ESEC A110: ISLAND ECOLOGY

Item	Value
Curriculum Committee Approval Date	12/08/2021
Top Code	030100 - Environmental Science
Units	3 Total Units
Hours	54 Total Hours (Lecture Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)

Course Description

Formerly: ECOL A110. Islands are used as the platform to discuss Ecology, Evolution, Speciation, Biogeography, Geology, and Human History as it relates to islands. This course focuses on California's Channel Islands and also covers the Hawaiian Islands, the Galapagos Islands, and many others. Field trip is required. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Use the Theory of Biogeography to explain the distribution of organisms on islands and within fragmented habitat on mainlands.
2. Describe the geologic history of various island formation and provide evidence to support the movement of some islands from their original position (i.e. movement of California's Channel Islands, the Hawaiian Islands, and the Galapagos Islands).
3. Explain the diversity of organisms on islands using ecological processes (i.e. interspecific relationships and environmental constraints), evolution (i.e. dwarfism, gigantism), and speciation.

Course Objectives

- 1. Apply the basic biological concepts of the ecosystem, classification, evolution, and biogeography to the life on and around islands.
- 2. Develop an understanding of several island ecosystems (tropical, temperate, and desert island flora and fauna; kelp forests, coral reefs, mangroves, intertidal, etc.)
- 3. Discuss the importance of the interrelationships between the living and non living components of island ecosystems.
- 4. Identify and discuss the elements of the theory of Island Biogeography.
- 5. List and discuss the principal ecological differences between the northern and the southern Channel Islands of Southern California.
- 6. Define and discuss island adaptive radiation, endemism, gigantism, dwarfism and give specific examples of each on the California Channel Islands and on other remote islands.
- 7. Identify and discuss how recently introduced species effect island ecology and give specific examples of this phenomena on the California Channel Islands.
- 8. Predict what will happen to pristine and uninhabited islands and their ecology when colonized by human beings.

Lecture Content

Overview of islands Island types: continental and oceanic Theory of Island Biogeography Immigration and colonization Application of the Theory to fragmented habitats on the mainland Evolution Divergent vs. Convergent Mechanisms of evolution mutation, gene flow, genetic drift, sexual selection, natural selection Effects of island on evolution Dwarfism, gigantism, predator relaxation Speciation Mechanisms for reproductive isolation Geological Processes Plate tectonic theory Hot spots Island formation Human history Island discovery, colonization, environmental impacts Marine Life Environmental factors: light, pressure, temperature, bouyancy, viscosity, salinity, ocean zones, intertidal zones, Food chain/trophic levels Kelp forests, coral reefs, mangroves, sandy beaches, tide pools Overview of various fishes, marine mammals, marine birds, and marine invertebrates Impacts of introduced and invasive species California Channel Islands Santa Catalina, Santa Barbara, San Nicholas, San Clemente, Anacapa, Santa Cruz, Santa Rosa, and San Miguel In depth discussion of other major island groups may include: Galapagos Islands, Hawaiian Islands, San Juan Islands, Caribbean Islands, etc Students will individually research and present on an island not covered in the lecture (Island description, location, geologic history, human history, and ecology: flora and fauna, environmental issues, etc)

Method(s) of Instruction

- Lecture (02)

Instructional Techniques

Lecture with power point presentation. Reading Assignments. Web-assisted assignments. In-class Discussion. Exams and Quizzes. Student Essay and Presentation

Reading Assignments

Assigned reading from textbook and other sources related to islands. (2.75 hours per week)

Writing Assignments

Examinations to include, in part, essay questions. Written report on a specific island. Write a field journal during the island field trip. (2 hours per week)

Out-of-class Assignments

Research on a specific island and various assignments related to the lecture content. (2 hours per week).

Demonstration of Critical Thinking

Objective measurement of student knowledge via writing assignments, examinations, and a literature research report and an oral report on a specific island.

Required Writing, Problem Solving, Skills Demonstration

Examinations to include, in part, essay questions. Field journal documenting the island field trip.

Eligible Disciplines

Biological sciences: Masters degree in any biological science OR bachelors degree in any biological science AND masters degree in biochemistry, biophysics, or marine science OR the equivalent. Masters degree required. Ecology: Masters degree in ecology or environmental

studies OR the equivalent OR see interdisciplinary studies. Masters degree required.

Textbooks Resources

1. Required Schoenherr, A.A., Feldmeith, C.R., and Emerson, M.J. Natural History of the Islands of California, ed. Los Angeles: University of California Press, 2003 Rationale: This is the best book on Californias Islands that also includes chapters on ecology, biogeography, evolutin and speciation, geology, detailed marine life, and human history.