

**Course offered for the PhD program
in Civil, Chemical and Environmental Engineering
a.y. 2026/2027 (42 cycle)**

(course is open for participation of students from other PhD cycles or programs)

1. Title

Simulating and optimizing chemical and process plants with DWSIM

2. Course Objectives and Description

The course is designed to provide future PhD students with fundamental knowledge on the simulation and optimization of chemical and process plants using the open-source software DWSIM.

The program will cover the following topics:

- Introduction to process simulation: basic principles, benefits, and application areas in the chemical industry;
- Getting started with DWSIM: user interface overview, creation of material streams, and setup of unit operations;
- Modeling of chemical processes: implementation of common process units such as reactors, heat exchangers, and separators;
- Thermodynamic packages and reaction modeling: selection of suitable models to ensure accurate simulation results;
- Process optimization: sensitivity analysis and energy optimization strategies using DWSIM tools;
- Case studies: simulation of real industrial processes and performance evaluation.

3. Course Organization

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

4. Teacher

The course will be held by Prof. Dario Bove

5. Duration and Credits

The course (10 hours) will consist of four lessons: two sessions of three hours and two sessions of two hours, for a total of 2 credits

6. Activation Mode and Teaching Period

The course will be offered annually, provided that at least one student registers by directly contacting the professor via email. The next edition of the course will take place in February 2027. The exact dates of the sessions will be confirmed approximately one month prior to the start of the course

7. Deadline for Registration

Registration must be completed by January 15th, 2027. Students are kindly asked to notify the professor of their registration by email at dario.bove@unige.it

8. Final Exam

The final exam will consist of an oral interview, during which the student will present and discuss a process simulation of their choice, developed using DWSIM. Students are requested to contact the professor by email to schedule the exam date.