Faculty of Health, Science and Technology
Geo-Science

Syllabus

Physical Geography and GIS

Course Code:	NGGA12
Course Title:	Physical Geography and GIS *Naturgeografi och GIS*
Credits:	7.5
Degree Level:	Undergraduate level
Progressive Specialisation:	First cycle, has less than 60 credits in first-cycle course/s as entry requirements (G1F)

Major Field of Study:
NGA (Physical Geography)

Course Approval
The syllabus was approved by the Faculty of Health, Science and Technology 2016-03-07, and is valid from the Autumn semester 2016 at Karlstad University.

Prerequisites
At least 4 ECTS credits completed for the course NGGA23 GIS I, 7.7, or equivalent

Learning Outcomes
Upon completion of the course, students should be able to:
- give an account of the basic processes of the formation and reformation of continents and landscapes as well as of the finite and renewable resources that we exploit,
- give an account of bedrock types, soil types and land shapes,
-give an account of basic oceanography, meteorology, hydrology and the water cycle and its importance as a natural resource,
- give an account of the processes that regulate the climate and discuss how the climate is affected by human societal development,
- give an account of the cause of changes in the state of land, sea and the atmosphere, both natural causes and human interference,
- give an account of how GIS can be used for modelling, simulation, analysis and visualisation of physical geographical land shapes and processes,
- give an account of existing natural geographical data and data bases and their availability and techniques and methods to regtrieve data,
- give an account of the importance and use of physical geographical knowledge and analyses in environmental engineering, landscape and construction planning.

Content
The earth as a celestial body is first introduced in terms of its interior and exterior structure and

development. Tectonics, plutonism, and vulcanism in relation to plate tectonics are presented. Regional geology is studied with a focus on Sweden and on dating methods and the geological time scale. Also included are basic oceanographic concepts and facts such as the chemical and physical properties of sea water, the circulation of water, mixture of water, and waves and tides.

In the fields of meteorology and climatology, students are introduced to atmospheric properties and processes. The module covers synoptic meteorology, atmospheric chemistry, global circulation, and the main climate zones. The module also covers local climates, microclimate, climate change, and related environmental issues.

The module treats the various landscape and landshape formation processes throughout history, processes which have resulted from crumbling, mass movement, and fluvial, littorial, glacial and eolic effects. The focus is on the development of the Scandinavian landscape, its soil types, and related land shapes. The module covers soil types as a natural resource as well as relevant technical applications. The cycle of water, land, surface and ground water are included.

GIS applications in the various areas above are described concurrently with the respective area treated. The course concludes with a minor project involving physical geographical data collected.

Reading List
See separate document.

Examination
Assessment is based on a written exam and individual hand-in assignments and a project assignment report.

Grades
One of the grades 5 (Pass with Distinction), 4 (Pass with Some Distinction), 3 (Pass) 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 and Master levels at Karlstad University stipulate the obligations and rights of students and staff.

Required course for the engineering programme Surveying Technology and Geographical IT