Environmental Chemistry and Element Cycling

Title	Environmental Chemistry and Element Cycling
Semester	E2022
Master programme in	Environmental Science
Type of activity	Course
Teaching language	English
Study regulation	Read about the Master Programme and find the Study Regulations at ruc.dk Læs mere om uddannelsen og find din studieordning på ruc.dk

REGISTRATION AND STUDY ADMINISTRATIVE

Registration	Sign up for study activities at stads selvbetjeningwithin the announced registration period, as you can see on the Studyadministration homepage. When signing up for study activities, please be aware of potential conflicts between study activities or exam dates. The planning of activities at Roskilde University is based on the recommended study programs which do not overlap. However, if you choose optional courses and/or study plans that goes beyond the recommended study programs, an overlap of lectures or exam dates may occur depending on which courses you choose.
Number of participants	
ECTS	10
Responsible for the activity	Gry Lyngsie (lyngsie@ruc.dk) Simon David Herzog (sherzog@ruc.dk)
Head of study	Per Meyer Jepsen (pmjepsen@ruc.dk)
Teachers	
Study administration	INM Studieadministration (inm-studieadministration@ruc.dk)
Exam code(s)	U60092

ACADEMIC CONTENT

Overall objective	This course will provide students with knowledge about chemical processes that occur in water, air, terrestrial and living environments, and the effects of human activity on these processes. The course will further provide an introduction to the principles of energy and element cycling across trophic levels in ecosystems, focusing on biogeochemical processes and their underlying physical, chemical, biochemical and biological drivers.
Detailed description of content	This course will provide students with knowledge about chemical processes that occur in water, air, terrestrial and living environments, and the effects of human activity on these processes. The course will further provide an introduction to the principles of energy and element cycling across trophic levels in ecosystems, focusing on biogeochemical processes and their underlying physical, chemical, biochemical and biological drivers.
Course material and Reading list	A combination of a textbook and scientific literature. More details will be announced on Moodle
Overall plan and expected work effort	The course is a 10 ETCS credit course, corresponding to an expected student work load of ca 270 hrs. ● Lectures, exercises, student oral presentation: 64-70 hrs ● Preparation: ca 200 hrs ● Portfolio: 2 hrs (see below) ● Exam: 1 hrs
Format	
Evaluation and feedback	The course includes formative evaluation based on dialogue between the students and the teacher(s). Students are expected to provide constructive critique, feedback and viewpoints during the course if it is needed for the course to have better quality. Every other year at the end of the course, there will also be an evaluation through a questionnaire in SurveyXact. The Study Board will handle all evaluations along with any comments from the course responsible teacher. Furthermore, students can, in accordance with RUCs 'feel free to state your views' strategy through their representatives at the study board, send evaluations, comments or insights form the course to the study board during or after the course.
Programme	This course is divided into three parts. ● In part I we will study the fundamental principles of environmental chemistry with a focus on student driven exercises. ● In part II we will study element and energy cycling processes, based on teacher driven lectures and class exercises. ● In part III we will study energy and element cycling in ecosystems, based on student presentations and class discussions on relevant papers

ASSESSMENT

Overall learning outcomes	After completing the course, students will be able to: • demonstrate knowledge of the major pathways and cycles of energy and matter in ecosystems • demonstrate knowledge of the chemical composition, processes, mechanisms and reactions that take place in environmental spheres • demonstrate knowledge on the turnover and bioavailability of major pollutants • demonstrate knowledge on how chemists and biologists approach and solve environmental problems • identify and analyze the main processes that drive biogeochemical cycles in various ecosystem types • apply basic principles of chemistry to analyse current environmental issues • evaluate and construct principal flows of matter and energy and their relative importance in various ecosystems • evaluate regulatory factors for energy and material cycles in ecosystems • advice and co-operate to solve ecological problems in which biogeochemical cycles are of central importance • think analytically and assess information in such ways to make informed conclusions and decisions about controversial environmental issues.
Form of examination	Individual oral exam based on a portfolio. The character limit of the portfolio is 2,400-24,000 characters, including spaces. Examples of written products are exercise responses, talking points for presentations, written feedback, reflections, written assignments. The preparation of the products may be subject to time limits. The character limits include the cover, table of contents, bibliography, figures and other illustrations, but exclude any appendices. Time allowed for exam including time used for assessment: 30 minutes. The assessment is an overall assessment of the written product(s) and the subsequent oral examination. Permitted support and preparation materials for the oral exam: All. Assessment: 7-point grading scale. Moderation: External examiner
Form of Re-examination	Samme som ordinær eksamen / same form as ordinary exam
Type of examination in special cases	
Examination and assessment criteria	The portfolio consists of two written exercises in class. At least 10 days prior to the oral exam the students receive a catalogue of preparatory questions for the oral exam. At the oral exam the student draws one of the questions and starts the oral exam with a presentation followed by a dialog about the course content. Students will be assessed by their ability to:

- demonstrate knowledge of the major pathways and cycles of energy and matter in ecosystems
- demonstrate knowledge of the chemical composition, processes, mechanisms and reactions that take place in environmental spheres
- demonstrate knowledge on the turnover and bioavailability of major pollutants
- demonstrate knowledge on how chemists and biologists approach and solve environmental problems
- identify and analyze the main processes that drive biogeochemical cycles in various ecosystem types
- apply basic principles of chemistry to analyse current environmental issues
- evaluate and construct principal flows of matter and energy and their relative importance in various ecosystems
- evaluate regulatory factors for energy and material cycles in ecosystems

The assessment of the oral exam is based on the student's ability to meet the criteria mentioned above and their ability to

- clearly present and communicate the scientific content of the course
- engage in a scientific dialogue and discussion with the assessors

Exam code(s)	Exam code(s) : U60092

Course days:

Hold: 1

Environmental Chemistry and Element Cycling (ES)

time	09-09-2022 12:15 til 09-09-2022 14:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	11.1-047 - studiesal (40)
Teacher	Gry Lyngsie (lyngsie@ruc.dk) Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time	13-09-2022 08:15 til 13-09-2022 10:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 14-09-2022 10:15 til
14-09-2022 12:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 16-09-2022 12:15 til
16-09-2022 14:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 20-09-2022 08:15 til
20-09-2022 10:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 21-09-2022 10:15 til
21-09-2022 12:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 23-09-2022 12:15 til
23-09-2022 14:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 27-09-2022 08:15 til
27-09-2022 10:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 28-09-2022 10:15 til
28-09-2022 12:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 30-09-2022 12:15 til
30-09-2022 14:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 04-10-2022 08:15 til
04-10-2022 10:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 05-10-2022 10:15 til
05-10-2022 12:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 07-10-2022 12:15 til
07-10-2022 14:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 11-10-2022 08:15 til
11-10-2022 10:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 12-10-2022 10:15 til
12-10-2022 12:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 14-10-2022 12:15 til
14-10-2022 14:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 25-10-2022 08:15 til
25-10-2022 10:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 26-10-2022 10:15 til
26-10-2022 12:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 28-10-2022 12:15 til
28-10-2022 14:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 01-11-2022 08:15 til
01-11-2022 10:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 02-11-2022 10:15 til
02-11-2022 12:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 04-11-2022 12:15 til
04-11-2022 14:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 08-11-2022 08:15 til
08-11-2022 10:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 09-11-2022 10:15 til
09-11-2022 12:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 11-11-2022 12:15 til
11-11-2022 14:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 15-11-2022 08:15 til
15-11-2022 10:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 16-11-2022 10:15 til
16-11-2022 12:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 18-11-2022 12:15 til
18-11-2022 14:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 22-11-2022 08:15 til
22-11-2022 10:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 23-11-2022 10:15 til
23-11-2022 12:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 25-11-2022 12:15 til
25-11-2022 14:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 29-11-2022 08:15 til
29-11-2022 10:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 30-11-2022 10:15 til
30-11-2022 12:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 02-12-2022 12:15 til
02-12-2022 14:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 06-12-2022 08:15 til
06-12-2022 10:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Simon David Herzog (sherzog@ruc.dk)
Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time 07-12-2022 10:15 til
07-12-2022 12:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Gry Lyngsie (lyngsie@ruc.dk)
Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time	09-12-2022 12:15 til 09-12-2022 14:00
location	12.1-073 - teorilokale i 12.1 (30)
Teacher	Simon David Herzog (sherzog@ruc.dk) Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time	13-12-2022 08:15 til 13-12-2022 10:00
location	12.1-073 - teorilokale i 12.1 (30)
Teacher	Simon David Herzog (sherzog@ruc.dk) Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time	14-12-2022 10:15 til 14-12-2022 12:00
location	12.1-073 - teorilokale i 12.1 (30)
Teacher	Simon David Herzog (sherzog@ruc.dk) Gry Lyngsie (lyngsie@ruc.dk)

Environmental Chemistry and Element Cycling (ES)

time	16-12-2022 12:15 til 16-12-2022 14:00
location	12.1-073 - teorilokale i 12.1 (30)
Teacher	Gry Lyngsie (lyngsie@ruc.dk) Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling - Hand-in of portfolio (ES)

time	21-12-2022 10:00 til 21-12-2022 10:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt

Environmental Chemistry and Element Cycling - Exam (ES)

time	17-01-2023 08:15 til 17-01-2023 16:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	12.1-067 - grupperum (12)
Teacher	Gry Lyngsie (lyngsie@ruc.dk) Simon David Herzog (sherzog@ruc.dk)

Environmental Chemistry and Element Cycling - Hand-in of portfolio (reexam) (ES)

time	31-01-2023 10:00 til 31-01-2023 10:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt

Environmental Chemistry and Element Cycling - Rexam (ES)

time	08-02-2023 08:15 til 08-02-2023 16:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	12.1-067 - grupperum (12)
Teacher	Gry Lyngsie (lyngsie@ruc.dk) Simon David Herzog (sherzog@ruc.dk)