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Tropical marine wildlife ecology begins with a series of online lesson modules to prepare students for two weeks of fieldwork on the Bay Islands, Honduras. Lesson modules introduce students to the fishes, turtles, algae, and invertebrates forming the ecological communities found off the island of Roatan, Honduras. New interactive lesson modules both introduce students to the members of the bottlenose dolphin (*Tursiops truncatus*) pod we will study and help them to build their ID skills before travelling to Honduras. Online activities have been specifically designed to prepare students to participate in a study analyzing the complex social network of dolphins. The nested nature of bottlenose dolphin alliances is arguably more complex than cooperation behavior in any non-human mammal and will be studied using a combination of network analysis and experiments involving ‘synchronous innovate behavior trials’.

The two-weeks spent studying abroad will also include observing and comparing a variety of different coral reef and marine communities within the Mesoamerican reef system (second in size only to the Great Barrier Reef of Australia), snorkeling through mangroves, conducting hands-on work with dolphins (*i.e.,* training and husbandry), snorkeling with a dolphin pod, and exploring the local island culture. While in Honduras students also have the opportunity to observe the diverse terrestrial fauna- including anoles (*e.g.*, *Anolis allisoni*), basilisks (*Basiliscus vittatus*), key deer (*Odocoileus virginianus clavium*), tropical birds, and the endangered Roatan island agouti (*Dasyprocta ruatanica****)***.

Upon completion of this course the successful student will be able to:

* Distinguish between major families of Caribbean reef fishes
* Identify major invertebrate groups inhabiting the Mesoamerican reefs of the western Caribbean
* Demonstrate proficiency at identifying species of indicator fish inhabiting the reefs surrounding the Island of Roatan, Honduras
* Interpret results of indicator reef fish surveys
* Conduct reef monitoring and data collection
* Demonstrate the ability to identify dolphins that are swimming and interacting with other members of the RIMS pod
* Demonstrate the ability to identify and record behavioral signaling among bottlenose dolphins
* Collect, analyze, and interpret behavioral data
* Analyze data and draw conclusions based on quantitative evidence
* Demonstrate proficiency at discussing scientific findings in a written report
* Demonstrate an ability to employ critical thinking, quantitative analysis, and hypothesis-driven methods of scientific inquiry
* Engage and educate others about important issues in marine conservation
* Reflect on intercultural learning through journaling

Online instruction 4/1/17 through 6/24/17 (Followed by field work on the Island of Roatan Honduras Dates TBA)

|  |  |  |  |
| --- | --- | --- | --- |
| **Online Module Topics\*** | **Start**  | **End**  | **Assignments**  |
| 1. **Icebreaker Activities** [orientation & meet your classmates]
 |  4/1 | 4/8   | **Readings:** Read all Course Information Documents. **Complete by 4/10****Synchronous videoconferencing (Zoom.com) icebreaker [TBA]** |
| **2.  Introduction to the Marine Environment and Reef Ecology** | 4/4  | 4/25  | **Readings:** Lesson Module**Quizzes\*** [**Due 4/25]**1. World Ocean and Geologic Province Quiz
2. Physical Oceanography Quiz

\* Each quiz may be taken up to 3 times, with highest score recoded.**Graded Discussion:** Impacts of Climate Change on Reef Ecology **[Complete by 4/25]** |
| **3.  Invertebrate Reef Organisms Found Off Roatan, Honduras**  | 4/25  | 5/16  | **Readings:** Lesson Module**Quizzes\*[Due 5/16]*** Algae Self-quizzes [completion only]
* ID Self-Quiz 1 [completion only - to help prepare for practical in Honduras]
* ID Self-Quiz 2 [completion only - to help prepare for practical in Honduras]
* ID Quiz\* 3 [graded assessment]
* ID Quiz\* 4 [graded assessment]
 |
| **4.  Marine Vertebrates of Roatan, Honduras**  | 5/16 | 6/6 | **Readings:** Lesson Module**Quizzes\* [Due 6/6]*** Fish and Invertebrate ID Quiz Series [completion only - to help prepare for practical in Honduras]
* ID Quiz 3 [graded assessment]
* ID Quiz 4 [graded assessment]
 |
| **5. Introduction to Dolphin Behavior** | 6/6  | 6/24  | **Readings:** Lesson Module **Class discussion (online and videoconferencing)** Dolphin ID Quiz Series [completion only] ID Quiz 5 [graded assessment held in Honduras] |

\*Module access opens one week prior to official start date.

**Sample Honduran Field Schedule**

**[Day 1] Sat**

Arrival and check in: Orientation to AKR and complimentary welcome drink. Unpack, settle in and explore AKR grounds.

**5:00 Orientation to Roatan Institute of Marine Sciences [RIMS]**

6:30 *Dinner at AKR*

**[Day 2] Sun**

7:00 *Breakfast at AKR*

**8:00 Lecture on the RIMS Coral Restoration Program**

10:15 Reef snorkel -- introduction to the marine environment of Roatan

12:00 *Lunch at AKR*

**1:00-2:00 Dolphin Lecture1 [Evolutionary history, anatomy & physiology and senses]**

2:30-4:45 Introduction to conducting behavioral research [review dolphin identification characteristics, conducting surface observations]

6:30 *Dinner at AKR*

**[Day 3] Mon**

7:00 *Breakfast at AKR*

**8:00 1st Dolphin Swim [beach encounter & open swim]**

10:00 Bus to Maya Key

10:30 Reef snorkel

12:00 *Lunch* ~ *Osgood Key Beach Picnic*

1:00 Tour of Animals and Mayan Cultural Center

2:15 Return back to RIMS on Bus

4:00-5:00 Practice session for dolphin behavior study

6:30 *Dinner at AKR*

**[Day 4] Tue**

7:00-8:00 Dolphin **Husbandry Session #1 [help prepare diets]**

8:00 *Breakfast at AKR*

**9:00 Dolphin Lecture 2** **[dolphin intelligence, cognition & communication, social dynamics and conservation]**

10:15 Reef snorkel

12:00-1:00 *Lunch at AKR*

1:00-2:00Free Time

2:15Reef snorkel

4:00-5:00 Dolphin behavior study

6:30-9:00 *Dinner at AKR*

**[Day 5] Wed June 3**

7:00-8:00 Dolphin behavior study

8:00-9:00 *Breakfast at AKR*

10:15 Reef snorkel

12:00 *Lunch at AKR*

**1:00-2:00 Dolphin Lecture 3** –[Training and Research]– **Teri Bolton**

2:15 Reef Snorkel [mapping benthic community]

4:00 Free time

5:00-10:00 ***BBQ Fiesta on the Key [Key-reggae, limbo, Garifuna dancers]***

**[Day 6] Thur**

7:00-8:00 Dolphin behavior study

8:00-9:00 *Breakfast at AKR*

**9:00 Mangrove Lecture**

10:15 Man-o-War Key Mangrove root snorkel

12:00-1:00 *Lunch at AKR*

1:00 **Lecture on coral reef threats** [Roatan’s changing reefs] and RIMS long-term reef monitoring project

2:15 Reef Snorkel

4:00-5:00 Free time

**6:00 Night Dive/snorkel Lecture** [community structure on the reef at night]

6:30 Night dive/snorkel

8:00-9:00 *Dinner at AKR*

**[Day 7] Fri**

6:45-7:15 *Breakfast at AKR*

7:30-8:15 Dolphin behavior study

**8:15 Dolphin Training Session** [hands-on introduction to the positive reinforcement training process used at RIMS]

10:15 Reef Snorkel - Sea grass and patch reef snorkel [organism collection and ID]

12:00 *Lunch*

1:00 Island tour – to Oakridge for mangrove boat tour and West End for souvenirs

7:00-9:00*Dinner at AKR*

**[Day 8] Sat**

7:00-8:00 Dolphin behavior study

8:15-9:15 *Breakfast at AKR*

9:15-11:30 Data analysis session

12:00-1:00 *Lunch at AKR*

1:00 Free time

4:00-5:00 Dolphin behavior study

6:30-9:00 *Dinner at AKR*

**[Day 9] Sun**

*Breakfast at AKR*

7:00-8:00 Dolphin behavior study

8:15-9:15 *Breakfast at AKR*

9:15-11:30 Data analysis session

12:00-1:00 *Lunch at AKR*

1:00 Free time

4:00-5:00 Dolphin behavior study

6:30-9:00 *Dinner at AKR*

**[Day 10] Mon**

7:00 *Breakfast at AKR*

**8:30** Bus to Oakridge fishing community

10:00 Dory ride through mangroves

11:30 *Lunch* at Oakridge

12:30 Return trip to AKR with stop for souvenir shopping

4:00 Dolphin study

6:30 *Dinner at AKR*

**[Day 11] Tue**

7:00-8:15 Dolphin behavior study

8:30-9:30 *Breakfast at AKR*

10:15 Reef snorkel

1:00 Free time

4:00-5:00 Dolphin behavior study

**5:15 Sea Turtle Talk [natural history, nesting, hatchlings & conservation]**

6:30 *Dinner at AKR – discussion of reef fish community structure*

**[Day 12] Wed**

7:00-8:30 Dolphin behavior study

8:30-9:30 *Breakfast at AKR*

10:15 Reef snorkel

12:00-1:00 *Lunch at AKR*

**1:00-2:00 Dolphin Husbandry Session #2 [medical protocols]**

2:00 Free time

4:00-5:00 Dolphin behavior study

6:30-9:00 *Dinner at AKR – discuss dolphin behavior study*

**[Day 13] Thur**

7:00 *Breakfast at AKR*

**8:00 Dolphin Swim [beach encounter & open swim]**

10:15 Data analysis and interpretation

12:30 *Lunch at AKR*

**1:00-2:00** Free time

2:15 Reef Snorkel

**4:00 Horseback Riding (optional)- need to signup upon arrival at AKR**

5:00-10:00 ***BBQ Fiesta on the Key [Key-reggae, limbo, Garifuna dancers]***

**[Day 14] Fri**

7:00-8:30 Dolphin behavior study

8:00-9:30 *Breakfast at AKR*

**10:00** Data analysis and interpretation

12:00-1:00 *Lunch at AKR*

1:00 Free time

2:15 Reef Snorkel

4:00-5:00 Dolphin behavior study

**6:00 Group discussion of reef surveys and dolphin research project**

8:00-9:00 *Dinner at AKR*

**[Day 15] Sat**

7:30-8:15 Final visit to Bailey’s Key: say goodbye to dolphins

8:00 *Breakfast at AKR* [Flight Departs Roatan, Honduras in afternoon]