

Science for Educators



Part 1: Life Science

*and
Ecology*



SCID 210



SALISH KOOTENAI COLLEGE
FALL 2016 - 2017

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:** Mon. and Wed., 10:00 – 11:50 a.m. Stevenson/Education Bldg. Rm. 113

Instructor Information:

- a. **Instructor:** Doug Ruhman
- b. **Office:** Evelyn Stevenson Education Building, Room 124
- c. **Office Hours:** Tues. and Thurs. 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 knowledge 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 in which you keep your own personal thoughts and reactions. 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. You will be asked to turn in the first 5 entries (first 5 weeks) at midterm. Weeks 6-10 will be turned in at the end of the quarter. The entries should be dated, and short (1-2 paragraphs). The Reflective Journal 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 your weekly entries simple, honest, and brief... about 1 paragraph or so.

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

During each class session there will be assigned reading in the textbook or handouts. 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 an optional 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 a recommendation to withdraw from the class. All missed assignments must be made up. See “Attendance Policy” below.

 **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. The quizzes will be about 2-3 weeks apart. The first quiz will be given in Week 4. Study guides and review sessions will be provided.

 **Final Project or Final Exam (150 points)**

For your final assessment in this course you may choose to take a cumulative final exam **OR** do a summative mini-research project that is related to the course content in some meaningful way. For the project, 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 10 minutes each. More information will be provided at the beginning of the course. Students will need to indicate their preferred option of project or exam no later than **November 23, 2016**.

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) will be referred to the SKC retention officer and will likely be withdrawn (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. It is highly recommended that students select a classmate as a partner who can get handouts, study guides, and other class materials and information to you if you can't be in class, and vice versa. It is the student's responsibility to acquire these materials and class information if they are not present.

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. Again, 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. It is important to notify your instructor in the first week if your success in this class may be dependent on accommodations regarding a known disability. The College complies with the Rehabilitation Act of 1973 and the Americans with Disabilities Act. Students may contact the College's Disability Officer, Linda Pete (linda_pete@skc.edu, 406.275.4968) or consult the SKC web page for Students with Disabilities for more information.

SKC Student Success:

The SKC Student Success Team is available to help you if you are having difficulties at SKC. The Team is available to help you with tutoring, adjusting to college life, time management, reading, study skills, personal issues, and more. They are located in the Late Louis Caye Building and you are welcome to drop- in at any time. Please contact the Success coaches to help you; James Steele, Jr 275-4712 and Laura Ginsburg at 275-4711.

Title IX:

The U.S. Department of Education's Office for Civil Rights (OCR), enforces Title IX of the Education Amendments of 1972. Title IX protects people from discrimination based on sex in education programs or activities that receive Federal financial assistance. Title IX states that:

No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance.

All employees at SKC are considered "**Responsible Employees**" which requires them to report incidents of gender-based discrimination (sexual violence, sexual harassment, rape, sexual assault, domestic violence, and/or stalking). In accordance with Title IX laws, students must be made aware of the following: If any employee of SKC, including instructors, learns of any potential gender-based discrimination, they are required to notify the Title IX Coordinator, **Rachel Andrews-Gould** (275-4985, located in BigKnife Building), immediately. Once an incident is reported to Title IX, the student will be contacted by the Title IX Coordinator for follow up. Students can also report directly to the Title IX coordinator in regards to any gender-based discrimination.

If any student wants to speak with someone confidentially, the following resources are available:

Center for Prevention and Wellness Agnes Kenmille Building Building #51 406.275.4913 or 406.275.4744	SAFE Harbor Advocacy Services 24-Hour Advocacy 406.676.0800
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Speaking with a confidential resource does not preclude students from making a formal report to the Title IX Coordinator if and when they are ready. In the confidential setting, students will be made aware of available resources and reporting options. An advocate is available for all students upon request through the Center for Prevention and Wellness.

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. An exploration of the physical and chemical properties of water and the affect of these characteristics on living beings and systems.

Weeks 4-5: Cells and Their Structures

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

QUIZ #1

Week 6: The Mechanisms of Life

In this Module we explore some basic processes and concepts dealing with living systems: Cell reproduction, Photosynthesis, and Energy Flow. **QUIZ #2**

Week 7: Human Reproduction and Genetics

A micro and macro exploration of the various stages and physiology of reproduction. An introduction to the principles of basic Mendelian genetics, including a study of DNA.

Week 8: The Incredible World of Plants

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

The Amazing Human Machine

Exploring the basic foundations and mechanisms of human anatomy, with a focus on the inter-connectedness of human biological systems. **QUIZ #3**

Week 9: Darwin and Evolutionary Theory

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 or Final Exam

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, or may elect to take a final exam instead of the research project. **QUIZ #4**