BIOL123H : Honors Evolution

General Information

Author:	• Karoline Rostamiani
Course Code (CB01) :	BIOL123H
Course Title (CB02) :	Honors Evolution
Department:	BIOL
Proposal Start:	Summer 2024
TOP Code (CB03) :	(0401.00) Biology, General
CIP Code:	(26.0101) Biology/Biological Sciences, General.
SAM Code (CB09) :	Non-Occupational
Distance Education Approved:	Yes
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000606862
Curriculum Committee Approval Date:	12/13/2023
Board of Trustees Approval Date:	01/09/2024
Last Cyclical Review Date:	04/01/2019
Course Description and Course Note:	BIOL 123H examines the history of life on earth, and the mechanisms that have led to the diversity we see today. Topics to be covered include a brief history of evolutionary thought, adaptive vs. neutral evolution (natural selection and genetic drift), biogeography, the origin of life, population genetics and speciation, an exploration of the fossil record and modern systematics, and recent work in the fields of sexual selection, behavior, development, and human evolution. The Honors course will be enhanced in one or more of the following ways: students will complete a research paper and/or presentation on a topic in evolutionary biology not covered in lecture, and/or essay questions on exams based on supplemental readings.
Justification:	Transferability/C-ID Change Changed local GE requirement.
Academic Career:	• Credit
Author:	• Karoline Rostamiani

Academic Senate Discipline

Primary Discipline:	• Biological Sciences
Alternate Discipline:	No value
Alternate Discipline:	No value

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

☐ Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Pre-Collegiate Level (CB21)

Not applicable.

Grading Basis

- Grade Only

Course Support Course Status (CB26)

Course is not a support course

Transferability & Gen. Ed. Options

General Education Status (CB25)

Local GE Requirement

Transferability

Transferable to both UC and CSU

Transferability Status

Approved

IGETC Area	Area	Status	Approval Date	Comparable Course
5B-Biological Science	Biological Science	Approved	08/28/2023	No Comparable Course defined.

CSU GE-Breadth Area	Area	Status	Approval Date	Comparable Course
B2-Life Science	Life Science	Approved	08/28/2023	No Comparable Course defined.

Units and Hours

Summary

Minimum Credit Units (CB07)	3
Maximum Credit Units (CB06)	3
Total Course In-Class (Contact) Hours	54
Total Course Out-of-Class Hours	108
Total Student Learning Hours	162

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

Variable Credit Course

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	3	6
Laboratory Hours	0	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	0
Course In-Class (Contact) Hours	
Lecture	54
Laboratory	0
Studio	0
Total	54
Course Out-of-Class Hours	
Lecture	108
Laboratory	0
Studio	0
Total	108

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Advisory

ENGL100 - *Writing Workshop

OR

Advisory

ESL151 - Reading And Composition V

Objectives

- Read and critically analyze various academic readings;
- Summarize readings;
- employ basic library research techniques;

Entry Standards

Entry Standards	Description

Read, analyze, and evaluate contemporary articles and stories for the comprehension of difficult content and the identification of main ideas and (topic-based) evidence.	ENGL 100
Write compositions (e.g., summaries and argumentative essays) that are easy to read and follow, though some errors in grammar, mechanics, spelling, or diction may exist.	ENGL 100

Course Limitations

Cross Listed or Equivalent Course	Description
BIOL 123 Evolution	No Value

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Methods of Instruction	Discussion
Methods of Instruction	Multimedia
Methods of Instruction	Collaborative Learning
Methods of Instruction	Demonstrations
Methods of Instruction	Presentations

Out of Class Assignments

- Written responses to assigned readings or videos
- Homework exercises (e.g., radiometric dating of fossils, DNA sequence database search)
- Research for a written paper and/or oral presentation

Methods of Evaluation	Rationale
Exam/Quiz/Test	Quizzes
Activity (answering journal prompt, group activity)	Homework exercises
Presentation (group or individual)	Student presentations
Writing Assignment	Research paper
Exam/Quiz/Test	Exams

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Zimmer, Carl	The Tangled Bank: an introduction to evolution	WH Freeman	2019	978-13190-79864

Other Instructional Materials (i.e. OER, handouts)

No Value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

Describe Darwin's contribution to our understanding of how evolution works.

Describe the major evolutionary forces that act to change populations over time.

Explain the processes of speciation and adaptive radiation.

Describe key events in the history of life on earth, including the origin of life and major extinction events.

Identify some important finds in the fossil record and describe what they demonstrate about the nature of evolution.

Describe what is known about human evolution and the impact of our evolutionary past on modern humans.

SLOs

Describe the mechanisms of evolution and their influences on populations over time. Expected Outcome Performance: 70.0

ILOs Core ILOs	Communicate clearly, ethically, and creatively; listen actively and engage respectfully with others; consider situational, cultural, and personal contexts within or across multiple modes of communication.
BIOL Core PLOs	Prepare for a career in Biology by completing the AS degree in Biological Science (or AS-T in Biology) and/or being accepted for transfer to a 4-year university program in biology or a related field.
ILOs General Education	apply reasoning to evaluate hypotheses and theories
	examine causality or associations between or among variables of the natural world

Describe the processes of speciation and their responsibility for the diversity of life on earth. Expected Outcome Performance: 70.0

ILOs Core ILOs	Communicate clearly, ethically, and creatively; listen actively and engage respectfully with others; consider situational, cultural, and personal contexts within or across multiple modes of communication.
BIOL Core PLOs	Prepare for a career in Biology by completing the AS degree in Biological Science (or AS-T in Biology) and/or being accepted for transfer to a 4-year university program in biology or a related field.
ILOs General Education	apply reasoning to evaluate hypotheses and theories
	examine causality or associations between or among variables of the natural world

Interpret evolutionary relationships as depicted in a cladogram or phylogeny. Expected Outcome Performance: 70.0

ILOs Core ILOs	Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.
	Communicate clearly, ethically, and creatively; listen actively and engage respectfully with others; consider situational, cultural, and personal contexts within or across multiple modes of communication.
BIOL Core PLOs	Prepare for a career in Biology by completing the AS degree in Biological Science (or AS-T in Biology) and/or being accepted for transfer to a 4-year university program in biology or a related field.
ILOs General Education	analyze, interpret, and present research evidence
	apply reasoning to evaluate hypotheses and theories
	examine causality or associations between or among variables of the natural world

Identify key events in the history of life on earth, including fossil discoveries and extinctions. Expected Outcome Performance: 70.0

ILOs Core ILOs	Communicate clearly, ethically, and creatively; listen actively and engage respectfully with others; consider situational, cultural, and personal contexts within or across multiple modes of communication.
BIOL Core PLOs	Prepare for a career in Biology by completing the AS degree in Biological Science (or AS-T in Biology) and/or being accepted for transfer to a 4-year university program in biology or a related field.
ILOs General Education	apply reasoning to evaluate hypotheses and theories
	examine causality or associations between or among variables of the natural world

Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?

No Value

Is this proposal submitted in response to learning outcomes assessment data?

No Value

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content

Overview of Topics in Evolutionary Biology (2 hours)
- The fossil record

History of Evolutionary Ideas (6 hours)
- Pre-Darwinian Ideas
- Charles Darwin
- Influences on Darwin

Deep Time (3 hours)
- Radiometric dating
- The fossil record

Genetics Primer (3 hours)
- Mendelian inheritance
- Mitosis and Meiosis
- Transcription and Translation

Microevolution (10 hours)
- Mutation
- Genetic drift
- Gene flow
- Natural Selection
    - Stabilizing
    - Directional
    - Diversifying

Speciation (3 hours)
- Allopatric vs. Sympatric
- Pre-zygotic vs. Post-zygotic isolation
- Biological Species Concepts
- Adaptive radiations

Origin of Life (3 hours)
- RNA world
- Prokaryotes and the origin of photosynthesis
- Endosymbiosis and the origin of eukaryotes

Development (3 hours)
- Homologous features
- Master control genes
- Gene duplication
- Constraints

Extinction (3 hours)
- History of mass extinctions
- Permian extinction and Pangaea
- K-T extinction and the rise of mammals
- Human-caused extinctions

Co-evolution (3 hours)

- Mutualism
- Arms race

Disease and Evolutionary Medicine (3 hours)

- Parasite and host
- Bacteria and antibiotic resistance
- Viruses (HIV case study)

Evolution of Sex (3 hours)

- The two-fold cost of sex
- Advantages of sexual reproduction
- Sexual selection
- Mating systems

Behavior (3 hours)

- Parent-offspring conflict
- Maternal investment
- Cooperation and inclusive fitness

Phylogeny and Systematics (3 hours)

- Biological classification
- Cladistics
- DNA sequence comparisons

Human Evolution (3 hours)

- Human ancestry
- Modern humans and our evolutionary legacy

Total Hours: 54