EASTERN ARIZONA COLLEGE
Introduction to Biological Research
Course Design
2015-2016

Course Information
Division: Science
Course Number: BIO 187
Title: Introduction to Biological Research
Credits: 4
Developed by: David J. Henson
Lecture/Lab Ratio: 3 Lecture/3 Lab
Transfer Status: ASU NAU UA

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<td>BIO Dept Elective</td>
<td>Elective Credit</td>
<td>ECOL Departmental Elective</td>
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Activity Course: No
CIP Code: 26.0100
Assessment Mode: Pre/Post Test (50 Questions/100 Points)
Semester Taught: Upon Request
GE Category: None
 Separate Lab: No
Awareness Course: No
Intensive Writing Course: No

Prerequisites
None

Educational Value
Students that complete this course will have a greater understanding and a foundational background for future involvement in research projects and professional partnership agreements

Description
This course is designed to introduce students to the scientific research process at an interactive level. Basic tools and procedures of an environmental or ecological researcher will be discussed and reinforced in the lab setting. The culminating product will be an individualized written research proposal that may become the basis for further scientific investigation in BIO 295.

Supplies
Field/Reflection Journals
**Competencies and Performance Standards**

1. **Analyze the steps and processes applicable to the Scientific Research Method.**

   **Learning objectives**
   
   What you will learn as you master the competency:
   
   a. Definition of Science.
   
   b. Description and applicability of the steps of the scientific method.
   
   c. Identification of the scientific method within established research papers.
   
   d. Identification of appropriate statistical analysis for the research type.
   
   e. Design experimental study based on scientific research method.

   **Performance Standards**
   
   Competence will be demonstrated:
   
   o in objective exams
   
   o in class assignments
   
   o in class presentation
   
   o by lab demonstrations

   Performance will be satisfactory when:
   
   o learner defines science and its application to the gaining of new knowledge
   
   o learner identifies problem statement, experimental design, data analysis, and conclusions within a research paper
   
   o learner explains and identifies different types of statistical analysis applicable to the experimental design
   
   o learner recognizes validity and bias as important components of research to be considered
   
   o learner designs a research project with the capacity for application

2. **Apply learned Resources to Research Development and Analysis.**

   **Learning objectives**
   
   What you will learn as you master the competency:
   
   a. Presentation of cited work and Modern Language Association (MLA) format.
   
   b. Conduct literature review using library and media resources.
   
   c. Use learned lab and field techniques in a manner that is both safe and appropriate for the intended research.
   
   d. Communicate with colleagues as a collaboration tool.
   
   e. Use computer technology to organize and present data.

   **Performance Standards**
   
   Competence will be demonstrated:
   
   o in objective exams
   
   o in class assignments
   
   o in multimedia activities
   
   o by lab and field applications

   Performance will be satisfactory when:
   
   o learner accurately cites research material within a written work

**Learning objectives**

*What you will learn as you master the competency:*

b. Conduct literature reviews for the topic chosen for research.
c. Design an experiment based upon the problem statement hypothesis.
d. Determine the appropriate statistical analysis for the data to be collected.
e. Appropriately cite research material within the research proposal.

**Performance Standards**

*Competence will be demonstrated:*

- in objective exams
- in class assignments
- within the context of a completed research proposal

*Performance will be satisfactory when:*

- learner determines a personal interest research problem
- learner uses learned strategies for gaining information using library, media, and historical archives
- learner completes a research proposal that contains all pertinent information necessary for consideration of a formal research project

**Types of Instruction**

Classroom presentation

On Campus Laboratory and Clinicals

**Grading Information**

**Grading Rationale**

4 exams x 100 points each + 1 Post Test x 100 points = 500 points (53%)
3 critical evaluations of published research x 50 points each = 150 points (16%)
12 labs x 10 point each = 120 points (13%)
2 lab practicals x 40 points each = 80 points (8%)

Research Proposal = 100 points (10%)
Grading Scale
A  100 – 89.5%
B  89.4 – 79.5%
C  79.4 – 69.5%
D  69.4 – 59.5%
F  59.4% and below