

**BIO 31 Course Outline as of Fall 2022****CATALOG INFORMATION**

Dept and Nbr: BIO 31 Title: TROPICAL BIODIVERSITY  
 Full Title: Tropical Biodiversity and Conservation  
 Last Reviewed: 10/11/2021

Units	Course Hours per Week		Nbr of Weeks		Course Hours Total	
Maximum	2.00	Lecture Scheduled	1.50	17.5	Lecture Scheduled	26.25
Minimum	2.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	1.50		Contact DHR	26.25
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 52.50

Total Student Learning Hours: 105.00

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

**Catalog Description:**

In this course, students will explore the ecology, evolution, flora, and fauna of tropical rainforests, cloud forests, and dry forests. Typically taught abroad. Countries such as Costa Rica are used to illustrate both the current biodiversity crisis and conservation efforts.

**Prerequisites/Corequisites:****Recommended Preparation:**

Eligibility for ENGL 1A or equivalent

**Limits on Enrollment:****Schedule of Classes Information:**

Description: In this course, students will explore the ecology, evolution, flora, and fauna of tropical rainforests, cloud forests, and dry forests. Typically taught abroad. Countries such as Costa Rica are used to illustrate both the current biodiversity crisis and conservation efforts. (Grade or P/NP)

Prerequisites/Corequisites:

Recommended: Eligibility for ENGL 1A or equivalent

Limits on Enrollment:

Transfer Credit: CSU;UC.

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>		Effective:	Inactive:
	C	Natural Sciences	Fall 2016	
<b>CSU GE:</b>	<b>Transfer Area</b>		Effective:	Inactive:
	B2	Life Science	Fall 2016	
<b>IGETC:</b>	<b>Transfer Area</b>		Effective:	Inactive:
	5B	Biological Sciences	Fall 2016	
<b>CSU Transfer:</b>	Transferable	Effective:	Summer 2007	Inactive:
<b>UC Transfer:</b>	Transferable	Effective:	Summer 2007	Inactive:

### **CID:**

### **Certificate/Major Applicable:**

Major Applicable Course

## **COURSE CONTENT**

### **Student Learning Outcomes:**

At the conclusion of this course, the student should be able to:

1. Integrate knowledge of ecology and evolution as it applies to tropical biomes in general, and to the biodiversity of one country in particular.
2. Evaluate the impacts of human population growth and resource use on tropical forests.
3. Describe the values of tropical forests and evaluate efforts to conserve their biodiversity.

### **Objectives:**

At the conclusion of this course, the student should be able to:

1. Explain the principles of evolution, including natural selection and speciation, relate them to genetics, and differentiate these principles from faith-based belief systems and pseudoscience.
2. Describe the geological history, climate, principle weather features, and biota of tropical forests.
3. Explain the patterns of biodiversity and species interaction found in tropical biomes and compare them to other biomes.
4. Identify common species of flora and fauna found in the tropical forests of a particular country.
5. Contrast the historical and contemporary rates of tropical forest disturbance and deforestation.
6. Evaluate the immediate and underlying causes of tropical forest disturbance and deforestation.
7. Explain the economic, political, cultural, and ecological values of intact tropical forests.
8. Use case studies of conservation programs to describe potential solutions to the loss of tropical biodiversity.

### **Topics and Scope:**

Topics will include but not be limited to:

- I. Scientific Method

- A. Definition of science and scientific method
- B. Compare to other methods of processing knowledge and making decisions
- C. Science versus pseudoscience
- II. Principles of Evolution
  - A. Natural selection and other mechanisms of evolution
  - B. Speciation
  - C. Adaptations
  - D. Relationship to biodiversity and the current extinction crisis
- III. Tropical Forest Ecology
  - A. Geological history
  - B. Climate and weather patterns
  - C. Biomes, ecosystems, and habitats
  - D. Rainforests, cloud forests, and dry forests
- IV. Biodiversity
  - A. Species richness and measurements of diversity
  - B. Tropical forests compared to other biomes and ecosystems
  - C. Carrying capacity
- V. Species Interactions
  - A. Niche partitioning
  - B. Competitive exclusion
  - C. Trophic relationships
  - D. Pollination and dispersion
  - E. Co-evolution
  - F. Keystone species
- VI. Threats and Changes to Tropical Forests
  - A. Historical, contemporary, and projected rates of disturbance and deforestation
  - B. Extinction
  - C. Succession
  - D. Causes and processes of disturbance and deforestation
- VII. Value of Intact Tropical Forests and Costs of Disturbance and Deforestation
  - A. Ways to assign value
  - B. Loss of biodiversity, resources, and environmental services
  - C. Local, regional, and global change
- VIII. Indigenous Cultures
  - A. Tribal forest populations
  - B. Threats and pressures
  - C. Impact on biodiversity
- IX. Potential Solutions to Ecological Challenges
  - A. Immediate action
  - B. Constraints
  - C. Protection and conservation
  - D. Restoration and reforestation
  - E. Sustainable use
  - F. Debt for nature swaps
  - G. Emerging ideas

Contact DHR Related Topics:

- I. Preparation of a Field Notebook - Structure and Organization
- II. Ecosystem and Habitat Identification
- III. Species Identification
  - A. Dominant plants
  - B. Common animals

## Assignment:

### Lecture Related Assignments:

1. Assigned reading from texts and other sources, 20-30 pages per class meeting
2. Response papers and other written homework
3. Oral presentation(s)
4. Participation in class discussions
5. Formal assessment: 2-4 quizzes and 2-4 exams

### Contact DHR Related Assignments:

1. Field notebook
2. Participation in field trips

## Methods of Evaluation/Basis of Grade:

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Response papers, written homework, and field notebook

Writing  
20 - 40%

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

None

Problem solving  
0 - 0%

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None

Skill Demonstrations  
0 - 0%

**Exams:** All forms of formal testing, other than skill performance exams.

Quizzes and exams

Exams  
50 - 70%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

Participation in class discussions and field trips, oral presentation(s)

Other Category  
5 - 20%

## Representative Textbooks and Materials:

The Diversity of Life. Wilson, Edward O. W.W. Norton and Company. 2010 (classic)

The Mammals of Costa Rica: A Natural History and Field Guide. Wainwright, Mark. Zona Tropical, Comstock Publishing Associates, Cornell University Press. 2007 (classic)

Travellers' Wildlife Guides: Costa Rica. Beletsky, Les. Interlink Publishing. 2005 (classic)

Foundations of Tropical Forest Biology. Chazdon, R.L. and Whitmore, T.C. University of Chicago Press. 2001 (classic)

Tropical Ecology. Kricher, John. Princeton University Press. 2011 (classic)

An Introduction to Tropical Rain Forests. 2nd ed. Whitmore, T.C. Oxford University Press. 1998 (classic)

Breakfast of Biodiversity: The Political Ecology of Rainforest Destruction. Vandermeer, John and Perfecto, Ivette. Institute for Food and Development Policy. 2005 (classic)

The Song of the Dodo: Island Biogeography in an Age of Extinction. Quammen, David. Touchstone. 1996 (classic)

The Sixth Extinction: An Unnatural History. Kolbert, Elizabeth. Harry Holt and Company. 2014 (classic)

Instructor-prepared materials