

Exam:

- written exam: Date will be fixed by SAC
- sample exams of previous years online
- miniproject counts 30 percent towards final grade

For written exam:

- bring 1 sheet A5 (double-sided) of own notes/summary
- HANDWRITTEN!
- no calculator, no textbook

Exam Preparation Q&A session:

- probably beginning of July, date to be fixed

LEARNING OUTCOMES

- Solve linear one-dimensional differential equations
- Analyze two-dimensional models in the phase plane
- Develop a simplified model by separation of time scales
- Analyze connected networks in the mean-field limit
- Formulate stochastic models of biological phenomena
- Formalize biological facts into mathematical models
- Prove stability and convergence
- Predict outcome of dynamics
- Describe neuronal phenomena
- Apply model concepts in simulations

Transversal skills

- Plan and carry out activities in a way which makes optimal use of available time and other resources.
- Collect data.
- Write a scientific or technical report.

Look at samples of past exams

Use a textbook, or video lectures. Don't use slides as only resources

miniproject

Comments:

You can look at a class like this one in two different ways:

The first one is the list of topics we have covered: single neurons, decision models, associative memory etc. The second one is the mathematical techniques that we have encountered. These are summarized in the list of **learning outcomes** (previous slide) that are also listed in the course book.

In the exam, I try to cover all the learning outcomes, such as **phase plane analysis, mean-field methods, stability analysis, stochastic models, separation of time scales, differential equations**. If you look at the earlier exams, you see what I mean. Of course, the techniques will be applied in one way or other to neurons and the brain, but these applications vary over the years.

A well-designed exam for me is one that checks the different mathematical techniques (may be k out of n techniques) because these techniques are also used in many other fields of science.

A well-designed exam should also have a couple of easier questions and a couple of difficult ones.

Typically the part a) is easier than the part e) of a given exercise.

The skills in the miniproject are orthogonal to those in the exam. It can happen that a student is great in the simulations and really bad in the theory and also the other way round. Please prepare well for the written exam because it counts 70 percent! The miniproject alone cannot get you a passing grade.

In past years, people who failed did so because of the exam.

Example: Miniproject 6.0 + exam 2.5 \rightarrow 3.75 average grade.

Miniproject 5.5 + exam 4.0 \rightarrow 4.5 average grade.