Science for Educators

Part 1: Life Science and Ecology

SCID 210

Salish Kootenai College
Fall 2013 - 2014

Doug Ruhman

SCID 210
Course Syllabus

Course Information:

a. Number: EDUC 210 **Title:** Science for Educators 1: Life Sciences and Ecology
b. Credits: 4
c. Prerequisite: none
d. Corequisite: none
e. Availability: This course is offered in Fall quarter only.
f. Time/Location: Tues. and Thurs., 2 - 3:50 p.m. Education Bldg. Rm. 113

Instructor Information:

a. Instructor: Doug Ruhman
b. Office: Education Building, Room 124
c. Office Hours: Mon. and Wed. 8:00 – 11:00 a.m.
d. Office Phone: (406) 275-4763
e. eMail: doug_ruhman@skc.edu

Required Materials:

Krogh, David **A Brief Guide to Biology** (2007) Pearson/Prentice Hall
ISBN 13: 978-0-13-185965-4 *Available at SKC Bookstore, or other online sources*

OPTIONAL TEXT: **Last Child in the Woods** (2005) by Richard Louv Workman Publishing ISBN 13: 978-1-56512-522-3 *Available at SKC Bookstore, or other online sources*

Handouts from the instructor

Course Description:

Science for Elementary Teachers 1 is designed to be a general overview into the life sciences for elementary teacher candidates and other interested students. Topics explored will include scientific and traditional creation stories, the scientific method, the foundations of life, cells, botany, animal adaptations, ecological systems, and alternative scientific theories. The course will conclude with a re-examination of cultural perspectives on life sciences.

Course Objectives:

This course is a designated General Education course on List I: Natural Sciences-Intro and emphasizes the Competencies of Cultural Knowledge and Critical Thinking (see below).

Upon completion of this course, students will be able to...

A. General Course Objectives

1. ...describe the basic elements of life, including simple atomic and molecular structures and the characteristics of all living organisms
2. ...articulate knowledge of the scientific method and scientific inquiry
3. ...describe the structure of the living cell and the functions of its parts
4. ...explain the principles of basic genetics
5. ...describe specific functions, structures, and processes of the human body
6. ...describe the structures and systems associated with the plant and animal kingdoms
6. ...define ecology and explain how living and non-living systems affect each other
7. ...articulate one or more alternative theories in the biological sciences

B. Critical Thinking Objectives

1. ...apply biological and ecological concepts to everyday situations
2. ...interpret and articulate connections between specific biological/ecological systems
3. ...compare and analyze various interactions between the scientific and cultural domains, especially as they relate to K-8 level science content

C. Cultural Knowledge Objectives

1. ...explore and describe connections between scientific principles and traditional Native American belief systems.
2. ...investigate and learn local stories and cultural practices which relate to biological science concepts

D. Citizenship Objectives

1. ...explore and describe connections between science content and local community health issues and concepts
2. ...apply biological concepts to Flathead Reservation environmental / ecological issues

E. Communication Objectives

1. ...impart information to the class and instructor relevant to biological/ecological course content using oral presentation skills and a variety of media tools
2. ...share personal insights and reactions to class learning and readings using reflective journaling, reading reaction papers, and other written forms

Course Requirements:

✍ Reflective Journal (**50 points**)

The Reflective Journal is like a small-scale diary that you keep your own personal thoughts and reactions in. The content of the RJ should reflect your involvement in this class, not "life in general". Write about how the class is going, what you're learning, the good and bad… but keep it focused on your science course. The entries should be done once per week (so you should have 10 entries at the end of the quarter). I recommend doing them over the weekend, reflecting on the previous week. The entries should be dated, and short (1-2 paragraphs). You keep this journal over the course of the quarter and hand it in at the end. It is for you and me only. No one else will be allowed to read your RJ unless you wish to share your written observations with the class. If it takes more than 5-10 minutes to do this each week, then you are doing too much! Keep it simple, honest, and brief.

🕮 Reading Responses (10 pts x 10= **100 points**)

During each class session there will be assigned reading in the textbook. At the beginning of the following class, the material will be discussed and a short write-up will be due. This "Reading Response" should include a brief summary of the material presented in the assigned readings and 1-2 questions for the class to discuss. More details on this requirement will be covered at the beginning of class.

🏛 Attendance and Participation (10 pts/week=**100 points**)

Attendance is very important in this class, as concepts will build on each other and missed in-class activities and discussions cannot be made up. If a student knows that they will have to miss a class, they MUST contact the instructor ahead of time and make arrangements. More than 3 missed classes (6 hours)

will result in the student being dropped from the class. All missed assignments must be made up.

Quizzes (25 pts ea. x 4 = **100 points**)

Throughout this course there will be 4 short quizzes covering the material from class and from the readings. Study guides and review sessions will be provided.

Final Project (**150 points**)

In this course you will do a summative mini-research project that is related to the course content in some meaningful way. You will be responsible for a 1-2 page paper on a life sciences topic, and you will need to present this project to the class in the last week of the quarter. Presentations will be short, about 5-10 minutes each. More information will be provided at the beginning of the course.

The total number of points possible = 500

Credit Hours:

Following the SKC Credit Hour policy, to meet the identified objectives of this course, this 4 credit course, delivered over a 10 week term will approximate:

2 hours/week classroom or direct faculty instruction
2 hours/week in-class laboratory work

In addition, out-of-class student work will approximate a minimum of 8 hours each week.

Grading:

Grades will be assigned as follows: (500 points total possible points)

450 or more points = A
400 - 449 points = B
350 - 399 points = C
300 - 349 points = D
below 300 points = F

Attendance Policy:

This class is largely interactive and learning occurs through participation in class discussions, presentations, and activities that are impossible to be duplicated outside of class. Therefore, it is required that students attend all class sessions. Participation is graded at 5 points/class. Late-arriving students receive a deduction of 2 points; 30 min. or more of absence will result in no points. An opportunity for make-up work is provided on an individual basis for emergency situations if the instructor is contacted and informed. Students missing more than 3 sessions (6 hours of class) without make-up work will be referred to the SKC retention officer and will likely be dropped from the class. Group assignments or reaction papers done in class cannot be made up. **Students are expected to arrive on time for class and stay until the designated time for dismissal**. If you have an emergency and cannot make it to class, **PLEASE** contact the instructor ahead of time and explain the circumstances. I will make every attempt to be fair. If you contact me, I will work with you. If you fail to do so, points will be adjusted accordingly.

In the event of emergency medical / health problems or extended absences for other reasons, students will be expected to meet the requirements of the course using outside-of-class methods such as phone/email/internet resources. It is the **student's** responsibility to communicate with the instructor to make sure that class assignments/requirements are completed if absences occur.

Help and Accommodations:

Reasonable accommodations are provided for eligible students with identified disabilities. The College complies with the Rehabilitation Act of 1973 and the Americans with Disabilities Act. Students may contact the College's Disability Officer, Stanley Fleming (stanley_fleming@skc.edu, 406.275.4968) or consult the SKC web page for Students with Disabilities for more information.

The faculty reserves the right to change the course syllabus or course content. Students will be provided advanced notice of changes in writing.

Course Outline: *(subject to modification relevant to scheduling and student needs)*

Week 1: Introduction / Understanding Science and Learning

Defining the life sciences, and looking into the origins of life from multiple points of view. Exploring the connections between children and the natural world.

Weeks 2-3: The Foundations of Life

Exploring the characteristics of living things and the building blocks of living systems, including atoms, molecules, and other basic structures.

Week 4: Cells and Their Structures

Building on week 3, an examination of the structures and functions of living cells.

Weeks 5-6: The Mechanisms of Life

In this Module we explore some basic processes and concepts dealing with living systems: Cell reproduction, Genetics, Photosynthesis, and Energy Flow.

Week 7: The Human Body and Animal Adaptations

The functions and structures of each system in the body is detailed, followed by a section on how various animal species' bodies have adapted to environmental change.

Week 8: The Amazing World of Plants

An overview of the function and structures of plants and plant communities.

Week 9: Darwin and Evolutionary Theory ***note: no class Thurs Nov. 28***

An exploration into the foundational concepts of Darwinian Evolutionary Theory; with a brief biographical analysis of Charles Darwin and the experiences which led to his revolutionary ideas about the origins of species.

Week 10: Course summary and Final Project Presentations

A focus on helping learners organize and create a successful summary of the course. Students submit final project write-ups and give presentations to the class.