1	**Module**	**Palaeobiology**	**7,5 ECTS**
2	Courses	Macroevolution (L) 2 SWH Analytical Palaeobiology (E) 4 SWH	GeoZentrum Nordbayern
3	**Responsible person**	Prof. Dr. Wolfgang Kiessling	

4	**Lecturers**	Prof. Dr. Wolfgang Kiessling Dr. Kenneth De Baets
5	**Contents**	Macroevolution This lecture introduces large-scale evolutionary patterns and discusses underlying mechanisms. The lecture will confront students with current macroevolutionary theories. Metrics of evolutionary rates and the identification of relevant evolutionary factors are taught. The focus is on biotic and abiotic controls of extinctions and originations. Scales and hierarchies of evolution are discussed in depth, as are the causes of evolutionary trends. Analytical Paleobiology This module presents modern methods of quantitative analyses of the fossil record. Computer exercises are introduced by short lectures on theoretical foundations. Students use R (www.r-project.org) and modify existing scripts to apply them to palaeobiological problems using data from the Paleobiology Database (www.paleobiodb.org) and other sources. Topics covered are reconstructions of biodiversity and their dynamics, measuring evolutionary rates, quality of the fossil record, and sampling standardization.
6	**Learning Objectives and Competences**	The students are able to: • Recognize, understand and reproduce large-scale evolutionary patterns. • Know multi-level evolutionary theory • Describe the basics of phylogenetic reconstructions, the identification of evolutionary rates and relevant evolutionary factors. • Identify biotic and abiotic controls of extinction and origination • Present the proofs for a hierarchical organization of evolutionary processes • Understand and apply modern quantitative methods of analyzing the fossil record at large • Use R and tailor existing scripts for palaeobiological problems • Apply statistics to separate biologically meaningful signals from random noise
7	**Prerequisites**	Basic computer skills
8	**Usability of the module**	Master Cell and Molecular Biology
9	**Incorporation in sample study plan**	2. semester of master studies
10	**Examination criteria**	Written examination (60 min) Oral presentation (20 min) on a specific subject using the Palaeobiology Database and modified or own R scripts.
11	**Grading**	Written examination (L) 50% Oral presentation 50%
12	**Regular cycle**	Annual in the summer term
13	**Workload**	Attendance time: 105 h Self-study: 120 h Total: 225 h equivalent to 7,5 ECTS Points
14	**Duration**	1 Semester
15	**Language**	English
16	**Preparatory Reading**	Foote, M. & Miller, A. I. (2006) Principles of paleontology. Current literature