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Models and parameter estimation (3BL2189)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
Master en biologie	**Cours: 30 pg**	**Voir ci-dessous**	3

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

Période d'enseignement:

- Semestre Automne

Equipe enseignante

Jacob Koella

Contenu

This is a course on theoretical conservation ecology and on using R.

We will discuss theoretical models that are (mostly) linked to the biology of conservation. The models include the basic models of population growth, stochastic models that describe times to extinction, spatial models that describe the invasion of species, the genetics of conservation, etc. Participants will learn to simulate the models with R.

The course will begin with en emphasis on learning R with simple models; towards the end participants should know enough R to deal with complex models.

A typical class will be a mix of my presentation of ecological concepts, my presentation of programming aspects, and you working on the programming exercises. Participants are expected to finish the programs as homework.

Forme de l'évaluation

CA graded :The final grade will be the average of three grades:

(i) At the beginning of a few classes, I will give a short (and easy) exam about a topic in R, and calculate the average grades for these exams.

(ii) I will grade two randomly chosen homework-programs for each student, and average the grade of these two assignments.

(iii) Each student will chose a topic to work on throughout the semester. They will have to find and simulate the model, present the results with appropriate figures and write a short report, which will be graded.

Reexamination in case of failure must be registered for next exam session of same year. The exam coordinated with the professor (not in Pidex). It will be an oral exam on aspects of R and of the models discussed in class.

Documentation

A textbook (available as pdf) written for the course.

Pré-requis

Basic mathematics is necessary.

Forme de l'enseignement

Lectures and practical

Objectifs d'apprentissage

Au terme de la formation l'étudiant-e doit être capable de :

- Use programs in R
- Develop theoretical models
- Simulate mathematical models with R
- Describe the theory of conservation

Compétences transférables

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- Describe complex issues
- Simulate complex dynamics
- Use R