

Population Demography & Evolutionary Ecology

Course title - Intitulé du cours	Population Demography & Evolutionary Ecology
Level / Semester - Niveau /semestre	M2 / S1
School - Composante	Ecole d'Economie de Toulouse
Teacher - Enseignant responsable	DE MAZANCOURT CLAIRE - ROY MELANIE
Other teacher(s) - Autre(s) enseignant(s)	Simon Blanchet
Other teacher(s) - Autre(s) enseignant(s)	Jorge Pena
Other teacher(s) - Autre(s) enseignant(s)	Jean Clobert
Other teacher(s) - Autre(s) enseignant(s)	
Other teacher(s) - Autre(s) enseignant(s)	
Lecture Hours - Volume Horaire CM	30
TA Hours - Volume horaire TD	
TP Hours - Volume horaire TP	
Course Language - Langue du cours	Anglais
TA and/or TP Language - Langue des TD et/ou TP	Anglais

Teaching staff contacts - Coordonnées de l'équipe pédagogique :

by email

Simon Blanchet (SETE) BLANCHET Simon <simon.blanchet@sete.cnrs.fr>

Jorge Pena (TSE) Jorge Peña <jorge.pena@iast.fr>

Jean Clobert (SETE) CLOBERT Jean <Jean.CLOBERT@sete.cnrs.fr>

Course's Objectives - Objectifs du cours :

This course will present an in-depth review of demographic and population dynamic tools. At the end of the course, students will be able to simulate demographic scenarios to evaluate the population growth of a species, and to think about potential demographic effects of different management actions. Several concepts will be presented to understand key demographic and fitness variables, to estimate them from data, and to calculate demographic and population dynamics. We will assess the effects of demographic, genetic and temporal variance.

The course will be divided into two main parts. The first part will introduce the fundamental principles of population and evolutionary demography and of life history theory (e.g., dynamics of class-structured populations, evolutionary trade-offs) as well as hands-on training in a software tool for the analysis of class-structured populations (ULM, <https://www.biologie.ens.fr/~legendre/ulm/ulm.html>). The second part aims at providing students some applied research tools for making these fundamental principles useful to help investigating some societal questions.

Prerequisites - Pré requis :

being accepted in the M2 Economics & Ecology track

Practical information about the sessions - Modalités pratiques de gestion du cours :

Attendance at lectures is required.

Grading system - Modalités d'évaluation :

The course grade will be determined by the performance of the student on assignments (individual or team-based assignments, and/or presentations), and/or a final exam.

Bibliography/references - Bibliographie/références :

Suggested readings:

- Carroll, S. P., Jørgensen, P. S., Kinnison, M. T., Bergstrom, C. T., Denison, R. F., Gluckman, P., ... and Tabashnik, B. E. 2014. Applying evolutionary biology to address global challenges. *Science*, 346, 1245993.
- Caswell H. Matrix population models. Sunderland, MA, USA: Sinauer; 2000 Jan.
- Hendry, A. P., Kinnison, M. T., Heino, M., Day, T., Smith, T. B., Fitt, G., ... and Gilchrist, G. 2011. Evolutionary principles and their practical application. *Evolutionary Applications*, 4, 159-183.
- Morris, W. F., and Doak, D. F. 2002. Quantitative conservation biology. Sinauer, Sunderland, Massachusetts, USA.
- Mills, S. L. 2013. Conservation of wildlife populations. Demography, genetics, and management. Willey-Blackwell.
- Stearns, S. C. 1992. The evolution of life histories. Oxford University Press.

Distance learning – Enseignement à distance :

Due to Covid19, most of classes will take place online