Physics 6318 Ocean Climate Modelling

Instructor: Dr. James Munroe
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We will meet over WebEx on Mondays and Thursdays at 11:00 NL

Evaluation:

Problem sets (6)	60%
Project	30%
Presentation	10%

The course will primarily be structured around a practical introduction to numerical ocean modelling using Python and Fortran following the textbooks:

Jochen Kämpf, *Ocean Modelling for Beginners*, 2009, Springer, e-ISBN 978-3-642-00820-7. **(OMB)**
Jochen Kämpf, *Advanced Ocean Modelling*, 2010, Springer, e-ISBN 978-3-642-10610-1. **(AOM)**

Both books are available from the MUN library as ebooks. Supplementary resources may be provided based on the research needs and interests of students in the course.

List of essential topics to be covered by textbook chapter:

1. Review of Numerical Methods and GFD	OMB 2, 3
2. Long Waves in a Channel	OMB 4
3. 2D Shallow-Water Modelling	OMB 5
4. Rotational Effects	OMB 6
5. 1D Models of Ekman Layers	AOM 2
6. Basics of Nonhydrostatic Modelling	AOM 3
7. 2.5D Vertical Slice Modelling	AOM 4
8. 3D Level Modelling	AOM 5

The pacing of the course will depend on the background of the students. Ideally, we will try and cover about one topic per week and to leave time for additional topics selected from the calendar description:

6318 Ocean Climate Modelling covers numerical techniques, finite difference, finite element and spectral methods. Introduction to the climate system. Ocean climate models. Box models. Variability on interdecadal, centennial and geological scales. Zonally averaged models. 3-D ocean modelling. Thermohaline circulation. General circulation models. Climate modelling and global warming.

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