

| Atmospheric Dynamics and Modeling | | | | | | |
|-----------------------------------|--|---------------|---------------------|----------------------|------------------|---------------------------|
| Type of Module | | | | Module Code | | |
| Basic Module | | | | BM-METADM | | |
| Identification Number | Workload | Credit Points | Term | Offered Every | Start | Duration |
| MN-GM-METADM | 180 h | 6 CP | 1. – 3. Semester | WiSe | Winter Term Only | 1 Semester |
| 1 | Course Types | | Contact Time | Private Study | | Planned Group Size |
| | a) Lectures | | 30 h | 60 h | | 15 |
| | b) Exercise | | 30 h | 60 h | | |
| 2 | Aims of the module and acquired skills | | | | | |
| | Aims: Advanced understanding of atmospheric dynamics and modeling with emphasis on the physics core of global climate and numerical weather prediction models. Acquired skills: capacity for model applications, development and construction, and capacity for model data analysis and critical assessment. | | | | | |
| 3 | Contents of the module | | | | | |
| | <ul style="list-style-type: none"> • Review on atmospheric dynamics and governing equations • Review on atmospheric waves and implications to atmospheric modeling • Model closure • Parameterization of the atmospheric boundary layer • Parameterization of land and ocean surface processes • Parameterization of convection and clouds • Introduction to non-linear system theory and ensemble forecast • Weather and climate predictability | | | | | |
| 4 | Teaching Methods | | | | | |
| | Lectures and tutorials (Compulsory attendance in tutorial) | | | | | |
| 5 | Prerequisites (for the Module) | | | | | |
| | Undergraduate level understanding of general and theoretical meteorology. | | | | | |
| 6 | Type of Examination | | | | | |
| | Written examination (graded). | | | | | |
| 7 | Credits Awarded | | | | | |
| | Successful participation in the exercises (50 % of the possible points have to be obtained) and passing of the examination. | | | | | |
| 8 | Compatibility with other Curricula | | | | | |
| | <ul style="list-style-type: none"> • 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 | | | | | |

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| 10 | Module Coordinator Y. Shao, H. Elbern |
| 11 | Further Information Recommended Literature: Stensrud DJ 2010: Parameterization Schemes: Keys to Understanding Numerical Weather Prediction Models. ISBN-10: 0521126762 Stull RB 2008: An Introduction to Boundary Layer Meteorology. ISBN-10: 9027727694 Kalnay E 2002: Atmospheric modeling, data assimilation and predictability. ISBN 0-521-79629-6. Trenberth KE 2010: Climate system modeling. ISBN-10: 0521128374 Domenico P and FW Schwartz, 2008: Physical and Chemical Hydrogeology. ISBN-10: 0471597627 |