

Mathematical Ecology

Credits: 7.5 ECTS

Course organizer and lecturer

Department of Mathematics and Mathematical Statistics
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Course period: September 2022 – January 2023

Prerequisites

Participants should have a working knowledge of ordinary differential equations and linear algebra. Some knowledge in probability theory is helpful.

Objective

The goal of the course is to teach classic material in mathematical ecology and adaptive dynamics theory for modelling and studying evolutionary processes.

There will be about one two-hour meeting per month to introduce the course material and answer questions. Outside of this time, participants are expected to work with the material on their own.

Content

The course covers models of single species and interacting species in continuous and discrete time, bifurcation theory, stochastic birth and death processes, branching processes, delay models, and adaptive dynamics theory.

Examination

The examination consists of project work and solving selected problems from the textbook.

Literature

The main course literature is Mark Kot's book. Adaptive dynamics will be taught based on an introductory text by the lecturer and collaborators.

Kot, M. *Elements of Mathematical Ecology*. Cambridge University Press, 2012.

Brännström, Å., Johansson, J., & von Festenberg, N. (2013). The hitchhiker's guide to adaptive dynamics. *Games*, 4: 304-328.