

7.7 Earth Data Science

Module Name Earth Data Science		Module Code CO-464	Level (type) Year 2 (CORE)	CP 7.5
Module Components				
Number	Name	Type		CP
CO-464-A	Surface and Subsurface Systems: Data, Models, and Processes	Lecture		2.5
CO-464-B	Marine and Atmospheric Systems: Data, Models, and Processes	Lecture		2.5
CO-464-C	Introduction to Geographic Information Systems	Lecture		2.5
Module Coordinator Vikram Unnithan, Joachim Vogt	Program Affiliation <ul style="list-style-type: none"> Earth and Environmental Sciences (EES) 		Mandatory Status Mandatory elective for EES	
Entry Requirements		Frequency	Forms of Learning and Teaching	
<i>Pre-requisites</i>	<i>Co-requisites</i>	annually	<ul style="list-style-type: none"> Lectures (52.5 hours) Private study (135 hours) 	
<input checked="" type="checkbox"/> None	<input checked="" type="checkbox"/> None			
		Duration	Workload	
		1 semester	187.5 hours	
Recommendations for Preparation				
Please review the content of the EES CHOICE modules EES-CH-GenEES and EES-CH-GenGeo.				
Content and Educational Aims				
<p>A general introduction to datasets, models, and tools in Earth and Environmental Sciences (EES) is provided in this module. Students learn to find, access, and display EES data and models of different types and formats, and to perform basic processing and visualization operations. Relevant EES structures and processes reflected in the data and models are explained and discussed in an innovative learning environment that combines traditional classroom instruction with hands-on computer exercises and group work. Of importance are geographic information systems (GIS) that are fundamental to many EES disciplines.</p>				

7.5 Geochemistry of Igneous and Aqueous Systems

Module Name Geochemistry of Igneous and Aqueous Systems		Module Code CO-462	Level (type) Year 2 (CORE)	CP 7.5
Module Components				
Number	Name	Type	CP	
CO-462-A	Trace Element and Radiogenic Isotope Geochemistry	Lecture Tutorials	+ 2.5	
CO-462-B	Aqueous and Marine Geochemistry	Lecture Tutorials	+ 2.5	
CO-462-C	Stable Isotope Geochemistry	Lecture Tutorials	+ 2.5	
Module Coordinator Michael Bau, Andrea Koschinsky	Program Affiliation • Earth and Environmental Sciences (EES)	Mandatory Status Mandatory elective for EES and Chemistry		
Entry Requirements		Frequency	Forms of Learning and Teaching	
<i>Pre-requisites</i>	<i>Co-requisites</i>	annually	<ul style="list-style-type: none"> lectures (37.5 hours) tutorials (15.0 hours) homework, self-study (135hrs) 	
<input checked="" type="checkbox"/> EES-CHGenGeo	<input checked="" type="checkbox"/> None			
Or		Duration	Workload	
<input checked="" type="checkbox"/> Chemistry - General and Inorganic Chemistry		1 semester	187.5 hours	
Recommendations for Preparation				
Please review the content of the EES CHOICE modules: EES-CH-GenEES, EES-CH-Geo.				

7.16.1.7 Climate Change

Module Name Big Questions: Climate Change		Module Code JTbQ-BQ-007	Level (type) Year 3 (Jacobs Track)	CP 2.5
Module Components				
Number	Name	Type		CP
JTBQ-007	Climate Change	Lecture		2.5
Module Coordinator L. Thomsen/ V.Unnithan	Program Affiliation <ul style="list-style-type: none"> Jacobs Track - Big Questions 		Mandatory Status <ul style="list-style-type: none"> Mandatory elective for students of all undergraduate study programs except IEM 	
Entry Requirements			Frequency	Forms of Learning and Teaching
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	annually	<ul style="list-style-type: none"> Lecture (17.5 hours) Private Study (45 hours)
<input checked="" type="checkbox"/> None	<input checked="" type="checkbox"/> None	<ul style="list-style-type: none"> the ability and openness to engage in interdisciplinary issues of global relevance media literacy, critical thinking and a proficient handling of data sources 	Duration 1 semester	Workload 62.5 hours
Recommendations for Preparation				
Critical following of the media coverage on the module's topics in question.				
Content and Educational Aims				
<p>All "Big Questions" (BQ) modules deal with the economic, technological, societal and environmental contexts of the global issues and challenges of the coming decades. The BQ modules intend to raise awareness of those challenges and broaden the students' horizon with applied problem solving beyond the borders of their own disciplines. Knowledge and skills offered in the interdisciplinary BQ modules support students in their development to become an informed and responsible citizen in a global society.</p> <p>This module will give a brief introduction into the development of the atmosphere throughout Earth's history from the beginning of the geological record to modern times and will focus on geological, cosmogenic and anthropogenic changes. Several major events in the evolution of the Earth that had a major impact on climate will be discussed, such as the evolution of an oxic atmosphere and ocean, onset of early life, snowball Earth, and modern glaciation cycles. In the second part, the course will focus on human impact on present climate change and global warming. Causes and consequences including case studies and methods for studying climate change will be presented and possibilities of climate mitigation (geo-engineering) and adaptation of our society to climate change (such as coastal protection and adaption of agricultural practices to more arid and hot conditions) will be discussed.</p>				
Intended Learning Outcomes				
<p>Students acquire transferable and key skills in this module.</p> <p>By the end of this module, the students should be able to</p>				