

## Applied Marine Ecology (I002535)

Wegens Covid19 kan mogelijk afgeweken worden van de onderwijs- en evaluatievormen. Dergelijke afwijkingen zullen via Ufora worden gecommuniceerd.

**Cursusomvang** *(nominale waarden; effectieve waarden kunnen verschillen per opleiding)*

**Studiepunten** 3.0      **Studietijd** 90 u      **Contacturen** 30.0 u

**Aanbodsessies en werkvormen in academiejaar 2021-2022**

A (semester 1)	Engels	Gent	werkcollege: PC- klasoefeningen	3.75 u
			excursie	5.0 u
			hoorcollege	5.0 u
			begeleide zelfstudie	2.5 u
			veldwerk	3.75 u
			online hoorcollege	10.0 u

**Lesgevers in academiejaar 2021-2022**

Janssen, Colin      LA22      Verantwoordelijk lesgever

**Aangeboden in onderstaande opleidingen in 2021-2022**

	stptn	aanbodsessie
<a href="#">Bachelor of Science in Environmental Technology</a>	3	A
<a href="#">Master of Science in Aquaculture</a>	3	A
<a href="#">Master of Science in Environmental Science and Technology</a>	3	A
<a href="#">Master of Science in de bio-ingenieurswetenschappen: land, water en klimaat</a>	3	A
<a href="#">Master of Science in de bio-ingenieurswetenschappen: milieutechnologie</a>	3	A
<a href="#">Uitwisselingsprogramma bio-ingenieurswetenschappen: landbouwkunde (niveau master-na-bachelor)</a>	3	A
<a href="#">Uitwisselingsprogramma bio-ingenieurswetenschappen: milieutechnologie (niveau master-na-bachelor)</a>	3	A
<a href="#">Uitwisselingsprogramma bio-ingenieurswetenschappen: land- en bosbeheer (niveau master-na-bachelor)</a>	3	A

**Onderwijstalen**

Engels

**Trefwoorden**

Marine biotic and abiotic processes, Marine ecosystems, Blue growth, Ocean threats

**Situering**

This course aims at describing and illustrating the fundamental and applied concepts of marine processes and ecosystems. In the theory lectures, the interactions between biotic and abiotic processes and the structure and functions of marine ecosystems are reviewed in detail. The field excursions integrate these theoretical aspects and give the student in-depth experience-oriented knowledge. In contrast with classic marine ecology, the modern human relation with the marine environment is incorporated in this course. Both blue growth threats and opportunities from a bioscience engineering point of view are discussed.

**Inhoud**

Part I - Ocean characteristics, physical-chemical processes and man

- Planet Ocean: Introduction and terms
- Moving Oceans: seafloor, winds and currents
- Salty Oceans: salinity and importance
- Deep Oceans: temperature, pressure and density
- Dark Oceans: light and importance

f) Chemical Oceans: CO<sub>2</sub>, interactions, climate change and consequences

Part II - Ocean life processes

a) Living Ocean: origin of life, biodiversity and production

b) Primary production: species, light/depth/nutrients/growth, cycles and phenomena

c) Microbial ecology: production, decomposition, ecological context and seasonal cycles

d) Secondary production: P/B ratio, measurements and drivers

Part III - Ocean Systems

a) Rocky and sandy shores: waves, tides, environmental variables, zonation and research

b) Estuarine ecology: zones, salinity and ecological features

c) Pelagic and benthic ecosystems

Part IV – Threats and opportunities in marine systems

a) Introduction: pressures, risks and benefits, ecosystem services and blue growth

b) "Toxic" Ocean: presence and effects of chemicals, other stressors

c) "Unbalanced" Ocean: risks of eutrophications

d) "Tasty" Ocean: need for food from the oceans

e) "Healthy" Ocean: provision of known and unknown health services

### **Begincompetenties**

General Biology, General Ecology, General Physics, General Chemistry

### **Eindcompetenties**

- 1 Understand the specific characteristics of the oceans and their importance for marine applications.
- 2 Understand the main physical-chemical and ocean life processes driving ecosystem dynamics in different marine ecosystems, and their importance for marine applications.
- 3 Discuss possible theoretical consequences and opportunities of/for human interactions in the different marine ecosystems.
- 4 Estimate in a quantitative way the consequences and opportunities of/for human interactions in the different marine ecosystems.

### **Creditcontractvoorwaarde**

Toelating tot dit opleidingsonderdeel via creditcontract is mogelijk mits gunstige beoordeling van de competenties

### **Examencontractvoorwaarde**

Dit opleidingsonderdeel kan niet via examencontract gevolgd worden

### **Didactische werkvormen**

Begeleide zelfstudie, excursie, hoorcollege, veldwerk, werkcollege: PC-klasoefeningen

### **Toelichtingen bij de didactische werkvormen**

The two field excursions will be organized: (1) to the rocky and sandy shores a salt marshland near Boulogne (France) and (2) a monitoring study on the Belgium part of the North Sea with the research vessel Simon Stevin. Both field exercises are a combination of applied fieldwork and lectures in the field. As such, students receive hand-on experience about the theoretical and practical content of the course. As the capacity of the research vessel Simon Stevin is limited, this field excursion is organized multiple (up to 4 times per program) times. In the "seminar: practical PC room classes" students learn how to convert theoretical marine processes and concepts into quantitative estimations. As such, students calculate for a few different problems how anthropogenic interactions influence marine ecosystems. Students do not have to write reports or make presentations for the field excursions and the PC classes, but participation is mandatory. (Guided) self-study is stimulated by offering example exam questions and specific (suggested reading) publications.

### **Leermateriaal**

Lecture presentations available via Ufora; for recommended literature see references

### **Referenties**

Kaiser et al., 2012, Marine ecology - Processes, Systems, and Impacts, Second Edition, Oxford University Press, 528 pages.

### **Vakinhoudelijke studiebegeleiding**

Q&A sessions at the beginning and/or end of every lecture, interaction during the lectures, discussions in groups (of different sizes), guided excursions and fieldwork, contact hours for individual guidance (upon request).

### **Evaluatiemomenten**

periodegebonden en niet-periodegebonden evaluatie

**Evaluatievormen bij periodegebonden evaluatie in de eerste examenperiode**

Schriftelijk examen met open vragen, schriftelijk examen met meerkeuzevragen

**Evaluatievormen bij periodegebonden evaluatie in de tweede examenperiode**

Schriftelijk examen met open vragen, schriftelijk examen met meerkeuzevragen

**Evaluatievormen bij niet-periodegebonden evaluatie**

Participatie

**Tweede examenkans in geval van niet-periodegebonden evaluatie**

Niet van toepassing

**Eindscoreberekening**

The final examination mark is based on the periodic evaluation (i.e. the exam). Students who eschew period aligned and/or non-period aligned evaluations (i.e. participation of mandatory excursions and PC classes) may be failed by the examiner.