Specialist Course | Cycle XXXIV
May-June, 2019 | Campus S. Caterina

Population Modeling

Stefano Mazzuco | *University of Padova*

May 24	10.00 – 12.00	Unstructured population models, basic notions of demographic measures	Room Cucconi
May 30	10.00 – 12.00	Leslie Matrix, Stable and Stationary populations, Lotka equation, Reproductive value	Room Cucconi
June 6	10.00 – 12.00	Rate of convergence, changes in growth rate and in vital rates, Population momentum	Room Cucconi
June 6	14.30 – 16.30	Practical session in computer lab	Asid 17
June 7	10.00 – 12.00	Interacting populations: linear model, Lotka-Volterra Model, Prey-Predator model	Room Cucconi
June 7	14.30 – 16.30	Practical session in computer lab	Asid 17

Programme at the page
www.stat.unipd.it/fare-ricerca/courses-201819-xxxiv-cycle

POPULATION MODELING
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Course Description

This course provides an introduction theoretical foundations of population modeling, starting from unstructured
population models to arrive at interacting populations modelling, going through stable and stationary
populations, and their characteristics. Basic notions of demography will be given during the course. Lectures
will be complemented by computer Lab sessions. Notions of matrix algebra, (ordinary) differential equations
and R coding are required.
Objectives
The objectives of this course are:

- To learn (or review) basic theoretical results about Population models.
- To understand (not necessarilyhuman) population dynamics and laws.
- To learn basic population modelling in practice.

Recommended texts

- Keyfitz, N. (1977) Introduction to the Mathematics of Population with revisions, Addison-Wesley, Massachusetts.
- Keyfitz, N. (1985) Applied Mathematical Demography, 2nd edition, Springer, New York.
- Preston S.H, Heuveline P. & Guillot M. (2001), Demography. Measuring and Modelin Population
- Processes, Blackwell Publishing.