Recommended plan of study

About the course

subject	Mathematical Bioscience
Recommended Study Plan	Read about the Master Programme and find the Study Regulations at ruc.dk If you have any questions regarding study planning, available courses etc. please contact the study administration at inm-exams@ruc.dk **List of courses/projects offered in the Autumn 2022** • Modelling of Biological Systems • General Molecular and Medical Biology • Elective courses: Genomics and Metabolism or Cancer Biology • Modelling project • Specialisation Project **List of courses/projects offered in the Spring 2023** • Dynamical Systems Analysis • Probability and Statistics • Advanced Eukaryotic Cell Biology 1 – Inside the Cell • Fundamental Mathematical Structures • Scientific Computing and Data Science • Specialisation Project • Modelling project

Course days:

Hold: 1

The programme's structure (click to read more)

time	01-02-2023 00:00 til 01-02-2023 00:00
forberedelsesnorm	ikke valgt
forberedelsesnorm D-VIP	ikke valgt
Content	**First semester** Objective The overall objective is to give an introduction to mathematical modelling of biological systems. In the course 'Modelling of biological systems' standard models are analysed mathematically and one basis of the underlying biological mechanisms. The modelling and analysis competencies are trained further in the semester project. Students with no biological background is advised to follow the course Foundation Course in Biology. **Mandatory study activities (total of 25 ECTS)** • Modelling of Biological Systems (10 ECTS) • Modelling Project (15 ECTS) **Elective study activities (total of 5 ECTS)**

- General Molecular and Medical Biology (5 ECTS)
- Biology Elective Course (5 ECTS)

Each semester, the board of studies approves a number of biology courses from Molecular Health Science, Chemical Biology or Environmental Science for students to choose from.

Students who need an introduction course to biology are highly recommended to choose the course in General Molecular and Medical Biology whereas students who have had biology as a part of their bachelor programme can choose either Molecular and Medical Biology or another elective course in the area of biology. The board of studies announces approved and offered courses for each semester.

Second semester

Objective

The overall objective in this semester is to give the student an understanding of the two different methodologies used in biology and in mathematics. Through the courses 'Advanced eukayrotic cell biology', 'Dynamical system analysis' and 'Probability and Statistics' the student will see examples of the biologist's, the statistician's, and the mathematician's logic, reasoning, formalism, and scientific methodology.

Mandatory study activities (total of 25 ECTS)

- Dynamical Systems Analysis (5 ECTS)
- Probability and Statistics (5 ECTS)
- Advanced Eukaryotic Cell Biology 1 – Inside the Cell (5 ECTS)
- Fundamental Mathematical Structures or Scientific Computing and Data Science (10 ECTS)

Elective study activities (total of 5 ECTS)

- Biology Elective Course (5 ECTS)

Each semester, the board of studies approves a number of biology courses from Molecular Health Science, Chemical Biology or Environmental Science for students to choose from.

Third semester

Objective

The overall objective in this semester is student specialisation. This is realized through the 15 ECTS specialisation project or the project-oriented internship. Also, the course 'Parameter estimation' focuses on advanced specialised methods in the analysis of model parametrisation. This semester also acts as preparation for the Master thesis semester.

Mandatory study activities

- Parameter Estimation (5 ECTS)
- Differential Geometry (5 ECTS)
- Pharmacology (5 ECTS)
- Specialisation Project or Project-oriented Internship (15 ECTS)

Fourth semester - Master Thesis

Objective

In the master thesis the objective is that the student show the ability to apply the skills, knowledge, and competencies obtained in the programme to independently, formulate a current research question/hypothesis in the field of mathematical bioscience. The student can investigate the problem by, for example, perform laboratory experiments and analyse the data both statistically and through existing models, design new mathematical models based on existing data, and/or formulate novel and original methods to analyse data and models.

Mandatory study activities

- Master thesis (30 ECTS)