AALBORG UNIVERSITET

STUDIEORDNING FOR KANDIDATUDDANNELSEN I GEOGRAFI, 2022

CAND.SCIENT.
AALBORG

MODULER SOM INDGÅR I STUDIEORDNINGEN

INDHOLDSFORTEGNELSE

SOIL AND GROUNDWATER

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

To give the students knowledge of the occurrence of soil and groundwater as natural resources and how these resources are affected by natural and anthropogenic induced processes and pollutants. Based on a description and analysis of the processes governing the resource under current conditions, the natural resource use and protection under future conditions is analysed, using combined field and laboratory measurements, GIS, analytical and numerical data analyses and modelling. It is noted that the semester unit may include substantial elements of cultural geography including demographic and market analyses, if these elements are relevant for, and connected to, the below described physical geography elements.

LEARNING OBJECTIVES

KNOWLEDGE

- Understand the physical, chemical and biological processes governing and sustaining the soil and groundwater resources.
- Understand how area use, area management, and area change can affect soil and groundwater systems.
- Understand how climate change can affect soil and groundwater systems and resources.

SKILLS

- To select relevant theories and literature.
- To collect, analyse and visualise the data on natural resource occurrence, governing processes and human impacts that forms the basis for a conceptual resource model.
- To measure relevant physical and biochemical parameters in the field and in the laboratory.
- To construct, calibrate and validate analytical and numerical resource models.

COMPETENCES

- Critically evaluate the data and theories used.
- Evaluate current and future used of groundwater resources.
- Must be able to communicate the results of the project work in a project report.
- Must be able to contribute successfully to teamwork within the problem area and make a common presentation of the result of the project work.
- To communicate findings and solutions graphical as well as oral to the relevant target audience.

LEARNING OBJECTIVES FOR PROBLEM BASED LEARNING

- Must be able to apply problem solving
- Must be able to use problem identification
- Must be able to apply objectives (cooperation agreement)
- Must be able to use contextual involvement (user involvement)
- Must be able to analyse teamwork/team composition
- Must have knowledge of process analysis
- Must be able to use problem formulation
- Must be able to assess meetings/scheduling of meetings
- Must be able to analyse time planning
- Must be able to apply problem analysis
- Must be able to analyse personal competencies and wishes
- Must be able to assess problem solving
- Must be able to apply project management
- Must be able to apply impact assessment

TYPE OF INSTRUCTION

Project work with supervision supplemented with instruction, workshops, presentation seminars, lab tests, etc.

EXTENT AND EXPECTED WORKLOAD

The projectmodule is 15 ECTS which is corresponding to 450 hours of study.

EXAM

EXAMS

Name of exam	Soil and Groundwater
Type of exam	Oral exam based on a project Oral exam based on presentation seminar and project report.
ECTS	15
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Jord og grundvand
Module code	B-GEO-K1-1A
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	15
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Per Møldrup

ORGANISATION

Education owner	Master of Science (MSc) in Geography
Study Board	Study Board of Built Environment
Department	Department of the Built Environment
Faculty	The Faculty of Engineering and Science

EXPERIMENTAL HYDROLOGY

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

To qualify the student to understand and estimate hydro-geological parameters by in-situ and laboratory test and experiments in relation to a specific site and/or transport phenomenon. This includes the planning of a measuring programme based on suitable measuring methods and positions, setting up a time schedule and a data processing procedure. The course aims to give especially students without experiences in problem and project based learning hands-on experiences with this leaning method.

LEARNING OBJECTIVES

KNOWLEDGE

- Groundwater system and its essential properties and parameters.
- Experimental methods for property and parameter estimation of the groundwater zone.
- Uncertainties and limitations of the applied methods.

SKILLS

- To select, design and conduct suitable in-situ test for estimating saturated hydraulic properties.
- To select, design and conduct suitable laboratory test for estimating hydraulic saturated hydraulic properties.
- To analyse and evaluate test results and methods regarding suitability and reliability.
- To organise documentation and presentation of measured data.

COMPETENCES

- To describe, analyse, and evaluate a specific part of the groundwater system, regarding its composition and its properties through a planned investigation of the system.
- To structure and plan the project and the work in a group.
- To produce technical documentation of complex problems, methods and results in group co-operation.
- To communicate findings and solutions graphical as well as oral to the relevant target audience.

TYPE OF INSTRUCTION

Lectures, etc. supplemented with project work, workshops, presentation seminars, field and lab tests.

EXTENT AND EXPECTED WORKLOAD

The module is 5 ECTS which is corresponding to 150 hours of study.

EXAM

EXAMS

Name of exam	Experimental Hydrology
Type of exam	Written or oral exam Written or oral exam based on presentation seminar and mini-project report. Exam format is decided by the start of the semester.
ECTS	5
Assessment	7-point grading scale
Type of grading	Internal examination

Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Eksperimentel hydrologi
Module code	B-GEO-K1-2
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Per Møldrup

ORGANISATION

Education owner	Master of Science (MSc) in Geography
Study Board	Study Board of Built Environment
Department	Department of the Built Environment
Faculty	The Faculty of Engineering and Science

ENVIRONMENTAL SOIL SCIENCE AND GEOSTATISTICS 2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

To give the students fundamental knowledge of water and contaminant transport, sorption and degradation in soil, and the use of geostatistical methods in contaminated soil studies. The student should understand the links between the physical, chemical and biological processes in soil. The student should know the principles behind and how to apply relevant laboratory and field methods for measurement of water and solute transport in soil. Furthermore, the student should know the principles behind and the applicability of relevant physical- and biological-based remediation methods for contaminated soil sites, and be able to calculate one-dimensional water and solute transport in the soil vadose zone.

LEARNING OBJECTIVES

KNOWLEDGE

- On fundamental soil physics.
- On soil texture and structure, physical and chemical phase distribution, pore-size distribution, water retention, hydraulic conductivity, soil-water sorptivity, unsaturated zone water transport, gas diffusion and chemical transport, sorption and biodegradation.
- On the basic principle of 1D analytical and numerical water and contaminant transport modeling.
- On evaluating the uncertainty of measured data and model results.

SKILLS

- To measure soil hydraulic properties in the laboratory.
- To apply parameter models for water retention, hydraulic conductivity, gas diffusion, and chemical dispersion to measured data or as predictive tools.
- To program and apply analytical and simple numerical water and solute transport models to measured data or in risk assessment.
- To apply relevant geostatistical methods to measured data in the soil and groundwater zones.

COMPETENCES

- To perform preliminary risk assessment and evaluate the conditions for on-site or in-situ clean-up methods for contaminated soil sites.
- To structure and produce technical documentation of complex problems, methods and results.
- To communicate problems, findings and solutions graphical as well as oral to the relevant target audience.

TYPE OF INSTRUCTION

Lectures, etc. supplemented with project work, workshops, presentation seminars, lab tests.

EXTENT AND EXPECTED WORKLOAD

The module is 5 ECTS which is corresponding to 150 hours of study.

EXAM

EXAMS

Name of exam	Environmental Soil Science and Geostatistics
Type of exam	Written or oral exam Individual oral or written exam. Exam format is decided by start of semester.

ECTS	5
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Jordfysik og geostatistik
Module code	B-GEO-K1-3
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Per Møldrup

ORGANISATION

Education owner	Master of Science (MSc) in Geography
Study Board	Study Board of Built Environment
Department	Department of the Built Environment
Faculty	The Faculty of Engineering and Science

GROUNDWATER FLOW AND RESOURCE MODELLING

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

To give the students fundamental knowledge of water and contaminant transport in the groundwater zone. Based on hydrological and hydrogeological data the student shall be able to set-up, calibrate and validate a groundwater model for an area of suitable size. Furthermore the student should obtain knowledge of model parameter and uncertainty estimation.

LEARNING OBJECTIVES

KNOWLEDGE

- On fundamental hydrogeology.
- On the basic principle of numerical groundwater modelling.
- On chemical transport, dispersion, sorption/retardation and degradation in the groundwater zone.
- On evaluating the uncertainty of the model results.

SKILLS

- To collect, analyse and visualise the various data that forms the basis for the conceptual model.
- To construct, calibrate and validate groundwater models.
- To simulate water and contaminate transport.
- To evaluate and quantify modelling uncertainty.

COMPETENCES

- To evaluate and handling hydrological data that forms the basis for groundwater modelling.
- To structure and produce technical documentation of complex problems, methods and results.
- To communicate problems, findings and solutions graphical as well as oral to the relevant target audience.

TYPE OF INSTRUCTION

Lectures, etc. supplemented with project work, workshops, presentation seminars, lab tests.

EXTENT AND EXPECTED WORKLOAD

The module is 5 ECTS which is corresponding to 150 hours of study.

EXAM

EXAMS

Name of exam	Groundwater Flow and Resource Modelling
Type of exam	Written or oral exam Individual oral or written exam. Exam format is decided by start of semester.
ECTS	5
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Grundvand: System og ressource
Module code	B-GEO-K1-4
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Rasmus Nielsen

ORGANISATION

Education owner	Master of Science (MSc) in Geography
Study Board	Study Board of Built Environment
Department	Department of the Built Environment
Faculty	The Faculty of Engineering and Science

AQUATIC GEOGRAPHY

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

To give the student knowledge and understanding about aquatic environment related problems, with focus on applying remote sensing techniques and environmental data for monitoring and characterisation of freshwater, marine and costal processes and conditions. It is noted that the semester unit may include substantial elements of cultural geography including demographic and market analyses, if these elements are relevant for, and connected to, the below described physical geography elements.

LEARNING OBJECTIVES

KNOWLEDGE

- Understand the physical, chemical and biological processes in aquatic environments.

SKILLS

- To select relevant theories and literature.
- Identify the hydrological, chemical and biological processes that are central for the analysis and evaluation in the aquatic environment.
- Evaluate methods for the analysis of changing impacts on aquatic environments.
- To use GIS and/or relevant numerical models for analysis on both local and larger scale aquatic problems

COMPETENCES

- To be able to conduct experimental, empirical and/or theoretical investigations which are necessary for the solution of one or more identified problems.
- Critically evaluate the data and theories used.
- Must be able to communicate the results of the project work in a project report
- Must be able to contribute successfully to teamwork within the problem area and make a common presentation of the result of the project work

LEARNING OBJECTIVES FOR PROBLEM BASED LEARNING

- Must be able to assess problemsolving
- Must be able to assess teamwork/team composition
- Must be able to understand and explain what process analysis is
- Must be able to assess impact assessment

TYPE OF INSTRUCTION

Project work with supervision supplemented with instruction, workshops, presentation seminars, lab tests, etc.

EXTENT AND EXPECTED WORKLOAD

The projectmodule is 15 ECTS which is corresponding to 450 hours of study.

EXAM

PREREQUISITE FOR ENROLLMENT FOR THE EXAM

- An approved PBL competency profile is a prerequisite for participation in the project exam.

EXAMS

Name of exam	Aquatic Geography
Type of exam	Oral exam based on a project Oral exam based on presentation seminar and project report.
ECTS	15
Assessment	7-point grading scale
Type of grading	External examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Akvatisk geografi
Module code	B-GEO-K2-1A
Module type	Project
Duration	1 semester
Semester	Spring
ECTS	15
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Lucia Margheritini
Time allocation for external examiners	B

ORGANISATION

Education owner	Master of Science (MSc) in Geography
Study Board	Study Board of Built Environment
Department	Department of the Built Environment
Faculty	The Faculty of Engineering and Science

LIMNOLOGY

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

To provide fundamental insight into freshwater ecology and freshwater ecosystems. The student will be introduced to physical, chemical and biological dynamics of natural freshwater ecosystems, and the effects of natural and anthropogenic perturbations on structure and function.

LEARNING OBJECTIVES

KNOWLEDGE

- Of key components of freshwater ecosystems.
- Of relevant theory for physical, chemical and biological processes in freshwater ecosystems.
- Of dominant anthropogenic types of pollution affecting freshwater ecosystems.

SKILLS

- Shall be able to differentiate between major types of streams, rivers and lakes.
- Shall be able to understand the exchange of matter between aquatic and terrestrial environments.
- Shall be able to explain lake and river ecosystem dependence on light, temperature, nutrients and organic matter.
- Shall be able to understand primary production, respiration and re-oxidation in freshwater ecosystems.
- Shall be able to determine the significance of hydraulic conditions on chemical and biological dynamics in lakes and rivers.
- Shall be able to analyse oxygen dynamics in freshwater environments.
- Shall be able to analyse impacts of pollution on biotic communities.
- Shall be able to use existing pollution indicators for running waters and lakes to assess the pollution of a given location.
- Shall be able to account for current river and lake restoration methods.

COMPETENCES

- Work with and analyse biological communities in relation to nutrient dynamics and organic matter cycling in lake and river ecosystems.
- Describe important organic and inorganic pollutants and pollution effects in freshwater ecosystems.
- Evaluate methods to prevent and alleviate anthropogenic perturbations in freshwater ecosystems using existing technologies.

TYPE OF INSTRUCTION

Lectures supplemented with project work, workshops, presentation seminars, field and lab work, etc.

EXTENT AND EXPECTED WORKLOAD

The module is 5 ECTS which is corresponding to 150 hours of study.

EXAM

EXAMS

Name of exam	Limnology
Type of exam	Written or oral exam Individual oral or written exam. Exam format is decided at the start of each semester.

ECTS	5
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Limnologi
Module code	B-GEO-K2-2
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Per Møldrup, Diana Stephansen

ORGANISATION

Education owner	Master of Science (MSc) in Geography
Study Board	Study Board of Built Environment
Department	Department of the Built Environment
Faculty	The Faculty of Engineering and Science

MARINE POLLUTION

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

- On marine ecosystems.
- On theory for physical, chemical and microbial processes in marine systems.
- On the most common types of marine pollution.

SKILLS

- To understand the exchange of matter between aquatic and terrestrial environments.
- To describe the marine ecosystem, light, salinity and temperature.
- To understand primary production, respiration and re-oxidation.
- To analyse microbial loops, food webs, turnover of C-N-S and P in aquatic environments.
- To analyse impacts on different marine compartments, e.g. water, sediments, biota.
- To analyse marine sediments.
- To distinguish pollution impacts on individuals, populations and communities.
- To evaluate man-made pollutants (xenobiotics, microplastics), metals and disease-causing microorganisms (pathogens) in marine waters.
- To assess recreational and bathing water quality and related faecal pollution source tracking.
- To understand the basic concepts of the legal framework regulating marine pollution (marine governance)

COMPETENCES

- Analyse the fate of nutrients in coastal marine ecosystem.
- Describe important organic and inorganic pollutants and pollution effects in coastal marine waters.
- Evaluate methods to prevent and alleviate antropogenic pollution in coastal marine waters evaluate meth.

TYPE OF INSTRUCTION

Lectures, etc. supplemented with project work, workshops, presentation seminars, lab tests.

EXTENT AND EXPECTED WORKLOAD

Since it is a 5 ECTS project module, the workload is expected to be 150 hours for the student.

EXAM

EXAMS

Name of exam	Marine Pollution
Type of exam	Written or oral exam Individual oral or written exam
ECTS	5
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Forurening af marine områder
Module code	B-VM-K2-8A
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Alvise Vianello

ORGANISATION

Study Board	Study Board of Built Environment
Department	Department of the Built Environment
Faculty	The Faculty of Engineering and Science

OCEANOGRAPHY AND TIME SERIES ANALYSIS

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of the course is to give the student a fundamental knowledge of water flow in marine environments. Based on the gained knowledge the student shall be able to analyse time series of environmental data and construct conceptual models for a given marine environment.

LEARNING OBJECTIVES

KNOWLEDGE

- On global ocean topography, currents, waves, temperature and salinity.
- On local currents in coastal zones and estuaries.
- On costal processes and hydraulics.
- On local and global ocean nutrient transport.
- On basic time series analysis.

SKILLS

- To perform a systematic analysis of the physics in the coastal zone and estuaries.
- To analyse time series in an oceanographic context.
- To analyse geophysical flows in the ocean and coastal zone.

COMPETENCES

- To evaluate, structure and present oceanographic data.
- Describe and analyse marine processes.
- To construct conceptual models for a specific marine environment on the basis on literature studies and data.
- To structure and produce technical documentation of complex problems, methods and results.
- To communicate problems, findings and results graphically as well as oral to the relevant target audience.

TYPE OF INSTRUCTION

Lectures supplemented with project work, workshops, presentation seminars, experimental work etc.

EXTENT AND EXPECTED WORKLOAD

The module is 5 ECTS which is corresponding to 150 hours of study.

EXAM

EXAMS

Name of exam	Oceanography and Time Series Analysis
Type of exam	Written or oral exam Individual oral or written exam. Exam format is decided by start of semester.
ECTS	5
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Oceanografi og tidsserieanalyse
Module code	B-GEO-K2-4
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Per Møldrup, Diana Stephansen

ORGANISATION

Education owner	Master of Science (MSc) in Geography
Study Board	Study Board of Built Environment
Department	Department of the Built Environment
Faculty	The Faculty of Engineering and Science

ADVANCED METHODS IN PHYSICAL GEOGRAPHY

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The main objective of this project module is to qualify the student to analyse and evaluate one or more problems within the field of physical geography. The project can comprise field surveys, laboratory experiments, modelling and/or theoretical problems. Emphasis in the project is on development of a strategy for measuring and modelling of physical geography processes. The project also aims to get the students to evaluate critically the use of literature, measurements and models. It is noted that the semester unit may include substantial elements of cultural geography including demographic and market analyses, if these elements are relevant for, and connected to, the below described physical geography elements.

LEARNING OBJECTIVES

KNOWLEDGE

- Shall have knowledge on how numerical methods and experiments methods complement each other and how to use experimental data to improve models in the field of physical geography.
- Understand and which uncertainties are associated to each method and how they can be analysed.
- Understand the physical, chemical and biological processes in aquatic environments.

SKILLS

- Use the existing literature and theories to plan a literature study and field and/or laboratory work within the field of physical geography.
- Critically use a select models currently used in physical geography.
- Independently explain choice of scientific theoretical and/or experimental methods in relation to the aim of the study.
- Plan and carry out the measurement program for field and laboratory measurements.
- Make a critical estimation of the chosen theories and methods as well as the analyses, results and conclusions.
- To select relevant theories and literature.

COMPETENCES

- Be able to combine, literature surveys, experimental data and numerical methods to develop better models within the field of physical geography.
- Communicate relevant scientific and professional aspects of project work in a clear and systematic way.
- Present and communicate results in a web-based media.
- Must be able to contribute successfully to teamwork within the problem area and make a common presentation of the result of the project work.

TYPE OF INSTRUCTION

Project work with supervision supplemented with instruction, workshops, presentation seminars, experimental work, etc.

EXTENT AND EXPECTED WORKLOAD

The projectmodule is 20 ECTS which is corresponding to 600 hours of study.

EXAM

EXAMS

Name of exam	Advanced Methods in Physical Geography

Type of exam	Oral exam based on a project Oral exam based on presentation seminar and project report.
ECTS	20
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Avancerede naturgeografiske metoder
Module code	B-GEO-K3-1A
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	20
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Per Møldrup, Diana Stephansen

ORGANISATION

Education owner	Master of Science (MSc) in Geography
Study Board	Study Board of Built Environment
Department	Department of the Built Environment
Faculty	The Faculty of Engineering and Science

MEASUREMENT TECHNOLOGY AND DATA ACQUISITION

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of the course is to enable the student to perform measurement and data acquisition in the laboratory and in the field. The course is equally divided between sensor technology and data acquisition with computers and data loggers.

LEARNING OBJECTIVES

KNOWLEDGE

- Knowledge on the different sensors available and the fundamental measuring principles.
- Knowledge on the computer based data acquisition, accuracy and error handling.

SKILLS

- Be able to plan experiments in order to get optimal information compared to the experimental effort.
- Be able to choose the right sensor technology for the problem at hand.
- Setting up the A/D and D/A converters with commercial programs or by own programs.
- Basic knowledge on digital image analysis

COMPETENCES

- Be able to plan an laboratory or field experiment and setup appropriate data acquisition.
- Be able to discuss validity of results and errors of the data acquired in relation to choice of sensor and analysis method.

TYPE OF INSTRUCTION

Lectures supplemented with project work, workshops, presentation seminars, experimental work etc.

EXTENT AND EXPECTED WORKLOAD

The module is 5 ECTS which is corresponding to 150 hours of study.

EXAM

EXAMS

Name of exam	Measurement Technology and Data Acquisition
Type of exam	Written or oral exam Individual oral or written exam. Exam format is decided by start of semester.
ECTS	5
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Måleteknik og dataopsamling
Module code	B-GEO-K3-2
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Asbjørn Haaning Nielsen

ORGANISATION

Education owner	Master of Science (MSc) in Geography
Study Board	Study Board of Built Environment
Department	Department of the Built Environment
Faculty	The Faculty of Engineering and Science

GLOBAL CHANGE BIOLOGY

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim is to qualify the student to understand how global changes affect biological systems.

LEARNING OBJECTIVES

KNOWLEDGE

- On how greenhouse gas emission is linked to climate change, and how climate changes affect greenhouse gas emissions
- On how climate changes can influence populations and community dynamics
- On how a changing climate impact on agriculture and horticulture
- On how climate historically has changed and impacted on life on earth
- On how populations adapt to changing thermal conditions through plastic and evolutionary responses
- On the role of evolution and phenotypic plasticity in relation to climate change
- About the factors that constraints evolutionary processes

SKILLS

- Apply predictive ecosystem models to estimate how ecosystems are affected by global changes and land use
- Discriminate between species invasion from gradual migration due to climate changes and random species invasion

COMPETENCES

- Describe and use strategies that can mitigate greenhouse emission

TYPE OF INSTRUCTION

Lectures supplemented with project work, workshops, presentation seminars, experimental work etc.

EXTENT AND EXPECTED WORKLOAD

The module is 5 ECTS which is corresponding to 150 hours of study.

EXAM

EXAMS

Name of exam	Global Change Biology
Type of exam	Written or oral exam Individual oral or written exam. Exam format is decided by start of semester.
ECTS	5
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Klimapåvirkning af biologiske systemer
Module code	B-GEO-K3-3
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Diana Stephansen

ORGANISATION

Education owner	Master of Science (MSc) in Geography
Study Board	Study Board of Built Environment
Department	Department of the Built Environment
Faculty	The Faculty of Engineering and Science

PROJECT-ORIENTED STUDY IN AN EXTERNAL ORGANISATION

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module:

- Must have knowledge about analytical, numerical and/or experimental methods for investigation of advanced geographical (physical) problems within the organization's field.

SKILLS

Students who complete the module:

- Must be able to apply analytical, numerical and/or experimental methods for analysis and assessment of advanced problems within the organization's field.
- Must be able to compare and evaluate limitations and uncertainties related to the methods used for solving advanced physical geography problems.

COMPETENCES

Students who complete the module:

- Must be able to apply proper scientific terminology in oral, written and graphical communication and documentation of problems and solutions within the organization's field.
- Must be able to communicate the results of the project work in either a project report or similar.

TYPE OF INSTRUCTION

Project-orientated study in an external organisation and project work. The study board must approve on the content of the project work before the study is commenced.

EXTENT AND EXPECTED WORKLOAD

The projectmodule is 30 ECTS which is corresponding to 900 hours of study.

EXAM

EXAMS

Name of exam	Project-oriented Study in an External Organisation
Type of exam	Oral exam based on a project Oral exam based on presentation seminar and project report.
ECTS	30
Assessment	7-point grading scale
Type of grading	Internal examination

Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Projektorienteret forløb i en virksomhed
Module code	B-GEO-K3-4
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	30
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Per Møldrup

ORGANISATION

Education owner	Master of Science (MSc) in Geography
Study Board	Study Board of Built Environment
Department	Department of the Built Environment
Faculty	The Faculty of Engineering and Science

MASTER'S THESIS

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

After completion of the project, the student should within the following topics:

LEARNING OBJECTIVES

KNOWLEDGE

- Have knowledge and comprehension within the field of the specialization at the highest international level.
- Be able to critically evaluate knowledge and identify new scientific problems within the field of the specialization.
- Have understanding of implications within the related research area including research ethics.

SKILLS

- Independently explain choice of scientific theoretical and/or experimental methods.
- During the project and when finalising it make an independent and critical estimation of the chosen theories and methods as well as the analyses, results and conclusions.
- Be able to apply a wide range of engineering and science methods in research and development in the field of specialization.
- Be able to communicate relevant scientific and professional aspects of project work in a clear and systematic way both to specialists and the public.

COMPETENCES

- Be able to work independently with a project on a specific problem within the field of the specialization at the highest international level.
- Independently be able to define and analyse scientific problems and based on that make and state the reasons for the decisions made.
- Be competent to solve new and complicated technical problems by the use of advanced mathematics, scientific and technological knowledge.
- Be able to evaluate the progress of the project independently and select and include additional literature, experiments or data when needed in order to maintain a scientific basis for the project.
- Be able to control complex and unexpected working situations and be able to develop new solutions.
- Must be able to communicate the results of the project work in a project report.

TYPE OF INSTRUCTION

Project work with supervision supplemented with instruction, workshops, presentation seminars, experimental work, etc.

A long master thesis has to include experimental work and has to be approved by the study board. The amount of experimental work must reflect the allotted ECTS.

EXTENT AND EXPECTED WORKLOAD

The projectmodule is 50 ECTS which is corresponding to 1500 hours of study.

EXAM

EXAMS

Name of exam	Master's Thesis
Type of exam	Master's thesis/final project

	Oral exam based on presentation seminar and project report.
ECTS	50
Assessment	7-point grading scale
Type of grading	External examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Kandidatspeciale
Module code	B-GEO-K3-5
Module type	Project
Duration	2 semesters
Semester	Autumn
ECTS	50
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Per Møldrup
Time allocation for external examiners	D

ORGANISATION

Education owner	Master of Science (MSc) in Geography
Study Board	Study Board of Built Environment
Department	Department of the Built Environment
Faculty	The Faculty of Engineering and Science

MASTER'S THESIS

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

After completion of the project, the student should within the following topics:

LEARNING OBJECTIVES

KNOWLEDGE

- Have knowledge and comprehension within the field of the specialization at the highest international level.
- Be able to critically evaluate knowledge and identify new scientific problems within the field of the specialization.
- Have understanding of implications within the related research area including research ethics.

SKILLS

- Independently explain choice of scientific theoretical and/or experimental methods.
- During the project and when finalising it make an independent and critical estimation of the chosen theories and methods as well as the analyses, results and conclusions.
- Be able to apply a wide range of engineering and science methods in research and development in the field of specialization.
- Be able to communicate relevant scientific and professional aspects of project work in a clear and systematic way both to specialists and the public.

COMPETENCES

- Be able to work independently with a project on a specific problem within the field of the specialization at the highest international level.
- Independently be able to define and analyse scientific problems and based on that make and state the reasons for the decisions made.
- Be competent to solve new and complicated technical problems by the use of advanced mathematics, scientific and technological knowledge.
- Be able to evaluate the progress of the project independently and select and include additional literature, experiments or data when needed in order to maintain a scientific basis for the project.
- Be able to control complex and unexpected working situations and be able to develop new solutions.
- Must be able to communicate the results of the project work in a project report.

TYPE OF INSTRUCTION

Project work with supervision supplemented with instruction, workshops, presentation seminars, experimental work, etc.

A long master thesis has to include experimental work and has to be approved by the study board. The amount of experimental work must reflect the allotted ECTS.

EXTENT AND EXPECTED WORKLOAD

The projectmodule is 60 ECTS which is corresponding to 1800 hours of study.

EXAM

EXAMS

Name of exam	Master's Thesis
Type of exam	Master's thesis/final project

	Oral exam based on presentation seminar and project report.
ECTS	60
Assessment	7-point grading scale
Type of grading	External examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Kandidatspeciale
Module code	B-GEO-K3-6
Module type	Project
Duration	2 semesters
Semester	Autumn
ECTS	60
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Per Møldrup
Time allocation for external examiners	D

ORGANISATION

Education owner	Master of Science (MSc) in Geography
Study Board	Study Board of Built Environment
Department	Department of the Built Environment
Faculty	The Faculty of Engineering and Science

MASTER'S THESIS

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

After completion of the project, the student should within the following topics:

LEARNING OBJECTIVES

KNOWLEDGE

- Have knowledge and comprehension within the field of the specialization at the highest international level.
- Be able to critically evaluate knowledge and identify new scientific problems within the field of the specialization.
- Have understanding of implications within the related research area including research ethics.

SKILLS

- Independently explain choice of scientific theoretical and/or experimental methods.
- During the project and when finalising it make an independent and critical estimation of the chosen theories and methods as well as the analyses, results and conclusions.
- Be able to apply a wide range of engineering and science methods in research and development in the field of specialization.
- Be able to communicate relevant scientific and professional aspects of project work in a clear and systematic way both to specialists and the public.

COMPETENCES

- Be able to work independently with a project on a specific problem within the field of the specialization at the highest international level.
- Independently be able to define and analyse scientific problems and based on that make and state the reasons for the decisions made.
- Be competent to solve new and complicated technical problems by the use of advanced mathematics, scientific and technological knowledge.
- Be able to evaluate the progress of the project independently and select and include additional literature, experiments or data when needed in order to maintain a scientific basis for the project.
- Be able to control complex and unexpected working situations and be able to develop new solutions.
- Must be able to communicate the results of the project work in a project report.

TYPE OF INSTRUCTION

Project work with supervision supplemented with instruction, workshops, presentation seminars, experimental work, etc.

EXTENT AND EXPECTED WORKLOAD

The projectmodule is 30 ECTS which is corresponding to 900 hours of study.

EXAM

EXAMS

Name of exam	Master's Thesis
Type of exam	Master's thesis/final project Oral exam based on presentation seminar and project report.
ECTS	30

Assessment	7-point grading scale
Type of grading	External examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Kandidatspeciale
Module code	B-GEO-K4-1
Module type	Project
Duration	1 semester
Semester	Spring
ECTS	30
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Per Møldrup
Time allocation for external examiners	D

ORGANISATION

Education owner	Master of Science (MSc) in Geography
Study Board	Study Board of Built Environment
Department	Department of the Built Environment
Faculty	The Faculty of Engineering and Science

REMOTE SENSING

2023/2024

MODULETS INDHOLD, FORLØB OG PÆDAGOGIK

Studerende, der gennemfører modulet, skal erhverve:

LÆRINGSMÅL

VIDEN

- Indsigt og forståelse for remote sensing som koncept og metode.
- Indsigt og forståelse for specifikke remote sensing teknologiers muligheder og begrænsninger.
- Kendskab til måleteknik og dataopsamlingsmetoder inden for remote sensing.

FÆRDIGHEDER

- Evne til at analysere et udvalg af remote sensing data med forskellige egenskaber, såsom droneoptagelser, geo- og vejrradar observationer samt satellit data o.l.
- Kunne anvende GIS-software til bearbejdning af remote sensing data.
- Kunne anvende billedbehandlings-software til opbygning af digitale terrænmodeller på baggrund af droneoptagelser.
- Reflektere kritisk over størrelser og usikkerheder på resultater baseret på remote sensing.

KOMPETENCER

- Vurdering og anvendelse af remote sensing inden for naturgeografiske problemstillinger.
- Udføre rumlige analyser og fremstilling af tematiske kort i GIS med udgangspunkt i remote sensing.
- Sammenholde resultaterne af remote sensing målinger og analyser med henblik på at give en naturgeografisk beskrivelse af en lokalitet.

KOMPETENCEMÅL GÆLDENDE FOR STUDERENDE DER LÆSER PÅ KANDIDATNIVEAU, MEN FØLGER UNDERVISNING PÅ BACHELORNIVEAU:

- Kunne reflektere over fagområdets tilgang til faglige problemstillinger på højt niveau og dets relation til andre fagområder.
- Kunne inddrage vidensområdet i løsningen af komplekse faglige problemstillinger og dermed opnå ny forståelse af et givet genstandsområde.

UNDERVISNINGSFORM

Forelæsning, workshops, opgaveløsning og underviserfeedback.

OMFANG OG FORVENTET ARBEJDSINDSATS

Kursusmodulets omfang er 5 ECTS svarende til 150 timers studieindsats.

EKSAMEN

PRØVER

Prøvens navn	Remote sensing
Prøveform	Aktiv deltagelse/løbende evaluering Reeksamen gennemføres som skriftlig eller mundtlig eksamen.

ECTS	5
Bedømmelsesform	Bestået/ikke bestået
Censur	Intern prøve
Vurderingskriterier	Vurderingskriterierne er angivet i Universitetets eksamensordning

FAKTA OM MODULET

Engelsk titel	Remote Sensing
Modulkode	B-GEO-B6-2
Modultype	Kursus
Varighed	1 semester
Semester	Forår
ECTS	5
Undervisningssprog	Dansk
Tomplads	Ja
Undervisningssted	Campus Aalborg
Modulansvarlig	Michael R. Rasmussen

ORGANISATION

Studienævn	Studienævn for Byggeri, By og Miljø
Institut	Institut for Byggeri, By og Miljø
Fakultet	Det Ingeniør- og Naturvidenskabelige Fakultet

AVANCERET GEOINFORMATIK

2023/2024

MODULETS INDHOLD, FORLØB OG PÆDAGOGIK

Studerende, der gennemfører modulet, skal erhverve:

LÆRINGSMÅL

VIDEN

- Viden om geodatabaser og GIS-datamodeller
- Viden om Distribueret GIS, herunder Web-GIS, mobil-GIS og distribuerede GP-værktøjer
- Viden om forskellige forespørgselsmetoder, herunder SQL og rumlige forhold
- Viden om bearbejdning af data i databasen
- Viden om avanceret modellering og rumlige analyser
- Viden om anvendelse og modellering af rasterdata, herunder højdemodeller og anden remote sensing data
- Viden om avancerede algoritmer til bearbejdning af rasterdata
- Viden om netværksbaserede analysemetoder
- Viden om automatisering i GIS, herunder modellering og programmering

FÆRDIGHEDER

- Opsætning og tilpasning af avancerede datamodeller
- Opsætning af avancerede webbaserede GIS-løsninger
- Skal kunne forberede et GIS-projekt til indsamling og bearbejdning af geografisk data
- Skal kunne forespørge og bearbejde data, såvel rumligt som i en relationel datamodel
- Gennemføre avancerede GIS-modelleringer og rumlige analyser
- Skal kunne lave avancerede hydrologiske analyser og opsætning af GIS-baserede hydrologiske modeller
- Skal kunne lave modeller til analyse af rasterdata
- Skal kunne lave netværksbaserede analyser og modeller
- Opsætning af workflows og automatiseringsrutiner til forenkling af gentagne arbejdsgange

KOMPETENCER

- Selvstændigt kunne strukturere en dataindsamling, datamodellering, og forberede analyser i et GIS
- Selvstændigt kunne gennemføre de nødvendige GIS-analyser og opsætte de nødvendige modelleringer til en given problemstilling
- Selvstændigt kunne automatisere en relevant GIS-arbejdsgang.

KOMPETENCEMÅL GÆLDENDE FOR STUDERENDE DER LÆSER PÅ KANDIDATNIVEAU, MEN FØLGER UNDERVISNING PÅ BACHELORNIVEAU:

- Kunne reflektere over fagområdets tilgang til faglige problemstillinger på højt niveau og dets relation til andre fagområder.
- Kunne inddrage vidensområdet i løsningen af komplekse faglige problemstillinger og dermed opnå ny forståelse af et givet genstandsområde.

UNDERVISNINGSFORM

Forelæsninger, øvelser & workshops

OMFANG OG FORVENTET ARBEJDSINDSATS

Kursusmodulets omfang er 5 ECTS svarende til 150 timers studieindsats.

EKSAMEN

PRØVER

Prøvens navn	Avanceret geoinformatik
Prøveform	Skriftlig eller mundtlig
ECTS	5
Bedømmelsesform	Bestået/ikke bestået
Censur	Intern prøve
Vurderingskriterier	Vurderingskriterierne er angivet i Universitetets eksamensordning

FAKTA OM MODULET

Engelsk titel	Advanced Geoinformatics
Modulkode	B-GEO-B6-4
Modultype	Kursus
Varighed	1 semester
Semester	Forår
ECTS	5
Undervisningssprog	Dansk
Undervisningssted	Campus Aalborg
Modulansvarlig	Jesper Ellerbæk Nielsen

ORGANISATION

Studienævn	Studienævn for Byggeri, By og Miljø
Institut	Institut for Byggeri, By og Miljø
Fakultet	Det Ingeniør- og Naturvidenskabelige Fakultet

GLOBALISERING OG UDVIKLING

2023/2024

MODULETS INDHOLD, FORLØB OG PÆDAGOGIK

LÆRINGSMÅL

VIDEN

Studerende, der gennemfører modulet, skal erhverve viden inden for:

- Naturressourcer og deres rolle i det moderne samfund
- Udvalgte humane- og naturressourcers betydning for udvikling i et globalt perspektiv
- Globaliseringens betydning for samfundets/menneskets valgmuligheder i forhold til udvikling samt konsekvenser i forskellige dele af verden
- Relevante geografiske analysemetoder til analyse af globaliseringens konsekvenser

FÆRDIGHEDER

Studerende, der gennemfører modulet, skal:

- Kunne analysere problemstillingen ud fra en syntesegeografisk synsvinkel.
- Kunne analysere geografiske problemstillinger ved selvstændig indsamling af data og vurdere kvaliteten og pålideligheden af de indsamlede data.
- Reflektere kritisk over de valgte teorier, metoder og analysetilgange.
- Reflektere kritisk over projektarbejdets resultater.
- Strukturere og formidle projektarbejdets faglige grundlag og resultater.

KOMPETENCER

Studerende, der gennemfører modulet, skal:

- Få forståelse for, hvordan globaliseringen påvirker brugen af naturressourcer
- Anvende og kritisk reflektere over geografiske teorier og metoder i relation til geografiske problemstillinger omhandlende interaktioner mellem samfund, ressourcer og miljø på globalt plan
- Tilrettelægge og gennemføre en problembehandling af syntesegeografisk karakter.
- Videnskabsteori indenfor "projekt-tema" og didaktik er en integreret del af projektarbejdet inkl. den mundtlige fremlæggelse ved evalueringen af projektet.

LÆRINGSMÅL FOR PROBLEMBASERET LÆRING

- Skal kunne anvende problemløsning
- Skal kunne analysere gruppesamarbejde/sammensætning
- Skal kunne forstå og forklare hvad procesanalyse er
- Skal have viden om personlige kompetencer og ønsker
- Skal kunne anvende projektledelse
- Skal kunne forstå og forklare hvad konsekvensvurdering er

KOMPETENCEMÅL GÆLDENDE FOR STUDERENDE DER LÆSER PÅ KANDIDATNIVEAU, MEN FØLGER UNDERVISNING PÅ BACHELORNIVEAU:

- Kunne reflektere over fagområdets tilgang til faglige problemstillinger på højt niveau og dets relation til andre fagområder.
- Kunne inddrage vidensområdet i løsningen af komplekse faglige problemstillinger og dermed opnå ny forståelse af et givet genstandsområde.

UNDERVISNINGSFORM

Problemorienteret projektarbejde i grupper med vejledning.

OMFANG OG FORVENTET ARBEJDSINDSATS

Projektmodulets omfang er 15 ECTS svarende til 450 timers studieindsats.

EKSAMEN

PRØVER

Prøvens navn	Globalisering og udvikling
Prøveform	Mundtlig pba. projekt
ECTS	15
Bedømmelsesform	7-trins-skala
Censur	Intern prøve
Vurderingskriterier	Vurderingskriterierne er angivet i Universitetets eksamensordning

FAKTA OM MODULET

Engelsk titel	Globalization and Development
Modulkode	B-GEO-B5-1
Modultype	Projekt
Varighed	1 semester
Semester	Efterår
ECTS	15
Undervisningssprog	Dansk
Undervisningssted	Campus Aalborg
Modulansvarlig	Lucia Margheritini

ORGANISATION

Studienævn	Studienævn for Byggeri, By og Miljø
Institut	Institut for Byggeri, By og Miljø
Fakultet	Det Ingeniør- og Naturvidenskabelige Fakultet

NATURRESSOURCER

2023/2024

MODULETS INDHOLD, FORLØB OG PÆDAGOGIK

LÆRINGSMÅL

VIDEN

Studerende, der gennemfører modulet, skal erhverve viden inden for:

- Forekomst og udnyttelse af biologiske og geologiske ressourcer, samt konflikter omkring landareal som begrænsende ressource.
- Forekomst og udnyttelse af vandressourcer, herunder havet, ferskvand og grundvand både til energiudvinding, produktionsforbrug eller drikkevandsressource.
- Forskellige energiressourcer og væsentlige energistrømme, med fokus på vedvarende energikilder.
- Viden om økosystemer, ecosystem services, økologisk footprint ved anvendelse og udnyttelse af naturressourcer.

FÆRDIGHEDER

Studerende, der gennemfører modulet skal kunne:

- Forstå sammenhængen imellem ressourcetype, udnyttelsesform og bæredygtighed.
- Identificere forskellige energiressourcer og deres udnyttelsespotentiale og begrænsninger.
- Identificere og analysere menneskelig påvirkning på miljøet.
- Reflektere over global virkning af menneskelige aktiviteter.
- Reflektere over prioriteterne ved udforskning af forskellige naturressourcer i forskellige samfund.

KOMPETENCER

Studerende, der gennemfører modulet:

- Kan diskutere og analysere menneskets indflydelse på de globale naturressourcer.
- Kan analysere begrænsninger eller forudsætninger for en bæredygtig udnyttelse af naturressourcer samt handlingsbehov i forhold til forvaltningen.
- Kan analysere påvirkningen af produktioners cyklus på naturressourcerne.

KOMPETENCEMÅL GÆLDENDE FOR STUDERENDE DER LÆSER PÅ KANDIDATNIVEAU, MEN FØLGER UNDERVISNING PÅ BACHELORNIVEAU:

- Kunne reflektere over fagområdets tilgang til faglige problemstillinger på højt niveau og dets relation til andre fagområder.
- Kunne inddrage vidensområdet i løsningen af komplekse faglige problemstillinger og dermed opnå ny forståelse af et givet genstandsområde.

UNDERVISNINGSFORM

Forelæsninger, øvelser & workshops

OMFANG OG FORVENTET ARBEJDSINDSATS

Kursusmodulets omfang er 5 ECTS svarende til 150 timers studieindsats.

EKSAMEN

PRØVER

Prøvens navn	Naturressourcer
Prøveform	Skriftlig eller mundtlig
ECTS	5
Bedømmelsesform	Bestået/ikke bestået
Censur	Intern prøve
Vurderingskriterier	Vurderingskriterierne er angivet i Universitetets eksamensordning

FAKTA OM MODULET

Engelsk titel	Natural Ressources
Modulkode	B-GEO-B5-2
Modultype	Kursus
Varighed	1 semester
Semester	Efterår
ECTS	5
Undervisningssprog	Dansk
Tomplads	Ja
Undervisningssted	Campus Aalborg
Modulansvarlig	Lucia Margheritini

ORGANISATION

Studienævn	Studienævn for Byggeri, By og Miljø
Institut	Institut for Byggeri, By og Miljø
Fakultet	Det Ingeniør- og Naturvidenskabelige Fakultet

GLOBALISERINGENS GEOGRAFI

2023/2024

MODULETS INDHOLD, FORLØB OG PÆDAGOGIK

Studerende, der gennemfører modulet:

LÆRINGSMÅL

VIDEN

- Skal kunne redegøre for globale strømme og rum, herunder de grundlæggende drivkræfter og tendenser på tværs af forskellige skalaer.
- Skal kunne identificere og analysere mønstre i strømme og rum på lokale, nationale og internationale skalaer.
- Skal kunne redegøre for forskelle og mønstre i globaliseringstendenser og –mønstre og komplekse samspil mellem strømme og rum.
- Skal kunne reflektere over teorier og begreber om globalisering og forskellige tilgange til at forstå og analysere globalisering, samt deres videnskabsteoretiske og metodiske forankring.
- Skal kunne reflektere over styrker og svagheder ved forskellige teorier om globalisering.

FÆRDIGHEDER

- Skal kunne analysere globalisering, dens forudsætninger og konsekvenser, som et historisk, socialt, økonomisk og politisk fænomen.
- Skal kunne anvende globaliseringsteori i en dansk såvel som international sammenhæng.
- Skal kritisk kunne reflektere over aktuelle tendenser indenfor globalisering på forskellige skalaer.
- Skal kunne arbejde med komplekse problemstillinger i samspillet mellem lokalitet og globalisering.

KOMPETENCER

- Kan formidle viden om globaliseringens grundlæggende dynamikker og udviklingstendenser til såvel fagfolk som ikke-fagfolk.
- Kan kritisk anvende tværdisciplinær viden fra forskellige felter til at forstå og analysere globalisering.

KOMPETENCEMÅL GÆLDENDE FOR STUDERENDE DER LÆSER PÅ KANDIDATNIVEAU, MEN FØLGER UNDERVISNING PÅ BACHELORNIVEAU:

- Kunne reflektere over fagområdets tilgang til faglige problemstillinger på højt niveau og dets relation til andre fagområder.
- Kunne inddrage vidensområdet i løsningen af komplekse faglige problemstillinger og dermed opnå ny forståelse af et givet genstandsområde.

UNDERVISNINGSFORM

Forelæsninger, øvelser & workshops.

OMFANG OG FORVENTET ARBEJDSINDSATS

Kursusmodulets omfang er 5 ECTS svarende til 150 timers studieindsats.

EKSAMEN

PRØVER

Prøvens navn	Globaliseringens geografi

Prøveform	Skriftlig eller mundtlig
ECTS	5
Bedømmelsesform	7-trins-skala
Censur	Intern prøve
Vurderingskriterier	Vurderingskriterierne er angivet i Universitetets eksamensordning

FAKTA OM MODULET

Engelsk titel	Globalization Geography
Modulkode	B-GEO-B5-3
Modultype	Kursus
Varighed	1 semester
Semester	Efterår
ECTS	5
Undervisningssprog	Dansk
Tomplads	Ja
Undervisningssted	Campus Aalborg
Modulansvarlig	Søren Kerndrup

ORGANISATION

Studienævn	Studienævn for Byggeri, By og Miljø
Institut	Institut for Byggeri, By og Miljø
Fakultet	Det Ingeniør- og Naturvidenskabelige Fakultet

DEMOGRAFI OG UDVIKLING

2023/2024

MODULETS INDHOLD, FORLØB OG PÆDAGOGIK

Studerende, der gennemfører modulet:

LÆRINGSMÅL

VIDEN

- Skal kunne redegøre for udvikling af samfund og befolkning, herunder de grundlæggende drivkræfter og tendenser på tværs af forskellige skalaer.
- Skal kunne identificere og analysere mønstre i udviklingsprocesser og tendenser på tværs af forskellige nationale og lokale områder, samt identificere og analysere befolkningsprocesser, dødelighed, fertilitet og migration og den resulterende befolkningsstruktur ift. aldersfordeling, urbanisering, sociologi og kultur.
- Skal kunne redegøre for forskelle og ligheder i udviklingstendenser globalt og lokalt, herunder forskelle i befolkningsudvikling.
- Skal kunne reflektere over udviklingsteoretiske teorier og begreber og forskellige tilgange til at forstå og analysere globalisering, samt deres videnskabsteoretiske og metodiske forankring.
- Skal kunne reflektere over demografiske teorier og redegøre for, samt anvende demografiske datakilder og analysemetoder.
- Skal kunne beskrive og identificere demografiske forhold på global, national og lokal skala med henblik på at kunne forstå og analysere befolkningsforhold i et givent område ud fra tilgængelige data.

FÆRDIGHEDER

- Skal kunne analysere udvikling og befolkningsprocesser, deres forudsætninger og konsekvenser, som sociale, økonomiske og politiske fænomener.
- Skal kunne anvende teorier og metoder om udvikling og demografi til at analysere, evaluere og sammenligne tendenser og mønstre i udvikling og demografi.
- Skal kunne reflektere over aktuelle tendenser i udvikling på forskellige skalaer, samt de demografiske tendenser og udviklingsmønstre.
- Skal kunne arbejde med komplekse demografiske og udviklingsproblemstillinger i en konkret kontekst.

KOMPETENCER

- Kan formidle viden om grundlæggende dynamikker og udviklingstendenser i såvel udviklings- som befolkningsdynamikker til såvel fagfolk som ikke-fagfolk.
- Kan kritisk anvende tværdisciplinær viden fra forskellige felter til at forstå og analysere udvikling og befolkningsudvikling.

KOMPETENCEMÅL GÆLDENDE FOR STUDERENDE DER LÆSER PÅ KANDIDATNIVEAU, MEN FØLGER UNDERVISNING PÅ BACHELORNIVEAU:

- Kunne reflektere over fagområdets tilgang til faglige problemstillinger på højt niveau og dets relation til andre fagområder.
- Kunne inddrage vidensområdet i løsningen af komplekse faglige problemstillinger og dermed opnå ny forståelse af et givet genstandsområde.

UNDERVISNINGSFORM

Forelæsninger suppleret med øvelser, feltstudie og selvstudie.

OMFANG OG FORVENTET ARBEJDSINDSATS

Kursusmodulets omfang er 5 ECTS svarende til 150 timers studieindsats.

EKSAMEN

PRØVER

Prøvens navn	Demografi og udvikling
Prøveform	Skriftlig eller mundtlig
ECTS	5
Bedømmelsesform	7-trins-skala
Censur	Intern prøve
Vurderingskriterier	Vurderingskriterierne er angivet i Universitetets eksamensordning

FAKTA OM MODULET

Engelsk titel	Demography and Development
Modulkode	B-GEO-B5-4
Modultype	Kursus
Varighed	1 semester
Semester	Efterår
ECTS	5
Undervisningssprog	Dansk
Tomplads	Ja
Undervisningssted	Campus Aalborg
Modulansvarlig	Lars Bodum

ORGANISATION

Studienævn	Studienævn for Byggeri, By og Miljø
Institut	Institut for Byggeri, By og Miljø
Fakultet	Det Ingeniør- og Naturvidenskabelige Fakultet

KANDIDATSPECIALE

2023/2024

MODULETS INDHOLD, FORLØB OG PÆDAGOGIK

Studerende der har gennemført modulet:

LÆRINGSMÅL

VIDEN

- Skal have viden og forståelse inden for specialiseringsområdet på det højeste internationale niveau.
- Skal være i stand til kritisk at evaluere viden og identificere nye videnskabelige problemer inden for specialiseringsområdet.
- Skal have forståelse for implikationer inden for det relaterede forskningsområde, herunder forskningsetik.

FÆRDIGHEDER

- Skal uafhængigt kunne forklare valg af videnskabelige teoretiske og/eller eksperimentelle metoder.
- Skal i løbet af projektet kunne foretage en uafhængig og kritisk vurdering af de valgte teorier og metoder samt analyser, resultater og konklusioner.
- Skal inden for specialiseringsområdet kunne anvende en bred vifte af ingeniør- og videnskabsmetoder inden for forskning og udvikling.
- Skal kunne kommunikere relevante videnskabelige og faglige aspekter af projektarbejdet på en klar og systematisk måde til både specialister og offentligheden.

KOMPETENCER

- Skal inden for specialiseringsområdet kunne arbejde uafhængigt med et projekt om et specifikt problem på højeste internationale niveau.
- Skal selvstændigt være i stand til at definere og analysere videnskabelige problemer og på baggrund heraf og angive årsagerne til de trufne beslutninger.
- Skal på kompetent vis kunne løse nye og komplicerede tekniske problemer ved hjælp af avanceret matematik, videnskabelig og teknologisk viden.
- Skal selvstændigt kunne evaluere projektets fremskridt samt udvælge og medtage yderligere litteratur, eksperimenter eller data, når det er nødvendigt for at opretholde et videnskabeligt grundlag for projektet.
- Skal være i stand til at kontrollere komplekse og uventede arbejdssituationer samt være i stand til at udvikle nye løsninger.
- Skal være i stand til at kommunikere resultaterne af projektarbejdet i en projektrapport.

UNDERVISNINGSFORM

Projektarbejde med vejledning suppleret med instruktion, workshops, præsentationsseminar, eksperimentelt arbejde osv.

OMFANG OG FORVENTET ARBEJDSINDSATS

Kursusmodulets omfang er 30 ECTS svarende til 900 timers studieindsats.

EKSAMEN

PRØVER

Prøvens navn	Kandidatspeciale
Prøveform	Speciale/afgangsprojekt Mundtlig prøve baseret på fremlæggelsesseminar og projektrapport.

ECTS	30
Bedømmelsesform	7-trins-skala
Censur	Ekstern prøve
Vurderingskriterier	Vurderingskriterierne er angivet i Universitetets eksamensordning

FAKTA OM MODULET

Engelsk titel	Master’s Thesis
Modulkode	B-GEO-K4-2
Modultype	Projekt
Varighed	1 semester
Semester	Forår
ECTS	30
Undervisningssprog	Dansk
Undervisningssted	Campus Aalborg
Modulansvarlig	Per Møldrup
Censornorm	D

ORGANISATION

Uddannelsesejer	Cand.scient. i geografi
Studienævn	Studienævn for Byggeri, By og Miljø
Institut	Institut for Byggeri, By og Miljø
Fakultet	Det Ingeniør- og Naturvidenskabelige Fakultet

URBAN GEOGRAFI

2023/2024

MODULETS INDHOLD, FORLØB OG PÆDAGOGIK

LÆRINGSMÅL

VIDEN

Studerende, der gennemfører modulet, skal erhverve viden om:

- Byens geografiske kompleksitet.
- Byens geografi på forskellige skalaer.
- Relevante geografiske teorier, metoder og problemstillinger i en bymæssig kontekst.
- Det metodiske grundlag for at undersøge en konkret situation, forhold, tilstand og/eller problemstilling i en urban kontekst.

FÆRDIGHEDER

Studerende, der gennemfører modulet:

- Skal kunne organisere og gennemføre indsamling og bearbejdning af data til at identificere og udforske geografiske problemstillinger i en konkret bymæssig kontekst.
- Skal kunne gøre brug af Geografiske Informationssystemer (GIS) software til at bearbejde geodata af bygeografisk relevans til at analysere en konkret bymæssig problemstilling.
- Skal kunne anvende en relevant teoretisk og naturvidenskabelig ramme for at analysere en konkret bymæssig problemstilling.
- Skal kritisk kunne reflektere over projektarbejdets resultater i videnskabsteoretisk sammenhæng.
- Skal kunne strukturere, dokumentere og formidle projektarbejdets faglige grundlag og resultater.

KOMPETENCER

Studerende, der gennemfører modulet, skal:

- Kunne anvende, udvikle og reflektere over geografiske teorier og metoder i en urban kontekst gennem selvstændigt og problemorienteret projektarbejde.
- Kunne arbejde med bymæssige problemstillinger i en tværfaglig samfunds- og naturvidenskabelig kontekst.
- Videnskabsteori indenfor "projekt-tema" og didaktik er en integreret del af projektarbejdet inkl. den mundtlige fremlæggelse ved evalueringen af projektet.

LÆRINGSMÅL FOR PROBLEMBASERET LÆRING

- Skal kunne forstå og forklare hvad problemløsning er
- Skal kunne forstå og forklare hvad gruppesamarbejde/sammensætning er
- Skal kunne anvende møder/planlægning af møder
- Skal kunne anvende tidsplanlægning
- Skal kunne anvende problemanalyse
- Skal kunne forstå og forklare hvad problemløsning er.

KOMPETENCEMÅL GÆLDENDE FOR STUDERENDE DER LÆSER PÅ KANDIDATNIVEAU, MEN FØLGER UNDERVISNING PÅ BACHELORNIVEAU:

- Kunne reflektere over fagområdets tilgang til faglige problemstillinger på højt niveau og dets relation til andre fagområder.
- Kunne inddrage vidensområdet i løsningen af komplekse faglige problemstillinger og dermed opnå ny forståelse af et givet genstandsområde.

UNDERVISNINGSFORM

Problemorienteret projektarbejde i grupper med vejledning.

OMFANG OG FORVENTET ARBEJDSINDSATS

Projektmodulets omfang er 15 ECTS svarende til 450 timers studieindsats.

EKSAMEN

PRØVER

Prøvens navn	Urban geografi
Prøveform	Mundtlig pba. projekt
ECTS	15
Bedømmelsesform	7-trins-skala
Censur	Ekstern prøve
Vurderingskriterier	Vurderingskriterierne er angivet i Universitetets eksamensordning

FAKTA OM MODULET

Engelsk titel	The City as Space and Place
Modulkode	B-GEO-B3-1
Modultype	Projekt
Varighed	1 semester
Semester	Efterår
ECTS	15
Undervisningssprog	Dansk
Tomplads	Ja
Undervisningssted	Campus Aalborg
Modulansvarlig	Søren Liedtke Thorndahl
Censornorm	B

ORGANISATION

Studienævn	Studienævn for Byggeri, By og Miljø
Institut	Institut for Byggeri, By og Miljø
Fakultet	Det Ingeniør- og Naturvidenskabelige Fakultet

NATURGEOGRAFISKE PROBLEMSTILLINGER I ET LOKALT PERSPEKTIV

2023/2024

MODULETS INDHOLD, FORLØB OG PÆDAGOGIK

LÆRINGSMÅL

VIDEN

Studerende, der gennemfører modulet, skal erhverve viden om:

- Samspil imellem menneske, natur, miljø og ressourcespørgsmål på lokal skala.
- Udvalgte naturgeografiske teorier om steder og relevante metoder.

FÆRDIGHEDER

Studerende, der gennemfører modulet, skal:

- Foretage systematiske valg af teorier og metoder til videns tilegnelse i forbindelse med problemanalyse og problembearbejdning på lokal skala.
- Foretage en kritisk vurdering af relevansen af den indhentede viden i forhold til projektarbejdet, herunder vurdering af de valgte modeller, teorier, begreber og/eller metoders egnethed.
- Kunne identificere, analysere og vurdere dem i forhold til arealanvendelse.
- Kunne anvende geografiske informationssystemer (GIS) til at kortlægge og vurdere den valgte problemstilling.

KOMPETENCER

Studerende, der gennemfører modulet, skal:

- Målrettet kunne tilegne sig geografisk viden og anvende denne tværfagligt i forskellige sammenhænge.
- Vurdere egen læring i forhold til de opstillede mål og egen studieindsats.
- Kunne formidle projektets resultater på en klart struktureret, sammenhængende og præcis måde, både skriftligt, grafisk (GIS) og mundtligt.
- Videnskabsteori indenfor "projekt-tema" og didaktik er en integreret del af projektarbejdet inkl. den mundtlige fremlæggelse ved evalueringen af projektet.

LÆRINGSMÅL FOR PROBLEMBASERET LÆRING

- Skal have viden om problemløsning
- Skal kunne anvende målsætninger (samarbejdsaftale)
- Skal kunne anvende kontekstinddragelse (brugerinddragelse)
- Skal kunne forstå og forklare hvad problemformulering er
- Skal have viden om problemanalyse
- Skal have viden om problemløsning
- Skal kunne forstå og forklare hvad projektledelse er.

KOMPETENCEMÅL GÆLDENDE FOR STUDERENDE DER LÆSER PÅ KANDIDATNIVEAU, MEN FØLGER UNDERVISNING PÅ BACHELORNIVEAU:

- Kunne reflektere over fagområdets tilgang til faglige problemstillinger på højt niveau og dets relation til andre fagområder.
- Kunne inddrage vidensområdet i løsningen af komplekse faglige problemstillinger og dermed opnå ny forståelse af et givet genstandsområde.

UNDERVISNINGSFORM

Problemorienteret projektarbejde i grupper med vejledning.

OMFANG OG FORVENTET ARBEJDSINDSATS

Projektmodulets omfang er 15 ECTS svarende til 450 timers studieindsats.

EKSAMEN

PRØVER

Prøvens navn	Naturgeografiske problemstillinger i et lokalt perspektiv
Prøveform	Mundtlig pba. projekt
ECTS	15
Bedømmelsesform	7-trins-skala
Censur	Ekstern prøve
Vurderingskriterier	Vurderingskriterierne er angivet i Universitetets eksamensordning

FAKTA OM MODULET

Engelsk titel	Local Scale Physical Geography Problems
Modulkode	B-GEO-B2-1
Modultype	Projekt
Varighed	1 semester
Semester	Forår
ECTS	15
Undervisningssprog	Dansk
Tomplads	Ja
Undervisningssted	Campus Aalborg
Modulansvarlig	Diana Stephansen
Censornorm	B

ORGANISATION

Studienævn	Studienævn for Byggeri, By og Miljø
Institut	Institut for Byggeri, By og Miljø
Fakultet	Det Ingeniør- og Naturvidenskabelige Fakultet

ANVENDT STATISTIK

2023/2024

MODULETS INDHOLD, FORLØB OG PÆDAGOGIK

LÆRINGSMÅL

VIDEN

- Grundlæggende begreber i sandsynlighedsregning, herunder stokastiske variable og sandsynlighedsfordelinger
- Forskellige former for deskriptiv statistik
- Statistisk inferens, herunder estimation, konfidensintervaller og hypotesetest
- Vigtige statistiske modeller, f.eks. lineær regression (simpel og multipel), variansanalyse, logistisk regression og log-lineære modeller (især kontingenstabeller)

FÆRDIGHEDER

- Skal med udgangspunkt i givne data kunne specificere en relevant statistisk model og redegøre for modellens antagelser og begrænsninger
- Skal kunne anvende relevant software til at udføre en statistisk analyse af de givne data og kunne fortolke opnåede resultater.

KOMPETENCER

- Skal kunne vurdere anvendelsesmuligheder af statistik inden for egne fagområder
- Skal være i stand til at forholde sig kritisk til resultaterne af en statistisk analyse
- Skal kunne kommunikere resultaterne af en statistisk analyse til personer uden specifik statistisk viden

KOMPETENCEMÅL GÆLDENDE FOR STUDERENDE DER LÆSER PÅ KANDIDATNIVEAU, MEN FØLGER UNDERVISNING PÅ BACHELORNIVEAU:

- Kunne reflektere over fagområdets tilgang til faglige problemstillinger på højt niveau og dets relation til andre fagområder.
- Kunne inddrage vidensområdet i løsningen af komplekse faglige problemstillinger og dermed opnå ny forståelse af et givet genstandsområde.

UNDERVISNINGSFORM

Forelæsninger med tilhørende opgaveregning.

OMFANG OG FORVENTET ARBEJDSINDSATS

Kursusmodulets omfang er 5 ECTS svarende til 150 timers studieindsats.

EKSAMEN

PRØVER

Prøvens navn	Anvendt statistik
Prøveform	Mundtlig
ECTS	5
Tilladte hjælpemidler	Der henvises til den pågældende semesterbeskrivelse/modulbeskrivelse
Bedømmelsesform	7-trins-skala

Censur	Intern prøve
Vurderingskriterier	Vurderingskriterierne er angivet i Universitetets eksamensordning

FAKTA OM MODULET

Engelsk titel	Applied Statistics
Modulkode	22BMATASTA1
Modultype	Kursus
Varighed	1 semester
Semester	Forår
ECTS	5
Undervisningssprog	Dansk
Tomplads	Ja
Undervisningssted	Campus Aalborg, Campus København
Modulansvarlig	Ege Rubak

ORGANISATION

Studienævn	Studienævn for Matematiske Fag
Institut	Institut for Matematiske Fag
Fakultet	Det Ingeniør- og Naturvidenskabelige Fakultet

DANSKE NATURTYPER

2023/2024

MODULETS INDHOLD, FORLØB OG PÆDAGOGIK

LÆRINGSMÅL

VIDEN

Studerende, der gennemfører modulet:

- Skal have et overordnet kendskab til Danmarks geologi og forskelle i naturtyper, jordbunds- og klimatiske forhold i de forskellige landsdele.
- Skal kende nogle af de mest karakteristiske naturtyper og interessante natur-lokaliteter i Danmark.
- Skal kende et bredt udsnit af Danmarks planter, og kunne bestemme planter vha. nøgler og have kendskab til deres krav til miljøet hvor de gror
- Skal kende Danmarks almindelige pattedyr, fugle, krybdyr og padder og have kendskab til deres udbredelse og levevis.
- Skal have kendskab til et udvalg af insekter, krebsdyr, bløddyr og andre invertebrater i Danmark
- Skal have kendskab til faunistisk og floristisk succession
- Skal have kendskab til Naturbeskyttelsesloven og andre love, bestemmelser, regulativer og offentlige planer, som vedrører beskyttelsen af naturen, og have kendskab til offentlig naturforvaltning.
- Skal kende til væsentlige problemstillinger på natur- og miljøområdet (eutrofiering, fragmentering og naturområder, biodiversitet m.v.) samt væsentlige interessekonflikter på miljøområdet (opdyrkning, byudvikling, landindvinding, jagt og fiskeri m.v.).

FÆRDIGHEDER

Studerende, der gennemfører modulet:

- Skal kunne karakterisere naturtyper på baggrund af en lokalitets vegetation, dyreliv og geologi
- Skal kunne vurdere hvilke lov- og regulativmæssige beskyttelseskrav, som omfatter en given lokalitet.

KOMPETENCER

Studerende, der gennemfører modulet skal:

- Målrettet kunne tilegne sig viden om danske naturtyper og anvende denne tværfagligt i forskellige sammenhænge, såsom prioritering af arealanvendelse, naturgenopretning eller klimaløsninger m.v.
- Formidle resultaterne af en naturtype-karakterisering på en klart struktureret, sammenhængende og præcis måde, både skriftligt, grafisk (GIS) og mundtligt.

KOMPETENCEMÅL GÆLDENDE FOR STUDERENDE DER LÆSER PÅ KANDIDATNIVEAU, MEN FØLGER UNDERVISNING PÅ BACHELORNIVEAU:

- Kunne reflektere over fagområdets tilgang til faglige problemstillinger på højt niveau og dets relation til andre fagområder.
- Kunne inddrage vidensområdet i løsningen af komplekse faglige problemstillinger og dermed opnå ny forståelse af et givet genstandsområde.

UNDERVISNINGSFORM

Forelæsninger, øvelser, ekskursion, feltarbejde & workshops

OMFANG OG FORVENTET ARBEJDSINDSATS

Kursusmodulets omfang er 5 ECTS svarende til 150 timers studieindsats.

EKSAMEN

PRØVER

Prøvens navn	Danske naturtyper
Prøveform	Aktiv deltagelse/løbende evaluering Reeksamen gennemføres som skriftlig eller mundtlig eksamen.
ECTS	5
Bedømmelsesform	Bestået/ikke bestået
Censur	Intern prøve
Vurderingskriterier	Vurderingskriterierne er angivet i Universitetets eksamensordning

FAKTA OM MODULET

Engelsk titel	Danish Biotypes
Modulkode	B-GEO-B2-4
Modultype	Kursus
Varighed	1 semester
Semester	Forår
ECTS	5
Undervisningssprog	Dansk
Tomplads	Ja
Undervisningssted	Campus Aalborg
Modulansvarlig	Diana Stephansen

ORGANISATION

Studienævn	Studienævn for Byggeri, By og Miljø
Institut	Institut for Byggeri, By og Miljø
Fakultet	Det Ingeniør- og Naturvidenskabelige Fakultet