

# Course I: Discovering the open sea – The challenges of studying a 3-dimensional environment

A programme developed by KAI Marine Services in collaboration with OCEANCARE to provide training for specialist in applied science for the management of the Marine NATURA 2000 Network



## Course Details

**Coordinating Unit:** KAI marine services

**Mode:** International, language English

**Level:** Undergraduate, graduate students are welcome too

**Duration and accommodation:** 7 days on board of a research vessel, shared cabins

**Participants:** A group of max. 4 students will join a team of 3-4 researchers/teachers

**Credit points:** 2 +1 (optional)

**Assessments:** Regular course attendance and successful completion of the technical and scientific tasks of the class (1 CP)

A written final report on the course (1 CP)

Optional: 1 CP for an additional 15 to 20 minute presentation on a scientific publication related to the topics covered in the class

**Applied Science Framework:** Project LIFE+ MIGRATE

**Location:** Mediterranean Sea (Maltese waters)

**Vessel:** Aurora Boreal a 12 metre catamaran

**Dates:** Check on website [www.kaiepeditions.com](http://www.kaiepeditions.com)

**Expenses:** 950 EUR (includes accommodation, food, drinking water and insurance on board, all course fees, harbour fees as well as a barbeque; excludes travelling cost).

We recommend students to apply for scholarships such as ERASMUS or Leonardo da Vinci, that might cover overseas internships/courses and or travelling cost.

## Course Description

This course will give you an insight into various aspects of marine conservation measures and applied research in this field, as well as an intense hands-on experience in working aboard a marine research vessel. You will be part of a research crew facing the challenge of studying highly mobile species in the open ocean. You will be trained by an expert crew with 24 years of experience in oceanography, marine acoustic and visual surveys, marine spatial management and marine ecology. The data you will produce will not only be dedicated to your personal learning experience but also be a valuable contribution to an applied science expedition in the framework of international conservation programs (the European Commission LIFE+ Nature Project MIGRATE and the International loggerhead turtle conservation Project OASIS) you are participating in.

## Learning Objectives

After successfully completing this course you should be able to:

**1** Learn about contemporary topics in marine science and conservation from a range of sources, be able to consider and analyse both the scientific and social components of the issue. Develop skills in scientific communication; be able to present and discuss a topic in open discussion, and in a formal written report. Understand how science works in terms of funding, ethical considerations and sustainable development policies.

**2** Consider potential risks working offshore, get trained in safety at sea. Understand weather forecasts, plan survey routes and establish an adequate strategy to develop a survey. Learn about basic concepts of navigation, sailing manoeuvres, plotting positions on charts, taking bearings, estimating distance, and calculating wave height and direction.

**3** Get trained in acoustic and visual survey, identify the target species. Approach cetaceans and sea turtles without generating disturbance, catch turtles and take biopsy samples. Practice underwater filming. Use photo-identification of cetaceans. Obtain satellite information (GPS, oceanographic maps etc.), and use diverse instruments (GPS, plotters, echo sounder, plankton filter, barometer, anemometer, sextant, compass, OASIS buoy, hydrophones, binoculars, secchi disk) to register atmospheric pressure, wind force and direction, sea surface anomalies, visibility, salinity, temperature, scattering layers, etc.

## Methods

- Ship board visual and acoustic survey of cetaceans, seabirds and marine turtles.
- Boat-based oceanographic measurements and sampling.
- Tracking and mark-recapture techniques to provide data for conservation of endangered species.
- Planning ship board surveys.
- Bearing and range-finding practice (“lookout calibration”).
- Plankton and micro plastic filtering and observation.
- OASIS buoy experiments of fish aggregation.
- Documentation and ethology (drawings, photos and video).
- Discussions based on video and photo documentations.

## Main topics

- Basics of oceanography and open ocean ecosystems.
- Understanding the movements of top pelagic species, mainly cetaceans and sea turtles.
- Combining *in-situ* data sampling with telemetry data.
- Special aspects of the Mediterranean Sea.
- Environmental problems and conservation.

## Certificate

After completion of the course a graded certificate will be issued, given the participants have fulfilled following requirements:

**Pre course reading** (is not essential but recommended)

## Requirements

Students should be prepared for teamwork in close quarters, spending all day outside at sea with heat, sun, wind and seawater. This can be quite strenuous, especially in summer. Be aware that they might get seasick during navigation in rough sea. Usually the vessel will not operate in such weather conditions if it can be prevented. However, weather can sometimes change unpredictably especially at sea. General good physical fitness is requested, but most important is a good sense of humour and willingness to learn.

## Daily Routine

KAI marine expeditions are not designed for tourists. Students will participate as fully operative expeditioners and be involved in the day to day life aboard besides the course/scientific activities. This will also include cooking and cleaning from time to time. The training and research programme planning depends largely on weather and sea state conditions. It is therefore only possible to give an approximate structure of the theory and practical hour timetable which will be established according to the weather forecast and splitting the course period in three types of day, **A)** Calm sea days – full time at sea, **B)** Breezy days – half day to full day at sea, **C)** Gale/stormy days – in port or at anchorage theory and coastal activities. This system should allow optimizing the use of time during the course, ensuring a total of xx hours of theory, xx hours of practical and leaving xx hours for free time.

| Time             | A) Calm seas  | B) Workable seas  | C) Bad weather forecast                                     |
|------------------|---|---|---|
| 07 <sup>00</sup> | Wake up – breakfast in 15' – out of port/anchorage          | Wake up & breakfast   |   |
| 07 <sup>30</sup> | Start survey practical                                      | Start theory session  | Wake up & breakfast   |
| 08 <sup>30</sup> |   |   | Start theory session  |
| 12 <sup>00</sup> |   | Lunch   |   |
| 13 <sup>00</sup> | Lunch   | Start survey practical                                      |   |
| 13 <sup>30</sup> |   |   | Lunch   |
| 20 <sup>00</sup> | End survey practical – dinner                               | End survey practical – dinner                               | End theory session – dinner                                 |
| 21 <sup>30</sup> | Daily wrap up session – forecast and sail-plan for next day | Daily wrap up session – forecast and sail-plan for next day | Daily wrap up session – forecast and sail-plan for next day |

As explained, the programming of theory and practical sessions will depend on the weather forecast. However, the initial schedule of sessions is as follows:

#### **DAY #1: Arrival on board - Introduction**

- Introduction of crew and Safety on board talk
- Introduction to programme (Framework, species, habitat, method)
- Weather forecast analysis and planning

#### **DAY #2: Navigation and getting the sea legs**

- Tools and deliverables for spatial planning
- Obtaining the data – visual surveys methods
- Basic concepts of navigation
- PRACTICAL – calibrating observers / survey
- Daily wrap-up, weather forecast analysis and planning

#### **DAY #3: The open ocean ecosystems**

- The relevance of physiography – measuring depths and slope
- The relevance of oceanography – on site sampling and Global Ocean Observation Systems
- PRACTICAL – OASIS experiments on FADs, sea grass prairies, and other habitat

#### **DAY #4: Tracking great pelagics**

- Bio acoustics – the relevance for cetaceans and measuring methods
- Tagging (photo-id, satellite tags, acoustic tags, etc.)
- PRACTICAL – survey data recording

#### **DAY #5: Risk assessment and management**

- Risks for critical habitat
- Risks for sea turtles
- Risks for cetaceans
- Marine Protected Areas
- PRACTICAL – survey data recording

#### **DAY #6: Survey at sea**

#### **DAY #7: Evaluation**

- Analysis of data collected
- PRACTICAL – survey data recording

## **Life On board - Sustainability**

We like to emphasize that KAI marine is based on respect for natural and cultural resources everywhere the wind takes us. Together we will experience a real adventure aboard a ship where we will live and work closely together as a team during the expedition. The boat is an example of energy self-sufficiency and we appreciate if this will be taken into account when using the facilities on board.

- Freshwater use (cleaning dishes, showers etc.): We avoid using a lot of freshwater aboard and only use it when it is not possible to use salt water instead. Showers will be also available in the harbour.
- Wastewater goes directly into the ocean therefore we only use biodegradable soaps and cleanser.
- Charging electrical items (mobile phones, PCs etc.): We have the possibility to charge electrical items while the engines are running and when we stay in the harbour. The vessel Aurora Boreal is also equipped with a solar panel.
- Internet use on board: Internet is available aboard when we are not too far from the coast; however we kindly ask all expeditioners to use internet only when it is really necessary and to turn off any automatic updates in their private PCs and Smartphone.

## **Alcohol and smoking**

Expeditioners are asked to avoid consumption of alcohol during working hours in order to reduce the risk of accidents. On the other hand, although KAI neither wants nor will discourage the enjoyment of fine wines that the region offers, will not tolerate the abuse of alcohol or any other behaviour that will disrespect the rest of the crew or the local people.

Smoking is not permitted inside the boat. For respect for non-smoking members of the crew, in the case of smoking on deck, full consideration is asked about it.

## **What to bring on board**

Try to reduce your luggage as much as possible given that we are in a boat where space is limited. Backpacks are more appropriate than suitcases.

- Comfortable clothes for warm (sun protection) and cold weather, if possible a hard-shell jacket (wind and rain protection)
- Swimsuit, snorkel gear and towel
- Sheet, thin blanket or summer sleeping bag
- Sun protection is extremely important! Do NOT forget sunscreen, sunglasses and cap or similar to protect yourself
- Take your own medications if need, especially those that help to avoid dizziness, if you get easily seasick (first aid kit is on board)
- Notebook and pencils, (also useful but not necessary: torch/headlamp)