ISCI 3103: Natural History for Middle School Teachers Fall 2011

Department of Biology, College of Arts & Sciences, Valdosta State University

Instructor: Dr. Leslie S. Jones **Office:** 1096 Bailey Science Center
Phone: 219-1337 **Email:** lesliesj@valdosta.edu

Office Hours: Tues & Thurs 2:00-3:00 or By Appointment. Please feel free to call the office or use email to schedule a convenient time. Anytime I am in my office, you are welcome to stop in to ask quick questions.

Textbooks:
A Custom Designed E-Book by McGraw Hill (www.mcgrawhillcreate.com/shop)
Natural Environments of Georgia. (1977). Charles H. Wharton, Atlanta: Georgia DNR {In Bookstore Soon}

Course Description: Natural History is the study of the relationships between living organisms and how they interact with, influence, and are influenced by their natural surroundings. According to the VSU Undergraduate Course Catalog, *Science 3103* is a "survey primarily of the biota of south Georgia and associated biological processes. Using the biota of southern Georgia as a model, students will study basic ecological principles, population structure and dynamics, life history patterns, and reproductive strategies and behaviors common to living systems. Special topics covered in the course include the biology of rare and endangered species and the importance of biological resources to human society."

Course Objectives: *Science 3103* addresses the VSU General Education Outcome that specifies "students will demonstrate knowledge of scientific and mathematical principles and proficiency in laboratory practices." It also fulfills the Biology Departmental outcomes that call for the ability to "describe the evolutionary processes responsible for biological diversity" and "interpret ecological data pertaining to the behavior of the individual organism in its natural environment; to the structure and function of populations, communities, and ecosystems; and to human impacts on those systems and the environment." This class will also bridge the gulf between scientific and educational disciplinary training by allowing future teachers to learn new scientific information through a variety of instructional strategies. The course has been designed to model methods that enact the rhetoric of the science education reform movement. This nontraditional approach to college science is structured to help prospective middle school teachers make connections between methods of teaching and the process of learning science.

Instructional Philosophy: The scientific subject matter has been chosen to align with the National Science Education Standards, the new Georgia Performance Standards, and subjects covered on the new GACE Science Exams. Course grades will be based on a variety of assessment techniques that are designed to produces evidence of achievement of the specified learning outcomes. Personal reflection and class discussions about teaching methods will facilitate the development of Pedagogical Content Knowledge. The course will provide students with an opportunity to move beyond the mere assembly of subject matter knowledge and develop sound pedagogical philosophies for teaching science to middle school students.

Academic Honesty: Members of the class are expected to maintain high standards of integrity. This course will use the VSU Handbook Code of Ethics as a basic standard of behavior, and everyone in the class is required to read the Biology Department Plagiarism Policy sign a statement verifying that these guidelines are understood. Evidence of dishonest conduct or cheating will result in no credit for the assignment and depending on the case, a grade of "F" for the course. Never copy text from a book or website and always cite sources unless it is very general or commonly known scientific information. Do not share your work with other students because both people will be held responsible. **When students work together on projects or assignments, each person is responsible for submitting completely individual, distinctly different products.** Do not expect lenience for claims that on the grounds of not knowing better. You will be reported to the Dean of Students.

Special Services: Students requiring classroom accommodations or modifications because of a documented disability should discuss this need with me at the beginning of the semester. Register with the Access Office, Farber Hall, 245-2498.

Family Educational Rights & Privacy Act: Grades cannot and will not be posted by Name, Social Security Number, or other Personal Identifiers. Grades and student work will not be given over the telephone, by email or to another student.

SCI 3103 – Course Design: Guidelines for Content & Evaluation

Enduring Understanding:

The natural world includes the totality of the physical and biological factors that have and continue to influence the evolution of living organisms.

Essential Questions:

What characterizes the systematic aspects of human investigations of the natural world?
How does the Theory of Evolution explain the history of life?
How have significant features of physiogeography of Georgia influenced the vast biodiversity of the state?
How does Inquiry-Oriented, Activity-Based pedagogy influence the teaching and learning of Life Science?

Basic Knowledge & Skills Students Will Acquire:

The Nature of Science as both a Body of Knowledge and Set of Processes
Principles of Ecology
Evolutionary History of Living Organisms
Essential Subject Matter Covered in the 7th Grade Life Science Section of the GPS
Techniques & Standards for Field Study of Living Organisms
Strategies for Teaching 7th Grade Life Science Based on the Georgia Performance Standards

Students in ISCI 3103 will be expected to:

I. Display a collection of information documenting personal growth through experiences.

II. Describe the evolutionary processes responsible for biodiversity and explain the characteristics of major Taxa.

III. Compare and contrast how the abiotic factors influence the biotic features of major ecosystems in Georgia.

IV. Characterize the Nature of Science.

V. Indicate the possession of conceptual understanding of the Nature of Science & the Life Science GPS.

Proof of mastery for each will be demonstrated by the knowledge & skill shown in:

I. Writing & Other Assignments – A summative, comprehensive evaluation of Pedagogical Content Knowledge in Life Science

II. Ecosystem Report – Scientific poster projects prepared individually and shared in interactive session

III. Midterm & Final Exams - Based on Labs, Lectures, Discussions, Field Trips, & Books

The following facets of understanding will be built into the course assessments:

Explanation – Description of subject matter and pedagogical practices
Interpretation – Demonstration of astute reasoning and ability to make meaningful connections between concepts
Application – Explanation of the links between subject matter and science instruction
Perspective – Identification of the nature of science in our formulation of an understanding of the natural world
Empathy – Indication of the recognition of the value and need to provide quality education in Middle Grades Science
Self-Knowledge – Illustration of personal reflection on the process of learning and teaching science

Course Assessment:

Course Assignments	20%
Class Participation	20%
Deportment & Attendance	10%
3 Midterms (10% Each)	30%
Final Exam	20%

Short Assignments: It is too easy to attend class on a regular basis, but put little thought into the course material until there is pressure to study for an exam. Regular short assignments will give you an idea of the course expectations and mandate regular attention to the material that is being covered. These assignments will be described in class and are due at the start of class or lab. These will be graded on a 10 point scale as follows: (10=Excellent, 8=Good, 6=Adequate/Minimal, Anything less must be resubmitted). Deadlines are firm because there are 50 students in the class. Papers will be graded down 10% if they are turned in after class, and reduced by another 10% for every additional day they are late.

Work Ethic: This course has an accurate reputation for being "a lot of work." Effort required will be rewarded by gains in understanding of scientific information. Success depends on consistent effort and hard work. Grades are based on the quality of the product produced, not the time spent on assignments.

Attendance: Since more than half of this course involves active experiences in the field and in the laboratory, it is not possible to "make-up" missed material. Three late arrivals to class will be counted as an unexcused absence. ALL other class absences must be made up by writing a research paper on the class lecture topic that uses no less than 2 outside published sources (i.e. not your text) and is 1 full single-spaced page (10-12 point type, 1" margins) and at least 500 words in length. Failure to submit these make-up papers to the instructor within 1 week of the absence, will impact the grade for the course. Anyone who misses more than 20% of the class sessions can receive a failing grade for the course.

	50%	**75%**	**100%**	**125%**
Attendance	2 Unexcused	3 xTardy/ 1 Unexcused	All Made-Up	No Tardies or Absences
Deportment	Rude/Impolite Disrupts Class	Passive in Class Off-Task	Volunteers Answers Involved in Labs	Very Active Participant Enhances Class Sessions

Class Participation Possibilities include:

- Sapelo Island Trip
- Lake Louise Trip
- Biology Meet & Greet (9/27) w/Write-Up
- School Visits with Teaching Experiences
- Science Seminars (w/Write Up) on Thursdays @ 4:00 - Schedule on the Web
- Community Service Involving Education
- Projects WET, WILD, & Learning Tree

Expectations on ISCI 3103 Writing Assignments

Objective
Written assignments will reinforce class lessons and will help you to learn, outside the classroom, through your own thinking. Papers are an opportunity to display your knowledge through more than just exams or what you might or might not say in class. These assignments also allow you to show your own style of expression and personal interests, so you should take pride them. Consider every assignment in this course a sign of your professionalism.

Focus
Well-crafted writing always has a specific purpose. Every paragraph or paper should have a distinct thesis or central idea. Your thesis should directly address the nature of the writing assignment. Decide on the topic and a specific case you want to make before you start writing. Write the thesis or topic sentence down and check back throughout the writing process to be certain that the work supports it.

Paper Organization
Before you begin to write, think through how you plan to develop your thesis and use an outline to structure the paper. An Introduction and Conclusion will be the first and last paragraphs of your paper. Start paper with something catchy to interest the reader. Make it perfectly clear, in this introductory section, what your point or central idea will be. Support that concept throughout the body of your paper. Paragraphs in the middle will be the Body of your text. Subheadings should be used for clarity. Your assignments in this class should usually be in first person. Avoid using statements such as "In this paper I will discuss…" since it is much more sophisticated to avoid this type of "crutch statement."

Paragraphs
Divide the paper by major themes and make each of these a distinct paragraph. You should have at least 3 paragraphs on a 1-page paper. The first sentence of each paragraph is a topic sentence that shows what the paragraph cover. ONE SENTENCE IS NEVER AN ENTIRE PARAGRAPH because there should be at least 3 sentences elaborating any significant idea.

Format
Your papers are to be typed using something comparable to 12-point Times New Roman type, single-spacing, and reasonable (1 inch) margins. Other professors often expect double-spacing, but to save paper, **I require single-spacing**. The lengths of these papers are stated in the assignments. After your draft you ideas, if the paper is too long, go back through and shorten it up by taking out the less important aspects. If it is too short, go back and incorporate more support or add more detail to what you are saying. When I say 1 page that means one sheet of paper that is full of text. Put your references and heading on that sheet. Use the word counting function on your word processor to be sure your text is 600-800 words per assigned page when single-spaced.

Requirements
Each paper should have a creative title identifying the approach to the assignment. A header on the upper right should include the student's name and the date of submission. Staple your papers or assignments, do not fold the corner or use a paper clip.

References
Be very careful about giving appropriate credit to the sources of any outside information that you use. You should have properly formatted references at the end of the paper that include: Author (Last name, Initials), Year (In parentheses), Title, Place & Name of Publisher, Pages. Use the APA or American Psychological Association style and check the web if you want an example of this. For WWWeb sources, use as much information about the author or site along with the WWWeb address. When you include information that is general knowledge, it does not require a citation in the text. If you can find the same information in 2 or 3 books, it does not require a citation in the text. Be sure to reword or paraphrase text from your sources to avoid plagiarism. Paraphrasing means changing more than 1 word in a sentence. Think about what something says and completely restate it in your own words. Avoid making your paper look like a mosaic of other people's ideas by using as few direct quotes as possible. The best idea is to quote someone only when the wording is extremely original and/or it can't be stated differently. A direct quote always requires a citation in the text with the page where the quote was found.

Grading
Your assignments will be described in detail in lecture, so listen carefully and be sure that you know what is expected or ask about anything that is unclear. Focus on the objective of the assignment and address it clearly in thesis of your paper. You can dramatically improve your work if you critique your own rough draft and revise it at least once. Outside feedback can also make a difference. Proofread to avoid careless errors. Spelling, Punctuation, and Grammar do effect our impression of the quality of your presentation. These papers will be graded on Effort, Quality, Organization, Content, Proper citations and whether or not you followed these directions. I will look specifically at extent of your coverage of the topic and the clarity in your presentation of the material. Be sure to support general statements and do not use hypothetical examples. Papers are due at the start of class and late work will be docked 10% each day.

ISCI 3103 - Tentative Course Schedule and Plan for Instruction

Dates & Topics	Lab	Assignments
1. The Natural World	**Levels of Organization**	
Aug 16 - Patterns in Nature		
18 - History of Science		Student Information Sheet
2. Scientific Reasoning	**Fish Lab**	
23 - Inductive		Unit Plan for Nature & Science
25 – Deductive		Evolution Survey & GA River Choice
3. Scientific Investigations	**Processes**	
30 - Inquiry		Compare & Contrast Chapters 1-6
Sept 1 - Data Analysis		*LearnSmart* Assignment #1
4. The Living World	**Grand Bay**	
6 – Characteristics of Life		Fish Lab Report
8 - Taxonomy		Computer Quiz on NoS
5. The Nature of Science	**Science Reports**	
13 - Midterm		**Study Hard**
15 - Test Review		Georgia River Detailed Outline & Map
6. The Controversy	**Mosaics**	
20 - Myths & Truths		Evolution Essay
22 - Evolution/Creationism Controversy		Self-Evaluation on Exam
7. Origins	**Fossils & Timeline**	
27 - Origin of Life		Research on E/C Controversy
29 - Earth History		*LearnSmart* Assignment #2
8. Selection	**Skulls**	
Oct 4 - Selection		Georgia River Narrative
6 - Speciation		*LearnSmart* Assignment #3
9. Speciation	**Genetics & Biodiversity**	
11 -Biodiversity		*LearnSmart* Assignment #4
13 - Systematics		Georgia River Photos
10. Human Evolution	**Primate Skulls**	
18 - Primate Evolution		
20 - Untangling Biological Diversity from the Social Construction of Race		Computer Quiz on Evolution
11. Adaptations		
25 - No Class Fall Break		Have Fun
27 – Pine Grove Field Trip		Georgia River Poster Draft
12. Nutrient Cycling	**Biogeochemical Cycles**	
Nov 1 - Midterm #2 – Evolution		**Study Hard**
3- Ecosphere		Essay on Race
13. Abiotic Factors	**Landforms & Soil Separation**	
8 - Biomes		*LearnSmart* Assignment #5
10 - Ecosystems		*LearnSmart* Assignment #6
14. Biotic Factors	**Turtle Population Study**	
15 - Communities		Electronic Submission of GA River Poster
17 - Populations		*LearnSmart* Assignment #7
15. Energy Flow		
22 – Lake Louise Field Trip		Computer Quiz on Ecology
24 - **No Class - Thanksgiving**		**Eat Well**
16. Georgia Ecosystems	**Georgia River Reports**	
29 - Midterm #3 – Ecology		**Study Hard**
Dec 1 - The Natural History of Georgia		Lake Louise Follow-Up
FINAL EXAM– Friday, December 9th 2011 - From 12:30 - 2:30		**Study Hard**

Georgia River Project

Alapaha
Alcovy
Altamaha
Apalachee
Aucilla
Bear
Brier
Broad
Canooche
Chatahoochee
Chatooga
Chestatee
Coleman
Consauga
Coosa
Coosawatee
Crooked
Darien
Dulpin
Etowah
Flint
Hiwasee
Hudson
Jacks
Jerico
Little
Mackay
Newport
Ochlockonee
Ocomulgee
Oconee
Odingsell
Ogeechee
Ohoopee
Okapilco
Oostanaula
Sapelo
Satila
Savannah
Suwanee
Soque
South
St. Marys
Tallapoosa
Talulah
Toccoa
Towaliga
Tugaloo
Yellow
Willacoochee
Withlacoochee

River Characteristics

Alluvial, Blackwater, Tidewater

Abiotic

Location
Age
Substrate
Headwaters
Mouth
Channel
Watershed / Drainage Basin
Length
Variation in Width
Change in Elevation
Flow Rate
Flow Volume
Bottom
Banks
Flood Plain
Water Clarity
Temperature
pH
Seasonal Variation
Pulses

Biota

Surrounding Ecosystems
Vegetation
Animals
Microbes

Human Impacts

Water Quality
Impoundments
Pollution
Bridges
Lakes
Usage

Class Project

8/25/11 - River Choice
9/15/11 - Detailed Outline & Map
10/4/11 - Creative Narrative Description
10/13/11 - Photos
10/27/11 - PowerPoint Draft
11/15/11 - Electronic Submission
11/29 & 12/1 - Presentations in Lab Sections