California State University, San Marcos General Education Program
GENERAL EDUCATION NEW COURSE CERTIFICATION REQUEST
• AREA B2: Life Science – No Lab Component
See GE Handbook for information on each section of this form

ABSTRACT

Course Abbreviation and Number: BIOL 105 **Number of Units: 3 _____**	**Course Title: Introduction to biology/ecology**	
College or Program: ☐CHABSS ☒CSM ☐CEHHS ☐COBA ☐Other_____	**Desired term of implementation:** ☐Fall ☒Spring ☐Summer Year: 2015	**Mode of Delivery:** ☒ face to face ☐ hybrid ☐fully on-line
Course Proposer (please print):Tracey Brown	**Email:traceyb@csusm.edu**	**Submission Date:10/10/14**

1. Course Catalog Description:
An introduction to the natural and physical processes governing environmental systems, as well as the ways in which human behavior impacts and is connected to the environment. Studies how living organisms function and evolve with the natural world, covering a diversity of organisms and physical environments. Examples of subjects covered in the course include energy flow, nutrient cycling, population dynamics, and the ecological and biological consequences of human activities.

2. GE Syllabus Checklist: The syllabi for all courses certified for GE credit must contain the following:

☒	Course description, course title and course number
☒	Student learning outcomes for General Education Area and student learning objectives specific to your course, linked to how students will meet these objectives through course activities/experiences
☒	Topics or subjects covered in the course
☐	Registration conditions
☒	Specifics relating to how assignments meet the writing requirement
☒	Tentative course schedule including readings
☒	Grading components including relative weight of assignments

SIGNATURES

11/4/14
Course Proposer Date

11/4/14
Department Chair date

Please note that the department will be required to report assessment data to the GEC annually. _____
DC Initial

	Support	Do not support*		Support	Do not support*
	☐	☐		☐	☐
Library Faculty Date			Impacted Discipline Chair Date		

	Support	Do Not Support*		Approve	Do not Approve
	☐	☐		☐	☐
Impacted Discipline Chair Date			GEC Chair Date		

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Course Coordinator: Phone: Email:

Part A: B2 Life Science General Education Learning Outcomes (GELOs) related to course content. [Please type responses into the tables.]

Life Science GELOs this c urse will address:	**Course content that addresses each GELO.**	**How will these GELOs be assessed?**
B2.1: Students will state or identify accepted modern biological principles and/or use knowledge of those principles to solve problems in the biological sciences.	Students will be given overviews of the natural and physical sciences relating to biology and ecology, how they relate to one another, and how to employ an interdisciplinary approach to understanding and problem solving. The primary biological principles investigated in this course will involve energy and material flow through the environment, basic principles of organismic biology, changes in biological populations and communities over time. These diverse fields will help students understand some of the most important ecological issues, including: population management, sustainability, watershed planning, and global climate change.	Exams will include specific questions relating to these various fields of sciences. For example, they will be asked to diagram the hydrological and carbon cycles. Furthermore, they must indicate where humans are altering these natural cycles and to what degree and propose solutions for minimizing these effects.
B2.2: Students will describe and apply the discipline's primary methods to problems through hypothesis development, critical evaluation of evidence, data collection, fieldwork, and/or employment of mathematical and computer analysis.	Students will be exposed to observational and experimental studies. Through either a lecture format or the use of readings, online examples and fieldtrips, students will be shown an environmental study or issue, and learn how these topics are explored in a scientific manner. During the overview of the sciences, emphasis will be placed on the scientific method and the logical and rigorous manner in which all sciences operate. Critical thinking and evaluation skills will similarly be reinforced.	Students will be asked to design their own study of a biological, ecological or environmental issue. For example, students will be asked to design a simple experiment to test water pollution runoff from an agricultural area. They will describe how to collect the data (water samples testing for nutrients), when to collect the data (during watering events or major rain events), and where sampling should take place (in the river above, at, and below the potential sources of pollution).
B2.3: Students will describe various theories relevant to the discipline.	Students will be given overviews of the natural and physical sciences, how they relate to one another, and how to employ an interdisciplinary approach to understanding and problem solving. The natural sciences addressed include biology, ecology, and organic chemistry. Students will also learn how the physical world helps shape our natural world. With an understanding of the physical sciences (e.g. geology, hydrology, physics) students will understand how the physical world is interconnected with our natural world, influencing our environment. These diverse fields will help students	On both essay exams and writing assignments, students will be asked to demonstrate mastery of the primary axioms in biology/ecology or environmental science. For example, they will need to present a coherent description of climate change for the planet. This will require discussing both natural (greenhouse effect, planetary trajectories and wobble) and anthropogenic (carbon

	understand some of the most important environmental issues, including: sustainability, watershed planning, and global climate change.	pollution) effects.
B2.4: Students will identify the limitations of scientific endeavors.	During the overview of the sciences, emphasis will be placed on the scientific method and the logical and rigorous manner in which all sciences operate. Critical thinking and evaluation skills will similarly be reinforced.	Students will be given multiple examples of environmental issues, and asked to provide their own personal interpretation or bias toward the subject, along with providing a scientific analysis of the issue. Also, students will be asked to evaluate a popular topic (like global warming) and compare/contrast the (often conflicting) information provided.
B2.5: Students will identify and consider the value systems and ethics associated with human inquiry.	Students will be taught to draw from the sciences as a base of understanding, and relate this knowledge to how differing economic and cultural states influence treatment and decisions about the environment. Class discussions will require presenting multiple disciplines and identify the various strategies necessary to address an environmental issue (e.g. the proposed development of a landfill and how it may potentially affect hydrology, water quality, air quality, seismology, habitat/species, cultural resources, etc).	Students will demonstrate cultural sensitivity, and how various socio-economic and cultural states help shape our treatment of the environment. They should be able to explain (in exam essays) the differences between two approaches to an environmental issue: e.g. how the United States is addressing climate change and carbon dioxide emissions versus how lesser developed countries (like India) are dealing with this same issue.

Part B: General Education Learning Outcomes required of all GE courses related to course content:

GE Outcomes required of <u>all</u> Courses	**Course content that addresses each GE outcome?**	**How will these GELOs be assessed?**
Students will communicate effectively in writing to various audiences. (writing)	Students will be required to articulate their knowledge across questions from simple basic principles to advanced critical analyses of complex issues. Writing is a critical aspect in any science. In the environmental sciences, a writing assessment provides the students an opportunity to evaluate an environmental issue.	Writing assessments will occur as part of an essay exam, where students will be assessed based on their ability to clearly demonstrate an understanding of the material, provide a scientific assessment of the subject, and present clear and reasoned solutions to both a general and scientific audience.
Students will think critically and analytically about an issue, idea or problem. (critical thinking)	During the overview of the sciences, emphasis will be placed on the scientific method and the logical and rigorous manner in which all sciences operate. Critical thinking and	They will have a writing assignment that will require the students to present both sides of a topic, such as climate change. They will

	evaluation skills will similarly be reinforced.	need to discuss the strengths and weaknesses of both sides.
Students will find, evaluate and use information appropriate to the course and discipline. (Faculty are strongly encouraged to collaborate with their library faculty.)	Information sources on issues in environmental sciences are diverse. Popular topics are often addressed in the peer reviewed literature, popular media, and internet-based forums. The information presented across these various information types is often vary in the amount of scientific rigor. Students will be exposed to the diversity of information outlets, and learn to distinguish between information that follows standard scientific methods and protocols from those sources that follow less stringent methods, contain biases, or opinions.	Students will be required to find multiple examples of specific environmental issues, and asked to provide their own personal interpretation or bias toward the subject, along with providing a scientific analysis of the issue. They will need to interpret the validity of their resources and contrast what is based in science and what is based in politics or social beliefs.

Part C: GE Programmatic Goals: The GE program aligns with CSUSM specific and LEAP Goals. All B2 courses must meet at least one of the LEAP Goals.

GE Programmatic Goals	***Course addresses this LEAP Goal:***
LEAP 1: Knowledge of Human Cultures and the Physical and Natural World.	☐ ***No*** ☒ ***Yes***
LEAP 2: Intellectual and Practical Skills	☐ ***No*** ☒ ***Yes***
LEAP 3: Personal and Social Responsibility	☐ ***No*** ☒ ***Yes***
LEAP 4: Integrative Learning	☐ ***No*** ☒ ***Yes***
CSUSM Specific Programmatic Goals	**Course content that addresses the following CSUSM goals. Please explain, *if applicable.***
CSUSM 1: Exposure to and critical thinking about issues of diversity.	☐ ***No*** ☒ ***Yes (please describe):Course addresses species diversity and cultural impacts***
CSUSM 2: Exposure to and critical thinking about the interrelatedness of peoples in local, national, and global contexts.	☐ ***No*** ☒ ***Yes (please describe):Some exposure in light of discussions of different social and governmental groups on environment***

Part D: Course requirements to be met by the instructor.

Course Requirements:	**How will this requirement be met by the instructor?**
Course meets the All-University Writing requirement: A minimum of 2500 words of writing shall be required in 3+ unit courses.	This will be met through on-line discussions, in-class writing assignments and essay answers on exams.
Courses in the life sciences will take as their primary focus such concepts found in traditional life science disciplines (e.g., levels of organization of living systems, from molecules to ecosystems, structures and functions of living organisms, principles of genetics, patterns and theories of evolution, interactions of organisms with each other and their environment).	This course includes study sections on energy flow, matter and the scientific method. The course will also have sections on ecosystems, population and community dynamics, biodiversity and evolution and gene flow, speciation, environmental interactions and how human activities can alter these natural processes. Environmental sustainability will be a major theme of the course as well.
Courses will require students to develop an understanding of the core information sources and the literature of the science disciplines.	Students will be given multiple examples of environmental issues, and asked to provide their own personal interpretation or bias toward the subject, along with providing a scientific analysis of the issue. They will need to interpret the validity of their resources and contrast what is based in science and what is based in

	politics or social beliefs.
Courses will require students to think critically so that they are able to distinguish scientific arguments from pseudo-scientific myths or opinions.	Students will be given multiple examples of environmental issues, and asked to provide their own personal interpretation or bias toward the subject, along with providing a scientific analysis of the issue. They will need to interpret the validity of their resources and contrast what is based in science and what is based in politics or social beliefs.

Please note although this course is UCC approved it has not been taught. This is a sample syllabus

CALIFORNIA STATE UNIVERSITY
DEPT. OF BIOLOGICAL SCIENCES

BIOLOGY 105

INTRODUCTION TO BIOLOGY AND ECOLOGY

INSTRUCTOR

TEXT

Essentials of Ecology 7th edition by G. Tyler Miller Jr.

COURSE ROLE

This is a lower division GE course for Environmental Studies students and other non-biology/biotechnology majors. Biology and Biotechnology majors will not get B2 credit, nor credit towards their major. For other majors it fulfills the B2 graduation requirement for an upper division science and/or math course.

COURSE DESCRIPTION

This course is an introduction to the natural and physical processes governing environmental systems, as well as the ways in which human behavior impacts and is connected to the environment. Studies how living organisms function and evolve with the natural world, covering a diversity of organisms and physical environments. Examples of subjects covered in the course include energy flow, nutrient cycling, population dynamics, and the ecological and biological consequences of human activities.

GE LEARNING OUTCOMES

B2.1 Students will state or identify accepted modern biological principles and/or use knowledge of those principles to solve problems in the biological sciences.
B2.2 Students will describe and apply the discipline's primary methods to problems through hypothesis development, critical evaluation of evidence, data collection, fieldwork, and/or employment of mathematical and computer analysis.
B2.3 Students will describe various theories relevant to the discipline.
B2.4 Students will identify the limitations of scientific endeavors.
B2.5: Students will identify and consider the value systems and ethics associated with human inquiry

STUDENT LEARNING OUTCOMES

Upon completion of this course, a successful student should:

- understand, value, and use the process of scientific investigation
- be familiar with basic biological and ecological concepts including ecosystems, evolution, biodiversity and population ecology
- be able to have informed discussion on global planetary topics such as climate change, energy and matter cycling
- be able to identify how how human activities may affect these systems
- be able to identify and describe major environmental challenges facing modern societies
- develop and use critical thinking to objectively analyze media coverage of environmental and other issues

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- become comfortable with data presented as graphs and figures; be able to interpret such information
- understand the decision-making process of individuals, institutions, and nations regarding environmental issues and realize the consequences of our individual and joint actions upon the biosphere
- identify ways that individuals can take steps to reduce their impact on the environment and promote a sustainable society

COURSE STRUCTURE

This course will be a combination of lectures, films and discussions. Part of your participation in this course will be via a web-based discussion site.

COURSE WEBSITE

This course will use the campus WebCT system for the delivery of lecture outlines, readings, study guides, gradekeeping etc. To access WebCT go to http://courses.csusm.edu and use your student i.d. (the prefix of your campus email account) and password to login. If you have difficulty you may need to contact the student helpdesk.

COURSE ASSESSMENT

This course will employ a variety of assessment tools to gauge your progress and performance in class. This will include:

Item	Number	Points Each	Points Total
In-class assignments	**6**	**10**	**50**
Threaded discussions	**5**	**10**	**50**
Exams	**3**	**50**	**150**
Total			**250**

It is in your best interest to attend all classes and be **on time**, as there will be random in-class assignments. Class disruptions (cell phones, pagers, texting, talking) will not be tolerated.

- **In-class assignments:** These assignments will occur anytime during the class period (sometimes at the beginning) and will be tailored to address your comprehension of key topics discussed during previous lecture periods or from the assigned reading. Some assignments will be in the form of take-home questions. Your best five out of six assignments will be selected.
- **Threaded discussions**: We will use WebCT to conduct "threaded discussions" where I will post a topic and you will be required to 1) read the posted message/material, 2) post a response to the topic, and 3) reply to another student's posting. Each topic will be available for only one week so you need to respond quickly! You need to make sure you reply only in the specific topic area. We will have a trial run of this system so you can see how it works. **This helps fulfill the University Writing Requirement.**
- **Exams:** All exams will consist of a variety of multiple-choice, matching, and short-answer essays. Exam questions will be based on the assigned work and lecture material to date. Each exam will typically cover the material of the previous five weeks (e.g. the third exam is not comprehensive, but may ask about over-arching concepts you learned about during the course. **This helps fulfill the University Writing Requirement.**

Note: *In order to understand reasons behind species extinctions and the rationale for many conservation efforts, you must understand evolution. Thus, we will spend considerable time discussing evolution and you will be expected to learn the concepts of evolution and apply them in exams and other class activities. If you are uncomfortable discussing and learning about evolution, you should consider dropping this course.*

DSS - Students with disabilities who require reasonable accommodations must be approved for services by providing appropriate and recent documentation to the Office of Disabled Student Services (DSS). This office is located in Craven Hall 4300, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909. Students authorized by DSS to receive reasonable accommodations should meet with the instructor during office hours in order to ensure confidentiality

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PLAGIARISM

Plagiarism**:** Copying of other's work or websites will be punished to the fullest degree. You will receive no warning if the instructor feels that plagiarism and/or copying has occurred. The instructor reserves the right to do everything in her power to punish this offence, but at a minimum, you will receive zero (0) points for plagiarized or copied work. **REVIEW THE CAMPUS GUIDELINES ON PLAGIARISM IN THE MOST RECENT ISSUE OF THE CSUSM COURSE CATALOG.**

Tentative Schedule – note dates may change!

WEEK	Lecture Topic
1	Introduction and the basis of Environmental Problems - Chapter 1
2	Science, Matter Energy and Systems – Chapter 2
3	Ecosystem design – Chapter 3
4	Population and Community Ecology
5	Exam #1 and Evolution – Chapter 4
6	Biodiversity
7	Species Interactions and Population control – Chapter 5
8	Human Population Growth and Impact – Chapter 6
9	Biogeochemical Cycles – Chapter 7
10	Exam #2 and Global Climate and Ecosystem Change
11	Urban Ecosystems – Assigned readings
12	Sustaining Biodiversity –Species – Chapter 9
13	Sustaining Biodiversity – Ecosystem Approach – Chapter 10
14	Sustaining Aquatic Biodiversity – Chapter 8, 11
15	Summary and Exam #3