CIEE Global Institute - London

Course name: Marine Biology & Ecology
Course number: (GI) ECOL 2001 LNEN
Programs offering course: London Open Campus
Open Campus Track: Sustainability and Environmental Sciences
Language of instruction: English
U.S. semester credits: 3
Contact hours: 45
Term: Spring 2020

Course Description

Life on Earth began in the ocean 3.9 billion years ago. It is still by far the largest coherent ecosystem, and life conditions are different compared to living in air on land. Light only penetrates a few hundred meters down, below is total darkness. This course will provide knowledge about the physical and chemical properties of seawater, and how it affects life. Students will study and compare the dynamics of the major habitats, such as deep sea, open waters, coastal regions, estuaries, coral reefs, polar regions etc. The course will present the dominating organisms in each compartment and contrast the flows of energy, carbon and nutrients. The course will also study the hydrodynamics of oceans, a key factor in understanding weather and climate changes. Students will be presented to different marine sampling and measuring techniques, and visit research facilities.

Learning Objectives

By completing this course, students will be able to:

- Understand the origin, biological history, and hydrography of the oceans.
- Compare the various habitats that are present in oceans and how they differ.
- Critically evaluate the essential characteristics of the pelagic zone.
- Recognize food webs, nutrient cycles, and feeding mechanisms.
- Understand the biology of selected groups of marine invertebrates and vertebrates.
- Assess the complexity and fragility of the oceans; analyze the impact of human behavior on environmental systems.

Course Prerequisites

Students should have completed one semester course in biology and one semester in chemistry.

Methods of Instruction
The teaching will consist of introductory lectures using PowerPoint and short films. The students write a paper on individually selected topics, finalized by an individual presentation. The instructor will frequently ask questions during the lectures, and the students are expected to engage in discussions about what they are learning as well as their ongoing projects. As a co-curricular activity we will participate in an exciting field trip on the Danish research vessel *Ophelia* departing from Elsinore. Onboard various biological experiments will be conducted, concluded by observing and investigating the different organisms sampled during the excursion in the lab. In the lab the students will be given a task to write a small report on one of the sampled organisms. Guest speakers will share expert knowledge in the form of presentations of various subjects within marine biology. Occasionally there will be allocated time to work on the individual assignments.

**Assessment and Final Grade**

Students will be assessed according to the following criteria:

1. Homework: 30%
2. Individual Project Paper: 25%
3. Lab Work Report: 15%
4. Presentation: 10%
5. Class Participation: 20%

**Course Requirements**

**Homework**
At the end of weeks 2, 4, and 6 the students will be given three essential questions on topics covered in class that week to be completed at home in a time limited assessment through Canvas. Questions are short essay type, and students will be expected to demonstrate comprehensive knowledge of the reading assignments.

**Individual Project Paper**
At the start of Week 2 the students selected a topic for a 2000 (total) word paper. The paper have to consist of an introduction, discussion, conclusion, literature list and an abstract. Students will meet weekly in small groups during class time and present how their project is developing. The paper will be graded by how thorough and appropriately the paper covers the entire subject. Students will first receive their grade after they have made their presentation of the paper, which should be no longer than 5 minutes in length. 80% of the assignment grade will be based on the written form of the paper, and 20% on the presentation.

**Lab Work Report**
Following the field trip the students will write a 1500 word report on an individually selected organism, found during the field trip. The students are expected to report any interesting traits (morphology, ecology, behaviour, feeding mechanism, etc.). The
assignment will be graded based on how thorough and detailed it’s analysis of the lab work, experiments, and results.

**Presentation**
Each student will deliver a 10-minute presentation about their Individual Project Paper topic. The presentation will be graded on how well they present their subject to the class, in a manner so everyone not being familiar with the subject will understand it. The presenter should be prepared to answer questions about the paper, to the best of their ability.

**Participation**
Participation is valued as meaningful contribution in the digital and tangible classroom, utilizing the resources and materials presented to students as part of the course. Meaningful contribution requires students to be prepared in advance of each class session and to have regular attendance. Students must clearly demonstrate they have engaged with the materials as directed, for example, through classroom discussions, online discussion boards, peer-to-peer feedback (after presentations), interaction with guest speakers, and attentiveness on co-curricular and outside-of-classroom activities.

**Attendance Policy**
Regular class attendance is required throughout the program, and all unexcused absences will result in a lower participation grade for any affected CIEE course. Due to the intensive schedules for Open Campus and Short Term programs, unexcused absences that constitute more than 10% of the total course will result in a written warning.

Students who transfer from one CIEE class to another during the add/drop period will not be considered absent from the first session(s) of their new class, provided they were marked present for the first session(s) of their original class. Otherwise, the absence(s) from the original class carry over to the new class and count against the grade in that class.

For CIEE classes, excessively tardy (over 15 minutes late) students must be marked absent. Attendance policies also apply to any required co-curricular class excursion or event, as well as to Internship, Service Learning, or required field placement. Students who miss class for personal travel, including unforeseen delays that arise as a result of personal travel, will be marked as absent and unexcused. No make-up or re-sit opportunity will be provided.

Attendance policies also apply to any required class excursion, with the exception that some class excursions cannot accommodate any tardiness, and students risk being marked as absent if they fail to be present at the appointed time.

Unexcused absences will lead to the following penalties:
<table>
<thead>
<tr>
<th>Percentage of Total Course Hours Missed</th>
<th>Equivalent Number of Open Campus Semester classes</th>
<th>Minimum Penalty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 10%</td>
<td>1 content classes, or up to 2 language classes</td>
<td>Participation graded as per class requirements</td>
</tr>
<tr>
<td>10 – 20%</td>
<td>2 content classes, or 3-4 language classes</td>
<td>Participation graded as per class requirements; <strong>written warning</strong></td>
</tr>
<tr>
<td>More than 20%</td>
<td>3 content classes, or 5 language classes</td>
<td>Automatic <strong>course failure</strong>, and possible expulsion</td>
</tr>
</tbody>
</table>

**Weekly Schedule**

NOTE: this schedule is subject to change at the discretion of the instructor, to take advantage of current experiential learning opportunities.

**Week 1**  
**Orientation Week**

Class 1:1  
Introduction and Origin of the Ocean

Introduction and the origin of the ocean, as well as its chemical and biological history.

Reading:  

**Week 2**

Class 2:1  
Hydrography

An introduction to the hydrography of the ocean: salinity, temperature, depth, currents, tides, stratification, hydrological cycle and surface/air interactions.

Reading:  

❖ Individual Project Paper topic due
Class 2:2  Habitats

The typical habitats present in the oceans: Coastal waters, estuaries, hard bottom, soft bottom, pelagic life and benthos. Students will attend an afternoon cruise followed by an evening of research in the laboratory.

Reading:

❖  Homework due

Week 3

Class 3:1  Life in the Pelagic

Insight into the phytoplankton, species and seasonal cycles, primary production and zooplankton and larvae.

Reading:

Class 3:2  Feeding Methods

Introduction to the various feeding methods: filter feeding, detritivores, carnivores and secondary production.

Reading:

❖  Presentations

Week 4

Class 4:1  Food Webs

Exploration of the different food webs: microbial food web, nutrient recycling, energy transfer in coastal waters and the deep sea.

Reading:

❖  Individual Project Papers due

Class 4:2  Invertebrates
An introduction to the biology of some of the most common invertebrates in the ocean: Cnidarians, Polychaetes, Crustaceans and Echinoderms. Students will visit University of Copenhagen and examine various ecophysiological experiments.

Reading:

❖ Homework due

**Week 5**  
Class 5:1 **Vertebrates**

Introduction to the biology of fish, sea birds and mammals. Students will visit The Blue Planet and examine the research projects the team work on, including offshore projects.

Reading:  

Class 5:2 **Marine Sampling and measuring**

An introduction to the monitoring and measuring methods used in the oceans. This session will also involve a field trip to Elsinore: a mandatory co-curricular activity taking place first on the research vessel *Ophelia* followed by lab work in the afternoon/evening. Students will also investigate an organism in the lab.

**Week 6**

Class 6:1 **Conservation**

Insight into speciation, invasion, extinction and how to conserve the marine biodiversity.

Reading:  

Class 6:2 **Human Impact on the Environment**
Introduction to some of the impacts we have on the ocean: Pollution, fisheries, runoff, human activities at sea and climate change.

Reading:

❖ Lab Work Report due
❖ Homework

Course Materials

Reading


http://www.bluemarinefoundation.com/
https://www.sciencedaily.com/releases/2017/10/171012103704.htm