DEPARTMENT OF EARTH SCIENCES

GVN345   Climate Data Applications, 7.5 credits

Klimatdatatillämpningar, 7,5 högskolepoäng
First Cycle

Confirmation

This course syllabus was confirmed by Department of Earth Sciences on 2021-01-13 and was last revised on 2021-03-29 to be valid from 2021-08-30, autumn semester of 2021.

Field of education: Science 100%
Department: Department of Earth Sciences

Position in the educational system

The course includes 7,5 credits at the undergraduate level. The course is offered as an elective course subject to availability.

The course can be part of the following programme: 1) Bachelor's Programme in Earth Sciences (N1GVS)

Main field of studies	*Specialization*
Earth Sciences	G2F, First cycle, has at least 60 credits in first-cycle course/s as entry requirements

Entry requirements

For admission to the course, ability to perform data analysis corresponding to GV2500 Data Analysis for Earth Sciences, 7,5 credits, or GVN330 Climate Data Analyses, 7,5 credits, is required.

Learning outcomes

After completion of the course, students can create and use quantitative models that encapsulate relationships between climate and weather-sensitive aspects of society and the environment.

On successful completion of the course the student will be able to:

Knowledge and understanding
Describe and discuss essential the elements from which climate data applications are built.

- Semi-empirical models.
- Time-step models (simulations): parameters and state variables; calibration.
- Empirical statistical models; parametric models.
- Alternatives for interpreting and presenting results; simple visualizations; trend lines; multi-criteria analysis; hypothesis testing.
- Climate model projections; scenarios; bias correction; percentile-based thresholds.

Competence and skills
- Perform a quantitative climate change impact assessment using time-series based modelling.
- Implement simple climate data applications in a programming environment.
- Work in group environments.
- Cite scientific literature authentically.
- Use oral and written communication skills, including tables and graphs, to convey technical information effectively and accurately.

Judgement and approach
- Think creatively to encapsulate partially-defined or abstract assignments into a form that they can be addressed using systematic procedures.
- Critically-evaluate and synthesize multiple analyses of climate-related vulnerabilities and opportunities.
- Objectively weigh the costs and benefits of response strategies to climate-related risk.

The course is sustainability-related, which means that at least one of the learning outcomes clearly shows that the course content meets at least one of the University of Gothenburg's confirmed sustainability criteria.

Course content
Climate data applications are conceptually-based, semi-empirical models which link weather conditions to particular events that effect society or the environment. They are the basis for turning climate knowledge into a useful application, for operational planning or risk calculations. The course shows how to create such models using real world examples, covering for example surface hydrology, urban air quality or

agricultural systems.

Form of teaching
The teaching comprises lectures, compulsory class-exercises (mainly computer-based) with short reports, and a major group project with written report and student presentation.

Language of instruction: English

Assessment
The course has two components:

1. Reports. Written reports, 5 credits: U/G/VG

2. Exercises and presentations. Participation in obligatory class exercises and student presentations, 2,5 credits: U/G

A student who has taken two exams in a course or part of a course without obtaining a pass grade is entitled to the nomination of another examiner. The student needs to contact the department for a new examiner, preferably in writing, and this should be approved by the department unless there are special reasons to the contrary (Chapter 6 Section 22 of the Higher Education Ordinance).

If a student has received a recommendation from the University of Gothenburg for special educational support, where it is compatible with the learning outcomes of the course and provided that no unreasonable resources are required, the examiner may decide to allow the student to sit an adjusted exam or alternative form of assessment.

In the event that a course has ceased or undergone major changes, students are to be guaranteed at least three examination sessions (including the ordinary examination session) over a period of at least one year, but no more than two years, after the course has ceased/been changed. The same applies to placements and professional placements (VFU), although this is restricted to just one additional examination session.

Grades
The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).
For the grade Pass (G) in the course the grade Pass (G) requires that all mandatory elements must be passed. For the grade Pass with Distinction (VG) for the course , VG is required for the *Reports* component.

Course evaluation

The students are given the opportunity to make an anonymous written evaluation of the course.

The results of and possible changes to the course will be shared with students who participated in the evaluation and students who are starting the course.

Additional information

Students enrolled in the N1GVS Bachelor's Programme in Earth Sciences, have precedence for admittance to the course.