Module Name	**How to make and keep a habitable planet - biogeochemistry-climate feedbacks and astrobiology**	
Module Number	MNF-bioc-357	
Person in Charge	Prof. Dr. Andreas Oschlies Phone: +49-(0)431-600-1936, E-mail: aoschlies@geomar.de	
Semester / Duration	3. semester / one semester	**Status**
Regular Cycle	annual in winter semester	Optional
Study Programme	Master of Science in Biological Oceanography	
Classes	**Class Title (Teaching Form)** **Lecturers**	**Contact Time / Group Size**
	How to make and keep a habitable planet – biogeochemistry-climate feedbacks and astrobiology (Lecture) Prof. Dr. Andreas Oschlies	2 hrs per week / 30 students
	How to make and keep a habitable planet – biogeochemistry-climate feedbacks and astrobiology (Exercise) Prof. Dr. Andreas Oschlies	1 hr per week / 30 students
Credit Points / Workload	5 ECTS / 150 hours	
Prerequisites		
Completion Module	None.	
Following Module	None	
Educational Objectives	The main goal of this seminar is to discuss recent hypotheses on how life and biogeochemical cycles developed on Earth or could develop on other planets, and how Earth has remained habitable for a very long time. Students will learn about biogeochemical-climate feedbacks operating on Earth and other planets, and gain practice in interpreting controversially discussed hypotheses about planetary evolution.	
Content of Teaching	Evolution of Earth, “young faint sun” paradox, role of physical and biogeochemical feedbacks, evolution of life and its impact on Earth’s atmosphere and climate. Climate variability, snowball Earth events, glacial cycles, and the anthropocene. Discussion of where and how to look for life on other planets.	
Examination	Written examination (graded).	
Literature	Ruddiman, W., “Earth’s Climate: Past and Future”, Freeman, NY, 465 pp; Schlesinger et al: “Biogeochemistry”, Elsevier; Kump, Kasting & Crane “The Earth System” Pearson Education; Gilmour & Sephton: “Astrobiology”, Cambridge Open University.	
Additional Information	This course is identical with MNF-klim-302. It is interdisciplinary and addresses students from the fields of physical oceanography and meteorology, biological oceanography, geology, and microbiology.	