GENERAL STUDIES COURSE PROPOSAL COVER FORM  
(ONE COURSE PER FORM)  

<table>
<thead>
<tr>
<th>1.) DATE: 01/30/2012</th>
<th>2.) COMMUNITY COLLEGE: Maricopa Co. Comm. College District</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.) COURSE PROPOSED: Prefix: <strong>BIO</strong> Number: <strong>109</strong> Title: <strong>Natural History of the Southwest</strong> Credits: <strong>4</strong></td>
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<td>CROSS LISTED WITH: Prefix: Number: ; Prefix: Number: ; Prefix: Number: ; Prefix: Number: ;</td>
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<td>4.) COMMUNITY COLLEGE INITIATOR: <strong>JOHN WESER</strong> PHONE: <strong>(480)423-6016</strong> FAX: <strong>(480)423-6101</strong></td>
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ELIGIBILITY: Courses must have a current Course Equivalency Guide (CEG) evaluation. Courses evaluated as NT (non-transferable are not eligible for the General Studies Program.

MANDATORY REVIEW:

☐ The above specified course is undergoing Mandatory Review for the following Core or Awareness Area (only one area is permitted; if a course meets more than one Core or Awareness Area, please submit a separate Mandatory Review Cover Form for each Area).

POLICY: The General Studies Council (GSC-T) Policies and Procedures requires the review of previously approved community college courses every five years, to verify that they continue to meet the requirements of Core or Awareness Areas already assigned to these courses. This review is also necessary as the General Studies program evolves.

AREA(S) PROPOSED COURSE WILL SERVE: A course may be proposed for more than one core or awareness area. Although a course may satisfy a core area requirement and an awareness area requirement concurrently, a course may not be used to satisfy requirements in two core or awareness areas simultaneously, even if approved for those areas. With departmental consent, an approved General Studies course may be counted toward both the General Studies requirements and the major program of study.

5.) PLEASE SELECT EITHER A CORE AREA OR AN AWARENESS AREA:

Core Areas: **Natural Sciences (SG)**   Awareness Areas: **Select awareness area...**

6.) On a separate sheet, please provide a description of how the course meets the specific criteria in the area for which the course is being proposed.

7.) DOCUMENTATION REQUIRED
☐ Course Description
☐ Course Syllabus
☐ Criteria Checklist for the area
☐ Table of Contents from the textbook required and/or list of required readings/books
☐ Description of how course meets criteria as stated in Item 6.

8.) THIS COURSE CURRENTLY TRANSFERS TO ASU AS:
☐ DEC prefix
☐ Elective

Current General Studies designation(s):

**SUMMER I 2012**

Effective date: **Select semester...** Course Equivalency Guide

Is this a multi-section course? ☑ yes ☐ no

Is it governed by a common syllabus? ☑ yes ☐ no District-wide Course Competencies & Outline

Chair/Director: **PETER BROWN** Chair/Director Signature: **Emailed approval to J. Ricker**

AGSC Action: Date action taken: ☐ Approved ☐ Disapproved

Effective Date:
Proposer: Please complete the following section and attach appropriate documentation.

**ASU--[SG] CRITERIA**

**I. FOR ALL GENERAL [SG] NATURAL SCIENCES CORE AREA COURSES, THE FOLLOWING ARE CRITICAL CRITERIA AND MUST BE MET:**

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>Identify Documentation Submitted</th>
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<tbody>
<tr>
<td>☒</td>
<td>☐</td>
<td><strong>1. Course emphasizes the mastery of basic scientific principles and concepts.</strong> Syllabus &amp; Weekly Schedule, Course Competencies, Tables of Contents of Textbooks, Laboratory Exercise Descriptions</td>
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<tr>
<td>☒</td>
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<td><strong>2. Addresses knowledge of scientific method.</strong> Syllabus &amp; Weekly Schedule, Course Competencies, Tables of Contents of Textbooks, Laboratory Exercise Descriptions</td>
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<tr>
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<td><strong>3. Includes coverage of the methods of scientific inquiry that characterize the particular discipline.</strong> Syllabus &amp; Weekly Schedule, Course Competencies, Tables of Contents of Textbooks, Laboratory Exercise Descriptions</td>
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<td><strong>4. Addresses potential for uncertainty in scientific inquiry.</strong> Syllabus &amp; Weekly Schedule, Course Competencies, Tables of Contents of Textbooks, Laboratory Exercise Descriptions</td>
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<td><strong>5. Illustrates the usefulness of mathematics in scientific description and reasoning.</strong> Syllabus &amp; Weekly Schedule, Course Competencies, Tables of Contents of Textbooks, Laboratory Exercise Descriptions</td>
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<td><strong>6. Includes weekly laboratory and/or field sessions that provide hands-on exposure to scientific phenomena and methodology in the discipline, and enhance the learning of course material.</strong> Syllabus &amp; Weekly Schedule, Course Competencies, Tables of Contents of Textbooks, Laboratory Exercise Descriptions</td>
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<td>☒</td>
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<td><strong>7. Students submit written reports of laboratory experiments for constructive evaluation by the instructor.</strong> Syllabus &amp; Weekly Schedule, Course Competencies, Tables of Contents of Textbooks, Laboratory Exercise Descriptions</td>
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<td>8. Course is general or introductory in nature, ordinarily at lower-division level; not a course with great depth or specificity.</td>
<td>Syllabus &amp; Weekly Schedule, Course Competencies, Tables of Contents of Textbooks, Laboratory Exercise Descriptions</td>
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**II. - AT LEAST ONE OF THE ADDITIONAL CRITERIA THAT MUST BE MET WITHIN THE CONTEXT OF THE COURSE:**

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<tbody>
<tr>
<td></td>
<td>A. Stresses understanding of the nature of basic scientific issues.</td>
<td>Syllabus &amp; Weekly Schedule, Course Competencies, Tables of Contents of Textbooks, Laboratory Exercise Descriptions</td>
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<tr>
<td></td>
<td>B. Develops appreciation of the scope and reality of limitations in scientific capabilities.</td>
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<td></td>
<td>C. Discusses costs (time, human, financial) and risks of scientific inquiry.</td>
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<tr>
<td>Course Prefix</td>
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<tr>
<td>BIO</td>
<td>109</td>
<td>Natural History of the Southwest</td>
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Explain in detail which student activities correspond to the specific designation criteria. Please use the following organizer to explain how the criteria are being met.

<table>
<thead>
<tr>
<th>Criteria (from checksheet)</th>
<th>How course meets spirit (contextualize specific examples in next column)</th>
<th>Please provide detailed evidence of how course meets criteria (i.e., where in syllabus)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please see attached documentation</td>
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</table>
1. Course emphasizes the mastery of basic scientific principles and concepts.

How the course meets the spirit
Natural History of the Southwest is a general education introductory biology course
designed to educate students on basic scientific principles and biological concepts
using the flora and fauna of the southwestern deserts of North America as a
platform.

Detailed evidence of how course meets requirement

Course Competencies:
1. Explain the scientific method of inquiry within the context of laboratory
   experimentation and research.
2. Describe the climatic patterns of the Southwest.
3. Describe general features of Southwestern geography.
4. Locate, characterize, and describe the major terrestrial biomes of the Southwest.
5. Describe the Linnaean model of taxonomy and demonstrate how it is used to classify
   living things.
6. Identify plants and animals of the Southwest and describe their unique characteristics
   and ecological relationships.
7. Describe and demonstrate plant and animal adaptations.
8. Illustrate ecological relationships between biotic and abiotic components of
   Southwestern ecosystems.

Course Syllabus:
Lectures: Weeks 1-16
Laboratory Activities Weeks 1-16 (See attached laboratory descriptions)
Laboratory Project: This is an independent student research project
Assigned Readings:
   Co./Falcon Press.
   Arizona-Sonora Desert Museum Press.
Field Trips: Students are required to attend field trips and to keep a field notebook
that includes field measurements and detailed observations.
Lecture quizzes, exam, laboratory exercises, laboratory practicals and

2. Addresses knowledge of scientific method

How the course meets the spirit
Students are taught fundamental concepts and methods used in scientific
investigation and how they are applied to the study of natural history. Students
learn how to quantify and record their observations, formulate questions and
hypotheses during laboratory and field sessions. Students also learn how test
hypotheses and the techniques used to collect and analyze data. Conclusions are formed based on their findings and are presented orally and/or in writing.

Detailed evidence of how course meets requirement

Course Competencies Addressed:
1. Explain the scientific method of inquiry within the context of laboratory experimentation and research.
5. Describe the Linnaean model of taxonomy and demonstrate how it is used to classify living things.
6. Identify plants and animals of the Southwest and describe their unique characteristics and ecological relationships.
7. Describe and demonstrate plant and animal adaptations.
8. Illustrate ecological relationships between biotic and abiotic components of Southwestern ecosystems.

Syllabus:
Lectures weeks: 1, 3, 4, 7, 11, 13, 14, 15
Weekly Laboratory Exercises 2, 3, 4, 5, 8, 11, 13, 14, 15 (See attached laboratory descriptions)
Laboratory Project
Field trips and required field journal: field notes encourage the development of observational skills, question development and hypothesis formation. These are requisite conditions for scientific investigations.

3. Includes coverage of the methods of scientific inquiry that characterize the particular discipline.

How the course meets the spirit
Inquiry based experiences significantly enhance student understanding of science content and concepts. Through field trips to various biotic communities and through their weekly laboratory and lecture experiences, students in *Natural History of the Southwest* develop a knowledge and understanding of scientific concepts and of how biologists study nature. Students learn how to observe, ask questions and to objectively obtain evidence to answer them. During the inquiry process, students develop an understanding of how to conduct a scientific investigation, collect and analyze data, and to develop conclusions based on their results. Students also learn to use tools such as taxonomic keys to identify organisms, sampling techniques for invertebrates and measurements of biological diversity.

Detailed evidence of how course meets requirement
Course Competencies Addressed:
1. Explain the scientific method of inquiry within the context of laboratory
experimentation and research.
5. Describe the Linnaean model of taxonomy and demonstrate how it is used to classify living things.
6. Identify plants and animals of the Southwest and describe their unique characteristics and ecological relationships.
7. Describe and demonstrate plant and animal adaptations.
8. Illustrate ecological relationships between biotic and abiotic components of Southwestern ecosystems.

Syllabus
Lectures weeks: 1, 3, 4, 5, 7, 11, 13, 14, 15
Laboratory Exercises: 2, 3, 4, 5, 7, 8, 9, 10, 11, 14, 15 (See attached laboratory descriptions)
Laboratory Research Project
Field trips
Field Journal
Writing assignments: Natural history writing and the writing techniques utilized are methods for disseminating technical scientific information to the general public.

4. Addresses potential for uncertainty in scientific inquiry
How the course meets the spirit
Science is probabilistic and tells us what is more or less likely to be true in Nature with varying degrees of certainty. Students learn that this uncertainty leaves room for scientists to alter or eliminate hypotheses. Students in Natural History of the Southwest address the concept of uncertainty in science by learning how to conduct controlled experiments, collect data and to analyze it with the use of basic statistics. Students determine if their tested hypothesis has been supported and explain their results within the parameters of their experiment.

Detailed evidence of how course meets requirement
Course competencies met:
1. Explain the scientific method of inquiry within the context of laboratory experimentation and research.

Syllabus:
Lectures: 1 ("Citizen Science"), 3, 7, 11, 14, 15
Laboratory exercises: 8, 15 (See attached laboratory descriptions)
Field trips and Field Assignments
Laboratory Research Project

5. Illustrates of the usefulness of mathematics in scientific description and reasoning
How the course meets the spirit
Mathematics allows biologist to objectively quantify patterns and to discern differences between organisms or differences/similarities in biological communities. Students in Natural History of the Southwest complete weekly
laboratory activities and partake in several field activities during the semester. Laboratory exercises and field activities involve quantification and analysis of physical and/or behavioral characteristics in order to compare organisms or habitats.

Detailed evidence of how course meets requirement
Course Competencies Addressed:
1. Explain the scientific method of inquiry within the context of laboratory experimentation and research.

Syllabus
Lectures: 1 ("Citizen Science"), 3, 7, 11, 14, 15
Laboratory exercises: 8, 15 (See attached laboratory descriptions)
Field trips
Laboratory Research Project

6. Includes weekly laboratory and/or field sessions that provide hands-on exposure to scientific phenomenon and methodology in the discipline, and enhance the learning of course material.

How the course meets the spirit
Students in Natural History of the Southwest conduct weekly hands-on laboratory exercises, a research project and attend several field sessions throughout the semester. Direct exposure to living organisms in the lab and field enhances the learning of species identifications and the corresponding organism’s adaptations to particular habitats. Students also gain experience with the techniques used for sampling, collecting and identifying organisms.

Detailed evidence of how course meets requirement
Course Competencies Addressed:
1. Explain the scientific method of inquiry within the context of laboratory experimentation and research.
3. Describe general features of Southwestern geography.
4. Locate, characterize, and describe the major terrestrial biomes of the Southwest.
5. Describe the Linnaean model of taxonomy and demonstrate how it is used to classify living things.
6. Identify plants and animals of the Southwest and describe their unique characteristics and ecological relationships.
7. Describe and demonstrate plant and animal adaptations.
8. Illustrate ecological relationships between biotic and abiotic components of Southwestern ecosystems.

Syllabus
Weekly laboratory exercises: (See attached laboratory descriptions)
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<th>Course Prefix</th>
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<td>109</td>
<td>Natural History of the Southwest</td>
<td>SG</td>
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Field trips & Field notes: Students are required to attend a minimum of two field trips and to keep a field journal and answer a series of questions. Journals and answers are submitted for evaluation.

7. **Students submit written laboratory experiments for constructive evaluation by the instructor.**

**How the course meets the spirit**

Students are required to participate in weekly laboratory exercises that involve observation, hypothesis formulation, hypothesis testing and analysis. These experiences help to aid student understanding and prime the students prior to their field trips.

**Detailed evidence of how course meets requirement**

*Course Competencies Addressed:*

1. Explain the scientific method of inquiry within the context of laboratory experimentation and research.

**Syllabus**

Research Project: Students are required to conduct a research project that requires a proposal and final report. Both of these are evaluated and returned to the student. Students are also required to submit written field notes for evaluation. Assessment: Grading criteria require completion of written laboratory assignments, laboratory tests, and lecture tests.

8. **Course is general or introductory in nature, ordinarily at lower-division level....not a course with great depth or specificity.**

**How the course meets the spirit**

BIO109 is a general education introductory biology course that has no prerequisites. All course competencies are addressed in lecture and lab. After the completion of this course, students will have gained a better understanding of fundamental ecological and evolutionary principles along with gaining experience and knowledge of ecological techniques used in scientific inquiry.

**Detailed evidence of how course meets requirement**

*Course Competencies Addressed:*

1. Explain the scientific method of inquiry within the context of laboratory experimentation and research.
2. Describe the climatic patterns of the Southwest.
3. Describe general features of Southwestern geography.
4. Locate, characterize, and describe the major terrestrial biomes of the Southwest.
5. Describe the Linnaean model of taxonomy and demonstrate how it is used to classify living things.
6. Identify plants and animals of the Southwest and describe their unique characteristics
and ecological relationships.
7. Describe and demonstrate plant and animal adaptations.
8. Illustrate ecological relationships between biotic and abiotic components of Southwestern ecosystems.

Syllabus:
Laboratory Exercises: (See attached laboratory descriptions)
Lectures (Weeks 1 -16)
Field Trips and Field Notes
Natural History of the Southwest is a course that uses examples of the flora and fauna of the Southwestern United States to teach basic biological concepts of evolution, taxonomy, adaptation, general ecology, biotic communities, species interactions, fundamental plant and animal characteristics, note taking, scientific methodology etc.. Books were chosen for their non-technical and introductory nature (see table of contents).
# Laboratory Exercise Descriptions

**Lab Exercise 1: Geography of the Southwest**  
In this laboratory exercise, students map and locate major geographic features of the southwestern United States and Mexico. Major features include major mountain ranges, rivers, forests, deserts etc.. The relationships between altitude, precipitation and major vegetative communities are plotted and examined for Arizona.

**Lab Exercise 2: Plant and Floral Anatomy**  
In this laboratory exercise, students learn to identify and describe various anatomical features of flowering plants. Students dissect flowers and record the number and location of floral structures. They develop hypotheses as to the possible functions of various structures prior to a classroom discussion on the topic. They also observe that some plant specimens lack floral structures and develop hypotheses as to the evolutionary advantages and disadvantages of incomplete vs complete floral anatomy.

**Lab Exercise 3: Classification and Identification of Common Plant Families**  
In this laboratory exercise, students develop and understanding of the Linnaean hierarchy and basic classification. Students develop their own taxonomic keys and learn to use taxonomic keys to identify plants to family, genus and species. Students focus on recognizing common plant families such as Mustard, Figwort and Mint, to name a few. Students are asked to make quantitative observations of plant morphology in order to distinguish one Family from another (e.g. numbers of petal, stamens etc.).

**Lab Exercise 4: Pollinators and Pollination Syndromes**  
In this laboratory exercise, students explore and discover the coevolutionary relationships between plants and pollinators. Examples of plants and pollinators throughout the Southwest are used to demonstrate the correlation between floral shape, size, arrangement, color and blooming period with the method of pollination. Additionally, students test the hypothesis that nectar sugar concentration or nectar volume is different between bird and insect pollinated plants. Students collect nectar and determine its sugar concentration with a refractometer and then calculate the volume and caloric content on a per flower basis.

**Lab Exercise 5: Spiders, Scorpions and Solpugids, Oh My!**  
In this laboratory exercise, students distinguish between the major groups of Arthropods within the Subphylum Chelicerata. Students make observations and sketches of morphology (e.g. numbers and type of appendages). They also propose a hypothesis for the functions of some of their appendages and propose an experiment that would test their hypotheses. Students learn about controlling variables, the use of quantitative characteristic Vs qualitative ones. They are asked to prepare a “figure” of possible results if their hypothesis was true.
Lab Exercise 6: Insects with incomplete metamorphosis
In this laboratory exercise, students learn to distinguish between the Class Hexapoda and other groups of arthropods. They learn to identify and recognize major insect Orders that use incomplete metamorphosis.

Lab Exercise 7: Insects with complete metamorphosis
In this laboratory exercise, students learn to identify and distinguish among the major insect orders that use complete metamorphosis. Students examine various developmental stages of insects that live in various habitats and relate morphology to ecology.

Lab Exercise 8: Arthropod diversity and habitat
In this laboratory exercise, students use their knowledge from previous labs to compare arthropod diversity among habitats within an ecosystem. Students develop a hypothesis to answer the question of how arthropod diversity may vary among habitats. Students learn about using transects and pitfall collecting methods to collect their data. Students identify and quantify their specimens, graph their data, analyze their data and discuss the limitations to their conclusions (e.g. pitfall traps will be biased toward non-flying insect taxa). This Exercise can be coordinated with the timing of a Field Trip or conducted on campus.

Lab Exercise 9: Native Fish in Peril
In this laboratory exercise, students learn the basic anatomy of a fish and use these features to distinguish between common fish families and/or fish species. Students learn to describe various adaptations in mouth shape, body shape, coloration and reproduction and to explain the advantages of each. Students use taxonomic keys to identify various fish species. The reasons for the loss of endemic Arizona species are highlighted and discussed in this lab.

Lab Exercise 10: Amphibians of Arizona
In this laboratory exercise, students learn to distinguish amphibians from one another using morphology and vocalizations. Students learn that vocalizations are species specific and are reproductive isolating mechanism even though many species look similar. Students also learn about the developmental pathways of various amphibian taxa.

Lab Exercise 11: Lizard Communities of a Mesquite Bosque
In this laboratory exercise, students learn to recognize lizard species found in mesquite Bosque habitats. They are presented with the question as to how several of these species are able to coexist within the same mesquite tree. Students examine specimens to develop hypotheses and are provided with videos of each species. Students are also presented with research on diet composition and tail break frequencies to answer the question.
Lab Exercise 12: Snakes of Arizona
In this laboratory exercise, students learn to recognize common snakes of Arizona. Students learn to associate species with habitat and diet. They also learn to distinguish among evolutionarily primitive snakes and evolutionarily more modern snakes.

Lab Exercise 13: Adaptations In Birds
In this laboratory exercise, students identify the major adaptations in birds and to evaluate the major importance of these structures to birds. Students are first presented with the challenge of “designing” a well-adapted bird to its habitat and then presenting their bird to the class and defending their explanation. Secondly, students are presented with photographs of Arizona birds and asked to identify how each bird is adapted to its particular habitat and/or to explain as to what niche the bird fills. Lastly, students are asked to distinguish between common bird species based on their calls.

Lab Exercise 14: Relationships between Mammal Skulls and their Foraging Behavior
In this laboratory exercise, students learn to identify various mammals from their skulls. Additionally, students learn to identify the various teeth found in mammals and relate teeth type, numbers of teeth and teeth morphology to the feeding habits of mammals. Students also determine the dental formula for each animal under study. Students relate the size and positioning of the eye orbits, the size of nasal passages, and other features to determine feeding strategy. Taxonomic keys are used to identify the skull specimens.

Lab Exercise 15: A Comparison of the Perennial Vegetative Communities Between North and South-facing Hillsides.
In this laboratory exercise, students conduct transects on north and south facing desert hillsides to determine the species diversity, percent cover and plant importance values of the area. Students identify the plants and calculate the various values. They graph their results and compare the hillsides with basic statistics in order to determine if the hillside plant communities differ. Students are asked to hypothesize as to the causes of the newly found relationship.

Research Project
This is a multi-week project that provides students with the opportunity to conduct a small research project using the principles of scientific inquiry. Students formulate a question, hypotheses, experimental methods, statistical analysis, graphing, and draw conclusions. Students are required to submit a research proposal to their instructor for evaluation prior to conducting their experiment and are required to present a brief presentation at the conclusion of the project.
Official Course Description: MCCCD Approval: 5-24-2005

BIO109 2006 Fall - 9999

LEC  4.0 Credit(s)  3.0 Period(s)  3.0 Load
Acad
LAB  0.0 Credit(s)  3.0 Period(s)  2.4 Load

Natural History of the Southwest

Study of the common plants and animals of the Southwest including their distribution, adaptation, behavior, and ecology. Introduction to basic field and laboratory techniques used in the study of natural history. Specific field problems presented dealing with plant and animal analysis and ecological interrelationships.

Prerequisites: None.

Course Note: Field trips may be required.

Course Attribute(s):
General Education Designation: Natural Sciences (General) - [SG]

Go to Competencies  Go to Outline

MCCCD Official Course Competencies:

BIO109 2006 Fall - Natural History of the Southwest
9999

1. Explain the scientific method of inquiry within the context of laboratory experimentation and research. (I)
2. Describe the climatic patterns of the Southwest. (II)
3. Describe general features of Southwestern geography. (II)
4. Locate, characterize, and describe the major terrestrial biomes of the Southwest. (III)
5. Describe the Linnaean model of taxonomy and demonstrate how it is used to classify living things. (IV)
6. Identify plants and animals of the Southwest and describe their unique characteristics and ecological relationships. (V, VI)
7. Describe and demonstrate plant and animal adaptations. (V)
8. Illustrate ecological relationships between biotic and abiotic components of Southwestern ecosystems. (VI)

Go to Description  Go to top of Competencies

MCCCD Official Course Outline:

BIO109 2006 Fall - Natural History of the Southwest
9999

I. Scientific Method of Inquiry
   A. Organization
   B. Application

http://www.maricopa.edu/curriculum/A-C/066bio109.html
II. Geography
   A. Climate
   B. Topography
   C. Natural resources
   D. Inhabitants

III. Terrestrial Biomes
   A. Lower deserts
   B. Upper deserts
   C. Forest
   D. Alpine tundra

IV. Taxonomy
   A. Linnaean model
   B. Systems
   C. Dichotomous keys

V. Plants and Animals
   A. Identification
   B. Unique characteristics
   C. Adaptations

VI. Ecological Relationships
   A. Biotic factors
   B. Abiotic factors

Go to Description  Go to top of Competencies  Go to top of Outline
BIO109 Natural History of the Southwest
Tentative Lecture Schedule
Fall, 2012

Lecture & Lab: Mondays/Wednesdays (6:00 – 8:50 PM)
Instructor: John Weser Phone: 480-423-6016 john.weser@sccmail.maricopa.edu
Office: NS114

Course Texts:


GENERAL COURSE INFORMATION:
Course Description. Study of the common plants and animals of the Southwest including their
distribution, adaptation, behavior, and ecology. Introduction to basic field and laboratory
techniques used in the study of natural history including methods used in basic scientific inquiry.
Specific field problems dealing with plant and animal analyses and ecological interrelationships
are discussed further in course lectures and through laboratory exploration and experimentation.
Specific field problems presented dealing with plant and animal analysis and ecological
interrelationships. Prerequisites: None.

Course Lecture Requirements:
Saguaro paper (Revised) = 50 points
Exam #1 = 80 points
Exam #2 = 80 points
Reading Quiz #1 (Alcock) = 40 points
Reading Quiz #2 (ASDM) = 40 points
Final Examination = 100 points

Course Lab Requirements:
Quizzes/Assignments (8 x10pts) = 80 points
Project = 70 points
Practical Examinations (3 x 70) = 210 points
Field Trip Reports/Field notes(2 x 50)= 100 points
Total Points = 850 points

Grades: A = 90-100%
B = 80 - 89%
C = 70 - 79%
D = 60 - 69%
F = 0 - 59%
DESCRIPTION OF COURSE REQUIREMENTS:

Laboratory Practical Exams (3 x 70 = 210 points)
These will be taken without the benefit of books or notes. They will cover only the laboratory material since the previous exam. The student rotates to “stations” around the room and will be expected to identify natural history specimens, artifacts, pictured images, etc. of various plants and animals. In addition to identifying the organisms on each exam the student will be expected to know aspects of their natural history as described during the laboratory exercises each week. Each practical exam will be worth 70 points.

Field Trip Reports/Field Journal (2 x 50 = 100 points)
Four field trips are scheduled in association with this semester’s Scottsdale Community College Southwest Natural History classes. These field trips make the subject matter “real” and you are required to attend a minimum of two. A grade of 50 points will be based on a report in your field journal consisting of student answers to a set of observations made during the activity and/or questions given at the end of each trip (25 pts.) and to a plant and animal survey (form found in the lab manual) (25 pts.). NOTE: You may substitute sets of plant and animal photographic images in place of species lists and answer sets (see your instructor about this option). While two field trips are required, students are invited and encouraged to attend more than two field trips. Their two highest scores on field trip reports will be used for grade determination.

Field Trip Dates

<table>
<thead>
<tr>
<th>Date</th>
<th>Field Trip Location</th>
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<tr>
<td>Sept. 27th</td>
<td>Jewel of the Creek, van or carpool and arrive at 7:30 a.m.</td>
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<tr>
<td>Oct. 18th</td>
<td>Brown’s Ranch meet at SCC at 7 a.m. to go by van</td>
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<tr>
<td>Oct. 25th</td>
<td>Coon Bluff, meet there at 8:00 a.m.</td>
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<tr>
<td>Nov. 15th</td>
<td>Gilbert Water Ranch, meet there at 8:00 a.m.</td>
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Laboratory Project
You and a partner will select a research question and write a proposal on how to quantitatively answer it. Your proposal will need to include: background information, question, the hypothesis you are going to test, a detailed methodology, data analysis and results and your conclusions. More information will be provided in lab.

Course Lecture Exams #1 and #2 (2 x 80 = 160 points)
These two exams will cover only the lecture material for that section. You will not be allowed to use notes while taking these exams. They will include a variety of question types. The material tested is heavily from the lecture. Each exam is worth 80 points.

Lecture Reading Quizzes (Alcock & ASDM) (2 x 40 = 80 points):
The BIO 109 reading quizzes will cover the readings listed on the course outline above. They will be closed book but you may use one page of your own prepared notes to take the reading quizzes. You may not use other books. Each reading quiz will consist of a total of 20 multiple choice questions worth 2 points each. You will have approximately 25 minutes to complete each reading quiz. Each quiz is worth 40 points.
Final examination: (100 points)

The Final examination for BIO109 will be a take-home exam worth 100 points. You will receive it one to two weeks before the final exam due date and can return it on or before that due date. You may consult any written sources of information that you wish to utilize. **DO NOT CONSULT WITH YOUR FELLOW STUDENTS OR ANY OTHER PERSON ON THIS EXAM.**

Saguaro Paper: 50 points

This exercise is a written one page (maximum) double-spaced typewritten article on the saguaro cactus in a “natural history style and format”. This style combines creative writing to tell a story with accurate natural history information. The paper is worth 50 points. Students will have one chance to revise their paper. The other natural history paper due this semester will also be graded according to the criteria listed below.

**ATTENDANCE POLICIES:**

**Attendance:**
Students are required to attend all lecture and laboratory sessions. More than 2 unexcused absences from lecture or lab may jeopardize your grade and class standing. You should discuss absences with me before they become a problem for us. If you choose to stop attending class or lab, you should withdraw from the course.

*Your performance in class depends a great deal on your attendance.* It is exceedingly important that you are on time for class, have few or no absences, and remain in class for the full period. One study found that for each class period missed, overall course grade dropped 3-5 percentage points. In the book *Where There's a Will There's an A*, Dr. Olney states that the first and last minutes of each class are the most important periods of the teaching hour.

**DISABILITIES**

If any student in this class has a disability, including a learning disability, please see me immediately so that we can arrange appropriate accommodation.

**GENERAL SCHOOL & COURSE POLICIES:**

**Academic Honesty:** A student found cheating on either an assignment or exam will receive a zero for that activity and be sent to the Department Chairperson and/or Dean. Cheating may result in withdrawal from the course and a failing grade assigned for the class. For your protection, please avoid even the appearance of academic dishonesty (this includes dishonest use of cell phones). Academic dishonesty also includes, but is not limited to, copying from sources such as the internet or books without including a citation to the material copied (such as text, photographs or diagrams). Quotes require quotation marks and attribution! Text shall be deemed to have been copied if it is substantially similar to the original source and has not been written in the student’s own words. Work that results from collaboration MUST be written in your own words and may not be copied from another students work. Work submitted as your own work that has been copied or contains even a single copied sentence **fragment** will be
considered plagiarized work. I reserve the right to deal with cheating or plagiarism by any of the following: 1) ZERO points for the project/assignment, 2) dropping the student one or more grade levels in their course grade, 3) immediate withdrawal from the course with a failing grade (Y), and/or 4) reporting the case to the Dean of Students. Please do not test these policies, as there is zero-tolerance!! As Sophocles (a great Athenian playwright) once said, “I would prefer even to fail with honor than to win by cheating.”

Policies: Disruptive behavior will not be tolerated. Students who misbehave or disrupt class will be contacted by me and given a verbal warning. Any subsequent misbehavior may result in the student being sent to the department Chairperson and/or Dean and/or withdrawal from the course. Visitors, including children of students, are not permitted in either the lecture or the labs.

Withdrawal Policy:
Withdrawal will be in accordance with the current college policy and as described in the college catalogue and conditions set forth in this syllabus. You will be withdrawn if you miss 4 labs.

Lab Equipment: Take care using all of the lab equipment, as some of it is delicate. Students are also expected to clean up after themselves in the lab by cleaning their own lab space and returning equipment back to where it was previously located or other site as designated by the instructor. Failure to follow these policies will affect your lab grade.

Laboratory safety:
The laboratory is designed to be safe. However, if you have a special health concern, especially if you are pregnant or suspect you might be pregnant, please consult your physician before attending the laboratory. Provide your physician with this syllabus and laboratory schedule, and we will provide him or her with a list of materials used in each laboratory as soon as we are contacted by his or her office.

Student Conduct:
Students are expected to be reflective, courteous, respectful and empathic to classmates, instructor and other college staff assisting in their learning. Students are expected to arrive on time for class and remain until class has ended. The instructor should be notified in advance if there is a need to leave early. Students will be expected to:

• Turn off cell phones and pagers before entering classroom (NO text-messaging!!).
• Be in class and be on time
• Be prepared for class sessions
• Participate in class activities
• Follow instructions and complete assignments.
• Keep up with and turn in assignments by due dates
• Put forth their best efforts
• Exchange phone numbers with two classmates in order to keep current.
• Ask questions when they don’t understand
• Maintain knowledge of their grade status
• Contact instructor right away about concerns or situations that interfere with their success in class
• Comply with policies found in the SCC Catalog and SCC Student Handbook.
Study Habits and Study Skills:
Announcements are given at the beginning of class. Please be on time. It is the student’s responsibility to get class notes from another student if you miss class.

Study skills and habits are easy to learn, but take practice to implement and master. You will need to read the text differently than you would non-scientific books and learn to write differently. I can coach you on study skills and the learning enhancement center has staff that can assist you: Plan on spending 4 hours of intense studying outside of lecture for every hour you spend in lecture. That equates to 12 hours of studying for this course EVERY week. Put the time in, and you will succeed. Introductory ("survey") science courses are absolutely unforgiving when it comes to procrastination and last minute cramming. My role as an instructor is to select information and activities that will assist you in developing the knowledge and skills to succeed in this course and others. But remember, no one can learn for you and the responsibility for learning rests on your shoulders. Finally, please realize that I am here to help you in the learning process.
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By John Alcock (1985)

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# Field Guid to the Plants of Arizona

By Anne Epple (1995)

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