Basic project 2 - Interaction between model, theory, experiment, and simulation in natural sciences

About the course

subject	Den internationale naturvidenskabelige bacheloruddannelse
Activity type	basic project
Teaching language	English
Registration	Students will be registered automatically, but have to confirm this registration by signing up for exam as a group. If you have to sign up for the project again, please contact nibbach-studyadministration@ruc.dk **Remember to sign up for the prerequisites for participation in the exam when signing up**
Detailed description of content	The project should be based on research question that focuses on how research is done in the individual natural sciences to create new knowledge through the interaction between theories, models, experiments and simulations. The project work thus lends itself to immersion in the individual science subjects and focuses on subject specific problems and methods. Experimental work is often included as a central element. The projects can be said to be "within" science. Natural science is understood to be the subjects affiliated with Nat Bach, including chemistry, computer science, environmental biology, geography, mathematics, medical biology, molecular biology and Tek Sam. **You can read about the study programme, project work, studycurriculum, rules and more at the intranet**
Expected work effort (ECTS-declaration)	Project work is 15 ECTS corresponding to a 405 hour workload. Nat Bach has issued a guide for the workload during the semester intranet-side • Start-up/group formation: 28 hours • Problem formulation seminar: 8 hours • Mid-term evaluations: 3 hours • Final evaluation: 3 hours • Project exam: 2 hours • Group supervision (incl. Practical help in ex lab/field): ca. 25 hours • **in total = 69 hours** • Report writing: 85 hours • Literature search and processing in group: 115 hours • Practical work e.g. lab, model design, analysis, fieldwork: 110 hours • Exam preparation: 25 hours **- In total: 405 hours**
Evaluation- and feedback forms	Project work is carried out in a dialogue with the supervisor who gives feedback on the progress of the project. The project work is evaluated in the house in cooperation with the class coordinator as well as in a written evaluation.
Administration of exams	INM Studieadministration (inm-studieadministration@ruc.dk)
Responsible for the activity	Martin Niss (maniss@ruc.dk)
ECTS	15
Learning outcomes and assessment criteria	• Knowledge and understanding of the nature of fundamental scientific issues within the Natural Sciences • Knowledge of the interplay between theories, models, simulations and experiments • Knowledge of natural scientific concepts, theories and methods relevant to the chosen issue

- Skills to be able to plan and carry out experimental investigations in a safe and responsible manner
- Skills to be able to produce, analyze and interpret empirical data using qualitative and quantitative methods
- Skills to be able to use mathematical and other formal representations and methods for problem-solving
- Skills to be able to select and use relevant IT tools in connection with empirical work and simulation
- Skills to be able to find and draw upon relevant scientific literature
- Skills to be able to read and draw upon original scientific literature in Danish and English
- Skills to be able to communicate an issue within the Natural Sciences and one's own investigations on the issue in conformity with academic norms and standards in a project report and a poster or other forms of communication/presentation
- The competence to be able to recognise, describe and analyze problems within the Natural Sciences, both independently and in collaboration with others
- The competence to be able to identify and link elements of theories, models, simulations, observations and experiments to the chosen issue
- The competence to be able to distinguish between and see relations between basic and applied problems within the Natural Sciences
- The competence to be able to design and carry out relevant experiments, simulations or other means of obtaining empirical data
- The competence to be able to design and analyze mathematical models
- The competence to be able to critically consider the strengths and weaknesses of the chosen theories and methods
- The competence to be able to study independently and in cooperation with others as well as sharing knowledge and reflections
- The competence to be able to organize and manage a project within defined frameworks and within the deadlines

Overall content

The purpose of the project is for the student to gain experience with fundamental scientific issues within the natural sciences through working on a representative example, as particular emphasis is placed on the interaction between theory and model on the one hand and the obtaining and analysis of empirical data through observation, experimentation or simulation.

Prerequisites for participation in the exam

Approval of the project work is contingent on the student having actively and satisfactorily participated in the project, including with respect to the following elements of the project work:

- The project formation process as well as selection and delimitation of the project's problem
- Problem statement seminar, where the problem statement is presented and discussed
- The halfway evaluation, including in relation to the drafting of the written halfway evaluation presentations as well as in the group's opponent role at the halfway evaluation
- The group's preparation of the project report and any other products
- The group's project presentation and opponent role at the internal final evaluation

Teaching and working methods

The project is problem-oriented, exemplary and participant-led. The intention of the project work is to develop the student's proficiency in applying natural science theories and methods while working on a delimited academic area. The project work entails the student independently formulating a problem statement of their own choosing so that the project provides an exemplary realisation of the purpose of the project in question. The project work concludes with the preparation of a project report. An integrated part of the project is to develop the student's competences in academic communication in a scientific context through sharing knowledge via oral presentations, posters, the project report or some other form of written communication aimed at a specific target group. Over the course of the project work, the group will undergo an evaluation together with the supervisor in connection with the halfway evaluation and once more at the end of the project.

Type of activity

Project

Form of examination (p1)

Oral group exam for the participants in the project.

The starting point for the oral exam is the project report and any supplementary material. The exam includes individual presentations within one of the topics selected by the examiner, which will be communicated to the students no later than 3 working days prior to the exam. Each individual presentation may last up to 5 minutes. A dialogue between the student(s) and the assessors about the project, will be conducted after the individual presentation(s).

There may be posed questions related to the subject area of the project report.

The assessment is individual and is based on the project report, any additional material and the student´s oral performance.

	Permitted group size: 2-7 students. The character limits of the project report are: For 2 students: 24,000-180,000 characters, including spaces. For 3 students: 24,000-192,000 characters, including spaces. For 4 students: 24,000-192,000 characters, including spaces. For 5 students: 24,000-204,000 characters, including spaces. For 6 students: 24,000-204,000 characters, including spaces. For 7 students: 24,000-204,000 characters, including spaces. The character limits include the cover, table of contents, summary, bibliography, figures and other illustrations, but exclude any appendices. The project report must include a summary in English, that is part of the assessment. Time allowed for exam including time used for assessment is for: 2 students: 60 minutes. 3 students: 75 minutes. 4 students: 90 minutes. 5 students: 105 minutes. 6 students: 120 minutes. 7 students: 135 minutes. Writing and spelling skills in the project report are part of the assessment. Permitted support and preparation materials at the oral exam: All Assessment: 7-point grading scale. Moderation: External examiner.
Form of Re-examination (p1)	Samme som ordinær eksamen
Exam code(s)	Exam code(s) : U26530

Course days:

Hold: 1

BP2 - Project Formation (NIB)

time	01-02-2023 08:30 til 01-02-2023 12:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	11.2-047 - gl. natfagsal (65)
Teacher	Nicholas Bailey (nbailey@ruc.dk)

BP2 - Project Formation (NIB)

time	02-02-2023 08:30 til 02-02-2023 12:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	11.2-047 - gl. natfagsal (65)
Teacher	Nicholas Bailey (nbailey@ruc.dk)

BP2 - Project Formation (NIB)

time	03-02-2023 12:15 til 03-02-2023 16:00
location	11.2-047 - gl. natfagsal (65)
Teacher	Nicholas Bailey (nbailey@ruc.dk)

BP2 - Project Formation (NIB)

time	06-02-2023 09:30 til 06-02-2023 15:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	11.2-047 - gl. natfagsal (65)
Teacher	Nicholas Bailey (nbailey@ruc.dk)

BP2 - Project Formation (NIB)

time	08-02-2023 09:00 til 08-02-2023 12:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	11.2-047 - gl. natfagsal (65)
Teacher	Nicholas Bailey (nbailey@ruc.dk)

Basic Project 2 - Deadline for project descriptions with indication of wishes for supervisor

time	10-02-2023 12:00 til 10-02-2023 12:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt

Basic Project 2 - Deadline for signing up for projects in STADS

time	16-02-2023 23:59 til 16-02-2023 23:59
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt

BP2 - Research question seminar (NIB)

time	08-03-2023 08:15 til 08-03-2023 14:00
location	11.2-047 - gl. natfagsal (65)

Teacher	Nicholas Bailey (nbailey@ruc.dk)

Basic Project 2 - Midterm Evaluation

time	22-03-2023 08:15 til 05-04-2023 18:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt

NIB Class meeting (NIB Lounge in building 12)

time	12-04-2023 12:00 til 12-04-2023 12:45
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt

NIB Class meeting (NIB Lounge in building 12)

time	08-05-2023 12:00 til 08-05-2023 13:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt

Basic Project 2 - Internal Evaluation

time	09-05-2023 08:15 til 11-05-2023 18:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt

Basic Project 2 - Hand-in of project

time	24-05-2023 10:00 til 24-05-2023 10:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt

BP2 - Presentation seminar (NIB)

time	12-06-2023 13:00 til 12-06-2023 15:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	03.1-s03 - auditorie a (120)
Teacher	Nicholas Bailey (nbailey@ruc.dk)

Basic Project 2 - Project examination

time	15-06-2023 08:15 til 30-06-2023 18:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt

Basic Project 2 - Project reexamination

time	01-08-2023 08:15 til 31-08-2023 18:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
Content	**The common study regulations § 18, 5:** A student who has failed to pass an ordinary project examination is automatically registered for the re-examination. The student is entitled to make changes to the failed project report. The project report must be submitted no later than 14 days after the date for the ordinary project examination