Boolean Networks in Life Sciences
2025–2026 Exam Information

Exam Format

The exam is oral and is composed of two parts:

1. 15 minute exposition on a topic that will be chosen at random at the beginning of the exam (list of topics given below).
2. 15 minute question session. The questions might cover also problematique outside of the topic of the first part.

Time will be granted for a short preparation ahead of the first part if requested.

The use of notes or other aides of any format is not allowed during the exam.

Exam Topics

The following is a list of all topics that can be chosen (at random) for the first half of the exam.

Note that not all topics have a one-to-one correspondence with a lecture/slide set. The general areas of interest covered by each topic are given in brackets.

- Boolean networks and their dynamics (formal definition of Boolean networks, "classical"/elementary semantics, transition systems);
- Attractors (definition and types of attractors, reachability and attractor analysis including complexity, trap sets and trap spaces);
- Interaction graphs and static analysis (interaction graphs of Boolean networks, interaction graph based bounds on possible attractors, synchronism sensitivity – fixed points, normal transitions);
- Most permissive semantics (transient values, properties and guarantees of most permissive semantics, comparison with "classical"/elementary semantics including complexity);
- Temporal logics (traces, execution trees, linear temporal logic, computational tree logic);

- Model checking (Kripke structure, types of linear temporal properties, decomposition theorem, using nondeterministic finite automata to "simplify" linear temporal properties);
- Network inference (network ensemble, parameters and parametrisations, abstract interpretation, narrowing);

Exam Dates

There are no set dates for the exam. The dates given in eKVV are only a formality and should be disregarded.

You can request your exam to be on any of the following dates according to your preference:

- March 12–13 [Thu–Fri];
- March 16 [Mon];
- March 24–27 [Tue–Fri];
- March 30–April 2 [Mon–Thu];
- April 7–10 [Tue-Fri];

The availability of the above dates is subject to change, please request your desired date with some days to spare, ideally at least a week ahead.

Exam dates are also possible later than April 10th, however, note that the 2026 Summer semester teaching would have started by then.