

Module name: Marine Biology and Limnology

Identification number MN-B-E 4	Workload 360 h	Credits 12	Term of studying* 1 st or 2 nd term of studying	Frequency of occurrence Summer term, 1 st half	Duration** 7 weeks
1	Type of lessons a) Lectures (L) b) Practical/Lab (P) c) Seminar (S)	Contact times*** a) 21 h b) 155 h c) 5 h	Self-study times 179 h (Preparing and reworking matters of L and P; Writing protocols)	Intended group size a) 10 students b) 10 students / supervising tutor c) 10 students / supervising tutor	
2	<p>Learning outcomes / Skills</p> <p>Students who successfully completed this module will have acquired advanced knowledge regarding marine biology with special emphasis on diversity and ecology of marine animals and as well as on functioning of organisms in freshwater systems with special emphasis on running waters. During a two-weeks stay at Biological Station Helgoland students will be introduced to marine life at sea shores, benthic habitats and pelagic environments including own marine biological projects and an expedition with the research vessel MS Uthörn to the North Sea around Helgoland. In a second part of the course freshwater ecology will be thought with focus on stream and river ecology including studies at the field station in Cologne. Excursions to running waters in the vicinity of Cologne will be combined with lab experiments concerning ecology and special adaptation of macro- and microinvertebrates to the life in different running water and stream systems. During this module, students will be trained to evaluate and understand the scientific literature in specific fields of contemporary marine and limnological research and will improve their skills in applying statistics and presenting scientific literature in oral and written form.</p>				
3	<p>Contents</p> <p>Main topics:</p> <ul style="list-style-type: none"> freshwater biology (esp. ecology of running waters, adaptations of macrofauna to abiotic factors in streams and rivers; incl. excursions), evaluation of river quality using a spectrum of abiotic and biotic characteristics, colonization of biofilms by micro- and macroinvertebrates, introduction into applied aspects marine biology (esp. functional diversity of marine fauna, adaptations to abiotic and biotic environments; field course at the Biologische Station Helgoland), typical life forms of marine habitats (incl. all groups of marine organisms, studies in marine aquaria), plankton studies, investigations of rocky shores and tidal flat communities (expeditions) soft skills: writing of scientific papers, incl. literature search, oral presentations, statistics 				
4	<p>Teaching methods</p> <p>Lectures; Seminar; Guidance to independent scientific research; Excursions; Training on application of statistics and presentation techniques in oral and written form</p>				
5	<p>Requirements for participation</p> <p>Bachelor; enrollment in the Master´s degree course “Biological Sciences” (see examination regulations for details)</p> <p>Additionally: Knowledge on fundamental ecological principles is indispensable to participate in this module.</p>				
6	<p>Type of examinations</p> <p>Exam prerequisites: Regular and active participation, passed written protocols</p> <p>Exams: One hour written examination about topics of the lectures and practical part (accounts for 70 % of the total module mark) and oral presentation of own marine biological studies (accounts for 30 % of the total module mark)</p>				

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7	<p>Requisites for the allocation of credits</p> <p>Total module mark at least “adequate” (see § 10 of the examination regulations for details)</p>
8	<p>Compatibility with other Curricula</p> <p>None</p>
9	<p>Significance of the mark for the overall grade</p> <p>In the Master’s degree course “Biological Sciences”: 15 % of the overall grade (see appendix 2 of the examination regulations)</p>
10	<p>Module coordinator and Participating faculty</p> <p>Module coordinator: Prof. Dr. H. Arndt, phone 470-3100, e-mail: hartmut.arndt@uni-koeln.de</p> <p>Participating Faculty: Prof. Dr. H. Arndt, Dr. G. Becker, Dr. A. Scherwaß</p>
11	<p>Additional information</p> <ul style="list-style-type: none"> - Subject module of the Master’s degree course “Biological Sciences” - Focus of research: (E) Ecology and Evolution - Literature: (i) Allan, J. Castillo, M. (2009) Stream Ecology. 2nd Edition, Springer; (ii) Knisely, K. (2013) A Student Handbook for Writing in Biology. 4th edition, Sinauer Associates - Additional reviews and original papers will be handed out during the module. - General time schedule: Week 1-3 (Mon.-Fri.): Lectures and practical work (excursions) in limnology; Week 4 and 5 (Mon.-Fri.): Lectures and practical work (excursions) in Marine Biology in the Field Station on the island Helgoland; Week 6: Analysis of experiments, finalization of written protocols and preparation of the oral presentation (held at the end of week 6); Week 7 (Mon.-Fri.): Preparation for the written examination - Introduction to the module: April 04, 2014 at 10 a.m., Cologne Biocenter, room - 1.005 (first basement floor) - Written examination: May 23, 2014; more details will be given at the beginning of the module

* According to the course schedule (see appendix 2 of the examination regulations)

** Preparation times before the official start of the module are not included here.

*** All decimal numbers were rounded. The values correspond to the effective contact times over the total duration of the module (including examination times).