

Information sheet for the “Bioinspired Systems 2022”

course

The lectures are held on **Thursdays 12:00-13:30** in room no. **5.86**

Dates and topics (might slightly change later):

	Date	Topic	Lecturer
1	September 15	Intro + Collective motion	Anna Zafeiris & Máté Nagy
2	September 22	Hierarchy formation - part 1	Anna Zafeiris
3	September 29	Hierarchy formation - part 2	Anna Zafeiris
4	October 6	Opinion dynamics	Anna Zafeiris
5	October 13	Biol synchronization + student discussion	Anna Zafeiris
6	October 20	Scaling, Criticality, Phase transitions and Correlations	Máté Nagy
7	October 27	Fractals and Self-Organized Criticality	Máté Nagy
8	November 3	Bioinspired robotics I. - Hardware design	Liang Li
9	November 10	Bioinspired robotics II. - Software design	Liang Li
10	November 17	Bioinspired robotics III. - Applications	Liang Li
11	November 24	Networks I. - Basic concepts, Small world property, Scale-free networks, Centrality metrics	Máté Nagy
12	December 1	Networks II. - Components, Robustness, Percolation, Epidemic spreading	Máté Nagy
13	December 8	Student projects	M. Nagy, A. Zafeiris

Note: We will have a guest lecturer, **Dr. Liang Li**, an engineer senior scientist specialised on bioinspired robotic design from the Max Planck Institute of Animal Behavior, Konstanz, Germany.

Final mark:

Students will receive their final mark either by

1. Taking an **oral exam** at the end of the semester: students draw 1 topic, where each topic covers a lecture. There will be a related short question, but from a different lecture. Or
2. There is a possibility to ‘qualify’ for an **easier and shorter exam** (consisting of 4-5 questions that can be answered in a sentence or two). In order **to qualify for this possibility**, students have to accomplish **either of the following two tasks** (which will be evaluated by a mark):
 - ↘ they can choose a lecture and write a **lecture note** of it. This has to contain around 15 written page (+ pictures), that is, 7-8,000 words. It should be a more detailed version of what was covered on the lecture; the details should be filled in based on the scientific literature related to the topic. The purpose of these notes is to create a detailed text related to the given topic which can be distributed among other students later. In order to avoid multiple lecture notes on the same topic, students can choose only of the ‘available’ (not yet taken) topics. Please check with any of the lecturers if your favorite field is still available or not!
The **deadline** for handing in the lecture notes is **1st of December!**
 - ↘ Students have the opportunity to follow their own interest and do a small stand-alone research project (related to the topics covered in the course). These studies must include a **simple model/simulation** as well, which will be **presented in class** in the form of a ~15 minutes presentation on the last lecture, **8th of December**. We strongly recommend checking the chosen research topic with either of the lecturers before starting the work.

In the second case, the final mark is a composition of two terms: the mark given for the project work (lecture note or presentation of one's own work) and the evaluation of the performance of the quick exam, which can modify the mark given for the project by plus or minus one.

Contacts:

Dr. Máté Nagy (mate.nagy * ttk.elte.hu) (“@” instead of “*”)

Dr. Anna Zafeiris (anna.kinga.zafeiris * ttk.elte.hu) (“@” instead of “*”)