

Population Demography and Life-History Theory

Course title - Intitulé du cours	Population Demography and Life-History Theory
Level / Semester - Niveau / semestre	M2 / S1
School - Composante	Ecole d'Economie de Toulouse
Teacher - Enseignant responsable	Piret Avila
Other teacher(s) - Autre(s) enseignant(s)	
Other teacher(s) - Autre(s) enseignant(s)	
Other teacher(s) - Autre(s) enseignant(s)	
Other teacher(s) - Autre(s) enseignant(s)	
Other teacher(s) - Autre(s) enseignant(s)	
Lecture Hours - Volume Horaire CM	20
TA Hours - Volume horaire TD	
TP Hours - Volume horaire TP	
Course Language - Langue du cours	English
TA and/or TP Language - Langue des TD et/ou TP	

Teaching staff contacts - Coordonnées de l'équipe pédagogique :

Piret Avila piret.avila@iast.fr

Course's Objectives - Objectifs du cours :

This course is an introduction to the theory of populations, their structure and how they change over ecological and evolutionary time. You will learn important measures of population dynamics, such as population growth, mortality rate, fertility rate, and measures of age structure and physiological structure. At the end of the course you will be able to interpret and build models of population dynamics and also understand the evolutionary processes shaping the life course of organisms (including human population). You will learn how to do population projections, to understand risk and consequences of environmental policies and policies influencing human life-histories (e.g. healthcare, education). You will also learn some fundamental evolutionary biology, e.g. is ageing inevitable? Why women tend to live longer lives than men? This course is mathematical, but no specific pre-requisites are expected (other than high-school level algebra).

Course outline :

The course will be divided into two main parts: (i) lectures introducing the theory of population demography and life-history theory and (ii) practical exercises allowing to students to learn how to build do population projections and evaluate how the fundamental evolutionary forces shape demographic schedules.

Prerequisites - Pré requis :

none

Grading system - Modalités d'évaluation :

Attendance at lectures is required.

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.
- 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.
- Stearns, S. 2004 The evolution of life histories. Oxford University Press.
- Caswell, H. 2001 Matrix population models. Sinauer Associates.
- 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.

Distance learning – Enseignement à distance :

Distance learning can be provided when necessary by implementing, for example: / En cas de nécessité, un enseignement à distance sera assuré en mobilisant, par exemple :

- Interactive virtual classrooms / Classe en ligne interactive
- Recorded lectures (videos) / Vidéo enregistrée de la présentation du matériel pédagogique
- MCQ tests and other online exercises and assignments / QCM et exercices en ligne
- Remote (online) tutorials (classes) / TP/TD à distance
- Chatrooms / Forums