GÖTEBORGS UNIVERSITET

Modelling strategies, 2 credits (hp)

Course period:	Last day for application:
November-December 2016	2016-10-15
Course leader / Address for applications: Roland Barthel / roland.barthel@gu.se	
Course description: The goal of this course is to introduce students to a broad range of different aspects of modelling. Different types of models, different modelling concepts and strategies will be discussed as well as modelling terminology and its usage in different disciplines. The intended audience are foremost Ph.D. students who have not modelled so far but also students who are already familiar with specific types of models but not with others. The goal is to create a common understanding of how models are developed and used in a very general sense. The course consists of theory (lectures) given by teachers with different modelling backgrounds and a practical assignment where students develop their own model in a group.	

Responsible department and other participation departments/organisations:
Department of Earth Sciences, University of Gothenburg
Teachers: Roland Barthel (Course leader and main contact) Teachers from the Department of Earth Sciences / Invited speakers
Examiner: Roland Barthel

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Faculty of Science; Department of Earth Sciences

Modelling strategies, 2 hp

Third cycle education

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1. Confirmation
The syllabus was confirmed by the Head of the Department of Earth Sciences 2016-05-31

Disciplinary domain: Science
Department in charge: Department of Earth Sciences
Main field of study: Earth System Sciences

2. Position in the educational system
Third-cycle education.

3. Entry requirements
Admitted to third cycle education.

4. Course content

The course consists of a theory part (class room lectures) and assignments.

The theoretical part covers:

- Motivation and objectives of modelling
- Modelling terminology and different usage of terminology
- Different types of models
- Concepts associated with modelling (calibration, validation, sensitivity analysis, uncertainty, scaling, etc.)

The assignments include:

- A report, analysis and discussion of a paper on modelling
- and/or the development of an own simple model (group work).

5. Outcomes
After completion of the course the Ph.D. student is expected to be able to

5.1. Knowledge and understanding

- Recognize important modelling concepts and strategies

- Describe important terms used by modellers

5.2. Skills and abilities
- Design simple conceptual models to describe simple processes/relations
- Be able to identify and categorize algorithms or equations to represent a system of physical process.

5.3. Judgement and approach
- Judge a models purpose, scope, validity, applicability and quality.

6. Required reading
Materials handed out during the course / recommended reading to be announced

7. Assessment

a. Analyse and discuss a research article on modelling. Identify the important concepts and strategies in the article; describe them using the correct modelling terminology; assess the model's purpose, scope, validity, applicability and quality. Individual report.

b. Develop a simple conceptual model for a physical system and design (qualitatively) a modelling strategy. Write a report describing: how the model represents the system conceptually; the modelling strategy used; and the model's scope and limitations. Group report.

c. Lecture attendance is compulsory (at least 70% of classes).

To pass the course the assignments have to submitted in due time and graded with G (pass).

8. Grading scale
The grading scale comprises Fail, (U), Pass (G).

9. Course Evaluation
The course evaluation is carried out together with the Ph.D. students at the end of each year.

10. Language of instruction
The language of the seminars and instruction is English.