

# Course Specifications

From the academic year 2015-2016 up to and including the

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 2)	English	lecture	15.0 h
		seminar: coached	7.5 h
		exercises	

Lecturers in academic year 2018-2019

Deckmyn, Alex	WE05	lecturer-in-charge
---------------	------	--------------------

Offered in the following programmes in 2018-2019

	crdts	offering
<a href="#">Postgraduate Studies in Weather and Climate Modeling</a>	3	A

Teaching languages

English

Keywords

Chaos, non linear dynamics, ensemble prediction systems

Position of the course

The atmosphere is a very chaotic system with many non linear dynamical processes which have of course an impact on weather forecasts. This course discusses the predictability of the behavior of the atmosphere. A number of techniques are explained and applied to gain better insight in the limits of weather models and how to improve them.

Contents

- 1 Chaos and non linear dynamics: Lorenz model, Lyapunov exponents, attractors, ...
- 2 Ensemble predictions systems: singular vectors, breeding, clustering, interpretation
- 3 Verification and economical value of weather forecasts.
- 4 Statistical postprocessing: Model-output statistics (MOS), Kalman filters

Initial competences

Elementary knowledge of classical mechanics, vector calculus and partial differential equations

Final competences

- 1 Understand the chaotic behavior of non linear systems and how this translates to the atmosphere.
- 2 Understand EPS techniques. Being able to judge forecasts using some verification techniques.
- 3 Understanding statistical adaption of model output.

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: coached exercises

Learning materials and price

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

References

“Statistical Methods in the Atmospheric Sciences”, Daniel S. Wilks, Academic Press, 1995.

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

Oral examination

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

Oral examination

Examination methods in case of permanent evaluation

Assignment

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible

Calculation of the examination mark