

## Modelling project

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|---------------------|---|
| Title               | Modelling project   |
| Semester            | E2022   |
| Master programme in | Mathematical Bioscience   |
| Type of activity    | Project   |
| Teaching language   | English   |
| Study regulation    | Read about the Master Programme and find the Study Regulations at <a href="http://ruc.dk">ruc.dk</a><br>Læs mere om uddannelsen og find din studieordning på <a href="http://ruc.dk">ruc.dk</a> |

### REGISTRATION AND STUDY ADMINISTRATIVE

|                              |  |
|------------------------------|--|
| Registration                 | <p>Sign up for study activities at <a href="#">stads selvbetjening</a> within the announced registration period, as you can see on the <a href="#">Studyadministration homepage</a>.</p> <p>Registration for project-exam: Please remember to confirm your registration by signing up for exam as a group when the group formation is final. The registration is through <a href="#">stads selvbetjening</a></p> <p>When signing up for study activities, please be aware of potential conflicts between study activities or exam dates.</p> <p>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.</p> |
| Number of participants       |  |
| ECTS                         | 15   |
| Responsible for the activity | Jesper Schmidt Hansen ( <a href="mailto:jschmidt@ruc.dk">jschmidt@ruc.dk</a> )   |
| Head of study                | Jesper Schmidt Hansen ( <a href="mailto:jschmidt@ruc.dk">jschmidt@ruc.dk</a> )   |
| Teachers                     |  |
| Study administration         | INM Studieadministration ( <a href="mailto:inm-studieadministration@ruc.dk">inm-studieadministration@ruc.dk</a> )  |
| Exam code(s)                 | U60162   |

### ACADEMIC CONTENT

|                                       |  |
|---------------------------------------|--|
| Overall objective                     | The overall purpose of the modelling project is that the student develop/ design or analyse existing mathematical models of an exemplary biological system through problem-oriented project work.  |
| Detailed description of content       | During the project work the student will obtain knowledge about a specific biological system, investigate how mathematical model(s) can be used to understand the underlying bio-chemico-physico processes and how it can be used as a predictive tool.  |
| Course material and Reading list      | The project curriculum will vary depending on the project theme and specific research question.<br><br>Relevant literature, software code, methods and so forth are discussed with the supervisor.   |
| Overall plan and expected work effort | The project is worth 15 ECTS points (405 hours).<br><br>The following are based on estimates and will vary significantly depending on the specific project: <ul style="list-style-type: none"> <li>● Semesterstart and group formation: ~ 10 hours</li> <li>● Project-formulation and presentation seminars: 2-4 hours</li> <li>● Supervision: 15 - 25 hours</li> <li>● Project work: ~350-380 hours</li> <li>● Exam: 30 min</li> </ul>  |
| Format                                |  |
| Evaluation and feedback               | All projects' processes will include ongoing dialogue-based (oral) evaluation between the students and the supervisor. Both students and supervisors are expected to provide constructive feedback and viewpoints during the process. Feedback concerning the academic content and progression, process and collaboration.<br><br>Every other year when the projects are handed in, there will also be an evaluation through a questionnaire in SurveyXact. The Study Board will handle all evaluations along with any comments from the head of study.<br><br>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 from their project process to the study board during or after the project process. |
| Programme                             | At the beginning of the semester the students will form groups defined by a theme or research question of their choosing. This choice can be facilitated by the supervisors or originate from the students.<br><br>The study activity is based around PPL, where the group work independently and critically with the topic. This includes finding, reading, and understanding relevant literature, having regular productive group meetings, propose relevant scientific methods, models, or/and analysis that can lead to an answer to the research question, composing text for the final project project, and more.<br><br>The project students agree with the supervisor on a regular meeting schedule; in order for the meetings to be fruitful the students must have an agenda and be well prepared for each meeting.          |

## ASSESSMENT

Overall learning outcomes

After this activity the student will be able to

- perform descriptive statistics of biological data-sets.
- demonstrate state-of-art knowledge about the specific biological system behind the data.
- demonstrate knowledge of previous mathematical model(s) describing the biological system.
- demonstrate an in-depth analytical/numerical understanding of one or more mechanism-based models found in the scientific literature or a model developed by the project group.
- argue how models can be used to understand the underlying biological processes and how models can be used as predictive tools.
- seek relevant literature, formulate research problems/hypotheses, work in a problem-oriented fashion, and conclude on the project research question.

Form of examination

Oral project exam in groups with individual assessment.

Permitted group size: 2-7 students.

The character limits of the project report are:

For 2 students: 24,000-307,200 characters, including spaces.

For 3 students: 24,000-307,200 characters, including spaces.

For 4 students: 24,000-307,200 characters, including spaces.

For 5 students: 24,000-307,200 characters, including spaces.

For 6 students: 24,000-307,200 characters, including spaces.

For 7 students: 24,000-307,200 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: Internal co-assessor.

Form of Re-examination

Same form as the ordinary exam

Type of examination in special cases

Examination  
and  
assessment  
criteria

Oral project exam in groups with individual assessment. The students begin the exam with a presentation with a duration of 8-10 min. each on a topic related to the project. After the presentation there will be a dialogue between the students, supervisor and co-assessor, specific questions may be asked to individual students.

The assessment criteria of the written part

- demonstrate state-of-art knowledge about the specific biological system behind the data.
- demonstrate knowledge of previous mathematical model(s) describing the biological system.
- argue how models can be used to understand the underlying biological processes and how models can be used as predictive tools.
- seek relevant literature, formulate research problems/ hypotheses, work in a problem-oriented fashion, and conclude on the project research question.

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

- clearly present and communicate the scientific content of the project
- engage in a scientific dialogue and discussion with the supervisor and co assessor

Furthermore, whether the performance meets all formal requirements in regard to both for the written og oral exam

- The project report must include a summary in English, that is part of the assessment.
- Writing and spelling skills in the project report are part of the assessment.

Exam code(s) Exam code(s) : U60162

Course days:

Hold: 1

## Modelling project - Intro (Mathbio)

time 01-09-2022 09:15 til  
01-09-2022 10:00

location 27.1-032 - biblioteket (12)

Teacher Jesper Schmidt Hansen ( jschmidt@ruc.dk )

## Modelling project - Forum 1 (Mathbio)

time 01-09-2022 11:15 til  
01-09-2022 13:00

location 09.2-009 - teorilokale (60)

Teacher Jesper Schmidt Hansen (jschmidt@ruc.dk)  
Kristine Niss (kniss@ruc.dk)

## Modelling project - IMFUFA Breakfast (canteen in building 27)

time 02-09-2022 09:15 til  
02-09-2022 10:00

## Modelling project - Forum 2 (Mathbio)

time 02-09-2022 10:15 til  
02-09-2022 12:00

location 27.1-052 - lokale 2 (20)

Teacher Jesper Schmidt Hansen (jschmidt@ruc.dk)

## Study Start event at Department of Science & Environment

time 02-09-2022 12:30 til  
02-09-2022 14:00

location 28b.0-05 - lille teorirum (20) / 28b.0-01 - store teorirum (30)

## Modelling project - Forum 3 (Mathbio)

time 05-09-2022 12:15 til  
05-09-2022 14:00

location 27.1-052 - lokale 2 (20)

Teacher Jesper Schmidt Hansen (jschmidt@ruc.dk)

## Modelling project - Forum 4 (Mathbio)

time 07-09-2022 12:15 til  
07-09-2022 14:00

location 27.1-052 - lokale 2 (20)

Teacher Jesper Schmidt Hansen ( jschmidt@ruc.dk )

## Modelling project - IMFUFA seminar (Mathbio)

time 07-09-2022 14:00 til  
07-09-2022 16:00

location 27.1-089 - teorirum 27 (66)

Teacher Nicholas Bailey ( nbailey@ruc.dk )  
Kristine Niss ( kniss@ruc.dk )  
Jesper Schmidt Hansen ( jschmidt@ruc.dk )

## Modelling project - Problem formulation seminar (Mathbio)

time 05-10-2022 14:00 til  
05-10-2022 16:00

location 27.1-089 - teorirum 27 (66)

Teacher Nicholas Bailey ( nbailey@ruc.dk )

## Modelling project - Hand-in of project

time 20-12-2022 10:00 til  
20-12-2022 10:00

forberedelsesnorm ikke valgt

forberedelsesnorm D-VIP ikke valgt

## Modelling project - Project examination

time 16-01-2023 08:15 til  
31-01-2023 18:00

forberedelsesnorm ikke valgt

forberedelsesnorm D-VIP ikke valgt

## Modelling project - Project reexamination

time 01-02-2023 08:15 til  
28-02-2023 18:00

forberedelsesnorm ikke valgt

forberedelsesnorm ikke valgt  
D-VIP

Content

The common study regulations § 20, 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