

**Course offered for the PhD program
in Civil, Chemical and Environmental Engineering
Curriculum in Chemical, Material and Process Engineering –
a.a. 2023/2024 (cycles XXXIX, XXXVIII and XXXVII)**

(possibility of participation for students in other PhD cycles or other PhD courses)

1. Title

Microalgae for carbon dioxide capture and wastewater treatment

2. Course description

The course aims at providing notions to the future PhD students on the growth and exploitation of microalgae for environmental purposes. The course will include the following topics.

- Microalgae: microorganism characterization and description of the main industrial growth plants (e.g.: open ponds, vertical and horizontal tubular photobioreactors, helicoidal and column photobioreactors).
- CO₂ capture from industrial emissions, to carry out bioenergetic studies of autotrophic metabolism;
- Microalgal mixotrophic metabolism: exploitation of microalgae to absorb and use many of the organic molecules contained in wastewaters, reducing their polluting load, leading to the production of additional microalgal biomass.
- Description of *ad hoc* plants for the growth and the collection of microalgae used for wastewater treatment.
- Laboratory activities: realization in the Environmental Biotechnology laboratory of one of the processes analyzed during the course.

3. Course organization

The course, organized into a single module, will consist of classroom lessons and practical laboratory training.

4. Teachers

The course teacher will be Prof. Alessandro A. Casazza.

5. Duration and credits

The course (16 hours) will consist of 4 lessons, 2 hours each, and a 8 hours tutorial in the laboratory, for a total of 3 credits.

6. Activation mode and teaching period

The course will be held yearly if at least one student will be registered by simple contact with teacher by email. The course will be held on June 2024. The exact dates of the lessons will be confirmed about one month before the beginning of the course.

7. Deadline for registration

Registration to the course must be made before March 20th, 2024. Students are requested to inform teacher by e-mail (alessandro.casazza@unige.it) about their registration.

8. Final exam

The final exam will consist in an interview on the topics covered by the course. The students are requested to contact teacher by email to establish the date of the exam.