UF UNIVERSITY of FLORIDA & FLORIDA STATE UNIVERSITY

# Biology of Sharks and Rays

Dr. Dean Grubbs, FSUCML & Dr. Gavin Naylor, FLMNH, UF

## Field Course May 31 –June 13, 2020


Biology of Sharks and Rays (4 cr.) Instructors: Dr. Gavin Naylor, (UF) and Dr. Dean Grubbs, (FSUCML)

Pre-requisites: This course is open enrollment targeted toward upper level undergraduates and beginning graduate students. However, it is strongly recommended that prospective students contact the instructors prior to signing up as there is a strong field component and students will be working without many of the comforts with which they might be accustomed. (gnaylor@flmnh.ufl.edu ; dgrubbs2@fsu.edu )

# Biology of Sharks & Rays May 31 – June 13, 2020

COURSE NUMBER: ZOO 4926 (undergrad) & ZOO 6927 (grad) Biology of Sharks and Rays (4 cr. hrs)

Prerequisites: lecture and lab courses in vertebrate animal diversity or permission of instructors.

DATES: May 31-June 13, 2020. (FSU Coastal & Marine Lab dates: May 31-June 6; Seahorse Key Marine Lab dates: June 7-13).

COSTS: Program Fee is $1050.00 per student plus fees for 4 credit hours (University of Florida Credit hour fees: undergrad in State: $850.84. graduate in state: $2,122.77). Registration: UF students register through UF portal. FSU students register here as transients: https://registrar.ufl.edu/registration/transients. Drop/Add deadline May 11-12, 2020

The last day to pay or defer tuition, housing, or fees for all students, without a $100.00 late fee is May 22, 2020.

INSTRUCTORS - Instructors: Dr. Dean Grubbs (FSUCML, dgrubbs2@fsu.edu ) & Dr. Gavin Naylor (FLMNH, UF, gnaylor@flmnh.ufl.edu ).

Course Description: Biology of Sharks and Rays is an immersion course geared towards upper level undergraduates and graduate students wishing to pursue research involving sharks, skates, rays and chimaeras. Information will be disseminated through a combination of lectures, laboratory assignments, and field exercises. The course will focus on the extant diversity of elasmobranch fishes, their evolution, zoogeography and ecology. We will cover form, function, physiology and ecology of different species of elasmobranchs emphasizing adaptations to different habitats. Toward the end of the course we will cover contemporary challenges associated with fisheries management of elasmobranch populations and their conservation. The course will have a strong field component, introducing students to some of the species of elasmobranchs that inhabit the varied estuarine, marine, and deep-sea habitats of the northern Gulf of Mexico. Students that complete this course will gain an understanding of (1) The evolutionary history of sharks and rays (2) The forces that have shaped their diversity and biogeographic patterns, (3) The variation in life history and ecology that is exhibited across the group (4) The physiological, behavioral and morphological adaptations that have allowed elasmobranchs to colonize different habitats. At the conclusion of the course, students will be able to identify the species that occur in the Gulf of Mexico, become familiar with a variety of sampling and tagging methods that are used to study their biology, and explain major environmental and historical influences that have shaped species abundances and distributions.

TEXT & READINGS: There is no text required for the course. All required handouts, readings, and lecture presentation outlines will be provided in class or posted on the web.

FISH IDENTIFICATION: Students will be expected to be able to identify and understand the taxonomy and phylogenetic relationships among species studied in the lab.

FIELD TRIPS: We will sample marine, and estuarine habitats over a series of field trips (weather permitting) based out of FSU Coastal and Marine Lab (May 31 -June 6 ) and Seahorse Key (June 7-13)

LAB ASSIGNMENTS: Laboratory assignments will center around two main topic areas: (1) species identification and (2) comparative anatomy. Students will carry out dissections and prepare a shark or ray jaw or chondrocranium for museum display and evaluate the utility of anatomical features for studying adaptation, ontogeny, and evolutionary relationships. These are time consuming projects that will take up most of the labs during the FSUCML portion of the course: Dr. Grubbs is building an elasmobranch skeletal collection to be housed at the FSU Coastal and Marine Lab. The work you carry out during the course will contribute toward this effort. You will be assigned a species for your jaw preparation, based on availability, during the first evening's lab. Time is built into the schedule to complete the assignment though it will require work after hours. You will be expected to review the primary literature associated with the species you work on. At the end of the class, you will present your preparation to the class describing the skeletal features that are distinctive and interpret these in light of the evolutionary history, life history, ecology, physiology, and behavior of the species.

LAB PRACTIAL: Lab practical format will be short answer / fill in the blanks. You are expected to be able to identify any shark or ray examined in lab to species. Also, you should be able to identify internal and external structures and their basic functions. Questions about habitats and ecology may also be asked.

EXAMS: There will be one lecture exam, a final that will cover all the material covered over the entre course period. GRADING: Grading will be based on the final exam score (30 pts), lab practical (30 pts), osteological presentation (20 pts), and participation (20pts).

| Staying at FSUCML (May 31- June 6)<br>3618 Coastal Highway 98 St. Teresa, FL \| 32358<br>Phone: 850-697-4120<br>*www.marinelab.fsu.edu* | Staying at Seahorse Key (June 7-13)<br>552 1st Street Cedar Key, FL 32625<br>Phone: 352-325-6078<br>*https://ncbs.ifas.ufl.edu/seahorse-key-marine-laboratory/facilities/* |
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| Week No. 1 will take place at the FSU Coastal & Marine Lab, 50 miles from the main FSU campus in St. Teresa, FL. Students will drive to St. Teresa in their own vehicles to arrive at the lab no later than 2:00pm on May 31 2020. Students and instructors will stay in FSUCML dormitories. Linens (twin sheets, pillow case, blanket, towel, and washcloth) will be provided. Dorm quiet hours are from 10 PM to 7 AM.<br><br>WHAT TO BRING: The lab is remotely located from any shopping - no fast food, no pharmacy, or major grocery stores within a 30 minute drive so bring what you think you will need in supplies and food. Linens provided (see above).<br><br>DINING: All cooking and dining will take place in the dorms, where there is access to a kitchen. Each student and faculty member will fend for him/herself for breakfast and lunch. We will have a communal evening meal each night. Students will rotate, with a different group responsible for the cooking each night. Mark all food items with your name since you will be sharing refrigerator space. A visitor's guide in each dorm provides a list of restaurants and grocery stores if you need toresupply. | Week No. 2 will take place at the Seahorse Key Marine Lab, which is only accessible by boat. Students are responsible for their own trans-portation from FSUCML to the dock at Cedar Key, and are expected to arrive no later than 2:00pm June 7th. Parking is available in the parking lot near the dock. A boat will transport students to Seahorse Key, where both students and instructors will live in Lighthouse dorms<br><br>WHAT TO BRING: This lab is on an island so bring what you think you will need to drink (water, sodas, tea) or eat (breakfast & lunch for 6 days). Bring a sleeping bag, pillow, towel and linens (note: linens are NOT provided at Seahorse Key).<br><br>DINING: All cooking and ding will take place in the dorms, where there is access to a kitchen. Each student and faculty member will fend for him/herself for breakfast and lunch. We will have a communal evening meal each night for which there will be a nominal charge. Students will rotate, with a different group responsible for cooking each night. Mark all food items with your name since you will be sharing refrigerator and cooler space. |

CLOTHING AND FIELD GEAR -- Field clothes, rain jacket, bathing suit, shoes that can get wet and dirty (flip flops are NOT acceptable; only close-toed and heeled shoes are worn in the field and on boats), hat, sun block, and insect repellent. Bring towels with you that you can take in the field. Seahorse Key is very rudimentary with few facilities. However, there will be a washer and drier at the FSUCML (located outside dorm 5 on the waterfront) during the first part of the course. You must bring your own laundry supplies (Please ONLY use HE detergent in the washer)

WIFI: There will be WiFi via the GUEST connection at the FSUCML for the first part of the course. No TV is available at either of the 2 field stations.

RESTRICTIONS: No alcohol or pets permitted at either of the two marine labs.