FMJ3381 Integrated Assessment of Climate, Land- Use, Energy and Water Systems 6.0 credits

Integrerad Analys av klimat-, markanvändnings-, energi- och vattensystem

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for FMJ3381 valid from Spring 2019

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

Admitted to PhD studies.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After successful completion, of the course, students will be able to:

1. Learn the methodological base of key water-energy and land-use assessment tools, and strategies to create an integrated framework for these tools where strategies with and without climate change projections can be analyzed.

2. Perform short resource analysis exercises in independent computer labs on each of the land-use, energy and water assessment tools as well as simplified integrated analysis based on the CLEWS assessment framework.

3. Apply the CLEWS assessment methodology on a chosen case study area, subject to an oral methodology presentation and a written final paper.

Course contents

The analysis of individual CLEW components (and their related services) is routinely undertaken using modelling tools. However, these models often lack the functionality required to conduct the integrated analysis required in developing climate-impact, land, energy, and water-use related policies. The development of an integrated tool linking the above components can enhance the knowledge about these systems and help policymakers assess different development strategies. During literature review and hands on learning of the methodology behind each individual resource assessment tool will give the students a broad knowledge base in resource assessment models. The tools included in the CLEWS framework are: General Circulation Models (GCM) to estimate weather changes, the Long Range Energy Alternatives Planning (LEAP) model, the Water Evaluation and Planning System (WEAP), and the Agro-Ecological Zones (AEZ) land production planning model.

During the course, students will work on individual assignments to learn the methodology and application of tools related to the course. The main focus will be given to knowledge sharing and in-depth hands-on training on the tools. After successful completion of the assignments, students will be involved in a challenging individual project on the national or regional level, where students will apply the CLEWS framework on real case studies.

Examination

- INL1 - Hand in assignments, 6.0 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

The student will have to do the following activities – in agreement and under the supervision of the course examiner and coordinator:

1. Detailed literature review and creation of a national or regional CLEWs model for National-level planning.

2. Prepare material, teach, and give feedback for 2 computer labs (2 * 2 hours) on the basis of related tools for the MSc courses offered by the division at KTH or abroad for international capacity building.

3. Prepare and deliver 3 lectures in MSc level courses (3 * 2 hours).

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.