Faculty of Arts and Social Sciences
Environmental Science

Syllabus

Applied Data Analysis for Interdisciplinary Environmental Studies

Course Code:	RMG911
Course Title:	Applied Data Analysis for Interdisciplinary Environmental Studies *Tillämpad dataanalys för tvärvetenskapliga miljöstudier*
Credits:	7.5
Degree Level:	Undergraduate level
Progressive Specialisation:	First cycle, has only upper-secondary level entry requirements (G1N)

Major Field of Study:
MXA (Environmental Science)
RHA (Risk Management)
RIM (Risk and Environmental Studies)

Course Approval
The syllabus was approved by the Faculty of Arts and Social Sciences 2026-03-02, and is valid from the Autumn semester 2026 at Karlstad University.

Prerequisites
General entry requirements plus upper secondary level English 6 or English level 2.

Learning Outcomes
Upon completion of the course, students should be able to
1. describe how data is used to analyse environmental and societal challenges in Sweden,
2. clean, structure, and visualise basic datasets using open and beginner-friendly tools,
3. interpret charts, maps, and basic descriptive statistics to identify patterns and differences,
4. apply methods for data analysis to concrete interdisciplinary case studies,
5. communicate data-driven results clearly and visually,
6. use guided templates in analysis or programming tools to carry out basic compilations and visualisations, and
7. reflect upon and critically examine data and its limitations and significance for society.

Content
The course introduces students to applied data analysis through a progressive structure that combines conceptual understanding, practical skills, and interdisciplinary application. The first part of the course covers an introduction to data literacy in environmental and social studies, including an overview of central Swedish data providers, such as Statistics Sweden (SCB), the Swedish Civil Defence and Resilience Agency (MCF), the Swedish Meteorological and Hydrological Institute (SMHI), and the Swedish mapping, cadastral, and land registration authority, Lantmäteriet. Ethical considerations, uncertainty, and responsibility in the use and interpretation of data are discussed with the aim of establishing a critical foundation for working with real-world datasets. In the next step, the course focuses on basic data types and data preparation, including tabular data and data that varies in time and space. Students develop basic skills in cleaning and structuring data while working with common challenges related to data quality, bias, and limitations. The course also addresses principles for clear and ethical data visualisation. Students learn how to work with charts, maps, and infographics, with a particular focus on visual storytelling and on communicating uncertainty. In the latter part of the course, concepts such as environmental risk, exposure, and vulnerability are introduced, which are applied through interdisciplinary case studies linked to natural events, such as floods or heat waves. This allows students to analyse real-world environmental challenges using data-driven approaches. In the final part of the course, students integrate environmental and societal data perspectives by addressing issues of scale, uncertainty, and interdisciplinary interpretation. The course concludes with an individually applied project where students translate

their analyses into insights that are relevant for societal decision-making. The course consists of several components with individual assignments and ends with a final project that brings the components together.

Reading List
See separate document.

Examination
Assessment is based on individual written and practical assignments, as well as an individual project presented in writing.

If students have a decision from Karlstad University entitling them to Targeted Study Support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

Grades
One of the grades Pass with Distinction (VG), Pass (G), or Fail (U) is awarded in the examination of the course.

Quality Assurance
Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

Course Certificate
A course certificate will be provided upon request.

Additional information
The local regulations for studies at the Bachelor's and Master's levels at Karlstad University stipulate the obligations and rights of students and staff.