Bioinformatics

Title	Bioinformatics
Semester	F2024
Master programme in	Molekylær biologi / Chemical Biology / Mathematical Bioscience / Molecular Health 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 selvbetjening within 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	5
Responsible for the activity	John Shorter (johnsh@ruc.dk)
Head of study	Lotte Jelsbak (ljelsbak@ruc.dk)
Teachers	
Study administration	INM Registration & Exams (inm-exams@ruc.dk)
Exam code(s)	U60178

ACADEMIC CONTENT

Overall objective	The aim is to give the students essential bioinformatics skills on a user level. The course introduces the students to describing bioinformatic problems, selecting bioinformatic methods and solving simple bioinformatic problems using existing tools.
Detailed description of content	The course will introduce the students to describing bioinformatic problems, selecting bioinformatic methods and solving simple bioinformatic problems using existing tools. Each lesson will focus on introducing a different bioinformatic tool to the students so that whey will have broad experience across a range of methods needed for their master's research.
Course material and Reading list	Udvalgte kapitler fra: Jin Xiong: Essential Bioinformatics, Cambridge University Press 2006: (Open access link) or a newer textbook. Additional material available from Moodle
Overall plan and expected work effort	The course is composed of 8 modules. Each module is concluded with a written module report. The module reports form the basis for the written final report. The module reports can be written individually or in groups of 2-3 students. The final report is written in groups of 2-3 students. • lectures 8 hrs • pc lab practical exercises 24 hrs • preparation for lectures and exercises 35 hrs • problem solution and report writing 70 hrs • total 135 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

Eight modules; each module focuses on a specific bioinformatical problem and consists of:

- One lecture session with theoretical background and practical introduction to the module exercise
- One exercise session with guidance to accessing programs, analyzing and solving the problem of the module.
- Writing a report based on each module (the module reports). A report ("the final report"), elaborated on selected parts of the module reports.

ASSESSMENT

Overall learning outcomes

After completing the course, the students will be able to:

- formulate a biological research problem so that it can be analysed from a bioinformatic perspective
- explain the opportunities and limitations in certain databases and programs
- search relevant databases
- search and select programs to solve bioinformatic problems
- use online programs and download, install and use local programs
- analyse a bioinformatic problem and select a solution

- solve simple bioinformatic problems
- communicate competently with bioinformaticians about more complex problems
- analyse complex data structures with relevant mathematical and statistical models/programs.

Form of examination	Oral group exam based on a product written by a group Permitted group size: 2-4 students. The character limit of the written product is: For 2 students: 9,600-72,000 characters, including spaces. For 3 students: 9,600-72,000 characters, including spaces. For 4 students: 9,600-72,000 characters, including spaces. 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 is for: 2 students: 20 minutes. 3 students: 25 minutes. 4 students: 30 minutes. The assessment is individual and based on the student's individual performance. The assessment is an overall assessment of the written product(s) and the subsequent oral examination.. Permitted support and preparation materials at the oral exam: PowerPoint presentation or equivalent and notes to presentation. Assessment: Pass/Fail. Moderation: Internal co-assessor.
Form of Re-examination	Samme som ordinær eksamen / same form as ordinary exam
Type of examination in special cases	

Examination and assessment criteria	The written product is "a final report" that elaborates on selected parts of the module reports. The oral exam starts with a presentation - based on an assigned question - from each of the students of maximum 5 min. After the presentations the exam is conducted as a dialogue between students and assesors. There may be posed questions in any part of the course content. Assesment criteria/students will be assessed by their ability to: • formulate a biological research problem so that it can be analysed from a bioinformatic perspective • explain and argue for the selection of program(s), data, databases, and settings used for this analysis • identify and discuss the in strengths and weakness of the completed analysis 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 final report • engage in a scientific dialogue and discussion with the assessor and co assessor Furthermore, whether the performance meets all formal requirements in regard to both for the written og oral exam.
Exam code(s)	Exam code(s) : U60178

Course days:

Hold: 1

Bioinformatics (MHS, CB)

time	17-04-2024 12:15 til 17-04-2024 16:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	11.1-047 - studiesal (40)
Teacher	John Shorter (johnsh@ruc.dk)

Bioinformatics (MHS, CB)

time	24-04-2024 12:15 til 24-04-2024 16:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	15.0-003 - auditorie 15 (68)
Teacher	John Shorter (johnsh@ruc.dk)

Bioinformatics (MHS, CB)

time	01-05-2024 12:15 til 01-05-2024 16:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	27.2-054 - lokale 3 (40)
Teacher	John Shorter (johnsh@ruc.dk)

Bioinformatics (MHS, CB)

time	08-05-2024 12:15 til 08-05-2024 16:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	27.2-054 - lokale 3 (40)
Teacher	John Shorter (johnsh@ruc.dk)

Bioinformatics (MHS, CB)

time	15-05-2024 12:15 til 15-05-2024 16:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	27.2-054 - lokale 3 (40)
Teacher	John Shorter (johnsh@ruc.dk)

Bioinformatics (MHS, CB)

time	22-05-2024 12:15 til 22-05-2024 16:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	27.2-054 - lokale 3 (40)
Teacher	John Shorter (johnsh@ruc.dk)

Bioinformatics (MHS, CB)

time	27-05-2024 12:15 til 27-05-2024 16:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	27.2-054 - lokale 3 (40)
Teacher	John Shorter (johnsh@ruc.dk)

Bioinformatics (MHS, CB)

time	29-05-2024 12:15 til 29-05-2024 16:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
location	27.2-054 - lokale 3 (40)
Teacher	John Shorter (johnsh@ruc.dk)

Bioinformatics - Hand-in of written product (MHS, CB)

time	10-06-2024 10:00 til 10-06-2024 10:00
forberedelsesnorm	ikke valgt

forberedelsesnorm D-VIP	ikke valgt

Bioinformatics - Exam (MHS, CB)

time	27-06-2024 08:15 til 28-06-2024 16:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
Teacher	John Shorter (johnsh@ruc.dk)

Bioinformatics - Hand-in of written product (reexam) (MHS, CB)

time	05-08-2024 10:00 til 05-08-2024 10:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt

Bioinformatics - Reexam (MHS, CB)

time	12-08-2024 08:15 til 12-08-2024 16:00
Teacher	John Shorter (johnsh@ruc.dk)