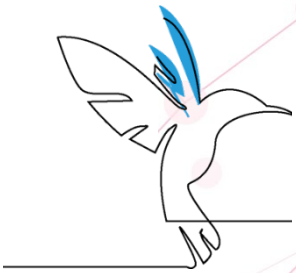
Quantitative Ecology & Evolution (QEE)



Explore this IDIL Master's track in detail, including its academic objectives, curriculum, research opportunities, admission requirements and career prospects.

TRACK OVERVIEW & LEARNING OBJECTIVES

Ecology and evolution have a strong mathematical basis, which helps us characterize complex interactions and processes between organisms and their environments. Mathematics and more generally, quantitative approaches, including programming and statistical sciences, are also crucial for processing, analysing and understanding large dataset. The IDIL Master Quantitative Ecology & Evolution aims to train students in the field of ecology and evolution, with a strong interface with mathematical sciences, statistics and numerical analysis.

This unique training will enable students to acquire solid skills both within ecology and evolution but IDIL QEE will also introduce them to interdisciplinarity, especially, the interface with mathematics.

KNOWLEDGE, SKILLS & COMPETENCIES

- Learning by doing. IDIL programs place a strong emphasis on learning by doing, and include In-lab units as part of the curriculum, as well as a subsidized research internship in M1 and M2. The IDIL program opens the doors to around a hundred laboratories at the University of Montpellier, where students will be working in immersion.

- Customized curriculum. IDIL students can tailor their course to suit their career plans and interests by selecting their courses from three different teaching units: Non Core, In-lab and Transversal training units. Support is provided to ensure that the student's course of study corresponds to his or her chosen orientation.

- Introduction to a new discipline. All IDIL students must choose a Non Core teaching unit, which is an introductory course to a discipline in another IDIL pathway. For example, a Comparative Politics and Public Policy student may take an introductory course in ecology and evolution. This arrangement gives students a unique profile, and is an effective way of developing interdisciplinary thinking, a major challenge in modern research.

- Mentoring. Throughout the IDIL program, students will be coached by a researcher from the Montpellier laboratories. The mentor's role is to prepare the student for the internship, teach theory through various workshops, and develop the student's professional network.

- Concrete skills include the disciplinary fundamentals of ecology and evolution, modeling (complex) ecological systems, analysis of large dataset, providing interdisciplinary links between ecology/evolution and mathematics, but also the fundamentals of the scientific method, from developing hypotheses, testing them, analyses and scientific writing.

Find out more about the IDIL graduate program here: https: //idil.edu.umontpellier.fr/

DETAILED CURRICULUM

- **Semestre 1 (S7)**
  - HAX799X9 UE Stochastic processes (2 ECTS)
  - HAB799B9 UE Study of variability (4 ECTS)
  - HAB715B UE Analytical and numerical methods in Ecology & Evolution (2 ECTS)
  - HAB798B9 UE Ecology (2 ECTS)
  - HAB797B9 UE Evolution (4 ECTS)
  - QAM1ILAB UE In-Lab (2 ECTS)
  - QAM1PPRJ UE Personal project : projet de recherche + anglais (10 ECTS)
  - QAM1TTRA UE Transversal training units IDIL (2 ECTS)
  - Non-core training unit (2 ECTS)

Semestre 2 (S8)

- HA1I11B UE Research Internship – Ecology (30 ECTS)

- **Semestre 3 (S9)**
  - HAB999B9 UE Spatial Data (4 ECTS)
  - HAX999X9 UE Bayesian Statistics (2 ECTS)
  - HAX998X9 UE Machine Learning (2 ECTS)
  - HAB961B UE Eco-evolutionary dynamics (2 ECTS)
  - HAB948B UE Population Risk & Heterogeneity (4 ECTS)
  - QAM2MUTP UE Multidisciplinary team project (10 ECTS)
  - QAM2TTRA UE Transversal units 2B IDIL (2 ECTS)
  - Non-core training unit (4 ECTS)
- **Semestre 4 (S10)**
  - HA1I21B UE Research Internship – Ecology (30 ECTS)

In-Labs :

- Developing individual-based eco-evolutionary models
- An introduction to laboratory experimentation in community ecology
- How to infer the structure of complex food webs?
- Swimming performance in fish larva challenged to an environmental stress
- Environmental DNA time series in Ecology and Evolution

- Concepts, questions and methods in experimental evolution

ADMISSION REQUIREMENTS & STUDENT PROFILE

- Bachelor's degree in a relevant field, including, ecology, evolution, environmental sciences, mathematics, physics.
- Minimum level of English B2
- CV and motivation letter
- 2 letters of support from a researcher and/or professor
- Estimated ranking in the student's class
- Explanatory transcript of grades
- Research Project: In this documents you will outline your research interests, big questions and concepts that you are interested in, but also preferred methods, study organisms, or field sites. Importantly, you will explain the reasons and motivation behind your choices. You are encouraged to cite relevant literature and mention specific local research institutes or teams that align with your research interests.

This selective interdisciplinary program is open to students with a bachelor's degree in the field mentioned above. However, students must have a very strong interest in biology/ecology AND mathematics.

CAREER OPPORTUNITIES

The IDIL program trains students by and for research. This implies that the main career path includes continuing onto a PhD program.

Although the IDIL program is research-oriented, it offers an incredible amount of professional experience throughout its duration, which can be used in any professional environment. How to work as part of a team, how to manage a project, how to use data are just some of the skills taught during this program.

RESEARCH LABORATORIES & ACADEMIC PARTNERS

University of Montpellier and all associated research institutes.