

module code /
module title

05-MMG-PD1 /Advanced Digital Competences

date / version of the module
description

05.07.2021

1	INFORMATION ON THE MODULE	
1a	module code	05-MMG-PD1
1b	module title (German title)	Advanced Digital Competences
1c	module title (English title)	Advanced Digital Competences
1d	credit points	6
1e	responsible for the module	Huhn-Frehers, Katrin
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	
1j	learning contents	This module offers for all master students a flexible organizational framework to acquire competences in advanced methods of digital data processing and programming in theory and practice. A wide range of subject-specific computer courses (mostly block courses) is offered e.g. numerical modelling, MATLAB introduction and application, times series analysis, GMT, etc. Furthermore, individual data / modelling projects related to actual research are possible on request. In order to fulfill this module, an equivalent of 6 CP has to be successfully completed.
1k	learning outcomes/ competencies/ targeted competencies	1) develop individual solution strategies for tasks of geoscientific data processing and implement them successfully by means of suitable software

		<p>2) analyse and apply geoscientific data with given tools and techniques</p> <p>3) develop a numerical model to simulate a specific geoscientific processes (e.g. sediment transport, tectonics, geodynamics, etc.)</p> <p>4) competent use of computer hardware and application software</p>																																																								
<p>11</p>	<p>calculation of student workload (part a: calculation of presence time and working hours)</p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>lecture(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>exercise(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> </table> <p><input checked="" type="checkbox"/> other form of course (e.g. block seminar), namely this: Block Course 70.0 h working hours</p> <p>with 5 SWS / with totaly 70 contact hours <input type="checkbox"/> presence time <input checked="" type="checkbox"/> working hours</p> <p>= sum of presence time and working hours:</p> <p>Presence time: 0 SWS (0 h) and Working hours: 70 h = total 70.0 hours</p>	<input type="checkbox"/>	0	lecture(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	exercise(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours
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	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>65.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>45.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>70.0 hours presence time, 180.0 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>winter semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>will be announced during the courses</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input checked="" type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (type, number)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL 2 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 50 % processing of tasks</p> <p>PL 2: 50 % processing of tasks</p> <p>PL 3: 0 % processing of tasks</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral</p> <p><input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input checked="" type="checkbox"/> Other (concrete definition is given in the examination regulations):</p> <p>processing of tasks</p>
2e	language(s) of instruction	<p><input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

module code /
module title

05-MMG-PG1 /Field and Lab Practice

date / version of the module
description

05.07.2021

1	INFORMATION ON THE MODULE	
1a	module code	05-MMG-PG1
1b	module title (German title)	Field and Lab Practice
1c	module title (English title)	Field and Lab Practice
1d	credit points	6
1e	responsible for the module	Bickert, Torsten
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	Depending on the chosen courses specific pre-knowledge might be necessary
1j	learning contents	<p>A broad spectrum of field, offshore marine and lab courses is offered. Integrated analysis includes sedimentology , geochemistry, oceanography, ecology, climatology and geophysics of the study areas including applied and exploration aspects.</p> <p>The advanced training in the field and in offshore marine settings offers to analyze and interpret marine environmental archives including applied geotechnical and exploration aspects. Courses comprise combined lectures and excursions as well as integrated field campaigns and educational cruises.</p>

1k	learning outcomes/ competencies/ targeted competencies	<p>- Expansion and deepening of skills in the field (addressing rocks, in connection with other subject-specific criteria, 3D presentation)</p> <p>- Linking own field observations with the theoretical background knowledge for the development and understanding of (</p>																																																								
1l	<p>calculation of student workload <i>(part a: calculation of presence time and working hours)</i></p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>lecture(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>exercise(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>1</td> <td>laboratory/laboratories with</td> <td>3</td> <td>SWS/ contact hours</td> <td>42</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> </table> <p><input checked="" type="checkbox"/> other form of course (e.g. block seminar), namely this: Field Exercise 42.0 h working hours</p> <p>with 3 SWS / with totaly 42 contact hours <input type="checkbox"/> presence time <input checked="" type="checkbox"/> working hours</p> <p>= sum of presence time and working hours:</p> <p>Presence time: 3 SWS (42 h) and Working hours: 42 h = total 84.0 hours</p>	<input type="checkbox"/>	0	lecture(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	exercise(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input checked="" type="checkbox"/>	1	laboratory/laboratories with	3	SWS/ contact hours	42	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours
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	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>66.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>30.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>84.0 hours presence time, 180.0 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>winter semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>Will be provided during the courses.</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input checked="" type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (type, number)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL 2 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p> <p>Depending on chosen courses the number and type of exam elements may vary</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 50 % field trip report</p> <p>PL 2: 50 % laboratory report</p> <p>PL 3:</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral</p> <p><input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input checked="" type="checkbox"/> Other (concrete definition is given in the examination regulations):</p> <p>field trip report</p> <p>laboratory report</p>
2e	language(s) of instruction	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

module code /
module title

05-MMG-BG1 /Biogeochemical Processes: Concepts

date / version of the module
description

05.07.2021

1 INFORMATION ON THE MODULE		
1a	module code	05-MMG-BG1
1b	module title (German title)	Biogeochemical Processes: Concepts
1c	module title (English title)	Biogeochemical Processes: Concepts
1d	credit points	6
1e	responsible for the module	Elvert, Marcus
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	Basic knowlegde of organic compound classes, life domains, cell composition and structures, diagenetic reactions
1j	learning contents	The module "Biogeochemical Processes: Concepts" will introduce the wide range of element cycles, their underlying reactions and driving forces in different marine environments, ranging in space from the sea surface to the deep biosphere. Starting with fundamentals in this interdisciplinary field of research, specific courses will guide the students through topics ranging from (in)organic geochemistry to (isotope) biogeochemistry and marine microbiology. The physical and chemical behaviour of light stable isotopes under natural environmental conditions, fractionation processes, microbially catalysed biogeochemical processes and respective research methods combined with recent applications will be provided.

1k	learning outcomes/ competencies/ targeted competencies	<p>1) The students will have the knowledge to interpret the functional relationships between microbially driven processes and elemental/molecular signatures.</p> <p>2) The students will understand the physical and chemical behavior of light stable isotopes under natural environmental conditions.</p> <p>3) Students will have an understanding of the physiology of important microbes in the marine environment and biogeochemical processes they are involved in.</p> <p>4) Students will be able to utilize both geo- and biomolecules as sources of information for the study of biogeochemical processes that have implications for paleoenvironmental proxies.</p>																																																																							
1l	calculation of student workload <i>(part a: calculation of presence time and working hours)</i>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>1,5</td> <td>lecture(s) with</td> <td>2,5</td> <td>SWS/ contact hours</td> <td>35</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>1,5</td> <td>exercise(s) with</td> <td>2,5</td> <td>SWS/ contact hours</td> <td>35</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td colspan="5">other form of course (e.g. block seminar), namely this:</td> <td></td> </tr> <tr> <td></td> <td>with 0</td> <td>SWS / with totally</td> <td>0</td> <td>contact hours</td> <td><input type="checkbox"/> presence time</td> <td><input type="checkbox"/> working hours</td> </tr> </table> <p>= sum of presence time and working hours:</p> <p>Presence time: 5 SWS (70 h) and</p> <p>Working hours: 0 h = total 70.0 hours</p>	<input checked="" type="checkbox"/>	1,5	lecture(s) with	2,5	SWS/ contact hours	35	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input checked="" type="checkbox"/>	1,5	exercise(s) with	2,5	SWS/ contact hours	35	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours	<input type="checkbox"/>		other form of course (e.g. block seminar), namely this:							with 0	SWS / with totally	0	contact hours	<input type="checkbox"/> presence time	<input type="checkbox"/> working hours
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	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>70.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>40.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>70.0 hours presence time, 180.0 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>winter semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>1) Berner, R.A. (1980) Early Diagenesis: A Theoretical Approach.</p> <p>2) Canfield, D.E., Kristensen, E., and Thamdrup, B. (2005) Aquatic Geomicrobiology.</p> <p>3) Killips & Killips (2005) Introduction to Organic Geochemistry, 2nd edition.</p> <p>4) Schulz, H.D. and Zabel, M. (2006) Marine Geochemistry.</p>

1r	more information on the module (<i>optional</i>)	
2 INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)		
2a	type of examination	<input checked="" type="checkbox"/> module exam; i.e. exam with only one component (MP) <input type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP) <input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)
2b	exam components or prerequisites (<i>type, number</i>)	<p><i>PL = graded component of the examination</i> <i>SL = ungraded component of the examination, coursework</i> <i>PVL = prerequisite of the examination (see AT Art. 5 Section 10)</i></p> <p><input checked="" type="checkbox"/> PL 1 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p> <p>Oral exam focusing on all three course topics offered in the module (30 min).</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 100 % oral exam</p> <p>PL 2:</p> <p>PL 3:</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral <input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment <input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis <input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis <input type="checkbox"/> Other (concrete definition is given in the examination regulations):
2e	language(s) of instruction	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Other, namely this:

module code /
module title

05-MMG-CC1 /Climate Change I: Fundamentals

date / version of the module
description

05.07.2021

1 INFORMATION ON THE MODULE		
1a	module code	05-MMG-CC1
1b	module title (German title)	Climate Change I: Fundamentals
1c	module title (English title)	Climate Change I: Fundamentals
1d	credit points	6
1e	responsible for the module	Paul, André
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	Basic knowledge in physical climatology, marine geology and programming
1j	learning contents	<p>This first of two modules on climate change gives an overview of the basic components of the climate system, introduces nonlinear processes and feedbacks and proceeds from conceptual to comprehensive numerical models of the atmosphere, ocean, ice sheets and the Earth system. This is complemented by the paleoclimatic history of the Arctic and Antarctic polar regions during the Cenozoic and Pleistocene, which includes the tectonic development and its impact on the ocean circulation and high-latitude biota, as well as the development of polar ice sheets and their effects on sea level and global thermal differentiation. Computer and sediment lab exercises provide an introduction to scientific programming and data analysis on the one hand and high-latitude sediments on the other hand.</p>

1k	learning outcomes/ competencies/ targeted competencies	<p>to obtain a basic understanding of the physics of the climate system</p> <p>to get an overview of global climate development at tectonic to centennial time scales with an emphasis on the polar regions</p> <p>to become able to assess the opportunities and limitations of numerical climate models and (paleo-) climate data</p> <p>to acquire essential skills in scientific programming and data analysis</p>																																																																							
1l	<p>calculation of student workload <i>(part a: calculation of presence time and working hours)</i></p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>0,5</td> <td>lecture(s) with</td> <td>3</td> <td>SWS/ contact hours</td> <td>42</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>0,5</td> <td>exercise(s) with</td> <td>3</td> <td>SWS/ contact hours</td> <td>42</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td colspan="5">other form of course (e.g. block seminar), namely this:</td> <td></td> </tr> <tr> <td></td> <td>with 0</td> <td>SWS / with totally</td> <td>0</td> <td>contact hours</td> <td><input type="checkbox"/> presence time</td> <td><input type="checkbox"/> working hours</td> </tr> </table> <p>= sum of presence time and working hours:</p> <p>Presence time: 6 SWS (84 h) and</p> <p>Working hours: 0 h = total 84.0 hours</p>	<input checked="" type="checkbox"/>	0,5	lecture(s) with	3	SWS/ contact hours	42	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input checked="" type="checkbox"/>	0,5	exercise(s) with	3	SWS/ contact hours	42	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>		tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours	<input type="checkbox"/>		other form of course (e.g. block seminar), namely this:							with 0	SWS / with totally	0	contact hours	<input type="checkbox"/> presence time	<input type="checkbox"/> working hours
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	with 0	SWS / with totally	0	contact hours	<input type="checkbox"/> presence time	<input type="checkbox"/> working hours																																																																			

	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>48.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>48.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>84.0 hours presence time, 180 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>winter semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>Hartmann, Dennis L.: Global Physical Climatology. Elsevier, 2nd edition, 498 pp., 2016.</p> <p>Open University: Ocean Circulation. Butterworth-Heinemann, 2nd revised edition, 286 pp., 2004.</p> <p>Ruddiman, W.F.: Earth's climate: past and future. W.H. Freeman, 3rd revised edition, 464 p., 2013.</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input checked="" type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (<i>type, number</i>)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL 1 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 100 % oral exam</p> <p>PL 2:</p> <p>PL 3:</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral</p> <p><input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input type="checkbox"/> Other (concrete definition is given in the examination regulations):</p>
2e	language(s) of instruction	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

module code /
module title

05-MMG-EA1 /Environmental Archives Methods

date / version of the module
description

05.07.2021

1	INFORMATION ON THE MODULE	
1a	module code	05-MMG-EA1
1b	module title (German title)	Environmental Archives Methods
1c	module title (English title)	Environmental Archives Methods
1d	credit points	6
1e	responsible for the module	Bickert, Torsten
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	Basic knowledge in marine geology, biogeochemistry, physical oceanography
1j	learning contents	This first of two modules on environmental archives aims at introducing and applying the most important methods to describe the marine environment in the past and to understand the processes of environmental change. Proxy implementation follows the stages of proxy development, validation and application. Proxy research is strongly interdisciplinary. This module, therefore, integrates geochemical, geological, geophysical and paleontological methodology. Stratigraphic methods are important in environmental studies and therefore implemented in several exercises.

1k	learning outcomes/ competencies/ targeted competencies	<p>to become familiar with proxy development and application</p> <p>to gain an understanding of the most important processes in paleoenvironmental change</p> <p>to be able to apply the methods to case studies of actual research</p> <p>to work objective-oriented and problem-based individually as well as in a team</p>																																																																							
1l	<p>calculation of student workload <i>(part a: calculation of presence time and working hours)</i></p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>1,5</td> <td>lecture(s) with</td> <td>2</td> <td>SWS/ contact hours</td> <td>28</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>1,5</td> <td>exercise(s) with</td> <td>2</td> <td>SWS/ contact hours</td> <td>28</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td colspan="5">other form of course (e.g. block seminar), namely this:</td> <td></td> </tr> <tr> <td></td> <td>with 0</td> <td>SWS / with totally</td> <td>0</td> <td>contact hours</td> <td><input type="checkbox"/> presence time</td> <td><input type="checkbox"/> working hours</td> </tr> </table> <p>= sum of presence time and working hours:</p> <p>Presence time: 4 SWS (56 h) and</p> <p>Working hours: 0 h = total 56.0 hours</p>	<input checked="" type="checkbox"/>	1,5	lecture(s) with	2	SWS/ contact hours	28	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input checked="" type="checkbox"/>	1,5	exercise(s) with	2	SWS/ contact hours	28	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>		tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours	<input type="checkbox"/>		other form of course (e.g. block seminar), namely this:							with 0	SWS / with totally	0	contact hours	<input type="checkbox"/> presence time	<input type="checkbox"/> working hours
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	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>84.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>40.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>56.0 hours presence time, 180.0 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>winter semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>mostly research papers, announced in the different courses</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input checked="" type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (type, number)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL 1 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 100 % written exam</p> <p>PL 2:</p> <p>PL 3:</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral</p> <p><input checked="" type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input type="checkbox"/> Other (concrete definition is given in the examination regulations):</p>
2e	language(s) of instruction	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

module code /
module title

05-MMG-GB1 /Evolution of Marine Ecosystems

date / version of the module
description 05.07.2021

1	INFORMATION ON THE MODULE	
1a	module code	05-MMG-GB1
1b	module title (German title)	Evolution of Marine Ecosystems
1c	module title (English title)	Evolution of Marine ecosystems
1d	credit points	6
1e	responsible for the module	Zonneveld, Karin
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	Basic knowledge in Palaeontology, (inkl. Micropalaeontology and/or Palynology) , Earth sciences and Earth history
1j	learning contents	This course will obtain provide insight into the most actual scientific knowledge that is available with respect to processes and mechanisms that triggert major keypoints in the evolution and development of marine ecosystems. Focus will lay on the interaction between climate, environment and life. Each theme will start with an introductory lecture where the major known mechanisms, climatic and environmental processes as well as hypothesis will be elucidatet. This will be followed by oral presentations of students that will present recently published key publications. These presentations have been previously prepared in the form of homework. After this the students and teachers will discuss the current scientific views and hypotheses.

1k	learning outcomes/ competencies/ targeted competencies	<p>1) Students gained detailed knowledge about climatic, environmental and biologic processes that led to major changes in marine ecosystems through time.</p> <p>2) Students have experience in reading, understanding and presenting scientific publications.</p> <p>3) Students know how to discuss scientific results and hypotheses.</p> <p>4) Students have gained experience in presenting scientific results in the form of oral presentations.</p>																																																								
1l	calculation of student workload <i>(part a: calculation of presence time and working hours)</i>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>0,3</td> <td>lecture(s) with</td> <td>1,3</td> <td>SWS/ contact hours</td> <td>18,67</td> <td>hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>0,3</td> <td>seminar(s) with</td> <td>0,3</td> <td>SWS/ contact hours</td> <td>18,67</td> <td>hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>0,3</td> <td>exercise(s) with</td> <td>1,3</td> <td>SWS/ contact hours</td> <td>18,67</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> </table> <p><input type="checkbox"/> other form of course (e.g. block seminar), namely this:</p> <p>with 0 SWS / with total 0 contact hours <input type="checkbox"/> presence time <input type="checkbox"/> working hours</p> <p>= sum of presence time and working hours:</p> <p>Presence time: 4 SWS (56 h) and</p> <p>Working hours: 0 h = total 56.0 hours</p>	<input checked="" type="checkbox"/>	0,3	lecture(s) with	1,3	SWS/ contact hours	18,67	hours of presence	<input checked="" type="checkbox"/>	0,3	seminar(s) with	0,3	SWS/ contact hours	18,67	hours of presence	<input checked="" type="checkbox"/>	0,3	exercise(s) with	1,3	SWS/ contact hours	18,67	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours
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<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence																																																				
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<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours																																																				

	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>74.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>50.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>56.0 hours presence time, 180.0 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>winter semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>Recently published Literature will be provided in the course</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input checked="" type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (<i>type, number</i>)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL 2 <input checked="" type="checkbox"/> SL 1 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p> <p>Presentation: short lecture by individual student about an actual scientific paper provided in the course (not graded), homework: short written scientific review about one of the course themes, presentation and report (individual) at the end of the course</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 50 % assignment</p> <p>PL 2: 50 % seminar paper</p> <p>PL 3: 0 % seminar talk</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input checked="" type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input checked="" type="checkbox"/> Presentation, oral</p> <p><input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input checked="" type="checkbox"/> Other (concrete definition is given in the examination regulations):</p> <p>seminar talk</p>
2e	language(s) of instruction	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

module code /
module title

05-MMG-OC1 /Magmatic and Hydrothermal Processes

date / version of the module
description

05.07.2021

1 INFORMATION ON THE MODULE		
1a	module code	05-MMG-OC1
1b	module title (German title)	Magmatic and Hydrothermal Processes
1c	module title (English title)	Magmatic and Hydrothermal Processes
1d	credit points	6
1e	responsible for the module	Bach, Wolfgang
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	
1i	content-related prior knowledge or skills	
1j	learning contents	Module covers (1) mantle melting in rifts, plumes, and subduction zones, (2) melt segregation and melt-rock interaction in the crust-mantle transition zone, (3) magmatic differentiation by crystallization and assimilation, and (4) seawater-crust exchange (including hydrothermal vents). We will use theory of phase relations and literature reviews in class and do thin section microscopy and handling of geochemical data in the practical part of the module.
1k	learning outcomes/ competencies/ targeted competencies	1) Students understand phase relations and mass balance constraints of mantle melting and magmatic differentiation.

		<p>2) Students are able to use thin section microscopy to determine textures and phase assemblages and turn these observations into models of rock formation.</p> <p>3) Students know how to work with rock geochemical data and interpret the results.</p> <p>4) Students understand the role of ocean crust formation and alteration in System Earth.</p>																																																								
11	<p>calculation of student workload (part a: calculation of presence time and working hours)</p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>0,5</td> <td>lecture(s) with</td> <td>2</td> <td>SWS/ contact hours</td> <td>28</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>0,5</td> <td>exercise(s) with</td> <td>2</td> <td>SWS/ contact hours</td> <td>28</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> </table> <p><input type="checkbox"/> other form of course (e.g. block seminar), namely this:</p> <p>with 0 SWS / with total 0 contact hours <input type="checkbox"/> presence time <input type="checkbox"/> working hours</p> <p>= sum of presence time and working hours:</p> <p>Presence time: 4 SWS (56 h) and</p> <p>Working hours: 0 h = total 56.0 hours</p>	<input checked="" type="checkbox"/>	0,5	lecture(s) with	2	SWS/ contact hours	28	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input checked="" type="checkbox"/>	0,5	exercise(s) with	2	SWS/ contact hours	28	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours
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	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>68.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>56.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>56.0 hours presence time, 180.0 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>winter semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>1) Searle M, Mid-ocean ridges, Cambridge University Press</p> <p>2) Winter J, Introduction to Petrology, Cambridge University Press</p> <p>3) Best MC & Christiansen EH, Igneous petrology, Blackwell Science</p> <p>4) Raith MM, Raase P & Reinhardt J, Thin section microscopy, ISBN 978-3-00-037671-9 (PDF)</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input checked="" type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (<i>type, number</i>)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL 1 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 100 % assignment</p> <p>PL 2:</p> <p>PL 3:</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input checked="" type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral</p> <p><input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input type="checkbox"/> Other (concrete definition is given in the examination regulations):</p>
2e	language(s) of instruction	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

**module code /
module title**

05-MMG-SS1 /Sedimentary Structures of Shelves and Passive Margins

date / version of the module description 05.07.2021

1	INFORMATION ON THE MODULE	
1a	module code	05-MMG-SS1
1b	module title (German title)	Sedimentary Structures of Shelves and Passive Margins
1c	module title (English title)	Sedimentary Structures of Shelves and Passive Margins
1d	credit points	6
1e	responsible for the module	Schwenk, Tilmann
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	basic knowledge of sedimentology and geophysics
1j	learning contents	The central focus of this module is the transport and deposition of sediment particles on passive margins and shelves with respect to external and internal forces, thereby integrating sedimentological, geophysical and actuo-paleontological results. One course is the training of the (integrated) interpretation of all kind of seismo-acoustic data as multibeam, sidescan sonar, sediment echosounder and high-resolution seismic systems. A second course introduces the main features of carbonate and terrigenous sedimentation patterns in tropical and non-tropical shelf environments along latitudinal and bathymetrical traverses. Analysis of sediment dynamics and ecological pattern on shelves provide important links between terrestrial and oceanic responses to global climate forcing. Within the third course sediment dynamics at passive

		<p>margins are analyzed. In particular, a variety of gravity-driven mass flows and contouritic deposition are discussed in terms of evolutionary models and a processed-based understanding.</p>																																																																														
1k	<p>learning outcomes/ competencies/ targeted competencies</p>	<p>Students know how to interpret seismo-acoustic data</p> <p>Students are able to analyse sedimentary facies</p> <p>Students are able to evaluate of conceptual sedimentation models for tropical and non-tropical carbonaceous and siliciclastic shelf settings</p> <p>Students have gained processed-based understanding of transport and depositional processes at passive margins</p>																																																																														
1l	<p>calculation of student workload <i>(part a: calculation of presence time and working hours)</i></p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>1,5</td> <td>lecture(s) with</td> <td>2</td> <td>SWS/ contact hours</td> <td>28</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>1,5</td> <td>exercise(s) with</td> <td>2</td> <td>SWS/ contact hours</td> <td>28</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td colspan="5">other form of course (e.g. block seminar), namely this:</td> <td></td> </tr> <tr> <td></td> <td></td> <td>with</td> <td>0</td> <td>SWS / with totally</td> <td>0</td> <td>contact hours</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td><input type="checkbox"/> presence time <input type="checkbox"/> working hours</td> </tr> </table> <p>= sum of presence time and working hours:</p> <p>Presence time: 4 SWS (56 h) and</p>	<input checked="" type="checkbox"/>	1,5	lecture(s) with	2	SWS/ contact hours	28	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input checked="" type="checkbox"/>	1,5	exercise(s) with	2	SWS/ contact hours	28	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours	<input type="checkbox"/>		other form of course (e.g. block seminar), namely this:								with	0	SWS / with totally	0	contact hours							<input type="checkbox"/> presence time <input type="checkbox"/> working hours
<input checked="" type="checkbox"/>	1,5	lecture(s) with	2	SWS/ contact hours	28	hours of presence																																																																										
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		Working hours: 0 h = total 56.0 hours
	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>30.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>94.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>56.0 hours presence time, 180 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>winter semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>Nittrouer et al., 2008: Continental margin sedimentation</p> <p>E.J.W. Jones: Marine Geophysics</p> <p>Handouts, scripts and specific literature will be provided</p>

1r	more information on the module (<i>optional</i>)	
2 INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)		
2a	type of examination	<input type="checkbox"/> module exam; i.e. exam with only one component (MP) <input checked="" type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP) <input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)
2b	exam components or prerequisites (<i>type, number</i>)	<i>PL = graded component of the examination</i> <i>SL = ungraded component of the examination, coursework</i> <i>PVL = prerequisite of the examination (see AT Art. 5 Section 10)</i> <input checked="" type="checkbox"/> PL 2 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification If necessary, further explanations:
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	PL 1: 50 % oral exam PL 2: 50 % project exercise report PL 3: PL 4:
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral <input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment <input type="checkbox"/> Portfolio <input checked="" type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis <input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis <input type="checkbox"/> Other (concrete definition is given in the examination regulations):
2e	language(s) of instruction	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Other, namely this:

module code /
module title

05-MMG-TE1 /Geophysical Surveying & Observation Technology

date / version of the module
description

05.07.2021

1	INFORMATION ON THE MODULE	
1a	module code	05-MMG-TE1
1b	module title (German title)	Geophysical Surveying & Observation Technology
1c	module title (English title)	Geophysical Surveying & Observation Technology
1d	credit points	6
1e	responsible for the module	Kopf, Achim
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	
1j	learning contents	The key questions and contents during the WS include: LV1: What is measured using marine technologies? What are the underlying (geo)physical principles in marine surveying ? How are surveys designed and parametrised? What instruments/sensors/technologies are utilised? LV2: For longer term observations, what systems exist in the ocean water body, on the seafloor, or below the seafloor, and how do they function? What are the pros and cons of each system? How do we process and interpret such data, and what is the future of ocean observation?
1k	learning outcomes/ competencies/ targeted competencies	Students have a profound understanding of marine technologies and how they function

		<p>Students are well introduced to geophysical survey planning and techniques used (including practicals to plan and parametrise surveys, exercises to work on the acquired data)</p> <p>Students know different observing systems in the ocean and on/below the seafloor, including the practical use to process (time series analysis) and interpret such long-term data</p> <p>Students know how to use marine geophysics and technology on RV Alkor</p>																																																																							
11	<p>calculation of student workload (part a: calculation of presence time and working hours)</p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>1</td> <td>lecture(s) with</td> <td>2</td> <td>SWS/ contact hours</td> <td>28</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>1</td> <td>exercise(s) with</td> <td>2</td> <td>SWS/ contact hours</td> <td>28</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td colspan="5">other form of course (e.g. block seminar), namely this:</td> <td></td> </tr> <tr> <td></td> <td>with 0</td> <td>SWS / with totaly</td> <td>0</td> <td>contact hours</td> <td><input type="checkbox"/> presence time</td> <td><input type="checkbox"/> working hours</td> </tr> </table> <p>= sum of presence time and working hours:</p> <p>Presence time: 4 SWS (56 h) and</p> <p>Working hours: 0 h = total 56.0 hours</p>	<input checked="" type="checkbox"/>	1	lecture(s) with	2	SWS/ contact hours	28	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input checked="" type="checkbox"/>	1	exercise(s) with	2	SWS/ contact hours	28	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours	<input type="checkbox"/>		other form of course (e.g. block seminar), namely this:							with 0	SWS / with totaly	0	contact hours	<input type="checkbox"/> presence time	<input type="checkbox"/> working hours
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	with 0	SWS / with totaly	0	contact hours	<input type="checkbox"/> presence time	<input type="checkbox"/> working hours																																																																			

	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>80.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>44.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>56.0 hours presence time, 180.0 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>winter semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>Literature to be provided in the individual classes</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input checked="" type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (<i>type, number</i>)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL 2 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 50 % project exercise report</p> <p>PL 2: 50 % written exam</p> <p>PL 3:</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral</p> <p><input checked="" type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input type="checkbox"/> Portfolio <input checked="" type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input type="checkbox"/> Other (concrete definition is given in the examination regulations):</p>
2e	language(s) of instruction	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

module code /
module title

05-MMG-MR2 /Deep-Sea Resources

date / version of the module
description

05.07.2021

1	INFORMATION ON THE MODULE	
1a	module code	05-MMG-MR2
1b	module title (German title)	Deep-Sea Resources
1c	module title (English title)	Deep-Sea Resources
1d	credit points	6
1e	responsible for the module	Bach, Wolfgang
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	
1j	learning contents	Formation of marine mineral (phosphorite, evaporite etc.) and metal deposits (Mn-nodules and -crusts, seafloor massive sulfide deposits). The students further work self-determined on regional marine resources after having been introduced to the basic knowledge of resources (hydrocarbons, phosphorites and evaporites, mineral deposits and marine deposits on land).
1k	learning outcomes/ competencies/ targeted competencies	Students understand how marine deposits form Students understand how and where marine deposits are preserved in the geological record

		<p>Students understand the connections between the magmatic, hydrothermal, and tectonic processes during ocean basin evolution (rifts and margins) and ocean basin closure (i.e. plate collision) and deposit formation</p> <p>Students have a comprehensive understanding of the distribution of marine resources on Earth</p>																																																																							
11	<p>calculation of student workload (part a: calculation of presence time and working hours)</p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>0,3</td> <td>lecture(s) with</td> <td>1,3</td> <td>SWS/ contact hours</td> <td>18,67</td> <td>hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>0,3</td> <td>seminar(s) with</td> <td>0,3</td> <td>SWS/ contact hours</td> <td>18,67</td> <td>hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>0,3</td> <td>exercise(s) with</td> <td>1,3</td> <td>SWS/ contact hours</td> <td>18,67</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td colspan="5">other form of course (e.g. block seminar), namely this:</td> <td></td> </tr> <tr> <td></td> <td>with 0</td> <td>SWS / with totally</td> <td>0</td> <td>contact hours</td> <td><input type="checkbox"/> presence time</td> <td><input type="checkbox"/> working hours</td> </tr> </table> <p>= sum of presence time and working hours:</p> <p>Presence time: 4 SWS (56 h) and</p> <p>Working hours: 0 h = total 56.0 hours</p>	<input checked="" type="checkbox"/>	0,3	lecture(s) with	1,3	SWS/ contact hours	18,67	hours of presence	<input checked="" type="checkbox"/>	0,3	seminar(s) with	0,3	SWS/ contact hours	18,67	hours of presence	<input checked="" type="checkbox"/>	0,3	exercise(s) with	1,3	SWS/ contact hours	18,67	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours	<input type="checkbox"/>		other form of course (e.g. block seminar), namely this:							with 0	SWS / with totally	0	contact hours	<input type="checkbox"/> presence time	<input type="checkbox"/> working hours
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	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>68.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>56.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>56.0 hours presence time, 180.0 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>winter semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>literature recherche is part of the students achievement.</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input checked="" type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (<i>type, number</i>)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL 1 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 100 % seminar paper</p> <p>PL 2:</p> <p>PL 3:</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input checked="" type="checkbox"/> Presentation, oral</p> <p><input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input type="checkbox"/> Other (concrete definition is given in the examination regulations):</p>
2e	language(s) of instruction	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

module code /
module title

05-MMG-MR1 /Continental Margin Resources

date / version of the module
description

05.07.2021

1	INFORMATION ON THE MODULE	
1a	module code	05-MMG-MR1
1b	module title (German title)	Continental Margin Resources
1c	module title (English title)	Continental Margin Resources
1d	credit points	6
1e	responsible for the module	Bohrmann, Gerhard
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	
1i	content-related prior knowledge or skills	Background in basics of geophysics, sedimentology and structural geology
1j	learning contents	This module will provide a basic understanding of ocean margin gas hydrate and hydrocarbon systems. Students will get a comprehensive insight into the physics, chemistry and geobiology of gas hydrates as well as into geochemical concepts of generation and migration of hydrocarbons. They will learn how biomarkers are used to identify origin, migration and alteration of hydrocarbons in marine sediments. In addition the module offers an introduction into the application of geoscience concepts in hydrocarbon exploration and development.
1k	learning outcomes/ competencies/ targeted competencies	1) Students understand key concept in hydrocarbon exploration 2) Students understand the principles of gas hydrate formation and distribution on earth

		<p>3) Students understand oil and gas formation, migration and in-reservoir alteration</p> <p>4) Students understand biomarkers as a tool to establish oil-source correlations and alteration histories using petroleum geochemical data</p>																																																																							
<p>11</p>	<p>calculation of student workload (part a: calculation of presence time and working hours)</p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>1,5</td> <td>lecture(s) with</td> <td>2,5</td> <td>SWS/ contact hours</td> <td>35</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>1,5</td> <td>exercise(s) with</td> <td>2,5</td> <td>SWS/ contact hours</td> <td>35</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>1 / 14</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td colspan="5">other form of course (e.g. block seminar), namely this:</td> <td></td> </tr> <tr> <td></td> <td>with 0</td> <td>SWS / with totaly</td> <td>0</td> <td>contact hours</td> <td><input type="checkbox"/> presence time</td> <td><input type="checkbox"/> working hours</td> </tr> </table> <p>= sum of presence time and working hours:</p> <p>Presence time: 6 SWS (84 h) and</p> <p>Working hours: 0 h = total 84.0 hours</p>	<input checked="" type="checkbox"/>	1,5	lecture(s) with	2,5	SWS/ contact hours	35	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input checked="" type="checkbox"/>	1,5	exercise(s) with	2,5	SWS/ contact hours	35	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input checked="" type="checkbox"/>	.	tutorial(s) with	1 / 14	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours	<input type="checkbox"/>		other form of course (e.g. block seminar), namely this:							with 0	SWS / with totaly	0	contact hours	<input type="checkbox"/> presence time	<input type="checkbox"/> working hours
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	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>60.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>36.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>84.0 hours presence time, 180.0 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>summer semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>Sloan, EDJ, and Koh CA (2007) Clathrate hydrate of natural gases (third edition). CRC press, Taylor & Francis Group, London, New York.</p> <p>Rose, Peter (2001): Risk Analysis and Management of Petroleum Exploration Ventures (AAPG Methods in Exploration No. 12)</p> <p>Jahn, Cook and Graham (2008) Hydrocarbon Exploration & Production (Developments in Petroleum Science)</p> <p>Tisso, B.P. and Welte, D.H. (1984) Petroleum Formation and Occurrence (2nd Edition, Springer-Verlag, Berlin)</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	

2a	type of examination	<input type="checkbox"/> module exam; i.e. exam with only one component (MP) <input checked="" type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP) <input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)
2b	exam components or prerequisites (type, number)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <input checked="" type="checkbox"/> PL 2 <input checked="" type="checkbox"/> SL 1 <input type="checkbox"/> PVL justification
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	PL 1: 50 % written exam PL 2: 50 % Presentation with written elaboration PL 3: PL 4:
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral <input checked="" type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input checked="" type="checkbox"/> Presentation and written assignment <input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis <input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis <input type="checkbox"/> Other (concrete definition is given in the examination regulations):
2e	language(s) of instruction	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Other, namely this:

module code /
module title

05-MMG-BG2 /Biogeochemical Processes: Projects

date / version of the module
description

05.07.2021

1 INFORMATION ON THE MODULE		
1a	module code	05-MMG-BG2
1b	module title (German title)	Biogeochemical Processes: Projects
1c	module title (English title)	Biogeochemical Processes: Projects
1d	credit points	6
1e	responsible for the module	Zabel, Matthias
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	Participation in "Biogeochemical Processes: Concepts"
1j	learning contents	Based on theoretical foundations given in module "Biogeochemical Processes: Concepts", we now focus on practical applications in the field and our geochemical laboratories. In addition to a one-to-two day field exercise focusing on biogeochemical sampling of marine sediments, groups of students will work on small, interdisciplinary projects, which will be designed according to recent research questions/techniques in the fields of marine (in)organic geochemistry and biogeochemistry. Specific topics of the concept module will be discussed in small groups, for example, principles of geochemical modeling or handling of complex data sets.

1k	learning outcomes/ competencies/ targeted competencies	<p>1) Students will be familiar with fundamental laboratory methods and techniques in (in)organic geochemistry essential for scientific geochemical work.</p> <p>2) Students will be able to tackle research questions in biogeochemistry.</p> <p>3) Students will be in a position to provide conceptions of the ocean as a biogeochemical system.</p> <p>4) Students will be provided with skills to work independently as well as in a team.</p>																																																								
1l	<p>calculation of student workload <i>(part a: calculation of presence time and working hours)</i></p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>lecture(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>exercise(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>1</td> <td>laboratory/laboratories with</td> <td>6</td> <td>SWS/ contact hours</td> <td>84</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> </table> <p><input type="checkbox"/> other form of course (e.g. block seminar), namely this:</p> <p>with 0 SWS / with total 0 contact hours <input type="checkbox"/> presence time <input type="checkbox"/> working hours</p> <p>= sum of presence time and working hours:</p> <p>Presence time: 6 SWS (84 h) and</p> <p>Working hours: 0 h = total 84.0 hours</p>	<input type="checkbox"/>	0	lecture(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	exercise(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input checked="" type="checkbox"/>	1	laboratory/laboratories with	6	SWS/ contact hours	84	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours
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	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>36.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>60.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>84.0 hours presence time, 180.0 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>summer semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>Ardrey (2003) Liquid Chromatography - Mass Spectrometry, John Wiley and Sons Ltd, 296 pages. Boudreau & Joergensen (eds) (2001) The benthic boundary layer. Oxford Press. Broekaert (2001) Analytical Atomic Spectrometry with Flames and Plasmas, Wiley-VCH, 364 pages. Canfield, Thamdrup & Kristensen (eds) (2005) Aquatic Geomicrobiology, Academic Press. Grob & Barry (2004) Modern Practice of Gas Chromatography, John Wiley & Sons Inc, 1045 pages. Schulz & Zabel (eds) (2006) Marine Geochemistry. 2nd ed., Springer Verlag.</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input checked="" type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (type, number)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL 2 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 66 % project exercise report</p> <p>PL 2: 34 % seminar talk</p> <p>PL 3:</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral</p> <p><input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input type="checkbox"/> Portfolio <input checked="" type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input checked="" type="checkbox"/> Other (concrete definition is given in the examination regulations):</p> <p>seminar talk</p>
2e	language(s) of instruction	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

module code /
module title

05-MMG-CC2 /Climate Change II: Models and Data

date / version of the module
description

05.07.2021

1 INFORMATION ON THE MODULE		
1a	module code	05-MMG-CC2
1b	module title (German title)	Climate Change II: Models and Data
1c	module title (English title)	Climate Change II: Models and Data
1d	credit points	6
1e	responsible for the module	Paul, André
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	Contents of module Climate Change I
1j	learning contents	This second module introduces to the reconstruction and modeling of abrupt climate changes, provides an overview of paleo and historical climate changes (from the role of oceanic gateways in the Cenozoic through Pleistocene climate cycles to natural climate variability during the Holocene) and presents an outlook on future climate changes in response to projected anthropogenic climate forcings. Available evidence for past climate changes (from ice and marine sediment cores) as well as current climate change (from historical and instrumental data) is discussed. Computer lab exercises with conceptual climate models and results of comprehensive climate models are used throughout to investigate the processes that cause those climate changes.

1k	learning outcomes/ competencies/ targeted competencies	<p>to become familiar with the reconstructed climate variations for selected time intervals of the Cenozoic</p> <p>to gain an understanding of the dynamics of abrupt climate changes</p> <p>to analyze proxy data and compare them to the results of numerical climate models</p> <p>to become able to assess the respective roles of natural and anthropogenic climate variations in past and future climate changes</p>																																																								
1l	<p>calculation of student workload <i>(part a: calculation of presence time and working hours)</i></p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>0,5</td> <td>lecture(s) with</td> <td>2,5</td> <td>SWS/ contact hours</td> <td>35</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>0,5</td> <td>exercise(s) with</td> <td>2,5</td> <td>SWS/ contact hours</td> <td>35</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> </table> <p><input type="checkbox"/> other form of course (e.g. block seminar), namely this:</p> <p>with 0 SWS / with total 0 contact hours <input type="checkbox"/> presence time <input type="checkbox"/> working hours</p> <p>= sum of presence time and working hours:</p> <p>Presence time: 5 SWS (70 h) and</p> <p>Working hours: 0 h = total 70.0 hours</p>	<input checked="" type="checkbox"/>	0,5	lecture(s) with	2,5	SWS/ contact hours	35	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input checked="" type="checkbox"/>	0,5	exercise(s) with	2,5	SWS/ contact hours	35	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours
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	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>56.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>54.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>70.0 hours presence time, 180 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>summer semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>Alley et al.: Abrupt Climate Change: Inevitable Surprises. National Academy Press, Washington, DC, 238 pp., 2002.</p> <p>Ruddiman, W.F.: Earth's climate: past and future. W.H. Freeman, 3rd revised edition, 464 p., 2013.</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input checked="" type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (<i>type, number</i>)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL 1 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 100 % oral exam</p> <p>PL 2:</p> <p>PL 3:</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral</p> <p><input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input type="checkbox"/> Other (concrete definition is given in the examination regulations):</p>
2e	language(s) of instruction	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

module code /
module title

05-MMG-EA2 /Environmental Archives Projects

date / version of the module
description

05.07.2021

1 INFORMATION ON THE MODULE		
1a	module code	05-MMG-EA2
1b	module title (German title)	Environmental Archives Projects
1c	module title (English title)	Environmental Archives Projects
1d	credit points	6
1e	responsible for the module	Mollenhauer, Gesine
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	Contents of module Environmental Archives I
1j	learning contents	This second module on environmental archives aims at applying the gained knowledge for analyzing and understanding marine archives in context of a current topic in paleoenvironmental research in the format of a student project. This includes a practical in core description, application of various laboratory methods, evaluation and interpretation of gained data sets in context of the literature, and a report in the format of a research publication.
1k	learning outcomes/ competencies/ targeted competencies	to become familiar with proxy development and application to gain an understanding of the most important processes in paleoenvironmental change to be able to apply the methods on case studies of actual research

		to work objective-oriented and problem-based individually as well as in a team																																																																																					
11	<p>calculation of student workload (part a: calculation of presence time and working hours)</p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>lecture(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>exercise(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>1</td> <td>laboratory/laboratories with</td> <td>4</td> <td>SWS/ contact hours</td> <td>56</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td colspan="5">other form of course (e.g. block seminar), namely this:</td> <td></td> </tr> <tr> <td></td> <td></td> <td>with</td> <td>0</td> <td>SWS / with totaly</td> <td>0</td> <td>contact hours</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td><input type="checkbox"/> presence time</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td><input type="checkbox"/> working hours</td> </tr> </table> <p>= sum of presence time and working hours:</p> <p>Presence time: 4 SWS (56 h) and</p> <p>Working hours: 0 h = total 56.0 hours</p>	<input type="checkbox"/>	0	lecture(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	exercise(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input checked="" type="checkbox"/>	1	laboratory/laboratories with	4	SWS/ contact hours	56	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours	<input type="checkbox"/>		other form of course (e.g. block seminar), namely this:								with	0	SWS / with totaly	0	contact hours							<input type="checkbox"/> presence time							<input type="checkbox"/> working hours
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						<input type="checkbox"/> working hours																																																																																	
	<p>calculation of student workload (part b: preparation time and follow-up work/self-study)</p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>84.0 hours</p>																																																																																					

	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>40.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>56.0 hours presence time, 180.0 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>summer semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>literature will be announced during the course.</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input checked="" type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>
2b	<p>exam components or prerequisites <i>(type, number)</i></p>	<p><i>PL = graded component of the examination</i> <i>SL = ungraded component of the examination, coursework</i> <i>PVL = prerequisite of the examination (see AT Art. 5 Section 10)</i></p> <p><input checked="" type="checkbox"/> PL 1 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p>

2c	Give this information for combination examinations only: Weights (in percentage) of component grades	PL 1: 100 % project exercise report PL 2: PL 3: PL 4:
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral <input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment <input type="checkbox"/> Portfolio <input checked="" type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis <input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis <input type="checkbox"/> Other (concrete definition is given in the examination regulations):
2e	language(s) of instruction	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Other, namely this:

module code /
module title

05-MMG-GB2 /Marine Molecular Geobiology

date / version of the module
description

05.07.2021

1	INFORMATION ON THE MODULE	
1a	module code	05-MMG-GB2
1b	module title (German title)	Marine Molecular Geobiology
1c	module title (English title)	Marine Molecular Geobiology
1d	credit points	6
1e	responsible for the module	Hinrichs, Kai-Uwe
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	Attendance of Modules "Evolution of Marine Ecosystems" and "Biogeochemical Processes: Concepts" is strongly recommended.
1j	learning contents	This module seeks to provide a comprehensive overview about molecular lines of inquiry in Geobiology and Paleoenvironmental Sciences. Students will learn how these techniques contribute to the exploration of the origins of life as well as the early life on Earth. Applications of molecular biomarkers will be exemplified with case studies from various eras in Earth history. Current research on the diversity of life, its functions in the environment and the limits of life in extreme environments will complement the contents focusing on past life. We will also introduce the concepts and current topics in Astrobiology. We will address fundamental questions such as: What is life and how did it originate? How did life function without oxygen and which traces did it leave in the geological record? How can we recognize and quantify consequences of life such as

		primary production? How can the appearance of certain life forms enable conclusions regarding past environmental conditions? What are the limits of life on Earth and other planets?																																																																													
1k	learning outcomes/ competencies/ targeted competencies	<p>1) An understanding regarding the key concepts describing the origins of life on Earth</p> <p>2) An appreciation of the importance of the coevolution of life and planet Earth through geological time</p> <p>3) An understanding of molecular biomarkers and their potential and limitations to track life and environmental processes in the past</p> <p>4) An understanding of life in extreme environments as potential analogue to early life and life on other planetary bodies</p> <p>5) Familiarity with the current literature in the field and ability to discuss and present current findings with peers</p>																																																																													
1l	calculation of student workload <i>(part a: calculation of presence time and working hours)</i>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>1</td> <td>lecture(s) with</td> <td>4</td> <td>SWS/ contact hours</td> <td>56</td> <td>hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>1</td> <td>seminar(s) with</td> <td>1</td> <td>SWS/ contact hours</td> <td>28</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>exercise(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> <tr> <td></td> <td></td> <td><input type="checkbox"/></td> <td></td> <td colspan="3">other form of course (e.g. block seminar), namely this:</td> </tr> <tr> <td></td> <td></td> <td>with</td> <td>0</td> <td>SWS / with totally</td> <td>0</td> <td>contact hours</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td><input type="checkbox"/> presence time <input type="checkbox"/> working hours</td> </tr> </table>	<input checked="" type="checkbox"/>	1	lecture(s) with	4	SWS/ contact hours	56	hours of presence	<input checked="" type="checkbox"/>	1	seminar(s) with	1	SWS/ contact hours	28	hours of presence	<input type="checkbox"/>	0	exercise(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours			<input type="checkbox"/>		other form of course (e.g. block seminar), namely this:					with	0	SWS / with totally	0	contact hours							<input type="checkbox"/> presence time <input type="checkbox"/> working hours
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		<p>= sum of presence time and working hours:</p> <p>Presence time: 6 SWS (84 h) and</p> <p>Working hours: 0 h = total 84.0 hours</p>
	<p>calculation of student workload</p> <p>(part b: preparation time and follow-up work/self-study)</p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>56.0 hours</p>
	<p>calculation of student workload</p> <p>(part c: exam preparation etc.)</p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>40.0 hours</p>
	<p>calculation of student workload</p> <p>(total amount of hours including a) - c))</p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>84.0 hours presence time, 180 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>summer semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature (optional)</p>	<p>1) Fenchel, T. (2003) The origin and early evolution of life</p> <p>2) Fenchel, T., Blackburn, H., King, G.M. (2012) Bacterial Biogeochemistry: The Ecophysiology of Mineral Cycling</p> <p>3) diverse research articles in the field of Geobiology, Astrobiology, Geomicrobiology and Paleo Sciences</p>

1r	more information on the module (<i>optional</i>)	
2 INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)		
2a	type of examination	<input type="checkbox"/> module exam; i.e. exam with only one component (MP) <input checked="" type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP) <input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)
2b	exam components or prerequisites (<i>type, number</i>)	<p><i>PL = graded component of the examination</i> <i>SL = ungraded component of the examination, coursework</i> <i>PVL = prerequisite of the examination (see AT Art. 5 Section 10)</i></p> <input checked="" type="checkbox"/> PL 2 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification If necessary, further explanations:
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	PL 1: 75 % oral exam PL 2: 25 % seminar paper PL 3: PL 4:
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Oral examination (single) <input checked="" type="checkbox"/> Presentation, oral <input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment <input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis <input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis <input type="checkbox"/> Other (concrete definition is given in the examination regulations):
2e	language(s) of instruction	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Other, namely this:

module code /
module title

05-MMG-OC2 /Geophysics of Plates, Mantle and Margins

date / version of the module
description

05.07.2021

1	INFORMATION ON THE MODULE	
1a	module code	05-MMG-OC2
1b	module title (German title)	Geophysics of Plates, Mantle and Margins
1c	module title (English title)	Geophysics of Plates, Mantle and Margins
1d	credit points	6
1e	responsible for the module	Pérez Gussinyé, Marta
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	
1i	content-related prior knowledge or skills	Background in basics of geophysics
1j	learning contents	<p>Key elements of the Earth's surface are plates, lithosphere and upper mantle, and this lecture deals with geophysical methods and data to characterize their properties, understand the kinematics of plates and discuss the geodynamical consequences.</p> <p>We introduce into advanced aspects of plate tectonics with a focus on plate boundaries as ridges, rifted margins, fracture and subduction zones. Geophysical evidence from earthquake seismology, reflection and refraction seismics as well as heat flow, magnetic and gravity measurements are used. Fundamental characteristics of both erosive and accretionary subduction margins are covered. Related exercises use various marine geophysical data sets to be worked up in groups.</p>

		<p>The role of the lithosphere in bending, rifting and continental breakup is introduced as well as mantle driving forces, convection and plumes and their consequences on elevation, crustal strength and deformation styles. Exercises are carried out using simple numerical simulation and modelling techniques.</p>																																																																														
1k	learning outcomes/ competencies/ targeted competencies	<p>1) Students have broadened and deepened their knowledge of deformation and mass transfer processes at convergent margins, mechanics and dynamics of forearc regions.</p> <p>2) Students are able to characterize tectonic processes at rifted margins and ridges.</p> <p>3) Students got familiar with geophysical, particularly reflection seismic, data interpretation.</p> <p>4) Students understand fundamental equations that govern subsidence at rifted margins and oceanic plates. They gained familiarisation of their solution using simple codes in Matlab.</p>																																																																														
1l	<p>calculation of student workload (part a: calculation of presence time and working hours)</p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>0,5</td> <td>lecture(s) with</td> <td>2</td> <td>SWS/ contact hours</td> <td>28</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>0,5</td> <td>exercise(s) with</td> <td>2</td> <td>SWS/ contact hours</td> <td>28</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> <tr> <td></td> <td></td> <td><input type="checkbox"/></td> <td colspan="4">other form of course (e.g. block seminar), namely this:</td> <td></td> </tr> <tr> <td></td> <td></td> <td>with</td> <td>0</td> <td>SWS / with total</td> <td>0</td> <td>contact hours</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td><input type="checkbox"/> presence time <input type="checkbox"/> working hours</td> </tr> </table> <p>= sum of presence time and working hours:</p>	<input checked="" type="checkbox"/>	0,5	lecture(s) with	2	SWS/ contact hours	28	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input checked="" type="checkbox"/>	0,5	exercise(s) with	2	SWS/ contact hours	28	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours			<input type="checkbox"/>	other form of course (e.g. block seminar), namely this:							with	0	SWS / with total	0	contact hours							<input type="checkbox"/> presence time <input type="checkbox"/> working hours
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<input checked="" type="checkbox"/>	0,5	exercise(s) with	2	SWS/ contact hours	28	hours of presence																																																																										
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		<input type="checkbox"/>	other form of course (e.g. block seminar), namely this:																																																																													
		with	0	SWS / with total	0	contact hours																																																																										
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		<p>Presence time: 4 SWS (56 h) and</p> <p>Working hours: 0 h = total 56.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>68.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>56.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>56.0 hours presence time, 180.0 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>summer semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>1) Turcotte, D. L. & G. Schubert (2002): Geodynamics: Applications of Continuum Physics to Geological Problems. John Wiley and Sons, New York</p> <p>2) Basin Analysis: Principles and Application to Petroleum Play Assessment, Allen and Allen, Wiley - Blackwell</p> <p>3) Mid-ocean ridges, Searle, Cambridge University Press</p>

		4) The oceanic crust, from accretion to mantle recycling, Juteau and Maury, Springer
1r	more information on the module (<i>optional</i>)	
2	INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)	
2a	type of examination	<input checked="" type="checkbox"/> module exam; i.e. exam with only one component (MP) <input type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP) <input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)
2b	exam components or prerequisites (<i>type, number</i>)	<i>PL = graded component of the examination</i> <i>SL = ungraded component of the examination, coursework</i> <i>PVL = prerequisite of the examination (see AT Art. 5 Section 10)</i> <input checked="" type="checkbox"/> PL 1 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification If necessary, further explanations:
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	PL 1: 100 % Oral group examination PL 2: PL 3: PL 4:
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral <input type="checkbox"/> Written examination <input checked="" type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment <input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis <input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis <input type="checkbox"/> Other (concrete definition is given in the examination regulations):
2e	language(s) of instruction	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Other, namely this:

module code /
module title

05-MMG-SS2 /Sedimentary Structures of Active Margins

date / version of the module
description

05.07.2021

1 INFORMATION ON THE MODULE		
1a	module code	05-MMG-SS2
1b	module title (German title)	Sedimentary Structures of Active Margins
1c	module title (English title)	Sedimentary Structures of Active Margins
1d	credit points	6
1e	responsible for the module	Huhn-Frehers, Katrin
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	basic knowledge of sedimentology and geophysics
1j	learning contents	Based on fundamental geoscientific knowledge on subduction zones, we now focus on the interplay between tectonic, seismic activity and mass transport processes at active convergent margins. This module combines two main objectives: (1) to gain a deeper insight into mass transfer processes and their manifestations at active convergent margins and (2) to introduce numerical simulation techniques and to have the ability to develop numerical models for various mass transfer scenarios at continental margins.
1k	learning outcomes/ competencies/ targeted competencies	1) Students have broadened and deepened their knowledge of deformation and mass transfer processes at convergent margins / mechanics and dynamics of forearc regions

		<p>2) Students are able to do a geotechnical characterization of marine sediments / lab techniques and interpretation</p> <p>3) Students are familiarized with geophysical, particularly reflection seismic, data interpretation</p> <p>4) Students are well introduced into and have gained an overview about numerical modelling techniques</p>																																																																							
11	<p>calculation of student workload (part a: calculation of presence time and working hours)</p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>lecture(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>exercise(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td colspan="5">other form of course (e.g. block seminar), namely this:</td> <td></td> </tr> <tr> <td></td> <td>with 0</td> <td>SWS / with totaly</td> <td>0</td> <td>contact hours</td> <td><input type="checkbox"/> presence time</td> <td><input type="checkbox"/> working hours</td> </tr> </table> <p>= sum of presence time and working hours:</p> <p>Presence time: 0 SWS (0 h) and</p> <p>Working hours: 0 h = total 56.0 hours</p>	<input type="checkbox"/>	0	lecture(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	exercise(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours	<input type="checkbox"/>		other form of course (e.g. block seminar), namely this:							with 0	SWS / with totaly	0	contact hours	<input type="checkbox"/> presence time	<input type="checkbox"/> working hours
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	with 0	SWS / with totaly	0	contact hours	<input type="checkbox"/> presence time	<input type="checkbox"/> working hours																																																																			

	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>79.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>45.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>56.0 hours presence time, 180 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>summer semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>1) Turcotte, D. L. & G. Schubert (2002): Geodynamics: Applications of Continuum Physics to Geological Problems. John Wiley and Sons, New York</p> <p>2) Charles A. Nittrouer James A. Austin Michael E. Field Joseph H. Kravitz James P. M. Syvitski Patricia L. Wiberg (2007): Continental Margin Sedimentation: From Sediment Transport to Sequence Stratigraphy. John Wiley and Sons, New York</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input checked="" type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (<i>type, number</i>)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL 1 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 100 % written exam</p> <p>PL 2:</p> <p>PL 3:</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral</p> <p><input checked="" type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input type="checkbox"/> Other (concrete definition is given in the examination regulations):</p>
2e	language(s) of instruction	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

module code /
module title

05-MMG-TE2 /Drilling, in situ Measurements & Robotic Systems

date / version of the module
description

05.07.2021

1	INFORMATION ON THE MODULE	
1a	module code	05-MMG-TE2
1b	module title (German title)	Drilling, in situ Measurements & Robotic Systems
1c	module title (English title)	Drilling, in situ Measurements & Robotic Systems
1d	credit points	6
1e	responsible for the module	Kopf, Achim
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	
1j	learning contents	The key objectives and contents in the SS include: LV1: What types of sampling and drilling techniques exist, and what are typical applications in academia and industry? How does industry drilling evolve and what sensors and technologies are used in downhole logging, LWD/MWD, etc.? LV2: In situ measurements, and CPT in particular, represent common practice in applied geology and soil mechanics research, so that different approaches and instruments will be introduced in lectures and deployed in field courses before data are processed, compared and interpreted. LV3: Marine robotics is a growing field spanning from cabled, human-operated systems (ROVs) to autonomous systems on the surface or in the water column (AUVs, gliders, wave gliders). The functions, opportunities and use cases of such systems will be taught in lectures before smaller systems will be taken into the field.

1k	learning outcomes/ competencies/ targeted competencies	<p>Students have a profound understanding of marine technologies and how they function</p> <p>Students are well introduced to drilling, logging and in situ measurement techniques in academia and industry</p> <p>Students are able to carry out a field CPT project and data processing</p> <p>Students understand how to use marine technology in waters (small ROV, AUV)</p>																																																																							
1l	<p>calculation of student workload <i>(part a: calculation of presence time and working hours)</i></p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>2</td> <td>lecture(s) with</td> <td>2,5</td> <td>SWS/ contact hours</td> <td>35</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>1</td> <td>exercise(s) with</td> <td>1,5</td> <td>SWS/ contact hours</td> <td>21</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td colspan="5">other form of course (e.g. block seminar), namely this:</td> <td></td> </tr> <tr> <td></td> <td>with 0</td> <td>SWS / with totaly</td> <td>0</td> <td>contact hours</td> <td><input type="checkbox"/> presence time</td> <td><input type="checkbox"/> working hours</td> </tr> </table> <p>= sum of presence time and working hours:</p> <p>Presence time: 4 SWS (56 h) and</p> <p>Working hours: 0 h = total 56.0 hours</p>	<input checked="" type="checkbox"/>	2	lecture(s) with	2,5	SWS/ contact hours	35	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input checked="" type="checkbox"/>	1	exercise(s) with	1,5	SWS/ contact hours	21	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours	<input type="checkbox"/>		other form of course (e.g. block seminar), namely this:							with 0	SWS / with totaly	0	contact hours	<input type="checkbox"/> presence time	<input type="checkbox"/> working hours
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	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>64.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>60.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>56.0 hours presence time, 180 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>summer semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>to be announced in the individual classes</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input checked="" type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (type, number)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL 3 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 50 % Portfolio</p> <p>PL 2: 25 % internship report</p> <p>PL 3: 25 % Oral group examination</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral</p> <p><input type="checkbox"/> Written examination <input checked="" type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input checked="" type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input checked="" type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input type="checkbox"/> Other (concrete definition is given in the examination regulations):</p>
2e	language(s) of instruction	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

module code /
module title

05-MMG-PD2 /Complementary Skills

date / version of the module
description

05.07.2021

1 INFORMATION ON THE MODULE		
1a	module code	05-MMG-PD2
1b	module title (German title)	Complementary Skills
1c	module title (English title)	Complementary Skills
1d	credit points	6
1e	responsible for the module	Ventura, Barbara
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	
1i	content-related prior knowledge or skills	
1j	learning contents	<p>Within this module students have the option to complement and focus their study profile individually and according to their own needs and interests by choosing additional courses from the modules "Advanced digital competencies", "Field-, marine- and lab practice" as well as interdisciplinary courses from the General Studies pool of the University of Bremen like languages, management or vocational preparation. Unpaid practicals as well as tutoring as teaching assistant or external courses, for example geological excursions, can be accepted upon previous agreement with modules responsible. Students are encouraged to ask for consultancy.</p>

1k	learning outcomes/ competencies/ targeted competencies	Gained skills depend on individual choice of the students.																																																								
1l	calculation of student workload <i>(part a: calculation of presence time and working hours)</i>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1" data-bbox="485 533 1541 1312"> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>lecture(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>exercise(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> </table> <p><input type="checkbox"/> other form of course (e.g. block seminar), namely this:</p> <p>with 0 SWS / with total 0 contact hours <input type="checkbox"/> presence time <input type="checkbox"/> working hours</p> <p>= sum of presence time and working hours:</p> <p>Presence time: 0 SWS (0 h) and</p> <p>Working hours: 0 h = total 0.0 hours</p>	<input type="checkbox"/>	0	lecture(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	exercise(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours
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	calculation of student workload <i>(part b: preparation time and follow-up work/self-study)</i>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>0.0 hours</p>																																																								

	calculation of student workload <i>(part c: exam preparation etc.)</i>	c) exam preparation (incl. examination) = sum of working hours: 0.0 hours
	calculation of student workload <i>(total amount of hours including a) - c))</i>	Total amount of the presence time and working hours a) to c): 0.0 hours presence time, 180 hours total Presence time-, self-study- and exam-workload depend on the specific courses chosen by the students.
1m	description of possible optional courses in the module	<u>Can a student choose between different courses within the module?</u> <input checked="" type="checkbox"/> General Studies courses of the University of Bremen, further courses and activities upon previous agreement
1n	language(s) of instruction	<input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Other, namely this:
1o	frequency	summer semester yearly
1p	duration	one semester module
1q	Literature <i>(optional)</i>	Dependent on courses chosen by the students.
1r	more information on the module <i>(optional)</i>	Course type depends on courses chosen by the students. Alternative course formats are possible. A total of 6 CP must be reached.
2	INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)	
2a	type of examination	<input type="checkbox"/> module exam; i.e. exam with only one component (MP) <input checked="" type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP) <input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)
2b	exam components or prerequisites <i>(type, number)</i>	<i>PL = graded component of the examination</i> <i>SL = ungraded component of the examination, coursework</i> <i>PVL = prerequisite of the examination (see AT Art. 5 Section 10)</i> <input type="checkbox"/> PL 0 <input checked="" type="checkbox"/> SL generally 2 <input type="checkbox"/> PVL justification

		<p>If necessary, further explanations:</p> <p>SL (study performance): only ungraded study performances, the final number of study performances depends on the chosen courses and vary between 1 and 6.</p>
2c	<p>Give this information for combination examinations only: Weights (in percentage) of component grades</p>	<p>PL 1:</p> <p>PL 2:</p> <p>PL 3:</p> <p>PL 4:</p>
2d	<p>form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)</p>	<p><input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral</p> <p><input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input type="checkbox"/> Other (concrete definition is given in the examination regulations):</p>
2e	<p>language(s) of instruction</p>	<p><input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

module code /
module title

05-MMG-PG2 /Field, Marine and Lab Practice

date / version of the module
description

05.07.2021

1	INFORMATION ON THE MODULE	
1a	module code	05-MMG-PG2
1b	module title (German title)	Field, Marine and Lab Practice
1c	module title (English title)	Field, Marine and Lab Practice
1d	credit points	6
1e	responsible for the module	Bickert, Torsten
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	
1j	learning contents	<p>A broad spectrum of field, offshore marine and lab courses is offered. Integrated analysis includes sedimentology , geochemistry, oceanography, ecology, climatology and geophysics of the study areas including applied and exploration aspects.</p> <p>The advanced training in the field and in offshore marine settings offers to analyze and interpret marine environmental archives including applied geotechnical and exploration aspects. Courses comprise combined lectures and excursions as well as integrated field campaigns and educational cruises.</p>

1k	learning outcomes/ competencies/ targeted competencies	<p>- Expansion and deepening of skills in the field (addressing rocks, in connection with other subject-specific criteria, 3D presentation)</p> <p>- Linking own field observations with the theoretical background knowledge for the development and understanding of (</p>																																																								
1l	<p>calculation of student workload <i>(part a: calculation of presence time and working hours)</i></p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>lecture(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>exercise(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>1</td> <td>laboratory/laboratories with</td> <td>3</td> <td>SWS/ contact hours</td> <td>42</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> </table> <p><input checked="" type="checkbox"/> other form of course (e.g. block seminar), namely this: Field Exercise 42.0 h working hours</p> <p>with 3 SWS / with totaly 42 contact hours <input type="checkbox"/> presence time <input checked="" type="checkbox"/> working hours</p> <p>= sum of presence time and working hours:</p> <p>Presence time: 3 SWS (42 h) and Working hours: 42 h = total 84.0 hours</p>	<input type="checkbox"/>	0	lecture(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	exercise(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input checked="" type="checkbox"/>	1	laboratory/laboratories with	3	SWS/ contact hours	42	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours
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	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>66.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>30.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>84.0 hours presence time, 180.0 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>summer semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>Will be provided during the courses.</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input checked="" type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (type, number)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL 2 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p> <p>Depending on chosen courses the number of exam elements may vary</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 50 % field trip report</p> <p>PL 2: 50 % laboratory report</p> <p>PL 3:</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral</p> <p><input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input checked="" type="checkbox"/> Other (concrete definition is given in the examination regulations):</p> <p>field trip report</p> <p>laboratory report</p>
2e	language(s) of instruction	<p><input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

module code /
module title

05-MMG-GP1 /Geoscientific Project

date / version of the module
description

05.07.2021

1	INFORMATION ON THE MODULE	
1a	module code	05-MMG-GP1
1b	module title (German title)	Geoscientific Project
1c	module title (English title)	Geoscientific Project
1d	credit points	15
1e	responsible for the module	Dobeneck, Tilo von
1f	type of module	compulsory module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	
1j	learning contents	In this module, students shall develop attractive geoscientific project ideas individually or in small teams, which they subsequently realize over 10-12 weeks time, document in a written report, and present in an oral colloquium presentation. Among possible project forms are e.g. mapping and field projects, technical and method developments, school, public, and media projects, as well as geoscientific engagements at companies, authorities and organizations. Participants independently establish contacts with potential project partners and supervisors, acquire new professional and management competences, demonstrate creativity and organization skills, and widen their horizons and career options.

1k	learning outcomes/ competencies/ targeted competencies	<p>1) Design, realize, document and present a professional geoscientific project following own conceptions or agreements with project partners</p> <p>2) Establish contacts and cooperations with companies, authorities, organisations or research institutions in Germany or abroad</p> <p>3) Develop new competences in scientific methods, project design and planning, decision-making, communication and management, that are beneficial for later career</p> <p>4) Gain insights into the project scenarios of fellow students and learn from their experiences by participating in several of the five yearly project report colloquia</p>																																																								
1l	calculation of student workload <i>(part a: calculation of presence time and working hours)</i>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>lecture(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>exercise(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> </table> <p><input checked="" type="checkbox"/> other form of course (e.g. block seminar), namely this: Project Exercise 10.0 h working hours</p> <p>with 0.5 SWS / with totally 10 contact hours <input type="checkbox"/> presence time <input checked="" type="checkbox"/> working hours</p> <p>= sum of presence time and working hours:</p> <p>Presence time: 0 SWS (0 h) and Working hours: 10 h = total 10.0 hours</p>	<input type="checkbox"/>	0	lecture(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	exercise(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours
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	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>400.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>40.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>10.0 hours presence time, 450 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>winter semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>1) Guidelines on the realization of the „Geoscientific Project“ for the master programs „Geosciences“ and „Marine Geosciences“, Faculty of Geosciences, University of Bremen</p>
1r	<p>more information on the module <i>(optional)</i></p>	<p>Semiannual information events on project module requirements and individual consultations regarding project ideas, written application and approval of project at exam office</p>
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input checked="" type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (type, number)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL 2 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 50 % project exercise report</p> <p>PL 2: 50 % presentation</p> <p>PL 3:</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral</p> <p><input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input type="checkbox"/> Portfolio <input checked="" type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input checked="" type="checkbox"/> Other (concrete definition is given in the examination regulations):</p> <p>presentation</p>
2e	language(s) of instruction	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

module code /
module title

05-MMG-RS1 /Research Seminar

date / version of the module
description

05.07.2021

1 INFORMATION ON THE MODULE		
1a	module code	05-MMG-RS1
1b	module title (German title)	Research Seminar
1c	module title (English title)	Research Seminar
1d	credit points	15
1e	responsible for the module	Bickert, Torsten
1f	type of module	compulsory elective module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	
1j	learning contents	The aim of this final course is to develop a concept and strategy for the master thesis of the students. Students are requested to submit their preliminary title and supervisor for their projected thesis. In close collaboration with the thesis advisors, a concept is then developed based on an intense contention with the actual research. While the development is conducted in small tutor groups, a large extent of independence is expected in the development and presentation of comprehensive research concepts by the students. Techniques of scientific inquiry (e.g., literature and data bank surveys, scientific rigor) and sound scientific conduct will be communicated and discussed.

1k	learning outcomes/ competencies/ targeted competencies	<ul style="list-style-type: none"> - development of a research proposal for MSc thesis - formulation of sound research questions and/or hypotheses based on state of the art - presentation and defense of own research concept - critical evaluation of other concepts 																																																																							
1l	calculation of student workload <i>(part a: calculation of presence time and working hours)</i>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;"><input type="checkbox"/></td> <td style="width: 10%; text-align: center;">0</td> <td style="width: 35%;">lecture(s) with</td> <td style="width: 10%; text-align: center;">0</td> <td style="width: 15%;">SWS/ contact hours</td> <td style="width: 10%; text-align: center;">0</td> <td style="width: 15%;">hours of presence</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;">1</td> <td>seminar(s) with</td> <td style="text-align: center;">1</td> <td>SWS/ contact hours</td> <td style="text-align: center;">56</td> <td>hours of presence</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">0</td> <td>exercise(s) with</td> <td style="text-align: center;">0</td> <td>SWS/ contact hours</td> <td style="text-align: center;">0</td> <td>hours of presence</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">0</td> <td>internship(s) with</td> <td style="text-align: center;">0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">0</td> <td>laboratory/laboratories with</td> <td style="text-align: center;">0</td> <td>SWS/ contact hours</td> <td style="text-align: center;">0</td> <td>total hours of presence</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">.</td> <td>tutorial(s) with</td> <td style="text-align: center;">0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> <td colspan="5">other form of course (e.g. block seminar), namely this:</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">with 0</td> <td></td> <td style="text-align: center;">SWS / with totaly 0</td> <td style="text-align: center;">contact hours</td> <td style="text-align: center;"><input type="checkbox"/> presence time</td> <td style="text-align: center;"><input type="checkbox"/> working hours</td> </tr> </table> <p>= sum of presence time and working hours:</p> <p>Presence time: 4 SWS (56 h) and</p> <p>Working hours: 0 h = total 56.0 hours</p>	<input type="checkbox"/>	0	lecture(s) with	0	SWS/ contact hours	0	hours of presence	<input checked="" type="checkbox"/>	1	seminar(s) with	1	SWS/ contact hours	56	hours of presence	<input type="checkbox"/>	0	exercise(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours	<input type="checkbox"/>		other form of course (e.g. block seminar), namely this:							with 0		SWS / with totaly 0	contact hours	<input type="checkbox"/> presence time	<input type="checkbox"/> working hours
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	with 0		SWS / with totaly 0	contact hours	<input type="checkbox"/> presence time	<input type="checkbox"/> working hours																																																																			

	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p>b) working hours for preparation/follow-up work of the course(s) and/or self-study</p> <p>= sum of working hours:</p> <p>224.0 hours</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p>c) exam preparation (incl. examination)</p> <p>= sum of working hours:</p> <p>170.0 hours</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p>Total amount of the presence time and working hours a) to c):</p> <p>56.0 hours presence time, 450.0 hours total</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p><input type="checkbox"/></p>
1n	<p>language(s) of instruction</p>	<p><input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>
1o	<p>frequency</p>	<p>winter semester yearly</p>
1p	<p>duration</p>	<p>one semester module</p>
1q	<p>Literature <i>(optional)</i></p>	<p>Will be provided by the supervisors of the master theses</p>
1r	<p>more information on the module <i>(optional)</i></p>	
2	<p>INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input checked="" type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (type, number)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL 3 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification</p> <p>If necessary, further explanations:</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1: 20 % seminar talk</p> <p>PL 2: 40 % seminar talk</p> <p>PL 3: 40 % written report</p> <p>PL 4:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral</p> <p><input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment</p> <p><input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report <input type="checkbox"/> Colloquium <input type="checkbox"/> Master Thesis</p> <p><input checked="" type="checkbox"/> Other (concrete definition is given in the examination regulations):</p> <p>written report</p> <p>seminar talk</p>
2e	language(s) of instruction	<p><input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p>

module code /
module title

05-MMG-MT1 /Module Master Thesis

date / version of the module
description

05.07.2021

1	INFORMATION ON THE MODULE	
1a	module code	05-MMG-MT1
1b	module title (German title)	Module Master Thesis
1c	module title (English title)	Module Master Thesis
1d	credit points	30
1e	responsible for the module	Bach, Wolfgang
1f	type of module	compulsory module
1g	programs using the module	
1h	organizational unit offering the module	Faculty 05: Geosciences
1i	content-related prior knowledge or skills	At least 60 CP of the study program including the Research Seminar have to be completed before applying to the thesis.
1j	learning contents	After the second semester, students are encouraged to start developing ideas for their master thesis, usually in close cooperation with one of the research groups at the Department of Geosciences or the cooperating Research Centers. During the research seminar in the third semester, the topic of the thesis work will be defined clearly. The fourth semester is dedicated to thesis work. Supervised by a lecturer each student will perform an independent scientific study and prepare a written essay.

		<p>Students will have a time period of 24 weeks for the realisation of their thesis work. Such thesis work may be a field study, a laboratory experiment or a project outside the university, e.g. in collaboration with industry.</p> <p>Students will deliver a copy of their thesis to the main examiner (usually the supervisor) and one co-examiner / three copies have to be submitted to the examining office. Examiners have a period of four weeks for their evaluation and grading of the thesis. In a final colloquium, the student has to present and defend his or her thesis. The duration of the colloquium will be 45 to 60 minutes. For successful completion of the Master thesis and the colloquium students earn 30 CP. A failed Master thesis may be repeated once only.</p>																																																								
1k	learning outcomes/ competencies/ targeted competencies	<p>1) Students are able to develop a topic for their master thesis by attending to contemporary marine geoscientific issues.</p> <p>2) Students have shown how to prepare and realize an independent scientific project including literature research, data preparation and interpretation, optional modelling and simulations.</p> <p>3) Students have shown the performance of the written essay.</p> <p>4) Students show the ability to present and defend their results.</p>																																																								
1l	<p>calculation of student workload <i>(part a: calculation of presence time and working hours)</i></p>	<p>The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).</p> <p>a) detailed calculation: SWS / presence time/working hours in each course of the module</p> <table border="1"> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>lecture(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>seminar(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>exercise(s) with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>internship(s) with</td> <td>0</td> <td>sum of working hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>seminar(s) with</td> <td></td> <td>SWS/ contact hours</td> <td></td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>0</td> <td>laboratory/laboratories with</td> <td>0</td> <td>SWS/ contact hours</td> <td>0</td> <td>total hours of presence</td> </tr> <tr> <td><input type="checkbox"/></td> <td>.</td> <td>tutorial(s) with</td> <td>0 / 0</td> <td>SWS/ contact hours</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>excursion(s) with</td> <td></td> <td>SWS contact hours in total</td> <td></td> <td>working hours</td> </tr> </table>	<input type="checkbox"/>	0	lecture(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	seminar(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	exercise(s) with	0	SWS/ contact hours	0	hours of presence	<input type="checkbox"/>	0	internship(s) with	0	sum of working hours			<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence	<input type="checkbox"/>	0	laboratory/laboratories with	0	SWS/ contact hours	0	total hours of presence	<input type="checkbox"/>	.	tutorial(s) with	0 / 0	SWS/ contact hours			<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours
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<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours																																																				

		<input checked="" type="checkbox"/> other form of course (e.g. block seminar), namely this: Thesis 0.0 h working hours with 0 SWS / with totally 0 contact hours <input type="checkbox"/> presence time <input checked="" type="checkbox"/> working hours = sum of presence time and working hours: Presence time: 0 SWS (0 h) and Working hours: 0 h = total 0.0 hours
	calculation of student workload <i>(part b: preparation time and follow-up work/self-study)</i>	b) working hours for preparation/follow-up work of the course(s) and/or self-study = sum of working hours: 860.0 hours
	calculation of student workload <i>(part c: exam preparation etc.)</i>	c) exam preparation (incl. examination) = sum of working hours: 40.0 hours
	calculation of student workload <i>(total amount of hours including a) - c))</i>	Total amount of the presence time and working hours a) to c): 0.0 hours presence time, 900 hours total
1m	description of possible optional courses in the module	<u>Can a student choose between different courses within the module?</u> <input type="checkbox"/>
1n	language(s) of instruction	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Other, namely this:
1o	frequency	summer semester yearly
1p	duration	one semester module

1q	Literature (<i>optional</i>)	1) depending on the thesis topic, will be provided by the supervisor. 2) has to be developed independently by the student. 3) 4)
1r	more information on the module (<i>optional</i>)	
2 INFORMATION ON THE MODULE EXAMINATION (see also AT Art. 5 section 8)		
2a	type of examination	<input checked="" type="checkbox"/> module exam; i.e. exam with only one component (MP) <input type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP) <input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)
2b	exam components or prerequisites (<i>type, number</i>)	<p><i>PL</i> = graded component of the examination <i>SL</i> = ungraded component of the examination, coursework <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <input checked="" type="checkbox"/> PL 2 <input type="checkbox"/> SL 0 <input type="checkbox"/> PVL justification
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	PL 1: 75 % master thesis PL 2: 25 % colloquium PL 3: PL 4:
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<input type="checkbox"/> Assignment <input type="checkbox"/> Oral examination (single) <input type="checkbox"/> Presentation, oral <input type="checkbox"/> Written examination <input type="checkbox"/> Group examination, oral <input type="checkbox"/> Presentation and written assignment <input type="checkbox"/> Portfolio <input type="checkbox"/> Project report <input type="checkbox"/> Bachelor Thesis <input type="checkbox"/> Internship report <input checked="" type="checkbox"/> Colloquium <input checked="" type="checkbox"/> Master Thesis <input type="checkbox"/> Other (concrete definition is given in the examination regulations):
2e	language(s) of instruction	<input type="checkbox"/> German 0 English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Other, namely this:

