.edu)
5. Academic Services (catalog@csus.edu)
6. Senate Curriculum Subcommittee Chair (curriculum@csus.edu)
7. Dean of Undergraduate (gardner@csus.edu)
8. Dean of Graduate (cnewsome@skymail.csus.edu)
9. Catalog Editor (catalog@csus.edu)
10. Registrar's Office (k.mcfarland@csus.edu)
11. PeopleSoft (PeopleSoft@csus.edu)

Approval Path

1. Tue, 03 Dec 2024 21:30:07 GMT
Mikkel Jensen (mikkel.jensen): Approved for PHYS Committee Chair
2. Tue, 03 Dec 2024 21:30:46 GMT
William DeGraffenreid (degraff): Approved for PHYS Chair
3. Thu, 06 Feb 2025 23:02:02 GMT
Mikkel Jensen (mikkel.jensen): Approved for NSM College Committee Chair
4. Wed, 19 Feb 2025 23:53:48 GMT
Chris Taylor (ctaylor): Approved for NSM Dean

History

1. Mar 24, 2022 by Mikkel Jensen (mikkel.jensen)
2. Jun 6, 2022 by Mikkel Jensen (mikkel.jensen)
3. Jun 8, 2022 by 302822325
4. Nov 8, 2024 by Mikkel Jensen (mikkel.jensen)

Date Submitted: Fri, 08 Nov 2024 21:05:03 GMT

Viewing: PHYS 172 : Biological Physics

Last approved: Fri, 08 Nov 2024 20:52:30 GMT

Last edit: Fri, 08 Nov 2024 21:05:02 GMT

Changes proposed by: Mikkel Jensen (218650862)

Contact(s):

Name (First Last)	Email	Phone 999-999-9999
Mikkel Herholdt Jensen	mikkel.jensen@csus.edu	9162787687

Catalog Title:

Biological Physics

Class Schedule Title:

Biological Physics

Academic Group: (College)

NSM - Natural Sciences & Mathematics

Academic Organization: (Department)

Physics and Astronomy

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

No

Catalog Year Effective:

Spring 2026 (2026/2027 Catalog)

Subject Area: (prefix)

PHYS - Physics

Catalog Number: (course number)

172

Course ID: (For administrative use only.)

203078

Units:

3

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:

This course change proposal includes two changes:

1. Update the course to indicate a pairing with PHYS 272, a proposed graduate-level physics course.
2. An addition of an 8th learning objective, "synthesize and present scientific literature in writing and orally." The assessment strategies have also been updated to accurately indicate how each LO is assessed in the course.

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

Investigation of subcellular and cellular biological systems using the fundamentals of physics. Topics will include a quantitative treatment of: the role of forces and energy in biology; thermodynamics of living systems; biopolymer, cytoskeletal and cellular mechanics; the physics of molecular motors and intracellular transport; applications of physical tools to study biological systems. Focus is on the interplay between physics and biology, and on how physical properties determine the biological function and behavior of living systems.

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

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

PHYS 11B or PHYS 5B may be taken concurrently with instructors consent; no biology coursework is required, though some knowledge of cell biology is helpful, and it is recommended that students consider taking a lower-division college course in biology prior to enrollment

Does this course have prerequisites?

Yes

Prerequisite:

MATH 26A or MATH 30. PHYS 5A and PHYS 5B; or PHYS 11A and PHYS 11B and PHYS 11C.

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):

Discussion

Discussion Classification

CS#04 - Lecture /Recitation (K-factor=1 WTU per unit)

Discussion Units

3

Is this a paired course?

Yes

Please confirm that it complies with the Paired Courses Policy and enter the course with which it is paired:

PHYS 272

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	Describe how biological function across length scales is governed by the principles of physics.	Homework sets - Graded homework Midterm exams Final exam
2	Explain how living systems create and maintain order and homeostasis in an entropy-driven world.	Homework sets - Graded homework Midterm exams Final exam
3	Describe ways in which biological systems sense and respond to physical stimuli from their surroundings.	Homework sets - Graded homework Midterm exams Final exam
4	Explain how biological behavior and function are linked to the systems' physical properties.	Homework sets - Graded homework Midterm exams Final exam
5	Critically assess how changes in the physical properties of a biological system can impact its behavior and function.	Homework sets - Graded homework Midterm exams Final exam
6	Describe the function of experimental tools used to probe the physical properties of biological matter.	Homework sets - Graded homework Midterm exams Final exam

7	Analyze quantitative problems in biology using principles of physics, such as forces and energy conservation.	Homework sets - Graded homework Midterm exams Final exam
8	Synthesize and present scientific literature in writing and orally.	Literature reading assignments In-class presentations Literature-based term paper

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

Syllabus PHYS 172.pdf

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

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

Key: 13669