



Valdosta State University, Department of Biology
 BIOL 4020 / 6020: Special Topics in Conservation: Natural History and
 Conservation of Florida's Springs
 Syllabus for Spring 2016: 4 credit hours

Instructor: Dr. Joshua S. Reece
 Office: Bailey Science Center Room 1213 Phone: 229-219-3293
 Email: jreece@valdosta.edu (preferred contact method) Office hours: W 1:30-3:30pm
 Class Meeting Times Per Week: MW 3:30-4:45pm in BSC 1202 for lecture and M 12-2:50pm in BSC 2073 for Lab

***This syllabus is subject to modification at the instructor's discretion. You will be notified of any and all changes, and the most up-to-date version of this document will always be available at this link: https://www.dropbox.com/s/gglau3jrwaqyr33/BIOL%204020_6020%20Spring%202016_working%20copy.docx?dl=0 ***

Course Overview

Welcome to BIOL 4020, Natural History and Conservation of Florida's Springs. This course is a synthetic upper division course in biology that integrates themes and concepts from the fields of ecology, conservation biology, and evolution. This course will expose you to the flora and fauna of Florida's freshwater springs and their conservation, economic, and cultural significance. This is a field course with lecture components that complement the field work. **Importantly, this course will have a mandatory field trip over the entire spring break, and two daytrips on Saturdays.** In addition to the primary text, which is a basic natural history guide, you will learn through examining the primary scientific literature. Some of these articles will be provided to you, but you will be expected to identify others on your own after training on how to search scientific journal databases. **We will be camping, rain or shine. When we are in the field, you will be doing A LOT of hiking, swimming, snorkeling, and canoeing. You will get dirty, muddy, and wet, and there will be zero tolerance for whining. If you don't like being outside, do not take this course.**

Course Objectives, Educational Outcomes, and Linked Assignments

Course objectives and linked assignments are given below. This course addresses Department of Biology educational outcomes 1, 2, and 5 (http://ww2.valdosta.edu/catalog/1314/ugrad/documents/UG_131-146.pdf) and VSU General Education Outcomes 4, 5, and 7.

| Objectives | Linked Assignments |
|---|--|
| Learn characteristic flora and fauna of Florida's freshwater springs | Field practicals |
| Do literature searches and read and assimilate information from primary scientific articles | Lecture material, small group presentations, individual papers |
| Understand ecological patterns and processes important to freshwater springs | Lecture material, small group projects |
| Understand how climate change and sea-level rise affect Florida's springs | Field trips, individual papers, and practicals |
| Work collaboratively in small groups | Gathering and analyzing data for group projects |
| Improve scientific writing and experimental design | Paper in peer-reviewed journal format |

Graduate Students

If you are taking the 6020 version of the course as a graduate student, you need to be in good standing with the graduate program as a pre-requisite for the course. You will be expected to write at a level beyond that of the undergraduate taking the course, and to be a leader in the field. In addition, your field practicals and quizzes will be separate from and more difficult than those given to the undergraduates.

Course Prerequisites and expectations

The course prerequisites are BIOL 1107, BIOL 1108, BIOL 3200, and BIOL 3250.

Course Credits

BIOL 4020 is a four credit course.

Required Texts and Materials

We will use the following required texts:

PURCHASE: The Springs of Florida, 2nd Edition, by Doug Stamm. Pineapple Press, Inc., Sarasota, FL. In addition, we will utilize peer reviewed literature for this course. A list of the papers and topics we will cover is given in this syllabus.

PURCHASE: Bryan, J.R., Scott, T.M., and G.H. Means (2008) Roadside Geology of Florida. Mountain Press Publishing Company, Missoula, MT

DO NOT PURCHASE (ON DIGITAL RESERVE IN LIBRARY): Myers, R.L. and J.J. Ewel (1990) Ecosystems of Florida. University of Central Florida Press, Orlando, FL.

FREE: Florida Natural Areas Inventory Ecosystem Guides: <http://www.fnai.org/naturalcommguide.cfm>

Link to primary literature for the course: https://www.dropbox.com/sh/4iigju7sxor5ase/AACfMoUAm38GZmkbQItD_Mdca?dl=0

Basis for Final Grade- This is subject to modification depending on the instructor's prerogative and the progress of the class.

| Assignment | Group or Individual | % of final Grade | Points each | Points total |
|--------------------------------------|----------------------------------|------------------|-------------|--------------|
| Department | Individual | 5% | 5 | 5 |
| Quizzes (5) | Individual | 25% | 5 | 25 |
| Field Notebook / Log | Individual | 5% | 5 | 5 |
| Field Practicals (3) | Individual | 15% | 5 | 15 |
| Small Group Presentations (2) | Group | 10% | 5 | 10 |
| Lit Review/Synthesis and Peer Review | Group topic, individual write-up | 10% | 10 | 10 |
| Midterm | Individual | 15 | 15 | 15 |
| Final | Individual | 15 | 15 | 15 |
| Total | | 100% | | |

Students will have until the end of the following week to contest any grades; after that time grades are final. Any questions about grades must be made in writing through email.

- Quizzes will be 10 questions in multiple choice and short-answer format and will encompass material from lecture, assigned readings, and discussions in the field.
- Your field notebook will include an entry for every day in the field. In it, you will take notes on my field lectures and note characteristic species, important ecological functions and processes, and conservation and cultural issues.
- Field practicals will be short answer quizzes of organismal ID, ecosystem features and processes discussed during field trips.
- Students will form small groups of 2-3 individuals for oral presentations on a group project. For the group project, students will present on one or more particular springs, their characteristic species, communities, and cultural and conservation issues. Students will evaluate each group member's contribution and students will be penalized if they did not contribute equally to a group project. You will basically give the lecture, in the field, for the spring you choose. You will see me model the lecture, then you will make up your own lecture. The lecture will be a group grade which will be based on presentation style, accuracy of material, and depth of coverage/synthesis of the topic. Include a handout for the students, which will be part of your grade (I will model this on our first field trip).
- You will write a literature review and synthesis based on the material you used for your lecture and covering the same topics. Importantly, this is to be a review and synthesis, not just a book report or term paper (we will talk about this more in class). While you will work on this as a group, each group member will write their own review/synthesis. I will model how to evaluate each others' papers, and then your peers will provide feedback on your paper for you to revise before you turn it in to me for a grade.

Attendance Policy: Students who miss two days of field trips without an excuse cannot receive a lab grade above a "D" (60%).

Grade Scale: 100-90% A; 80-89% B; 70-79% C; 60-69% D, 0-59% F

Student Conduct

You will be respectful of your classmates and your instructor. Cell phone use is not allowed during class, especially not when I am lecturing in the field.

Course Policies: Technology and Media

Email: Please email me only from a VSU email account. I am unable to respond to emails from non-VSU accounts.

Classroom Devices: You may NOT use your cell phones in class under any circumstances. You may bring cell phones on field trips, but no calls are to be taken when we are working in the field, and no unauthorized use (texting, social media, etc.) of cell phones will be allowed while in the field. Phones may be used for photographing or taking GPS points when permission is given to do so.

Accommodations Statement

Students with disabilities who are experiencing barriers in this course may contact the Access Office for assistance in determining and implementing reasonable accommodations. The Access Office is located in Farber Hall. The phone numbers are 229-245-2498 (V), 229-375-5871 (Video Phone), and 229-219-1348 (TTY). For more information, please visit <http://www.valdosta.edu/student/disability> or email access@valdosta.edu.

Academic Integrity

Academic integrity is the responsibility of all VSU faculty and students. Students are responsible for knowing and abiding by the Academic Integrity Policy as set forth in the Student Code of Conduct and the syllabus. All students are expected to do their own work and to uphold a high standard of academic ethics. Cheating (including plagiarism) will not be tolerated. The instructor reserves the right to dismiss you from the course without credit if you are caught cheating. You will be respectful of your instructor and your fellow students at all times, or you will be dismissed from the class and potentially the course.

List of springs we will visit and schedule

There will be two mandatory Saturday day-trips.

For the mandatory trip over Spring Break we will leave on the Saturday before spring break, and return on the following Friday. **Our tentative schedule is:**

- Saturday- VSU to Peacock Springs State Park, then to O'Leno State Park to camp
 - Leave VSU at **time**,
 - Arrive at Peacock Springs 1.5 hours later
 - Nearest restaurant 5 miles away (Chinese, subway, burger king, pizza hut, Italian deli, etc)
 - Diving here
 - Leave Peacock Springs at **time**,
 - Arrive at O'Leno State Park 1 hour later
 - Restaurants within 5 miles
 - No diving
- Sunday- From O'Leno to Ichetucknee State Park to swim and canoe. Back to O'Leno for second night
 - 20 mins from O'Leno to Ichetucknee
 - Restaurants within 5 miles
 - Diving here
 - 20 mins back to O'Leno
- Monday- From O'Leno to Juniper Springs to snorkel, canoe, and stay the night.
 - Drive 1.5 hrs to Juniper Springs

- No diving
 - Restaurants within 5 miles
- Tuesday, from Juniper Springs to Alexander Springs to snorkel and Canoe, return to Juniper Springs.
 - 20 mins to Alexander Springs
 - Diving here
 - Restaurants within 5 miles
 - 20 mins back to Juniper
- Wednesday: from Juniper Springs to Blue Springs to swim and hike, return to Juniper Springs
 - 1 hr to Blue Springs
 - Diving here
 - Restaurants within 5 miles
 - 1 hr back to Juniper
- Thursday: from Juniper Springs to Salt Springs to swim and hike, return to Juniper Springs
 - 30 mins to Salt Springs
 - No diving
 - Restaurants within 5 miles
 - 30 mins back to Juniper
- Friday: pack up and head home.
 - 2.5 hrs to VSU, add 30 mins for bathroom break

List of Topics Covered During the Course

| Date | Topics | Reference Material | Assignments |
|--------------------|--|---|--|
| Jan 11 | No class – read Ch. 6 in Stamm (2008), and pages 68-73 in Bryan et al. (2008) | | |
| Jan 13 | Introductions | Syllabus | |
| Jan 18 | No Class | | |
| Jan 20 | Introduction to springs: distribution and basic geology; Spring classification | Ch. 6 in Stamm (2008), pages 68-73 in Bryan et al. (2008); Florida DEP SP# 52, pages 2-17 | |
| Jan 25 | Distribution of Springs | Mapping Exercise | Map and one-paragraph description |
| Jan 27 | Natural history: Flora | Ch. 1 Stamm (2008); Florida Natural Areas Inventory (fnai.org) | Quiz #1 |
| Feb 1, 3 | Natural history: terrestrial fauna | Ch. 1 Stamm (2008); p. 392-422 Myers and Ewel (1990) | |
| Feb 3 | Natural history: terrestrial fauna | Florida Natural Areas Inventory (fnai.org) | Quiz #2 |
| Feb 8 | Natural history: aquatic fauna | Ch. 2 Stamm (2008), fnai.org | Oral Presentation #1 on climate change |
| Feb 10 | Natural history: aquatic fauna | Kleen and Breland (2014), Laist et al. (2013), Work et al. (2010) | |
| Feb 15 | Scientific writing | How to write a scientific paper | |
| Feb 17 | Review | | Rough draft of paper due |
| Feb 20 | Saturday Field Trip to Madison Blue Springs | | Field Practical #1 |
| Feb 22 | TBA | | |
| Feb 24 | Ecosystems associated with springs | fnai.org mapping exercise and habitat guide | |
| Feb 29 | Ecosystems associated with Springs | fnai.org mapping exercise and habitat guide | |
| March 2 | Midterm | | |
| March 7 | Implications and interpretations from fossil evidence in springs | p. 22-43 in Bryan et al. (2008) | |
| March 9 | Implications and interpretations from fossil evidence in springs | Wentz and Gifford (2007) | |
| March 12-18 | Spring Break Trip | | Field Practicals #2 and #3; Quiz #3 |
| March 21 | Conservation issues: human and nature conflicts | Florida State of the Water Report (2012) | Peer reviews of papers due |
| March 23 | Conservation issues: human and nature conflicts | Albertin et al. (2012) | |
| March 28 | Conservation issues: conflicts and restoration | Edwards et al. (2006) | Quiz #4 |

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|----------------|--|---|------------------------------------|
| | efforts | | |
| March 30 | Conservation issues: conflicts and restoration efforts | Katz et al. (2009), Heffernan et al. (2010) | |
| April 4 | Climate change-temperature | Heimlich and Bloetscher 2011 | |
| April 6 | Climate change-temperature | Heimlich and Bloetscher 2011 | |
| April 9 | Saturday Field Trip to Suwanee Springs | | |
| April 11 | Climate change-precipitation | Rahel and Olden (2008), Schmidt et al. (2001) | Final draft of papers due |
| April 13 | Climate change-precipitation | Li et al. 2011 | Oral Presentation #2 on Flow Rates |
| April 18 | Sea-level rise | Obeysekera et al. (2013) | Field Notebooks Due |
| April 20 | Sea-level rise | Cable et al. (1997) | Quiz #5 |
| April 25 | Review | | |
| April 27 | Review | | |
| May 2 | Final Exam | | |

Release and Waiver of Liability

Please read and sign the following:

I acknowledge that participation in field excursions involves some risks of injury, illness, and/or loss of personal property, despite the best intentions and responsible actions of participants and leaders. I agree to release and forever discharge Valdosta State University and the Board of Regents of the University System of Georgia, its members individually, and its officers, agents and employees from any and all claims, demands, rights and causes of action of whatever kind or nature, arising from and by reason of any and all known and unknown, foreseen and unforeseen bodily and personal injuries, including death, damages to property and the consequences thereof, resulting from my participation in the field excursion(s) described above.

I certify that, to the best of my knowledge, I am in good health and physically capable of undertaking an intensive field biology exercise. I am able to swim 800 meters without a floatation device and without stopping. I am able to hike for 5 miles in warm and humid weather without stopping.

I have read the above statement carefully before signing. Further, I understand that this Release and Waiver of Liability shall be effective for a period of one year from this date.

Print Full Name

Signature

Date

Rubrics: All rubrics are subject to modification until the assignment is presented to you in class, at which time the rubric will be final.

Rubric For Field Notebook

Worth 5 points.

Your field notebook is your way of keeping notes in this class. In it, you should record your observations of each specific field site and of the natural communities present at that site. For each entry, you should record highly interactive species, one specific example of how climate change has or will affect this community, and one specific example of how sea-level rise has or will affect this community. In addition, you should mention one key ecosystem service provided by this community, and issues relevant to conservation and culture.

Your Field Notebook will be graded using the following rubric:

| | |
|--|-------------------|
| Record of every community visited at every field site: | 0.5 points |
| Brief description of each natural community: | 1 point |
| Named two highly interactive species characteristic of each natural community: | 1 point |
| Climate Change: | 1 point |
| Conservation and Cultural significance | 1 point |
| Ecosystem Service: | <u>0.5 points</u> |
| Total: | 5 points |

What to Expect for Field Practicals:

You will have three practicals in the field. The field practicals will be short answer and vary between approximately 10 and 20 questions. We will all walk around as a group, each person carrying a notepad and something to write with. You may not use your notes or any external materials during a practical. I will ask everyone a question, such as, “what is this plant, characteristic of the ecosystem we are in today” and you will write down the name of the plant. Or perhaps I will ask, “what is the federally endangered species that is endemic to this natural community?” These will all be topics that we have gone over in lecture or discussion before taking the field practical. You will write your answers down, and I will collect and grade them. They will be worth 5 points each, for a total of 15 points or 15% of your final grade.

Small Group Oral Presentation Rubric:

Students will form small groups of two individuals to generate a lecture on a particular topic. There are two presentations, each approximately 5-7 minutes long. The first will be on a literature review of the impacts of climate change to Florida Springs. The second will be on an analysis of how water demand and precipitation are related to records of flow rates for Florida springs. Each of your oral presentations will be graded as follows:

| | |
|--|------------------|
| Quality of handout (spelling, grammar, appearance) | 0.5 points |
| Presenter style (eye contact, volume, enthusiasm) | 1 points |
| Quality and accuracy of information presented | 2.5 points |
| Completeness (addressed all topics) | <u>1 point</u> |
| Total | 10 points |

Rubric for Scientific Paper

Each individual will write a scientific paper that is based on some aspect of Florida's springs covered in this course. The topic of your paper will have to be approved by your professor, and should focus on the major points we discuss at each field site (flora and fauna, ecosystem services, conservation, and cultural importance). Synthesize the relevant literature on as many of these points as is possible. If you are unsure of how a synthesis paper is different from a term paper, here is one way to think about it:

Term paper style: Smith (2014) showed that spring flow depends on rainfall. Yoder (2013) showed that salt water encroaches into springs with sea-level rise.

Review/synthesis style: Sea level rise can pose many threats to coastal ecosystems, but they can also impact inland systems such as freshwater springs by salt water encroachment through the aquifer (Yoder 2013). Springs derive their freshwater from the aquifer, including waters that have been trapped underground for long periods of time, but there is also a relationship between rainfall and spring flow (Smith 2014).

See the difference? The synthesis is an interpretation of the literature, not just a review/restating of it. You will receive peer review on your literature review prior to turning it in to me for a grade, and after your initial grade, this literature review will become the first half of your scientific paper. The length should be 5-10 pages double spaced 12 point Times New Roman font with 1 inch margins.

You will also peer review each other's work. Each of you will review two of your classmates rough drafts, which means that you will each have input from two of your classmates on your paper. The quality of your peer review will be factored into your grade (see point totals below).

Your scientific paper will have the same structure as most of the papers we have read in class. It will be a review or synthesis paper, because you are probably not collecting original data on which to publish. So, look at the review and synthesis papers we have read. You should format your paper to be submitted to the Georgia Academy of Science

(<http://www.gaacademy.org/gajsci.htm#III.%20Georgia%20Academy%20of%20Science%20Information%20for>) or to the Florida Academy of Science

(http://www.floridaacademyofsciences.org/pdf/Guide_for_Authors_1-22-2014.pdf) journals, you should clearly follow their instructions and make it clear to me which journal you are writing for. You will include the following sections: Abstract, Introduction and Background, Methods of Literature Review, Review/Synthesis, and References. You may subdivide the major sections as you see fit. If your paper fails to conform to the journal requirements, it may be rejected and you will receive a zero. This assignment is 30% of your grade, so don't let that happen to you! As for length, do not ask me how long it needs to be: you will have read several papers and will be familiar with their average length. Overall, the following rubric will be used to grade your scientific papers:

| | |
|--|------------------------|
| Conforms to journal instructions to authors: | 1 point |
| Abstract effectively summarizes the entire paper: | 1 point |
| Conforms to the topic outlined above in bold text: | 1 point |
| Quality, novelty, and accuracy of information presented: | 2 points |
| Use of the peer-reviewed literature: | 2 points |
| Adequately puts the proposed research in the context of previous work: | 1 point |
| Grammar, syntax and spelling: | 1 point |
| Peer review: | 1 point |
| Total: | <hr/> 10 points |