

## MARINE ECOLOGY IN MOOREA, FRENCH POLYNESIA (ZOO 4926 / ZOO 6927)

### Tentative Course Syllabus (revised 16 October 2013)

Instructors: Mike Gil ([m.gil@ufl.edu](mailto:m.gil@ufl.edu)) and Craig Osenberg ([osenberg@ufl.edu](mailto:osenberg@ufl.edu))

#### Course description

This course has two core objectives: 1) provide a conceptual understanding of ecology with an emphasis on marine community ecology in tropical coral reefs, and 2) immerse students in field research, from conceptualization to final products (including formal presentations and reports). This course is an extended-spring offering; it includes regular bi-weekly classes on campus at UF (7 classes total), and it culminates in a 2-week field research trip to Moorea, French Polynesia, where student groups will lead their own research projects.

#### Grading

The course grade breakdown will be as follows:

- Assignments: 40%
- Participation: 15%
- Peer evaluation: 10%
- Final presentation: 10%
- Final report: 25%

#### Spring semester classes (on UF campus)

We will meet every other week in the spring semester for up to two hours to cover course content and engage in discussions designed to prepare students for independent field research.

#### Class 1: Introduction

- **Readings:** Course syllabus, Mittelbach, Ch. 1, 4, 12
- **Lecture:** Introduction to Ecology
- **Discussion:** Go over syllabus and discuss course objectives and expectations
- **Assignment due next meeting:** Create a list of three topics in ecology that interest you and describe (briefly) what you find most interesting about these topics.

#### Class 2: Key concepts in community ecology, Part I

- **Readings:** Mittelbach, Ch. 2-3, 14
- **Lecture:** Community assembly, succession and biodiversity
- **Discussion:** Formulating questions in science
- **Assignment due next meeting:** Using this week's readings as a guide, formulate a hypothetical research question and describe how you would begin trying to answer it. At a minimum, each response must include a list of independent and dependent variables you would explore, the experimental setting, and anticipated challenges with the chosen approach (no more than 1 typed page in length).

### Class 3: Key concepts in community ecology, Part II

- **Readings:** Mittelbach, Ch. 5, 7, & 9
- **Lecture:** Species interactions
- **Discussion:** Field research 101: research approaches, experimental design, replication, good research practices
- **Assignment due next meeting:** One day, while snorkeling in a reef you notice that there is a high abundance of sessile snails growing atop dead coral colonies. You decide to conduct a field experiment to test the effects of these snails on reef corals. Describe your experimental approach, including your control(s), treatments and how you will deal with potential confounding factors (no more than 1 typed page in length).

### Class 4: Coral reef ecology

- **Readings:** Kaiser et al., Ch. 10, Moorea Biocode Species Identification Guide.
- **Lecture:** Coral reef ecology
- **Discussion:** Group research project topic options
- **Assignment due next meeting:** Study reef species guide for quiz next class. Form research groups, begin discussing approach to research question(s), and create an annotated bibliography including at least 8 references.

### Class 5: Coral reefs of Moorea

- **Reef Biodiversity Quiz**
- **Readings:** Traçon et al. (2011)
- **Lecture:** Coral reefs of Moorea
- **Discussion:** Planning field methods for group research projects
- **Assignment due next meeting:** Methods summary, field research schedule, and field supplies list

**\*Field trip will be scheduled for springs to practice snorkeling and basic surveying techniques\***

### Class 6: Data analysis and interpretation

- **Readings:** TBA
- **Lecture:** Principles in data analysis and presentation
- **Discussion:** What to do with your data once you have them
- **Assignment due next meeting:** Expected results summary

### Class 7: Pre-departure session

- **Readings:** Pre-departure summary
- **Lecture:** None
- **Discussion:** Field logistics in Moorea

### **Field research trip (1-16 June, Moorea, French Polynesia)**

Student groups of 3-4, each advised by an instructor, will conduct intensive research out of the Richard B. Gump South Pacific Research Station on the island of Moorea in French Polynesia. Most days (10-12) will be broken down into a 3-4 hours of research in the morning, followed by an hour break for lunch and then 3-4 hours of research in the afternoon. Field research will be conducted using snorkel gear and surveying/manipulative techniques previously discussed in the course. Wet and dry lab space will also be available for use in student research projects. Though formal instruction will be limited during this time, class meetings and guest lectures will be planned during the evenings and between research activities on certain days. Class meetings will begin after students are introduced to field sites and given the opportunity to explore the reef and their research ideas in the field. The meetings will consist of the following:

**Meeting 1:** Discuss research projects in light of the system (a.k.a. the “reality check” phase).

Assignment: anticipated challenges to research project and amendments to proposed approach

**Meeting 2:** Discuss data collection plans and needs among groups. Assignment: re-examine and amend field research schedule

**Meeting 3:** Discuss data analysis and presentation

**Meeting 4:** Final group research presentations

### **Additional activities/excursions**

Students will have the opportunity to take part in additional activities and excursions, including:

- Thinking about grad school?: An instructor-led panel discussion on the ins and outs of graduate school in science
- Field trip to Tamae (the best beach and shore-access reef on the island)
- Field trip to Belvedere (the best non-treacherous lookout on the island)
- Traditional Tahitian feast (Atitia Tahitian Cultural Center)
- Tahitian dance exhibition (Atitia Tahitian Cultural Center)

### **Course texts:**

Kaiser et al. 2005. Marine Ecology: Processes , systems and impacts. Oxford.

Mittelbach, G. G. 2012. Community Ecology. Sinaur.

Ricklefs, R. E. 2008. The Economy of Nature. Freeman.

Trapon, M. L., M. S. Pratchett, and L. Penin. 2011. Comparative effects of different disturbances in coral reef habitats in Moorea, French Polynesia. Journal of Marine Biology 2011:1-11.