

# BI 221: Tropical Biology

## Course Syllabus

### Spring 2017

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#### Course description

BI 221: Tropical Biology and BI 222: Field Studies in Tropical Biology constitute a four-credit, two-course sequence that introduces students to the biological complexity of tropical ecosystems. BI 221 is a 2-credit course offered during spring semester (odd years) that examines the fundamental scientific concepts and theories that describe tropical systems. Course work will cover a variety of topics, including the natural history of tropical biota, patterns of species diversity, rainforest ecology and conservation, coral reef ecology, and Belizean history and culture. BI 222 is a 2-credit course offered the following summer that complements the understanding of tropical biology students have gained in the classroom by providing a hands-on field experiences in the ecologically diverse Central American country of Belize. Throughout the trip, Saint Anselm faculty and local experts will lead field exercises in two of the most species rich ecosystems on the planet, the neo-tropical rainforest and coral reef. With its emphasis on Belizean ecosystems and travel within the country, this course provides students a unique opportunity to learn about and then experience the ecology and culture of a different country.

**Prerequisite:** Completion of one semester of a lab biology course; permission to register by instructor.

**Notes:** Students enrolling in BI 221 are also expected to enroll in BI 222 offered the following summer session I. Both 2-credit courses are required to fulfill one 4-credit biology lab course requirement. See the course instructors for the BI 222 syllabus, dates of travel, summer tuition costs, course fees, and travel information for Belize (packing lists and health considerations).

#### Required Texts

- *Tropical Nature: Life and Death in the Rain Forests of Central and South America.* Adrian Forsyth and Ken Miyata. 1984. Simon and Schuster. 248 pp. ISBN 978-0-684-18710-5.
- *Sensuous Seas: tales of a marine biologist.* Eugene H. Kaplan. 2006. Princeton University Press. 288 pp.

**Course meeting place and time:** Mondays 1:30 - 3:20pm (unless otherwise noted on Schedule), Goulet 3100

#### A Note about Credit Hours

This course has been designated a 2-credit course. According to the college's definition of a "credit hour," which defines the expectations for the amount of work for a 2-credit course such as this one, is six hours of engaged student learning per week. In this course two of those hours are spent in class, and therefore it is expected that students spend approximately four engaged student learning hours per week working outside of class on work such as reading, preparing discussion answers, researching information for papers, and studying for exams.

#### Attendance Policy

Attendance in BI 221 is mandatory and excessive absences will affect your final grade. A 'documented' absence is one documented by notification of the Dean's Office. All other absences are considered undocumented. For every undocumented absence beyond **one (1)**, your course participation grade will be reduced by 5 points. Keep in mind that work missed (e.g. exam or discussion) resulting from any undocumented absence may not be made up. For documented absences, contact me in advance so that the make-up option may be arranged.

## Athletics and Attendance

It is my goal that student athletes achieve all their athletic goals in addition to attending all their classes and labs. For this to happen it is important that you notify me of any scheduling conflict *in advance* and *in person* so that we can make alternate arrangements when necessary.

## Course grade

| Grade | %     | Grade | %     |
|-------|-------|-------|-------|
| A     | >93   | C     | 74-76 |
| A-    | 90-93 | C-    | 70-73 |
| B+    | 87-89 | D+    | 67-69 |
| B     | 84-86 | D     | 64-66 |
| B-    | 80-83 | D-    | 60-63 |
| C+    | 77-79 | E     | <60   |

| Points Distribution                   |            |
|---------------------------------------|------------|
| Mid-term <sup>a</sup>                 | 100        |
| Belizean organism papers <sup>b</sup> | 40         |
| Final Exam <sup>a</sup>               | 120        |
| Participation                         | 20         |
| <b>Total Points</b>                   | <b>320</b> |

<sup>a</sup>Exams will include any of the following: multiple choice, matching, true/false, fill-in-the-blank, short answer, and essay questions. The final exam will include a cumulative component.

<sup>b</sup>Belizean organism papers. Each student will be assigned two primary literature articles, one highlighting a terrestrial organism, and a second highlighting a marine organism of Belize. Each student will write a short paper on each that provides: (1) a description of the organism's general biology and ecological role, and (2) a synopsis of the research conducted and key findings of the assigned journal article.

## Sakai

Sakai is a set of software tools designed to help instructors, researchers, and students create websites for collaboration. This important online resource will be used in BI 221 to post announcements, assignments, grades, and lecture outlines. You can access Sakai using your student ID and password at:  
<https://learn.anselm.edu/portal/>

## Academic Resource Center

The Academic Resource Center (ARC) offers students assistance in developing or refining the academic skills that lead to college success. For ARC hours and contact information visit their website at: [www.anselm.edu/Current-Students/Academic-Resources/Academic-Resource-Center](http://www.anselm.edu/Current-Students/Academic-Resources/Academic-Resource-Center)

## Cell phone policy

Cell phones, pagers, etc. are an unnecessary distraction and are not to be used in the classroom. Furthermore, because camera phones and text messaging have been used to cheat in university courses, handling a cell phone during an exam will be viewed as cheating. In such an instance, you will be escorted from the room and given a failing grade on the exam.

## Academic honesty

The standards of academic honesty are very high at Saint Anselm, and therefore it is recommended that you review the policy set forth in the Saint Anselm College Catalogue. Depending on the severity of the infraction, cases of cheating or plagiarism may result in a failing grade of the assignment/exam in question, failing grade in the course, or expulsion.

## Course Schedule

| Date   | Lecture Topic / Readings                                                                                                           | Description                                                                                                    |
|--------|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Jan 12 | Introduction to Tropical Biology<br>Reading: Ch. 1 (Forsyth & Miyata)<br>Introduction to tropical marine ecosystem and coral reefs | Course overview / Syllabus / Paper assignment<br>Life in the Tropics / Ecosystems of Belize                    |
| Jan 19 | Coral Reef Anatomy<br>Reading: Prologue, Chs. 1, 4, 25 (Kaplan)<br><b>BI 222 Deposit Due</b>                                       | Coral reef distributions / Structure and composition / Colony morphology / Zonation                            |
| Jan 26 | Coral Reef Community and Inshore Tropical Communities<br>Reading: Chs. 11, 22, 26 (Kaplan)                                         | Coral reef community structure / Mangrove community / Seagrass community                                       |
| Feb 2  | Behavioral ecology of coral reef organisms<br>Reading: Chs. 15 and 30 (Kaplan)                                                     | Invertebrates / Fishes / Species interactions (symbiosis, competition, predation, grazing)                     |
| Feb 9  | Belize barrier reef system<br>Reading: Chs., 13, 19, 31 (Kaplan)                                                                   | Introduction to the Belize Barrier Reef / Threats / Conservation / South Water Caye Marine Reserve             |
| Feb 16 | <b>Mid-term Exam</b><br>Discussion: BI 222 equipment/supplies                                                                      |                                                                                                                |
| Feb 23 | Introduction to Tropical Rainforests<br>Reading: Chs. 2, 3 (Forsyth & Miyata)<br><b>Marine Organism Paper Due</b>                  | Primer of forest community and ecosystem ecology / Rainforest soils / Fertility and nutrient cycling / Light   |
| Mar 2  | Winter Recess                                                                                                                      |                                                                                                                |
| Mar 9  | Tropical Rainforest Ecology<br>Reading: Chs. 4, 5, 6 (Forsyth & Miyata)                                                            | Rainforest structure and composition / Trees / Palms / Epiphytes / Vines and lianas / Flowers and pollination  |
| Mar 16 | Tropical Rainforest Ecology<br>Reading: Chs. 7, 8 (Forsyth & Miyata)                                                               | Fruits and seed dispersal / Chemical and other defenses / Rainforest biodiversity causes and consequences      |
| Mar 23 | Tropical Savannas<br>Reading: Laughlin, 2002 (Handout)<br>Lecture: Field Methods in Forest Ecology                                 | Introduction to tropical savannas / Pine savannas of Belize / Introduction to field data collection techniques |
| Mar 30 | Field Methods in Forest Ecology<br>**Note: 1:30 – 5:00 PM                                                                          | NH temperate deciduous forest data sampling<br>(Rain-out day Apr 20)                                           |
| Apr 6  | Easter Recess                                                                                                                      |                                                                                                                |
| Apr 13 | Underwater sampling methods<br>**Note: 1:30 – 5:00 PM                                                                              | Snorkel lessons / recording underwater observations / collecting underwater data                               |
| Apr 20 | Field Methods in Forest Ecology<br>Reading: Handout                                                                                | Documentary: Belize: reefs, reserves and ruins                                                                 |
| Apr 27 | Belizean History and Culture<br>Final Exam review<br><b>Terrestrial Organism Paper Due</b>                                         | Data analysis and results                                                                                      |
| May 7  | <b>Final Exam @ 9:00am</b>                                                                                                         |                                                                                                                |