Université Paris-Saclay
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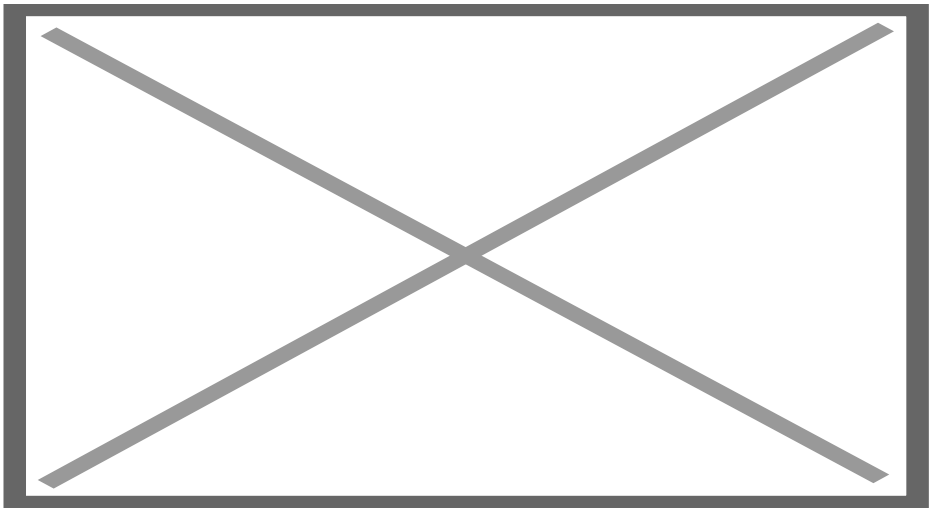
M2 Géomécanique et Sous-Sol

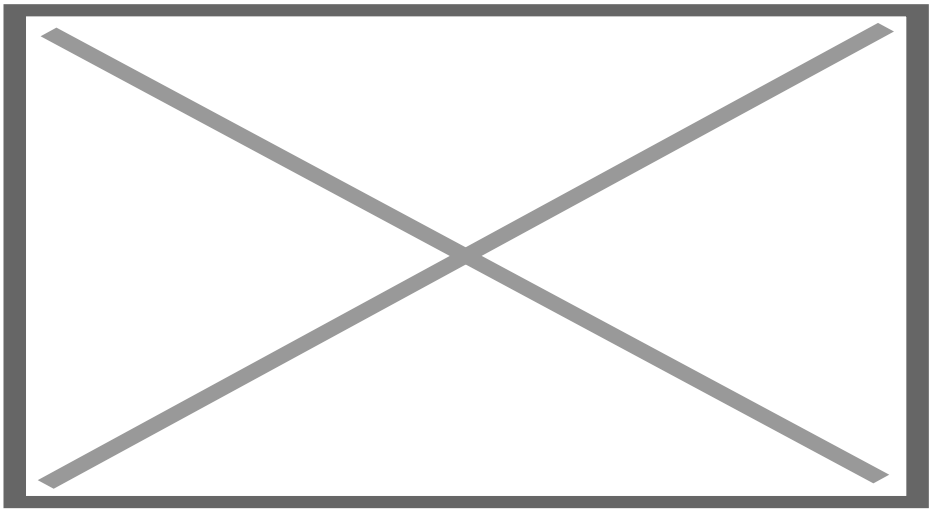
Master's degree
Specialisation Civil Engineering
Language(s) of instruction
English
French

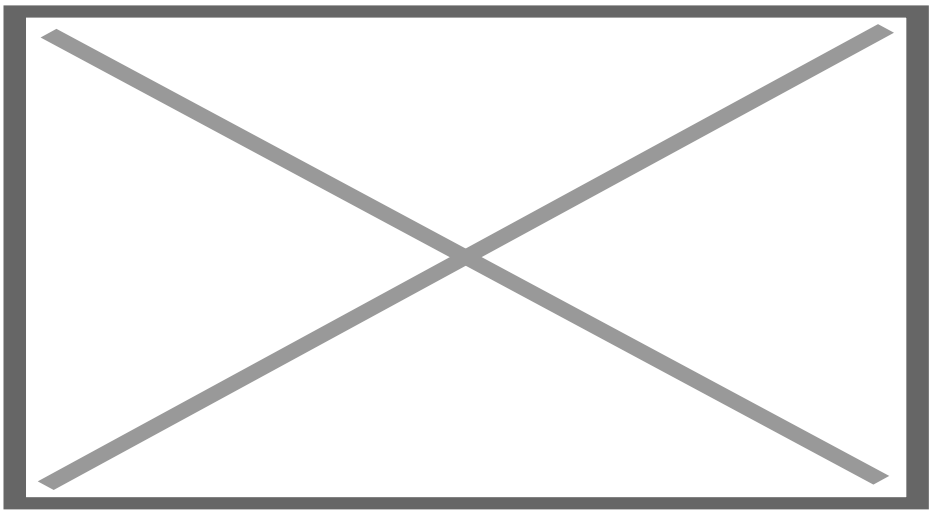
https://www.universite-paris-saclay.fr/en/education/masters-degree/civil-engineering/m2-geomecanique-et-sous-sol

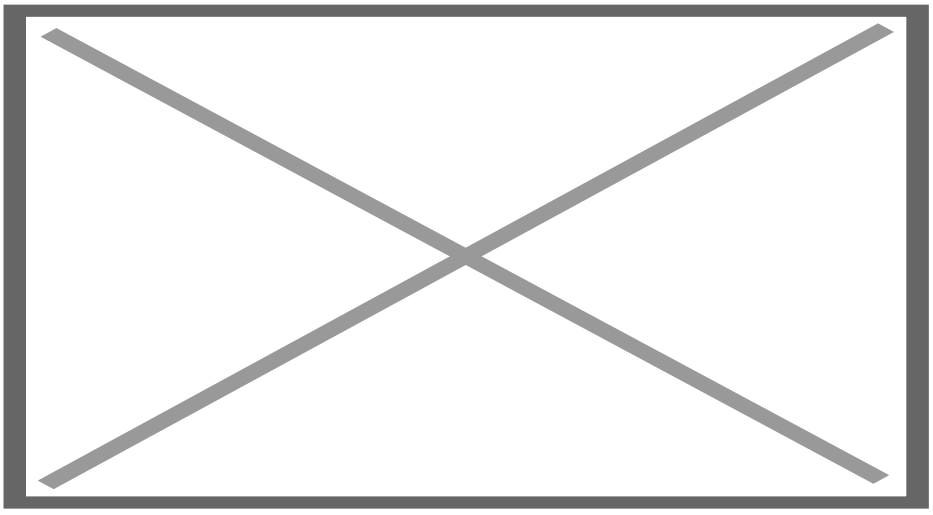
Although focused on Geotechnical engineering, this Master's allows students to explore the intersection of mechanical and civil engineering, thanks to a focus on modelling the behaviour of materials, structures and their environment. The course are taught at three different sites: CentraleSupélec in Gif-sur-Yvette, École nationale des ponts et chaussées in Champs sur Marne and Sorbonne Université in Paris.

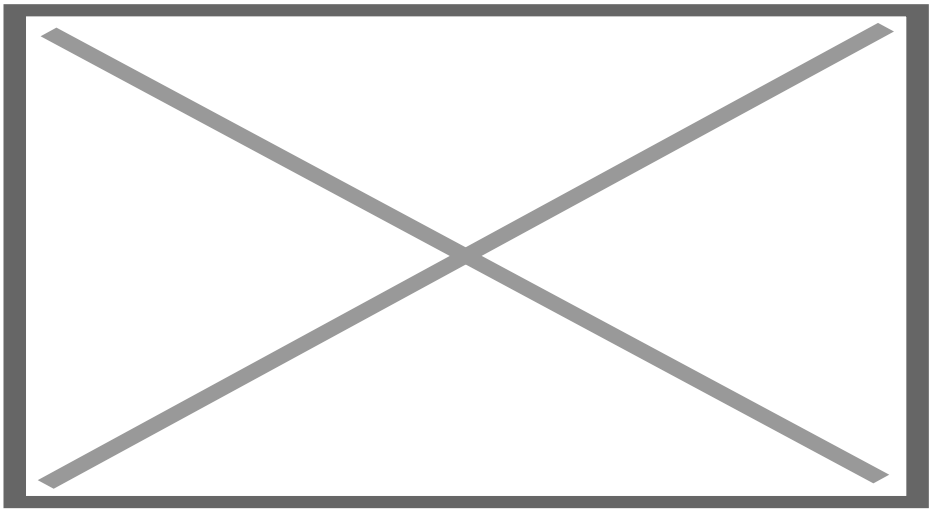
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Information

- Overview
- Application requirements
- Schedule

Présentation

Skills

Model, simulate and experiment to understand scientific and technological challenges.

Objectives

This course is research-oriented, but is aimed at two separate student audiences: firstly, students from engineering schools where the original curriculum is aimed at joining professions in industry, and secondly, students from universities, in France or abroad, who have followed a more disciplinary course. The common objective in both categories is to get students used to the world of research, and more specifically how the scientific community operates, and life in a laboratory. The targeted competency is mastery of modern analysis and modelling methods in the fields of geomechanics and geoengineering, with a strong focus on environmental implications. The following topics form the basis of the curriculum: the behaviour of (geo)-structures and civil engineering materials and the specific phenomena affecting them (uncertainties, multi-physical couplings, soil-structure interaction, wave propagation, various loads, etc.), as well as natural hazards.

Admission

Capacity

Available Places

10

Target Audience and Entry Requirements

Admission to the Master's in Geomechanics and Subsoil is not automatic for students with a 1st year Master's degree; the student's portfolio will first be examined, and the prerequisites (mechanics, numerical methods, mathematics) will be verified. Admission to 2nd year Master's requires a level of competencies that are in line with the first year of the Master's programme, or one of the following diplomas: from engineering schools or universities in France or abroad.

Période(s) de candidature

Inception Platform

From 21/01/2026 to 21/06/2026

Supporting documents

Compulsory supporting documents

Motivation letter.

Letter of recommendation or internship evaluation.

All transcripts of the years / semesters validated since the high school diploma at the date of application.

Curriculum Vitae.

Recommendation letters.

Additional supporting documents

Certificate of French (compulsory for non-French speakers).

Certificate of English level (compulsory for non-English speakers) or GMAT / GRE test results.

VAP file (obligatory for all persons requesting a valuation of the assets to enter the diploma).

Supporting documents :
- Residence permit stating the country of residence of the first country
- Or receipt of request stating the country of first asylum

- Or document from the UNHCR granting refugee status
- Or receipt of refugee status request delivered in France
- Or residence permit stating the refugee status delivered in France
- Or document stating subsidiary protection in France or abroad
- Or document stating temporary protection in France or abroad.

Programme

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	di le c
Géosciences (3EN2020)	3	Semestre 1	27						
Charger le détail									
Modèles pour l'étude des climats passé, présents et futurs	3	Semestre 1	12	6	9				
Charger le détail									
Atte?nuation : réduction des émissions	3	Semestre 1	18	9					
Charger le détail									
Cycle hydrologique : observations, traçage, modélisation et enjeux climatiques	3	Semestre 1	12	15					
Charger le détail									
Emissions ne ?gatives et ge ?o-inge? nierie	3	Semestre 1	18	6					
Charger le détail									
Méthodologie en géosciences (3EN2260)	3	Semestre 1	27						
Charger le détail									
UE libre Catalogue S1	2.5	Semestre 1							

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	di le c
Charger le détail Coupled Energy and Mass Transfers in Porous Media	3	Semester 1							
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practic class
Numerical Solid Mechanics: Finite Element Method – Theory and Applications	3	Semestre 1	26	4				
Charger le détail								
Modélisation et comportement multi-physique et multi-échelle des géo-matériaux (M3G) - UE Obligatoire	6	Semestre 1	36	15				
Charger le détail								
Rock Mechanics and Rock Engineering	3	Semester 1	36					
Charger le détail								
Interaction sols-structures : fondations et soutènements (ISSSF) - UE à Choix	3	Semestre 1	30					
Charger le détail								
Loss Assesment for Natural Hazards	3	Semester 1	33					
Charger le détail								

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practic class
Earthquake Engineering	3	Semester 1	36					
Charger le détail								
Dynamique de sols et ISS	3	Semestre 1	30					
Charger le détail								
Reconnaissances géophysiques et stage de terrain (R3G) - UE à Choix	3	Semestre 1	30		18			
Charger le détail								
Rock Mechanics and Rock Engineering (part 2)	3	Annualized	27					
Charger le détail								
Coupled Energy and Mass Transfers in Porous Media	3	Semester 1						
Charger le détail								
UE libre Catalogue S1	2.5	Semestre 1						
Charger le détail								

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dista learn cou
Stage de recherche ou industriel	21	Semestre 2							
Charger le détail									
Projet d'initiation à la recherche	9	Semestre 2							
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practica class
Thermodynamics of solid materials	3	Semester 1	30					
Charger le détail								
Modélisation des incertitudes et apprentissage statistique pour le calcul des matériaux et des structures (MIFO)	3	Semestre 1	27	6				
Charger le détail								
Méthodes expérimentales (MEXP)	3	Semestre 1	9		9			
Charger le détail								
Numerical Methods	3	Semester 1	30					
Charger le détail								

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis lea co
Elastic Wave Propagation in Solids	3	Semester 1	21	9					
Charger le détail									
Numerical Solid Mechanics: Finite Element Method – Theory and Applications	3	Semestre 1	26	4					
Charger le détail									
Loss Assesment for Natural Hazards	3	Semester 1	33						
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis lea co
Earthquake Engineering	3	Semester 1	36						
Charger le détail									
Dynamique de sols et ISS	3	Semestre 1	30						
Charger le détail									
Scientific Machine Learning and applications to Mechanics	3	Semester 1	20		10				
Charger le détail									
Advanced Structural Modeling	3	Semestre 1							
Charger le détail									
High Performance Computing in Solid Mechanics	3	Semester 1	24	6					
Charger le détail									
UE libre Catalogue S1	2.5	Semestre 1							
Charger le détail									

Teaching Location(s)

GIF SUR YVETTE

Contact

- **Fernando LOPEZ-CABALLERO**

  CentraleSupélec

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http://www.universite-paris-saclay.fr/formation/master/genie-civil/m2-geomecanique-et-sous-sol-geo2