

ENV-3190J Tropical Marine Biology Field Course 2019-2020

COURSE DESCRIPTION

This course is aimed to highlight the importance of tropical marine biology to study the biology and the interaction of marine species that we will discover in the Pacific coast of Costa Rica. Marine ecosystems of the eastern tropical Pacific provide a baseline source for species of high commercial interest in satisfying humans demand for food worldwide. However, numerous marine species are threatened by unsustainable human activities, such as overfishing and habitat destruction. We will develop a critical understanding of concepts and application in Marine Biology, where the students will also be introduced to a wide range of practical activities by visiting field stations and natural laboratories in Costa Rica.

COURSE OBJECTIVE

The objective of this course is to obtain a general comprehension of concepts, issues, and application pertinent to tropical marine biology. We will study Costa Rican marine ecosystems, biodiversity and environmental issues through field trips to coral reefs, sandy and muddy beaches, mangroves and estuaries. We will also learn about integrated coastal management approach and some cases of studies.

- Program Dates:
 - 2 weeks Online **Dec 4 – 14, 2019**
 - 2 1/2 weeks in Costa Rica with lectures and field sessions **January 6 –22, 2020**
- Hours and credits: 20 online hours, 25 lecture hours, 35 field session hours (6 US credits)

Program Objectives:

The purpose of this program is to expose exchange students to:

- General comprehension of the concepts and issues addressed in marine biology.
- Costa Rican marine ecosystems, biodiversity and environmental issues through field trips and fieldwork in coral reefs, sandy and muddy beaches, mangroves and estuaries.
- The importance of integrated coastal management.

ON-LINE CONTENTS:

1. The Region: Biogeography of Central American Isthmus
Marine and coastal environments in Costa Rica
2. Introduction to Tropical Marine Biology
3. Physical and Chemical Oceanography
4. Tropical Marine habitats: Reefs
5. Tropical Marine habitats: Intertidal zones
6. Tropical Marine habitats: Mangroves and estuaries
7. Global Warming in marine ecosystems

On-line Evaluation:

Important note: Each student must be punctual when making delivery of the requested documents in each of the tasks, because otherwise the student **will lose the total score in their assignment**.

Personal presentation and letter of interest → 5%

Each person must write a small letter, explaining why he/she decided to take the course, what expectations it has, what it is currently studying, or whether it is professional in any area. You must include a photograph doing some activity that will passionate you or a photo of your own that you want to share.

Readings and assignments → 35%

Each student on each day of the online course will receive a scientific article or a technical document. The student will do their reading and as directed by the teacher, the student will have to solve a questionnaire, make a summary, essay or diagram related to the assigned reading. Each assignment must be sent on *Canvas* platform according to the date determined by the professor.

Research proposal → 10%

Format: (Times New Roman, Source: 12 to 1.15 spacing).

Description: Each topic should address the same logical structure that is covered throughout its bibliographic review:

1. Introduction to the topic (bibliographic **citations** should appear).
2. Source of the problem (bibliographic **citations** should appear).
3. Scope of the problem at the global and regional level in the case of Costa Rica (bibliographic **citations** should appear).
4. Examples to solve the problem (bibliographic **citations** should appear).
5. The document containing a minimum of three (3) pages without counting the consulted bibliography.
6. Bibliography (**minimum 10 bibliographic references** quoted in the APA 6th edition format).

ON-SITE CONTENTS & ITINERARY:

Note: Due to the intensity of the program, students have to study all readings and materials before their arrival and during their free time. Furthermore, students will develop a final presentation (max. 20 minutes) on previously established topics concerning marine animals, ecosystems and management issues, which will be presented to the class during the last days. Each group can prepare their topic before their arrival; however, emphasis is on on-site documentation and interviews with local people. Each topic will be addressed throughout the entire field trip by the professor, but students are expected to deepen their knowledge whenever possible, by asking the teacher, guides, community members, etc. and document their observations with own photos. The goal of this evaluation is to train students in on-site research and documentation to address and solve a particular problem. Students will evaluate the other student's presentation as well as their own. Topics will be shared with the students during the on-line courses.

The final exam constitutes an oral evaluation on the topics presented. The teacher will evaluate each answer together with the group who presented a particular topic and on which content students of other groups were evaluated.

On-site Evaluation:

Video-field trip activities → 15%

It will be evaluated in groups, according to the number of students, by means of a video report of field which must contain:

- The name of the students, the name of the course, as well as the logo of Veritas University and the logo of the University of origin each student.
- The content of the video will evaluate the registration of all the activities carried out in the field and in the laboratory in the video.
- The video can be narrated by the voice of the students or by means of key text that introduces each activity.
- The video must have a minimum duration of 3 minutes 30 seconds.

Final research presentation → 35%

The oral presentation will be group, according to the number of students, will be exposed to the rest of the class and must contain the following aspects:

- Cover with the title of the research, name of the students, name of Veritas University, the University of origin of the students.
- Research objectives.
- Questions to develop in the exhibition.
- Introduction to the topic.
- Methods and materials used to collect information in these should appear: expert interviews, interviews with local people, interviews with tourists, taking audiovisual material (photos, videos, and surveys) to support the information collected.
- Important results, discussion and possible solutions to the problem posed.
- The bibliography must present a minimum of 10 references, these must be published scientific articles.
- Each group of students will have 20 minutes to expose their topic.

TENTATIVE PROGRAM SCHEDULE

January 5 (Sunday)	Activities: Welcome to COSTA RICA.
	Airport Pick up.

January 6 (Monday)	BIOMOL – Veritas Campus.
8:05 am	Course Overview and Field itinerary.
9:00 am	-Information about the course and field trips. -Basic concepts.
11:00 am	-Introduction to individual research projects.
12:00 pm	Lunch at Veritas.
13:00 – 15:00 pm	-Species identification of sharks, rays and bony fishes (laboratory identification).
18:00 pm	Dinner with San Jose Host families.

January 7 (Tuesday)	Leave to BIOMOL – Veritas Campus.
7:00 am	Breakfast with the host families.
8:30 am	Leave to Curú Wildlife Reserve (ON TIME!!!).
10:45 am	Takes the tickets for the ferry: Puntarenas-Paquera
11:00 am	Boarding the ferry.
12:20 am	Check-in to the hostel
1:00 am	Lunch on the hostel-restaurant.
4:30 pm	-Bioluminescence night (TOUR) in Curú Wildlife Reserve. (This includes a snack)
8:00 pm	Dinner on hostel-restaurant.

January 8 (Wednesday)	Curú Wildlife Reserve.
8:00 am	Breakfast on the hostel-restaurant.
9:00 am	-Guided hike in Curú Wildlife Reserve.
10:30 am	-Paquera high school sustainability project.
12:00 pm	Lunch in the high school of Paquera.
18:00 pm	-Meeting: Responsible Fishing.
19:15 pm	Dinner on Fisheries Association.

January 9 (Thursday)	Curú Wildlife Reserve.
7:15 am	Breakfast on the hostel-restaurant.
8:30 am	-Discovery diving & snorkel.
12:00 – 2:30 pm	Lunch on Reserva Playa Tortuga (RPT) and free time on the beach.
Afternoon	-Start fish census for identification (using the videos that the students took on the field).
19:00 pm	Lunch on the hostel-restaurant.

January 10 (Friday)	Leave to Curú Wildlife Reserve.
7:15 am	Breakfast on the hostel-restaurant.
8:45 am	Takes the tickets for the ferry: Paquera-Puntarenas.
9:00 am	Boarding the ferry.
10:15 am	Road to Reserva Playa Tortuga (RPT) from Puntarenas.
12:00 pm	Lunch on road.
17:00 pm	Check in Reserva Playa Tortuga (RPT).
17:30 pm	-Introduction to Reserva Playa Tortuga (RPT) projects. -Protocol for extraction of tissue samples, manipulation and morphology measurement of rays species.
19:30 pm	Dinner at RPT.

January 11 (Saturday)	Reserva Playa Tortuga (RPT).
8:00 am	Breakfast at RPT.
9:00 am	-Field work in Terraba-Sierpe river (sampling of rays and use traps for bony fishes).
12:00 pm	Lunch on the field.
18:00 pm	Dinner in RPT.
19:15 pm	- Night census crocodiles: (Grupo 1), el recorrido en los alrededores del río cercano a la reserva. - Monitoreo de serpientes: (Grupo 2), buscar serpientes en los senderos de la reserva.

January 12 (Sunday)	Reserva Playa Tortuga (RPT).
8:00 am	Breakfast at RPT.
9:00 am	-Field work at Terraba-Sierpe river (sampling of rays and use traps for bony fishes).
12:00 pm	Lunch on the field.
18:00 pm	Dinner at RPT.
19:15 pm	- Night census crocodiles: (Grupo 2), el recorrido en los alrededores del río cercano a la reserva. - Monitoreo de serpientes: (Grupo 1), buscar serpientes en los senderos de la reserva.

January 13 (Monday)	Reserva Playa Tortuga (RPT).
7:30 am	Breakfast at RPT.
8:30 am	Leave for Caño Island.
9:30 am	Snorkel activities at Caño Island (identification of marine organism using videos).
12:00 md	Lunch in a beach.
18:00 pm	Dinner at RPT.
19:00 pm	Video-Fish Identification (ID)

January 14 (Tuesday)	Leave of Reserva Playa Tortuga (RPT).
7:30 am	Breakfast at RPT.
8:30 am	Return to San José.
12:00 md	Lunch on the road.
	Free afternoon.
18:00 pm	Dinner with host families

January 15 (Wednesday)	Road to South Caribbean (Cahuita - Pto. Viejo).
8:00 am	Breakfast with host families.
9:00 am	Leave to South Caribbean.
12:00 am	Lunch on road.
13:00 pm	Check in the hostel.
15:00 pm	-Exploratory snorkel; rays identification (capture and processing). -Traps for bony fishes.
18:00 pm	Dinner in the restaurant.

January 16 (Thursday)	South Caribbean (Cahuita - Pto. Viejo).
7:45 am	Breakfast in the restaurant.
9:00 am – 12:00 pm	-Capture of Lionfish. -Snorkeling.
12:00 pm	Lunch at the beach.
13:00 – 15:00 pm	-Lecture about the Lionfish problematic in the region. -Processes of the Lionfishes.
18:30 pm	Dinner in the restaurant.

January 17 (Friday)	South Caribbean (Cahuita - Pto. Viejo).
8:00 am	Breakfast in the restaurant.
9:00 am – 12:00 pm	-Exploratory snorkel; rays identification (capture and processing). -Traps for bony fishes.
12:00 pm	Lunch at Veritas Campus.
13:00 – 15:00 pm	-Exploratory snorkel; rays identification (capture and processing). -Traps for bony fishes.
18:30 pm	Dinner in the restaurant.

January 18 (Saturday)	Leave to South Caribbean (Cahuita - Pto. Viejo).
8:00 am	Breakfast in the restaurant.
9:00 am	Leave to San José.
12:00 pm	Lunch on road.
Free afternoon	
18:00 pm	Dinner with the host families.

January 19 (Sunday)	BIOMOL – Veritas Campus
8:00 am	Breakfast with host families.
9:00 am – 12:00 pm	-Introduction to Molecular Conservation Biology. -DNA extraction of shark fins samples and PCR.
12:00 pm	Lunch at Veritas Campus.
13:00 – 15:00 pm	-DNA extraction of shark fins samples and PCR (continue). -Electrophoresis process and analysis of the results in the UV_transilluminator.
18:30 pm	Dinner with host families.

January 20 (Monday)	BIOMOL – Veritas Campus
7:15 am	Breakfast with the host families.
8:30 am – 12:00 pm	-Electrophoresis process and analysis of the results in the UV_transilluminator. -Start to work in the laboratory report.
12:00 pm	Lunch at Veritas Campus.
13:00 – 15:00 pm	-Continue working in the laboratory report.
18:00 pm	Dinner with the host families.
20-21:30	Optional Tropical Dance Classes on Campus at zone 7 (please take the Shuttle service to arrive and to leave back to homestays)

January 21 (Tuesday)	BIOMOL – Veritas Campus
7:00 am	Breakfast with the host families.
8:00 am - 12:00 pm	-Presentation of laboratory report. -Individual preparation for final presentation (can use campus resources and computer labs) and video field report.
12:00 pm	Lunch at Veritas Campus.
13:00 - 17:00 pm	-Individual preparation for final presentation (can use campus resources and computer labs) and video field report.
19:00 pm	Dinner with the host families.

January 22 (Wednesday)	BIOMOL – Veritas Campus
7:00 am	Breakfast with San Jose Host families.
8:00 am - 12:00 pm	-Exposition of final research presentation and video field report.
12:00 pm	Lunch at Veritas Campus.
13:00 pm - 15:00 pm	- Exposition of final research presentation and video field report.
18:00 pm	Dinner with San Jose Host families.
20-21:30	Optional Tropical Dance Classes on Campus at zone 7 (please take the Shuttle service to arrive and to leave back to homestays)

January 23 (Thursday)	Activities: Departure.
	Airport Drop off.