

Module Name	Air-Sea-Exchange	
Module Number	MNF-bioc-277	
Person in Charge	Prof. Dr. Anja Engel Phone: +49 (0)431 600-1510, Email: aengel@geomar.de Prof. Dr. Christa Marandino Phone: +49-(0)431-600- 4219, E-mail: cmarandino@geomar.de	
Semester / Duration	2./4. semester / one semester	Status optional
Regular Cycle	annual, in summer semester	
Study Programme	Master of Science in Biological Oceanography, Master of Chemistry (focus on Marine Chemistry)	
Classes	Class Title (Teaching Form) Lecturers	Contact Time / Group Size
	<u>Air-Sea-Exchange</u> (Lecture) Prof. Dr. Anja Engel Prof. Dr. Christa Marandino	2 hrs per week / 15 students
	<u>Air-Sea-Exchange</u> (Seminar) Prof. Dr. Anja Engel Prof. Dr. Christa Marandino	1 hr per week / 15 students
Credit Points / Workload	5 ECTS / 150 hours	
Prerequisites	None	
Completion Module	None.	
Following Module	None	
Educational Objectives	In this module students will learn the basics of air-sea gas exchange and biological production of the sea surface microlayer. The influence of the sea surface microlayer on gas exchange and primary aerosol formation will be discussed. Furthermore the module offers an interdisciplinary basis to understand biogeochemical processes at the surface of the ocean and in the lower atmosphere. There will be a secondary, but major, focus on the critical reading and discussing of international scientific publications.	
Content of Teaching	This module provides a comprehensive overview of biogeochemical processes at the interface between the ocean and the atmosphere. Topics will include models/theory of gas transfer, physical and chemical influences on gas exchange, quantification of gas exchange and methods of research, microbial control on the sea surface microlayer, microbial trace gas cycling, and the role of air-sea exchange processes in climate change. The subject will be taught through lectures and student led discussions of relevant scientific literature.	
Examination	Oral presentations – pass/fail	
Literature	Nightingale, P. D. (2009) Air-Sea Gas Exchange in Surface Ocean-Lower Atmosphere Processes, Le Quere and Saltzman eds., AGU, Washington, USA, pp 69. Liss, P. S. and Duce, R. A. (2005). The sea surface and global change. Cambridge University Press	
Additional Information	This lecture is interdisciplinary and addresses students from the fields of biological oceanography and chemistry. The lecture will be given regularly every week in English.	