

Course Specifications

From the academic year 2016-2017 up to and including the

Numerical Techniques (C002872)

Course size (nominal values; actual values may depend on programme)

| | | | | | |
|---------|-----|------------|------|-------------|--------|
| Credits | 3.0 | Study time | 90 h | Contact hrs | 22.5 h |
|---------|-----|------------|------|-------------|--------|

Course offerings and teaching methods in academic year 2018-2019

| | | | |
|----------------|---------|------------------------------------|--------|
| A (semester 1) | English | lecture | 15.0 h |
| | | seminar: practical PC room classes | 7.5 h |

Lecturers in academic year 2018-2019

| | | |
|----------------|------|--------------------|
| Degrauwe, Daan | WE05 | lecturer-in-charge |
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Offered in the following programmes in 2018-2019

| | | |
|--|-------|----------|
| | crdts | offering |
| Postgraduate Studies in Weather and Climate Modeling | 3 | A |

Teaching languages

English

Keywords

Hyperbolic systems, time stepping, filtered equations, discretisation, stability

Position of the course

The differential equations needed for atmospheric modeling and data-assimilation require a sound and cost-effective numerical discretisation. All kinds of techniques are used nowadays and a selection is discussed in this course.

Contents

Initial competences

Linear algebra, differential calculus, being able to program in FORTRAN or c

Final competences

- 1 The student should know and understand the current numerical techniques used nowadays in atmospheric modeling and data assimilation.
- 2 He/she should be capable to choose the appropriate scheme for a set of differential equations in his/her research on atmospheric sciences.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Lecture, seminar: practical PC room classes

Learning materials and price

Slides (with hand outs, estimated cost: €10)

References

"Numerical Methods for Wave Equations in Geophysical Fluid Dynamics", Dale R. Durran, Springer, 1999

Course content-related study coaching

Support via Minerva (forum), e-mail and private discussions upon appointment

Evaluation methods

end-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period

Assignment

Examination methods in case of periodic evaluation during the second examination period

Assignment

Examination methods in case of permanent evaluation

Oral examination, assignment

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible

Extra information on the examination methods

Project + presentation

Calculation of the examination mark

Based on interactions during the project, the end result of the project (report), the presentation of the project and answers to questions during the presentation