Fiche UE Master Sciences de la Mer

SCIENCES SORBONNE UNIVERSITÉ

DESCRIPTIF DE L'UE

CODE UE	MARINE BIODIVERSITY: EXPERTISE IN FLORA
MU4MRM52 6 ECTS M1	**MOTS CLÉS** : Macroalgae ; Marine plants; Field work; Taxonomy; Biological traits;; life cycles **RESPONSABLES** : Nathalie Simon & Christophe Destombe, Station Biologique de Roscoff

FORMAT DE L'UE

MODALITÉS D'ENSEIGNEMENT

Courses: 20h
Practical field work : 12h
Practical lab work : 28h
Teaching language : English

MODALITÉS D'ÉVALUATION

- **Autonomous work in small groups** (production of illustrated documents on seaweeds species) (30%)
- **Oral presentation** (30%)
- **Final written exam** (40%).

RESUME DE L'UE

This master degree summer course is a hands-on introduction to marine plants with an emphasis on seaweeds. It trains the students to recognise and identify the typical marine algae in various coastal habitats of Brittany. The organisms are studied in their environment during field excursions and *in vivo* back to the laboratory. The students will become familiar with identification of the main species using morphological and ecological characters, as well as with their cell features and life cycles. The course also offers an introduction to the use of genetic characters to study seaweeds systematics and evolution. These studies build the foundation from which the main scientific questions in the systematics, biology, ecology and evolution of marine flora can be addressed. Check out a short video introducing the course: https://youtu.be/qER5dy2up-0



OBJECTIFS D'APPRENTISSAGE

Students will be able to :

- **describe and analyse the morphology** (including anatomy and cytology) of seaweeds and marine plants

using the **dedicated vocabulary**
- **point out the relevant morphological, biological, ecological characters** needed to identify seaweeds
- **identify the most common seaweeds** of the western English Channel
- **identify and interpret seaweeds reproductive structures**
- **set limits in the use of morphology** for taxa identification (in other words, students will be able to explain when, and why they cannot give a species names to a specimen)
- **explain the importance of genetic characters** in algal systematics and taxonomy

PREREQUIS

Basic knowledge in biology is needed to attend the course. An upgrade of the prerequisites will be proposed to the students approximately one week before the start of the course. It consists of a formative quiz, which allows the review of a number of basic notions of biology.

BIBLIOGRAPHIE / SITOGRAPHIE

Short video introducing the course : https://youtu.be/qER5dy2up-0

Class books:

- Graham LE, Graham JM, Wilcox LW et al. (2019). *Algae (3rd Edition)*. Ljlmpress.com
- de Reviers B. (2002, 2003) Biologie et phylogénie des algues Tome 1 & 2. Belin Sup Sciences. 351 pp.

Field guides:

- Bunker F. et al. (2017). Seaweeds of Britain and Ireland. Wild Nature Press. 312 pp.
- Cabioc'h J, Floc'h J-Y, Le Toquin A et al. (2014) Algues des mers d'Europe. Guide Delachaux. 272 pages

World list of algal species:

- Guiry MD, Guiry GM. AlgaeBase. National University of Ireland, Galway http://www.algaebase.org/

FONCTIONNEMENT DE L'UE

The Marine Flora course is a **hands-on introduction to marine plants with an emphasis on seaweeds and on practical work**. Its objective is to **train students to the scientific methods used to identify marine plants, and in particular macroalgae**. This summer course is **open to students of all Universities** and to professionnals whose activities require knowledge in systematics, biology and marine ecology. It is given in **english**.

The course includes:

- **Fieldwork**: the students will **study seaweeds and marine plants in their environments** and learn how to collect specimen for further studies. Five field trips to very contrasting coastal and nearshore habitats, accessible during low tide are organized (sheltered and exposed rocky-shores, soft shores). When possible, samples from pelagic and subtidal environments are collected during a sea excursion on an oceanographic boat.
- **Practical coursework in the lab**: the students will **conduct *in vivo* observations** of the sampled species under a dissecting microscope or optical microscope to study the biological and taxonomic criteria presented during the lectures. Each student has access to a microscope and a dissecting microscope during the whole course.

- **Exercises in using identification keys:** the students will have access to a number of specialized works and teaching documents designed for the course to identify the species collected during field trips. Students also have access to on-line tools.
- **Lectures** on the characteristics of the main seaweed phyla: morphology, anatomy, cytology and pigmentation, reproduction, ecology, classification (including molecular phylogeny).
- **Projects**: the students will participate to a **collaborative work aiming at producing a list of the native or introduced species growing in the artificial habitats of the Roscoff marina**. They will also have the opportunity to make a herbarium.

The course is organised by the Station Biologique de Roscoff, which offers **direct access to the temperate marine flora *in situ***, and facilities for studying them in the lab. The course also takes advantage of the **Moodle** platform in order to provide the students with relevant teaching resources. **The course instructors are research lecturers in phycology** who have extensive teaching experience on seaweed biodiversity in coastal and nearshore environments.