

ISLAND BIOLOGY

University of Florida ZOO4926
Santa Fe College WIS2930
Summer A, 19-28 May 2017

Instructor: Dr. Coleman M. Sheehy III (coleman3@ufl.edu)

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Assistant instructor: Patrick Norby, Florida Museum of Natural History

Enrollment eligibility: Open to undergraduate students (at all levels) interested in immersing themselves in an intensive 10-day field course in a remote island setting. **For more information, email Dr. Coleman Sheehy (coleman3@ufl.edu).**

Prerequisite: Introductory biology (preferred but not required)

Class size: 14 students max

Credits: 3 credit hours

Lab Fees: \$400.

Lab fees are set by the department and help to cover boat/fuel costs, equipment purchases, and other course needs directly related to accomplishment of the course objectives.

Total Course Costs: \$400 lab usage fee per person plus tuition and food costs

***Pre-course orientation and logistics meeting:** Tuesday, May 16th at 1:00pm (room 511 Carr Hall)

Course schedule: Depart from Gainesville the morning of **Friday, May 19th**
Return to Gainesville late afternoon on **Sunday, May 28th**

There is no textbook. Course readings will be provided by the instructor.

Registration deadline: May 5th at 5:00pm

Course Description:

Islands have long been regarded as important “natural laboratories” that have contributed to the advance of many scientific disciplines, including evolution, ecology, biogeography, phylogeography, and conservation biology. Although islands comprise only 5% of the world’s land surface, they support 30% of the world’s biodiversity hotspots, which include rare and recently-extinct species. This course will provide students with an introduction to island biology and self-directed field research. We will explore various aspects of island biology, often within the context of the nutrient enrichment occurring on Seahorse Key from the nesting bird colony and its potential influence on insular biodiversity. Students will conduct guided independent mini research projects and present the results to peers at the end of the course. We will explore many pristine habitats on Seahorse Key and on several other nearby islands within the refuge. The course will focus on the following:

- Defining islands and biodiversity
- Identifying characteristics of islands and their implications for evolution of biodiversity
- Identifying biogeographical processes and their implication for insular biodiversity
- Understanding dynamics of spatially subsidized food webs on islands
- Identifying conservation and management concerns of island biotas

The overall goals of this course are to provide students with a working understanding of island biology and to provide valuable field research experience. The specific objectives are for students to:

- Collect and analyze data within the theoretical framework of island biogeography theory
- Learn field techniques for data collection
- Work and learn in a team environment; develop problem-solving skills in a challenging field setting
- Engage in active, student-directed learning
- Refine written and oral communication skills

The course will include classroom lectures (at the Seahorse Key Marine Laboratory) and field research on Seahorse Key and other nearby islands/ecosystems. Lectures are designed to include material relevant to the ecological setting of the course and as preparation for fieldwork.

Rationale: This course helps support the highest quality post-secondary education. Specifically, this course addresses students pursuing careers in any biological field involving research, including ecology, evolutionary biology, conservation biology, invasive ecology, wildlife management, and pre-professional fields. Ultimately, this course will help students develop a vocabulary for technical communication, field and laboratory research skills, and analytical problem solving skills.

Impact Assessment: Island Biology is designed as an interdisciplinary class for science majors. Success in the course is dependent on an ability to make connections between related phenomena and the “what it means” mentality that drives active research.

Evaluation: This course utilizes project-based learning as a primary means of student evaluation. Grading is based on student participation and performance in the student-directed research projects, a field notebook, in-class discussions, a final presentation and a written abstract. Projects and assignments in this course require demonstration of scientific reasoning skills (deductive or inductive inference, control of variables, application of a model to a new situation, interpretations based on fundamental theories, and interpretation of data in both tabular and graphical form). A student grade on a designated assignment or the overall grade in the course is also indicative of the extent to which they understand and are able to apply these broader skills. **Dr. Sheehy and the teaching assistant will assist students individually with all aspects of their projects.**

Course objective, description, and format: The goal of the course is to increase student awareness and appreciation of islands and associated biodiversity, with a special focus on the Big Bend region of Florida’s Gulf Coast. Topics will include natural history, ecology, evolution, behavior, biodiversity, biogeography theory, and identification of many of Florida’s native wildlife species (and some introduced species). Conservation and management issues of select species and habitats will be covered as well. Information delivery will consist of mini-lectures by the course instructor and guest speakers, class discussions, assigned readings, and guided island and boat trips. Students will conduct independent (guided) research projects on approved topics, and present their findings to their peers. Students will provide a copy of these results to the instructor for use by SKML. Participating students will live on-site at the Seahorse Key Marine Laboratory (SKML) dorms, located in the island’s historic lighthouse. Field excursions may include, but are not limited to: hikes, night walks, boat trips, snorkeling, and other inquiry-based habitat/ wildlife observations on Seahorse Key and surrounding areas in the Big Bend region of Florida’s Gulf Coast.

Activity schedule and exploratory topics are tentative and inherently flexible due to weather, tides, and other natural phenomena. Some details may change to meet the needs of instructors, guest speakers, or students.

Grading Breakdown:

Students will conduct independent research on a guided topic of their choice. Students will also maintain a Rite-in-the-Rain **field notebook** throughout the 10-day experience. Daily entries will include both formal and informal observations, data collected, and notes from lectures and discussions. Due on the last day of class. **This will constitute 25% of the overall grade. Notebooks will be provided.**

Students will present a **PowerPoint presentation** synopsis of their research project to their peers on the final full day of the course in the lab classroom. Presentation should contain the background, hypothesis, methodology, results, and preliminary conclusions (discussion) of your research. Presentations should be 15 minutes, with 5 minutes for questions (20-min time slot). Data and a pdf of the presentation must be provided to the instructor on the day it is presented. **Full credit = 35%. Detailed instructions will be provided.**

Students will write a **scientific abstract** (500 words max) summarizing their study. This includes background information, hypothesis, methods, results and discussion. Abstracts are due via email by 5:00 pm on Friday, 2 June 2017. **Full credit = 25% for this component. Detailed instructions will be provided.**

Finally, students may receive up to 15% for participation and consistent demonstration of an inquisitive, positive, and thoughtful attitude. This includes reading assigned materials, asking questions, working together, participating in activities, and showing one another (and the environment) respect at all times. Living in a field station and working under potentially adverse conditions can be difficult, but it is **an essential skill to be developed by professional field biologists.**

The standard University of Florida and Santa Fe College grading scales are employed in this course. For example:

Letter Grade	Grade Points	% Grade
A	4.0	≥ 93%
A-	3.67	89-92.9%
B+	3.33	85-88.9%
B	3.0	81-84.9%
B-	2.67	76-80.9%
C+	2.33	71-75.9%
C	2.0	66-70.9%
C-	1.67	61-65.9%
D+	1.33	57-60.9%
D	1.0	54-56.9%
D-	0.67	50-53.9%
F	0.0	< 50%

The Field Setting:

Seahorse Key Marine Lab: our very own 165-acre island, set within the pristine Cedar Keys National Wildlife Refuge. Seahorse Key Marine Lab offers a unique opportunity to examine a wide variety of coastal species and ecosystems up close.

Seahorse Key:

The island is a relic dune of unusual height for this region of the Gulf Coast, giving the students a 52-foot perch from which to view Gulf ecosystems. There is a long history of human use of the island, from Native American (complete with shell middens), to building the lighthouse in 1854 to guide traders safely into Cedar Key, to Civil War action, to protection of the whole island in the National Wildlife Refuge System. The University of Florida established the Marine Laboratory in 1951 on land leased from the Wildlife Refuge. The laboratory provides excellent access to marine grasses and algae, sandy beaches, mangroves, sand and mud flats, oyster reefs, sponge-shell litter channels, turtle grass beds, salt marsh, and hydric hammock. The forested island uplands provide nesting habitat for over 10,000 birds that include brown pelicans, ibis, egrets, cormorants, herons, spoonbill, and osprey. These birds will be raising chicks nearby when our class is in session! Lots of other marine-associated wildlife can be observed on the island and surround area, including oysters, clams, shrimp, crabs, fish, snakes, sharks, rays, diamondback terrapins, sea turtles, manatees, and dolphins. In addition to wildlife, many plants are found on Seahorse Key. The island represents the northern limit for several tropical species of plants and animals.

Accommodations & Meals:

While on Seahorse Key, students will dorm in the historic lighthouse building. This rustic building has 26 bunk beds, and two full bathrooms with showers. The brand new kitchen is equipped with refrigerators, freezers, a microwave and a toaster, cooking pots and pans, plates, cups, and utensils. Meals will be prepared by our group in the building's kitchen. Breakfast will be self-service (with self-clean up) and will include packing a lunch for later. Dinner will be prepared by the students in teams of two. The first team will cook and the second will oversee clean up. We will rotate so all teams have the opportunity to cook and clean up. **We will meet before the course begins to plan meals and discuss any food concerns.**

All rooms in the lighthouse have electrical outlets, lights, and fans. Laptop computers are strongly encouraged and will be important for class assignments (please let the instructor know if you do not have laptop access when signing up for the class). **If possible, bring a USB drive to transfer files.** Although cell phones are great for emergencies and for phoning home in the evening, their constant use will be discouraged. The lab is not equipped with Internet access, but you may be able to set up a personal Wi-Fi hotspot depending on your cell phone plan.

Expectations and Conduct:

Students are responsible for fully understanding all of the information presented in this syllabus. If there are any questions regarding this information, it is the student's responsibility to bring it to the instructor's attention. In addition, students are responsible for attending all activities associated with this course and completing all assignments. Students are expected to contribute equally to research projects.

Failure to do any of these things may result in failure of the course (see Grading). Any assigned reading material is to be read before the appropriate class session. Students are

responsible for asking questions anytime they need clarification (remember, there is no such thing as a bad question). Every student is responsible for their own behavior—specifically in being respectful and collegial to other students and with instructors. Students must fully respect the Seahorse Key Marine Lab facility, rules and regulations of the lab and, importantly, the environment. **With regard to field trips, students should put safety above all else and ask questions and make decisions that reflect this priority.** Academic dishonesty (e.g., plagiarism, cheating, fabrication) is a violation of the regulations and will not be tolerated. In fairness to students who put in an honest effort, academic dishonesty will be harshly treated. Any form of cheating whatsoever will result in an ‘F’ for the course. Consult UF's Academic Honesty code for further information.

Students must adhere to the following while at the Seahorse Key Marine Lab:

1. Each person using the Seahorse Key Marine Laboratory (SKML), including boats and facilities, must sign a liability release form.
2. Each visitor understands that SKML property is used in cooperation with a Memorandum between the U.S. Fish & Wildlife Service and the University of Florida, and that Seahorse Key is part of the Cedar Keys National Wildlife Refuge. The visitor agrees to abide by rules of both the U.S. Fish & Wildlife Service and the University of Florida.

This course will occur while over 10,000 colonial nesting birds will be nesting on or near Seahorse Key. The island is closed to the public during this time to protect the birds. Per USFWS regulations, everyone will need to wear yellow vests (provided) when on the south beach to show that we have permission to be on the island during this time.

3. Firearms are forbidden at the SKML and on the island of Seahorse Key.
4. Domestic animals (dogs, etc.) are not permitted at Seahorse Key, unless they are part of an approved research project or are necessary to help a disabled person. Please notify the SKML staff if you have a special need.
5. Alcoholic beverages are not permitted at Seahorse Key or on University of FL boats.
6. Removal of plants, wildlife, or archeological artifacts is not permitted without a Special Use Permit from the U.S. Fish & Wildlife Service.
7. All trash must be packed out when a visitor leaves the island. Plastic garbage bags will be provided for this purpose.
8. Use of the laboratory facilities and/or lodging facilities (historic lighthouse) requires the user to clean the affected spaces and leave the facilities as they were found.

9. Please note that there are venomous snakes (Florida cottonmouths, *Agkistrodon piscivorus*) that inhabit Seahorse Key and are sometimes seen in the open areas surrounding the buildings. Watch for snakes and do not disturb them. These snakes are not aggressive, but they are potentially dangerous if stepped on or molested. Due to the snake presence, visitors are required to carry a flashlight, wear shoes, and stay on paths if walking outside after dusk. Rattlesnakes are also occasionally seen on the island, but they are not common.

10. Also be cautious about stingrays, which are present in surrounding waters. If in water, always wear water shoes and shuffle your feet when wading to avoid stepping on stingrays.

11. The interior of Seahorse Key (hammock) is closed to public use for the safety of visitors and the protection of the flora and fauna. The only exceptions to this rule are the trail that leads east from the generator shed to the historic gravesites, or possession of a Special Use Permit from the U.S. Fish & Wildlife Service.

12. Persons are not allowed to jump or dive from the dock or docking facilities, and swimming is not permitted at the dock or boat basin.

13. No fires are permitted on Seahorse Key except for cooking fires in the outside grill.

14. Orderliness in personal conduct and living habits is essential for comfort and good public relations. Please remember that Seahorse Key is part of a National Wildlife Refuge.

Boat Safety:

1. Only SKML staff members may operate SKML boats with engines.
2. Canoes may be used only on the north side of the island. You must request permission, sign out the canoe or kayak, and indicate where you are going and for how long. Students must go out in boats in pairs or a small group.
3. Shellfish may not be collected for personal use. Fishing with a hook and line is allowed only if you have a valid recreational saltwater fishing license **physically with you** (<http://myfwc.com/license/recreational/saltwater-fishing/>).

Use of lighthouse building:

1. The lighthouse living quarters are inside a building that is on the National Register of Historic Places. It was once occupied by Civil War soldiers! Please treat the building and the things within it with care, and do not tape or nail items to the walls. Visitors are permitted to climb the staircase to the light turret, but no more than four average-size persons may do so at the same time.

2. Please do not leave perishables inside the refrigerator when you leave the island unless you have prior permission from the SKML staff. Please do not allow wet or smelly items (e.g., fish) to "soil" the insides of refrigerators.
3. Do not remove furniture from rooms or buildings.
4. Be considerate of others, and do not allow screen doors to slam. Walk and talk quietly at night while others might be sleeping.
5. Do not remove kitchen utensils, cutlery, glasses, etc. from the kitchen or dining area. **Pots and pans are not to be used as buckets for holding or collecting organisms.**
6. Always clean up your dishes or glasses immediately after they are used.
7. Do not leave valuable personal items exposed in your rooms.
8. All garbage and trash should be put in the garbage containers or large trashcans in the kitchen.
9. Empty bottles and cans should be deposited in a recycle bin lined with a trash bag.
10. Shirts are required at all meals.
11. Water conservation is essential. Please try to use water efficiently in showering, dishwashing, and cleanup. Conserve shower water by wetting yourself first, turning off the water, lathering up, and then rinsing quickly. Please clean up following fieldwork by using the hose by the laboratory steps or the tank spigot at the west end of the lighthouse instead of showering.
12. Although there is potable water from wells available from the kitchen spigots, the quality of water may vary during drought periods. Therefore, clean freshwater will be supplied daily from Cedar Key.

Hurricane preparation:

This course will occur just before the Florida hurricane season (June 1st through November 30th). Nonetheless, we will be closely monitoring the local weather forecast. If the forecast calls for the threat of a tropical storm or hurricane in our area, we will return to Gainesville. If this happens, you will be eligible for a refund of your tuition and unspent laboratory fees.

University of Florida Policy Statements

Academic Honesty: In 1995 the UF student body enacted a new honor code and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students. In adopting this honor code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the university

community. Students who enroll at the university commit to holding themselves and their peers to the high standard of honor required by the honor code. Any individual who becomes aware of a violation of the honor code is bound by honor to take corrective action. The quality of a University of Florida education is dependent upon community acceptance and enforcement of the honor code.

The Honor Code:

We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. On all work submitted for credit by students at the university, the following pledge is either required or implied: **“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”** The university requires all members of its community to be honest in all endeavors. A fundamental principle is that the whole process of learning and pursuit of knowledge is diminished by cheating, plagiarism and other acts of academic dishonesty. In addition, every dishonest act in the academic environment affects other students adversely, from the skewing of the grading curve to giving unfair advantage for honors or for professional or graduate school admission. Therefore, the university will take severe action against dishonest students. Similarly, measures will be taken against faculty, staff and administrators who practice dishonest or demeaning behavior. Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean or Student Honor Court. (*Source: 2007-2008 Undergraduate Catalog*) It is assumed all work will be completed independently unless the assignment is defined as a group project, in writing by the instructor. This policy will be vigorously upheld at all times in this course.

Software Use: All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Campus Helping Resources: Students experiencing crises or personal problems that interfere with their general wellbeing are encouraged to utilize the university’s counseling resources. Both the Counseling Center and Student Mental Health Services provide confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance. The Counseling Center is located at 301 Peabody Hall (next to Criser Hall). Student Mental Health Services is located on the second floor of the Student Health Care Center in the Infirmary.

- *University Counseling Center*, 301 Peabody Hall, 392-1575, www.counsel.ufl.edu
- *Career Resource Center*, CR-100 JWRU, 392-1602, www.crc.ufl.edu/
- *Student Mental Health Services*, Rm. 245 Student Health Care Center, 392-1171, www.shcc.ufl.edu/smhs/

Students with Disabilities: The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty student disability related issues.