

Water and Environmental Engineering

Course offer in English



Autumn semester
2024/2025

Last Update: March 2024



ENGEES

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FOREWORD

Dear students from our partner universities and engineering schools abroad,

This “taught in English” course offer is one result of the internationalisation process of our Engineering degree course. All the modules that are presented in this document are guaranteed in English for your incoming mobility. However, it may happen that some projects are presented in French by external lecturers. In this case, our professors will ensure an individual support and group work will always be done in English.

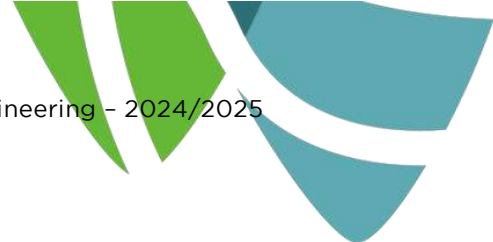
Considering the importance of selecting the right destination for your semester abroad, it’s worth noting that Strasbourg, situated in the heart of Europe, is a stunning and international city with approximately 20% of its student population from abroad.

Since 2023, ENGEES is located in the historic building of the “Manufacture des Tabacs”, in the dynamic and charming neighbourhood of the Krutenau.

For the successful integration into everyday life, we highly recommend at least a basic knowledge of French to all students who are interested in our English taught course offer. French as a Foreign Language courses are available and will allow you to improve your language skills during your stay.

If you have further questions, please do not hesitate to contact us at engees-mobilin@unistra.fr

A bientôt à l’ENGEES,
we are looking forward to welcoming you very soon!



IMPORTANT INFORMATION FOR CHOOSING YOUR COURSES

Autumn term lecture period: from mid-September to the end of January.

Learning agreement:

To avoid temporal overlap, you must choose ONLY ONE of the two specialisation courses offered in English: ***Water Treatment (highlighted in blue in the table) or Hydrosystem management (highlighted in green).***

For a short presentation of the ***Water treatment specialisation*** by video, [click here](#).

For a short presentation of the ***Hydrosystems specialisation*** by video, [click here](#).

The courses in white can be chosen independently of the specialisation you selected.

Please use the online learning agreement to fulfil your choices.

Language skills:

Proficiency in English at a minimum level of B2 is required.

A2 level in French is recommended to enjoy everyday life at school and in Strasbourg.

If you are interested to follow intensive French classes for 2 weeks in the beginning of September, please contact us.

	Teaching units	Description	ECTS	Teaching hours			Assessment type
				Lecture	Practical work	Projects and field visits	
Water treatment specialisation	S9 TREAUS2 - Wastewater treatment level 2	<p><u>Subjects covered by this teaching unit:</u></p> <ul style="list-style-type: none"> - Sanitation and ecological transition - Extensive fields - Intensive treatment (micropollutants, innovations) - Leachates - System start-up - Treatment of micropollutants <p><u>Objectives:</u> deepen knowledge of a number of specific/recent wastewater treatment issues. Identify current and future challenges in wastewater treatment processes.</p>	4	27	20		Written exam
	S9 TREAUS3 - Modelling in wastewater treatment	<p><u>Objectives:</u> students will acquire the tools needed to understand the physical processes and associated mathematical models involved in biological treatment using activated sludge. Know how to model the dynamic operation of a wastewater treatment plant.</p>	2	2	12		Group work
	S9 MYTHREA - Wastewater engineering	<p><u>Objectives:</u> the general aim of this teaching unit is to provide students with the tools they need to understand the physical processes and associated mathematical models involved in the extensive treatment of pollution in free cultures and fixed cultures. Three major objectives: -Identify the physical mechanisms involved in the treatment of wastewater through extensive processes, -Describe biological kinetics and the factors influencing them, -Model the interactions between hydrodynamics and reactive transfers.</p>	3	13	13		Written summary + homework assignment
	S9 TREAUC2 - Drinking water treatment level 2	<p><u>Subjects covered by this teaching unit:</u></p> <ul style="list-style-type: none"> - Industrial water issues - Emerging issues & specific treatments - Integrated project <p><u>Objectives:</u> the aim of this module is to complement it by providing an introduction to current and future treatment issues, as well as to specific drinking water production contexts, such as PVD or intervention in emergency humanitarian situations, as well as an initial introduction to the specific context of industrial water treatment. It also aims to take a step back and lay the foundations for thinking about the upstream/downstream issues of a drinking water production plant project, the problems of rehabilitation, diagnosing an existing installation, managing an installation in the event of non-compliance and controlling operating costs.</p>	3	14		24	Project (1 report per group of 3-4 students)
	S9 GESER - Erosion and solid transport management	<p><u>Subjects covered by this teaching unit:</u></p> <ul style="list-style-type: none"> - Solid transport in mountains - Solid transport in rivers <p><u>Objectives:</u> the aim of this course is to provide the knowledge needed to understand and manage solid transport phenomena in lowland and mountainous areas.</p>	2	4		20	Project (2 reports)

Hydrosystem management specialisation	<p>S9 GESTER - Territorial management of the environment and risks (to be confirmed)</p>	<p>Objectives: understand the institutional and economic instruments of public action to manage water</p> <p>Understand the social, political and economic dimensions of extreme situations: floods, water shortages and conflicts of use.</p> <p>Understand, through foresight, what technical choices about water have to say about societal choices, and conversely, understand the links between scientific rigour and political pragmatism.</p>	5	36	16		Multiple Choice Question (MCQ) + project
	<p>S9 HYDROMOD3 - Flood risk management, 2D modelling, flooding, urban rivers (cross-disciplinary)</p>	<p>Subjects covered by this teaching unit:</p> <ul style="list-style-type: none"> - Cost-benefit analysis - Drawing up of a Risk Prevention Plan - 2D modelling - Vulnerability to flooding <p>Objectives: this unit covers regulatory approaches to risk management and advanced flood modelling tools (2D approach). These two areas are assessed.</p>	3	6	20	12	Oral exam + project
	<p>S9 GESQUAL1 - Management of contaminant transfer</p>	<p>Objectives: understanding: interaction between microbiological, chemical and hydrological processes in the transfer of contaminants.</p> <p>Acquiring the basics: observing and characterising the transfer of contaminants.</p> <p>Understanding and using modern analytical approaches: assessing and predicting the transfer and degradation of contaminants.</p>	4	12	12	12	Project (one report per group on the quantification and prediction of contaminant transport in the study site and one individual report)
	<p>S9 GESQUAL2 - Management of natural aquatic environments</p>	<p>Subjects covered by this teaching unit:</p> <ul style="list-style-type: none"> - Management of natural aquatic environments - Land restoration <p>Objectives: to propose, implement and evaluate actions for the protection, restoration and management of natural aquatic environments in order to achieve the European objectives of good ecological status; this course is based on mastery of the knowledge acquired in ecological engineering (UE INGECOL -S9), river hydraulics and hydro-ecology, including ecological diagnostic tools. Teaching and practical application in the context of a visit and a restoration project, plus a visit and a seminar on dams ("EDF" presentation).</p>	3	10		34	Project + oral exam
	<p>S9 FLE - French as a foreign language</p>	<p>French as a foreign language</p>	3	18			Continuous assessment
	<p>S9 PROTUT - Supervised project</p>	<p>The supervised project is a group project (3 students per team) carried out by 3rd year student-engineers in response to a research issue raised by our school researchers. A researcher supervises the students' work to ensure the scientific validity of the project.</p> <p>Skills:</p> <ul style="list-style-type: none"> - Use the project approach to understand and respond to a professional and scientific need - Project management: identifying deliverables, tasks, sticking points, managing project progress - Learn about innovation 	5	6		120	Project + oral exam

Other teaching units taught in English	S9 ACV - Life cycle analysis	Objectives: training in the sustainable design of products or systems, using the ISO 14040 standard as a reference, to carry out an environmental life cycle analysis that assesses potential environmental impacts on several environmental compartments: air, soil, water, living organisms and non-renewable resources.	3	6	8		Group work
	S9 WAMAI - Water management - International perspective <i>(to be confirmed)</i>	Objectives: This teaching unit is specially developed for international students to understand the stakes of Water management in France and in an international context.	5	To be specified			
	S9 MOSYFEN - Hydraulic and wind energy recovery systems	Objectives: - Renewable energy: resources and challenges for the energy transition - Water turbines: from large-scale plants to small-scale tidal turbines - Wind turbines: operating principles and optimisation	2				
	S9 MOSYFEN - Tools for experimental modelling	Objectives: - Computer-aided design (CAD) - Manufacturing processes and rapid prototyping (FabLAB) - Instrumentation, acquisition and control systems	3				
	S9 MOSYFEN - Numerical simulation of flows with moving parts	Objectives: - Theoretical bases in numerical fluid mechanics - Construction and validation of a numerical model of fluid systems on OpenFOAM - Dynamic meshing techniques for modelling moving elements	3				