Physical Climatology

Type of Module	Module Code
Basic Module	BM-METCLIMATE

Identification Number	Workload	Credit Points	Term	Offered Every	Start	Duration
MN-GM-METCLIMATE	180 h	6 CP	1. – 3. Semester	SuSe	Summer Term Only	1 Semester

1	Course Types	Contact Time	Private Study	Intended Group Size
	a) Lectures	30 h	60 h	15
	b) Exercise	30 h	60 h	

2 Aims of the module and acquired skills

Understanding of global climate system, processes and interactions; Correct interpretation of climate observations and simulations; Overview of climate modeling and analysis.

3 Contents of the module

- Climate as a dynamic system
- Atmospheric general circulation
- Global energy, water and carbon cycles
- Ocean dynamics and circulation
- Atmosphere – ocean interactions
- Atmosphere – land and ice interactions
- Regional and global reanalysis with examples from the HErZ project
- Large-scale interactive climate systems
- Introduction to global climate models
- Climate scenarios and projections

4 Teaching Methods

Lectures and tutorials (compulsory attendance in tutorial)

5 Prerequisites (for the Module)

Formal: None

Bachelor level meteorology, mathematics and scientific programming.

6 Type of Examination

Written examination (graded).

7 Requisites for the allocation of credits

Successful participation in the exercises (50 % of the possible points have to be obtained) and passing of the examination.

8	**Compatibility with other Curricula** • Other modules of equal value can be admitted and announced by the examination board after agreement. • Suitable as an elective course for mathematics, physics and geoscience students
9	**Proportion of Final Grade** 6/114
10	**Module Coordinator** Y. Shao, F. Steffany
11	**Further Information** **Recommended Literature:** Trenberth KE 2010: Climate system modeling. ISBN-10: 0521128374 Peixoto JP and AH Oort 2007: Physics of Climate. ISBN-10: 0883187124 Grotjahn R 2004: Global Atmospheric Circulation: Observations and Theories. ISBN-10: 019517481X Robinson W 2001: Modeling Dynamic Climate Systems. ISBN-10: 0387951342 Lau K-M and D Waliser 2012: Intraseasonal Variability in the Atmosphere-Ocean Climate System. ISBN-10: 3642139132. Robinson, W., Modeling Dynamic Climate Systems, 2001. Lau, K.-M. and D. Waliser, Intraseasonal Variability in the Atmosphere-Ocean Climate System, 2012. Rayner, J.N., Dynamic Climatology: Basis in Mathematics and Physics, 2000.