

Master of Science and Technology in Complex Systems Engineering

Presentation

The Master of Science and Technology in Complex Systems Engineering (MScT CSE) addresses the need for engineers trained at an international level, capable of understanding, modeling, designing, implementing, and managing these "complex systems." It aims to train bicultural engineers with strong scientific and technical skills, as well as solid experience in management, innovation, and research.

This 2-year program is divided into 2 parts:

- The DNM National Master's Degree SCIENCES ET TECHNOLOGIES, mention INGENIERIE DES SYSTEMES COMPLEXES ;
- Additional modules relating to the validation of optional courses to harmonise knowledge levels and language skills, as well as training related to project management, general management and organisation.

The MScT CSE is fully taught in English and composed of three tracks:

Environmental Engineering, focused on Water & Energy - M1 & M2

- Biomedical Engineering, focused on Biomechanics and device design, quantitative imaging, and diagnostics (detection and treatment & interpretation) - M1 & M2
 - Engineers for Smart Cities, offered in joint-degree with the Université Côte d'Azur, focused on Smart City – M2
- This Master's degree is centered on the strengths and assets of the Ecole Centrales' training specificities: multi-disciplinary teaching in sciences and engineering, tight links with companies, awareness of societal issues,

managerial teaching,... addressed through a combination of academic teaching, workshop activities, projects, immersion and experiential learning.

Close links with laboratories have been forged thanks to a rhythm promoting periods of immersion throughout the two years of the course.

Within the Environmental Engineering and Biomedical Engineering tracks, many courses are shared with the engineering program at Centrale Méditerranée.

In addition to these 120 ECTS required for the National Master's Degree "mention Ingénierie des Systèmes Complexes", an additional 20 ECTS are accumulated during semester 7 (10 ECTS) and semester 9 (10 ECTS). These credits reward the acquisition of specific skills from the Centrale Engineer's competence framework:

- Soft skills: Understanding communication profiles, Leadership and Eloquence, Optimization of collective performance, Change management

- Mastery of complexity: The proposed "Training" activities aim to explore the means of describing and analyzing complexity in all its dimensions (dynamic systems, complex industrial project management, human factors, ...)

The validation of 140 ECTS is necessary to obtain the Institution Diploma "Master of Science and Technology in Complex Systems Engineering (MScT CSE)", conferred by the Ecole centrale de Marseille in addition to the National Master's Degree "mention Ingénierie des Systèmes Complexes".