

Cape RADD

Marine Biology Field Course Information Document



Language of instruction: English

Course duration: 2 / 3 / 4 weeks

Prerequisite:

All Cape RADD marine biology field course candidates must possess a diving certification from an internationally recognized training agency and personal dive insurance. (Certification can be completed any time before the 1st week of the course). *Personal dive insurance (e.g. DAN) is highly recommended.

Course Description

This is an exciting and unique opportunity for you to develop as a SCUBA diver, freediver, field biologist, or conservationist and to broaden your horizons as a wildlife enthusiast. The course introduces students to diving knowledge and techniques with broad applications but will focus on using scuba and freediving research techniques to better understand rocky reef and kelp forest communities along the coastal waters of the Cape Peninsula. Students will learn and apply several internationally recognized research methods in the field.

The first week will be focused on developing your SCUBA diving skills. This includes the internationally recognized SSI Open Water Diver course for those who need to learn and refresher and acclimatization dives for those already qualified. Once you are comfortable in the water, we will start Cape RADD's scientific diving courses, which include both theoretical and practical elements. During the rest of the course, you will conduct dive surveys, collecting data on selected research projects. You will survey various dive sites along the Cape Peninsula Marine Protected Area, using methods selected from those discussed in class. You will be accompanied by field biologists and/or dive instructors during field work.

You will have plenty of free time to explore Cape Town. After course hours and on weekends, you're welcome to enjoy the many experiences the city and its surroundings have to offer.

Learning Objectives

Upon completion of the Cape RADD course, students will gain:

- Fundamental knowledge, develop skills, and understand the research methodology necessary to conduct underwater scientific investigations, particularly in temperate marine environments.
- Vast SCUBA and free-dive experience in sometimes challenging conditions and the ability to prepare a dive objective and safety briefing.
- Proficiency in underwater identification of Southern African fish, sharks, algae, and major invertebrate groups.
- Experience conducting globally and regionally used methodologies for the study of rocky reef and kelp forest ecosystems.
- Familiarity with the use of underwater equipment and effectiveness under various conditions.

Methods of Instruction

The course will feature engaging presentations on the diverse field techniques and analytical methods we employ in our research. Each classroom session is followed by practical, hands-on fieldwork, giving you the opportunity to apply what you've learned in real-world conditions. These practical sessions may include SCUBA dives, freediving, or snorkeling excursions, during which you will practice and refine the specific survey or data collection method covered in the presentations. By alternating between theory and immersive field experience, you will develop both the technical skills and the confidence needed to conduct independent marine research.

Training dives

For students who still need to complete their open water diving certification, training will take place either in the pool or in open water and will cover three key components: dry skills (practicing skills on land before performing them in the water), wet skills (mastering those skills underwater), and a series of in-depth dive briefings and presentations to prepare you for safe and confident diving.

Students who are already Open Water certified will take part in a series of **refresher and acclimatization dives**. These dives are designed to fine-tune buoyancy, improve comfort in the water, and ensure all participants are fully prepared before introducing more complex scientific diving tasks.

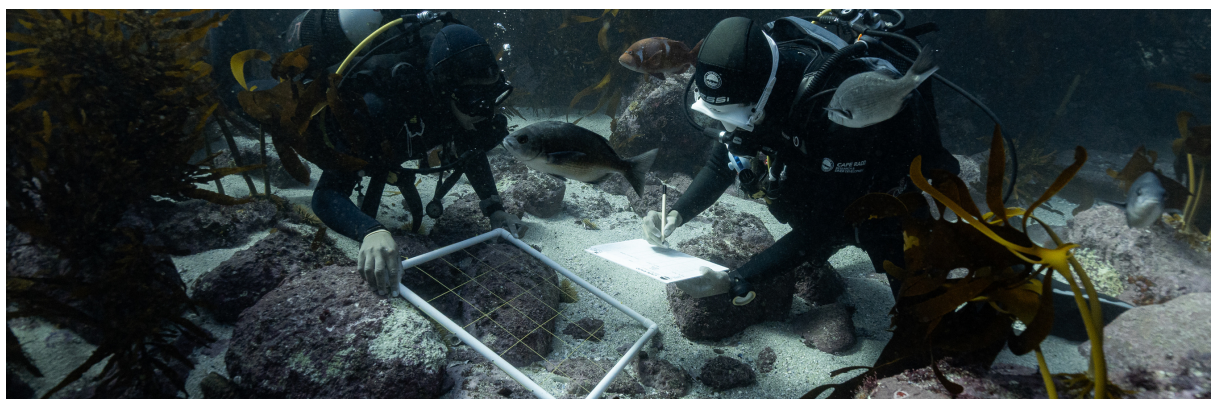
Before each research expedition, you'll receive a detailed project overview and a comprehensive dive briefing from the dive leader. This will outline the objectives, methods, and any safety considerations for the day. By the time you enter the water for data collection, you'll be confident in both the diving and the science.

These are the types of dives you may undertake during the course:

1. Scientific diving sampling methods practical dives: A practical on how different equipment is used underwater for sampling.
2. Citizen Science Roving Diver snorkel survey: Systematically exploring a dive site to observe target species.
3. Fish visual transect dive: Moving along a predetermined transect line and noting the number and species of fish in an area.
4. Invertebrate belt transect surveying dive: Using belt transect sampling techniques to quantify macroinvertebrates along a transect line.
5. Kelp surveying dive and snorkel: Identifying and quantifying the density of kelp species in an area.
6. Nudibranch survey dive: Using the roving diver survey to search for nudibranchs along a predetermined dive route.
7. Shark egg case survey: Using the roving diver survey to search for shark egg cases and analyze them underwater.

*NOTE: Our dive days are weather-dependent.

Research Projects



At Cape RADD, our research is shaped by curiosity and a passion for understanding the ocean. While our focus may evolve as projects wrap up and new questions surface, we're always working to expand our knowledge of the marine environment. Our long-term monitoring projects provide valuable insight into the health of our ocean ecosystems, while shorter-term studies allow us to respond to emerging challenges and opportunities. We share updates so you can follow along with our latest discoveries and research goals.

During your time with us, you'll take part in several of our ongoing research projects, gaining hands-on experience with real-world marine science. You'll then work in a small group to design and carry out your own short-term research project, applying the knowledge and skills you've developed throughout the course. This "mini project" will take you through every stage of the research process, from planning and data collection to analysis and interpretation, culminating in a final presentation of your findings at the end of the course.

Current projects

1. Kelp forest monitoring - Fish, algae and invertebrate monitoring program (PISCO)
2. Endemic shark population ecology using citizen science and artificial intelligence (Fin Spotter)
3. Kelp Density and Distribution
4. Nudibranch Diversity and abundance
5. Shark egg case deposition preferences and hatching success
6. Shark abundance and diversity using Baited Remote Underwater Video
7. Intertidal Rocky Shore invertebrate monitoring
8. Marine debris monitoring
9. Environmental DNA sample collection



Safety

Your safety is our top priority. Dive/snorkel skills and tasks vary depending on the dive site, weather conditions, and the dive objective at hand, but we will always dive within the limits set by the student's ability and confidence. Even though this course will get you out of your comfort zone, we will never force any student to dive if they feel uncomfortable.

Before each dive or snorkel session, the dive master will conduct a comprehensive briefing. Along with outlining the dive objectives, this will cover the planned dive time, maximum depth, site-specific hazards, current water conditions, and the relevant emergency procedures. Students are expected to give their full attention during these briefings to ensure they understand and can follow all safety guidelines.

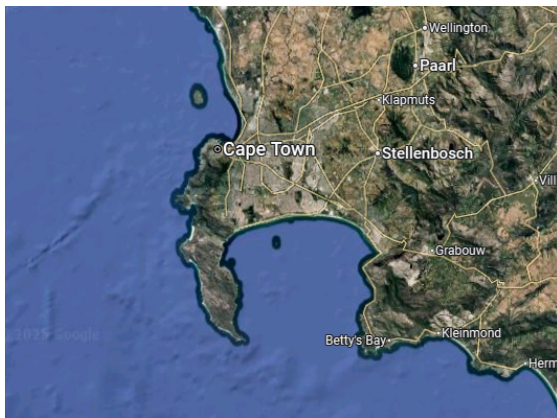
We monitor the weather and observe the sea conditions before every water activity. The skipper/dive master will make a decision whether the task objective can be successfully achieved based on these conditions. If the answer is no, then the excursion will be cancelled and an alternative itinerary will be organized.

Students are expected to respect and follow all decisions made by staff. For your safety, please avoid any reckless behavior and do not exceed the limitations set by staff, as doing so may place you in unnecessary danger.

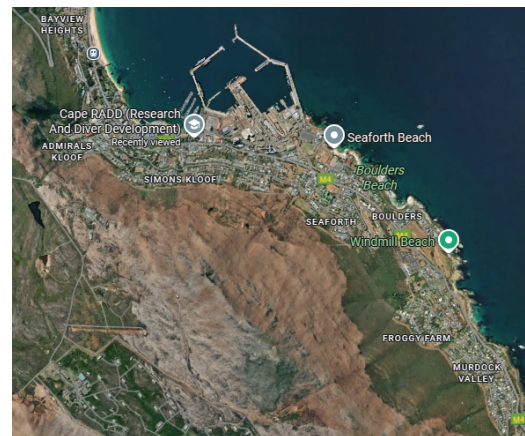
Our Location



Cape RADD is located in the Ocean Hub, 117 St Georges street, Simons Town.



The City of Cape Town



Simon's Town

Most of our time will be spent at the Ocean Hub in Simon's Town. It is about an hour's drive from the city center on the western side of False Bay. Most of our diving activities will be close to Simons Town. Simon's Town is a small town with shops, cafes, restaurants, bars, and historical museums. It is also the headquarters for the South African Navy. There is a laundromat in Simons Town as well as ATMs, a police station, and a Sea Rescue launch site.

The weather in Simon's Town is generally warm; however, should the wind pick up, it can bring on a bit of chill, so it's important to bring warm clothing. Nights could be cold as well; do not assume that it will be hot all the time. However, do pack in sun protection cream, as the Capetonian sun can be harsh on clear days.



Simons Town is also the home and foraging grounds of two Chacma baboon troupes. Baboons will try to enter living spaces to get to food, so it is important that we keep all doors and windows closed when no one is in the vicinity. Baboons also commonly roam the streets, and although the Simons Town troops are not known to harass people, we should always keep our distance so as not to cause them unnecessary stress.

Accommodation



For your time with Cape RADD, you will be staying in our ‘RADD PAD’ accommodation. The house is located in Glencairn, a suburb just outside of Simons Town, about a 10-minute drive to the Ocean Hub. Pick up and drop off will be provided by Cape RADD staff during the course hours. For any extra activities that you would like to do in your free time, you will need to acquire your own transport.

Uber and Bolt work quite well in Cape Town. There is also the 'On the go' taxi service, which you can make use of.

The accommodation will be shared with other students on the course. It is a dormitory-style living space with shared amenities, so we ask that students respect the space by keeping common areas clean and tidy. You may need to share a room with another student on the course. There is one bathroom in the house, which will also be shared among students.

Baboons will try to enter living spaces to get to food, so it is important that we keep all doors and windows closed when no one is in the vicinity. Ensure all of the windows are closed, in your room and the common areas, before leaving the house.

Lectures



Lectures are one to two hours and cover a variety of fields and disciplines. These include aspects of diving safety and protocol, fauna and flora identification, ecology of local habitats, biological knowledge, surveying methods, photograph and video analyses, experimental design, and statistical analyses. The list of lecture topics available during the Cape RADD marine field course is as follows:

1. Dive orientation: Introduction to Cape Town waters, dive planning, dive safety
2. Citizen science program and the importance of public engagement
3. Introduction to scientific diving 1 & 2 (physics of diving, benthic surveying techniques, local fish identification, BRUV, macroinvertebrate identification, fish surveying techniques)
4. Kelp Forest ecology
5. Introduction to freediving workshop

6. Cape RADD project protocol and dive objectives: experimental design
7. Biological knowledge: predator vs. prey, white shark, cape fur seal, shark physiology, deterrent, white shark population
8. Measuring biodiversity
9. Data input, visualization & analyses
10. Introduction to R-Studio
11. Introduction to GIS
12. Marine Parasitology
13. Shark reproduction
14. Scientific communication

Students will also be trained in post-survey data management and analyses. This includes inputting, checking, and analyzing various databases such as iNaturalist, ELMO Africa, and the Cape RADD database. During our journal club sessions, you will have the opportunity to present a topic of your choice on previous research or experiences you have been involved with (biology-based).

Planned Activities

We have put together an itinerary that is both educational and fun. We want to get the most out of this course while also allowing you to explore Cape Town. Furthermore, we will be at the mercy of the wind and weather, so this schedule may change at a day's notice; please respect any changes.

There are usually two sessions separated by an hour-long lunch break every day. **Please note, this plan is not set in stone, as activities are highly weather- and tide-dependent.** There will be free time to do extra activities.

Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Week 1	Orientation & Welcome Peninsula Drive	Fish & Invertebrate Identification Workshop	Scientific Diving Methodology Lecture	Introduction to Diving in South Africa Scientific diving practical	Rocky Shore Ecology Workshop Rocky Shore sampling	Diving Speciality Courses (optional)	
Week 2	Measuring the Biodiversity of False Bay Scientific communication workshop	Citizen Science Snorkel FinSpotter workshop, using AI to count sharks	Kelp forest Survey dive GIS Workshop	Kelp forest survey Dives (boat entry)	Nudibranch Survey Dive (shore entry) Journal Club: Present a Paper		
Week 3	Freediving Workshop Freediving Practical	Survey Dive BRUV Video Analysis	Kelp Forest Research Lecture Kelp forest monitoring	False Bay Expedition Survey Dives (boat entry)	Introduction to R Kelp Forest Data Collection		
Week 4	Survey Dive Advanced R Workshop	Survey Dives (boat entry)	Marine Parasitology Microscope & Dissection Workshop	Survey Dive Visualising Data	Fun Dive Journal Club 2 Farewell party		

This course is more than just a field school, it's a chance to immerse yourself in one of the world's most biodiverse marine ecosystems, develop practical scientific diving skills, and contribute to ongoing research that makes a real difference in ocean conservation. By the end of your time with us, you'll not only walk away with new knowledge and qualifications but also with lasting friendships, unforgettable experiences, and the confidence to take the next step in your journey as a marine scientist, diver, or conservationist.
