université de TOURS

POLYTECH TOURS

École polytechnique de l'Université de Tours

Département Aménagement et Environnement

EXCHANGE PROGRAM:
URBAN AND TERRITORIAL PLANNING AND ENVIRONMENT

Course catalog proposal

	FALL SEMESTER (S3-S5-S9)					
Apoge code	**Teaching Unit Title**	**semestre**	**Lectures**	**Tutorials**	**Project**	**ECTS**
UE2.S5	Statistics	S5	22	20		3
UE3.S5	water policies & uses (flood intervention)	S5	10	10		1,5
UE3.UIT.S7	Territorial planning and developement stratégies	S7	**12**	**12**		2
UE1.S7	General hydrology	S7		**30**		3
UE4.UIT.S7	Ecodesign workshop (specialisation RESEAU)	S7	46		46	4
UE4.UIT S7	European climate policies (specialisation ITI)	S7		**12**		1
UE2.IMAGE S9	Urban and anthropised rivers in Europe and the world	S9		24		3
UE3.S9	research methodology and innovation			10	72	4
Supervised projects in engineering	Supervised project 1				600	20
Supervised projects in engineering	Supervised project 2				400	15
Q1EORAL2 - Q1ECLAE2	Oral and written French			48		8
TU01*	Group project 1			26		10
TU02*	Geomatics			40		10
TU03*	Research Methodology		4	6		5
	SPRING SEMESTER					
Apoge code	Teaching Unit Title	**semestre**	**Lectures**	**Tutorials**	**Project**	**ECTS**
UE1.S6	advanced geomatics		2	24		2
UE3.S6	Biodiversity	S6	14	12		2
UE3.S6	Aquatic and urban ecosystems	S6	14	12		2
UE2.IMATGE.S8	Water law and wetland policies (multi-use and multi-function in wetlands)	S8	16	16		3
UE3.UIT.S8	group project (specialisation ITI or RESEAU)	S8		66	66	9
Supervised projects in engineering	Supervised project 1				600	20
Supervised projects in engineering	Supervised project 2				400	15
TU05*	Urban ecology	S8	10	10		5
Q1EORAL2 - Q1ECLAE2	Oral and written French			48		8

*Course availability subject to the opening of the Master M1 "Planning and sustainability".

Crédits are subject to change

FALL SEMESTER (S3-S5-S9)

UE2.S5 Statistics
Study of fundamental computer concepts: computer architecture, coding, Boolean algebra, operating systems, networks.
Development and analysis of problem-solving algorithms (Python): sorting and complexity, distance calculation (Euclidean, spherical), Dijkstra, etc. Links will be established with geomatics and statistics for more integrated teaching.

UE3.S5 water policies and uses
Information: Concerns only the part of the courses run by Mathilde Gralepois (Flood prevention).
The objective of this unit is to explain the history of flood prevention, territorial strategies and the evolution of options between defence infrastructures and nature-based solutions. The course studies the construction of public policies, the stakeholders and the tools implemented. The course explains the transition from public action based on hazard control to current crisis management positions.

UE3.UIT-S7 Territorial planning and development strategies
The aim of this course is to enable students to understand the main concepts involved in territorial development strategies, particularly in relation to innovation and sustainability issues.
In class, students will explore these strategies and dynamics through case studies carried out by groups of 3-4 students.

UE1.S7 General hydrology
This course will cover the notions of the water cycle, water balance, watersheds, hydrographic networks, hydrological processes and hydrological regimes.
The principle of the course is original: each student will be invited to discover the important basics of the course through personal work at home and in class, using online course material and quizzes to integrate each of the notions covered.
tutorials discussions and exercises/projects will enable students to apply these basics through active learning.

UE4.UIT.S7 ecodesign workshop (specialisation RESEAU)
The course consists of producing a project based on a commission that students must continually reformulate in order to make its modeling possible (this modeling makes it possible to dimension the project's solutions and various urban devices). The exercise applies to the design of a sustainable neighbourhood and the production of a working scale model or digital mock-up (VR) that meets the workshop specifications.

UE4.UIT. S7 European climate policies (specialisation ITI)
The aim of the course is to show the progress made and the obstacles encountered at European level in implementing mitigation, adaptation and loss reduction policies linked to climate change.

The role of European climate policy regulations in development issues and projects is both binding (resource preservation, low-carbon trajectory...) but also still poorly implemented in terms of social justice objectives, reducing inequalities, reducing carbon footprints or even desartificialisation.

UE2.IMAGE S9 Urban and anthropized rivers in Europe and the world
This course will cover the following topics: Adaptation measures and E&S (environmental and social) risks associated with urban/anthropized rivers - international issues and approaches (Europe and outside Europe). The course includes theory and analysis of existing urban restoration/conservation projects. The aim is to: Understand the environmental and social issues surrounding watercourses and wetlands in urban and highly anthropized environments, particularly in the context of climate change ; Acquire knowledge of environmentally-friendly adaptation and mitigation approaches and techniques in civil engineering and urban planning ; Analyze specific international case studies. Where appropriate, introduction to E&S impact studies

UE3.S9 research methodology and innovation
The objectives are as follows: Formulate a research question and choose a case study, a type of data and methodological tools to answer it ; Carry out data collection and analysis, adjusting initial objectives as necessary to suit the field situation ; Report on research in an intelligible and organized manner, both orally and in writing.

Supervised projects in engineering: project 1 and project 2
The “Research apprenticeship exchange program’’ is a course unit dedicated to international exchange students coming to Tours to study engineering sciences. This individualized program enables students to carry out projects within a research laboratory of the Graduate School of Engineering ‘Polytech Tours’. It consists of a project performed in a laboratory under the supervision of a lecturer, assistant professor or professor. The students will be evaluated by means of an oral presentation,
a written report and a theory test. The students can complete their study program with French courses for foreign students and with field courses taught in French or English.

Q1EORAL2 - Q1ECLAE2 : Oral and written French
French language and culture (in common with other courses at Polytech Tours).
This course is mandatory. The lessons are taught at the University Center for Teaching French to International Students (Centre Universitaire d'Enseignement du Français pour Etudiants Etrangers - C.U.E.F.E.E.

TU 01 : Group project 1
In this module, students integrate and cooperate in a work group. They undertake an interdisciplinary diagnosis, analysing the spatial situation from the perspective of morphologies, populations, the economy, urban history, etc. They acquire expertise in applied research tools. They produce an analysis grid and test it on the ground.

TU 02 : Geomatics
This course provides the skills that are necessary to define a GIS and its components, including the ability to model data, to create thematic maps and to choose visual

variables. These skills can be applied and further developed in the research projects that are carried out in group or individually.

TU 03 : Research methods
The course helps students to design a research strategy adapted to their topic. This comprises developing research questions, identifying useful sources to conduct planning research, presenting and structuring a research dissertation to meet required norms and rules. Following this unit, students will be able to carry out a critical choice of bibliographic sources and they will understand the idea of an original contribution to research.

SPRING SEMESTER (S6-S8)

UE1.S6 advanced geomatics
The aim of this course is to resolve planning and environmental issues by setting up a geomatics chain of processing, analysis and output of results for practitioners, decision-makers and users. By way of example, this course will look at daily mobility and associated itineraries, the exposure of major urban issues to natural hazards, multi-criteria analysis (slope, visibility, exposure) to identify favorable sites for development, and so on.
The preferred pedagogical approach is to apply the principles and functions of GIS spatial analysis (geodatabase, projection system, joins, geoprocessing, model builder, etc.) in an integrated way, according to the theme being addressed.

UE3.S6 Biodiversity
This course focuses on the basic knowledge in animal and plant systematics necessary to carry out ecological diagnostics in the field, to understand, interpret and write management and planning documents for natural and anthropized environments.

UE3.S6 Aquatic and urban systems
This course focuses on the functioning of aquatic systems: lake ecosystems, rivers, peat bogs and marshes, the notion of hydrosystem; matter cycles and functional groups; examples of organisms, case studies. It also covers environmental approaches to urban planning with a course on urban plant communities and habitats.

UE2.IMATGE.S8 Water law and wetland policies (“multi-use and multi-function in wetlands”).
Information: Concerns only the part of the courses run by Mathilde Gralepois (“multi-use and multi-function in wetlands”).
The aim of this course is to show how wetlands can be multifunctional spaces, particularly in urban areas, offering opportunities to combine wellbeing, environmental education, the reduction of heat islands, the protection of biodiversity, rainwater management and so on. This course will look at projects to understand the role of the various stakeholders, tools and regulations.

UE3.UIT.S8 group project (ITI or RESEAU)

ITI: Students should be able to transcribe new urban project and planning approaches to territories. The aim of the course is to teach students how to become urban project managers. The teaching method is based on workshop practice in international, multidisciplinary teams. Students work in foreign contexts and/or with international students from a variety of backgrounds. The international added value is to introduce students to innovative solutions developed abroad and to open them up to interculturality.
RESEAU: The aim of the course is to introduce students to the urban project management approach. Students respond to a commission from an external player (public or private) to design a project that meets more or less formal specifications. The aim of the workshop is to produce a set of solutions combining various environmental themes, in the form of group projects.

Supervised projects in engineering: project 1 and project 2
The "Research apprenticeship exchange program'' is a course unit dedicated to international exchange students coming to Tours to study engineering sciences. This individualized program enables students to carry out projects within a research laboratory of the Graduate School of Engineering 'Polytech Tours'. It consists of a project performed in a laboratory under the supervision of a lecturer, assistant professor or professor. The students will be evaluated by means of an oral presentation,
a written report and a theory test. The students can complete their study program with French courses for foreign students and with field courses taught in French or English.

TU05 Urban ecology
The concept of urban ecology is approached via the interrelationships between communities and the natural and built environments at local, regional and global scales. The society is losing its appreciation for the ecosystem services, thereby diminishing resilience in terms of mitigating problems arising out of urbanization. While urbanization has many detrimental effects on the ecosystem, it has also led to innovations aimed at reducing these effects.

Q1EORAL2 - Q1ECLAE2 : Oral and written French
French language and culture.
This course is mandatory. The lessons are taught at the University Center for Teaching French to International Students (Centre Universitaire d'Enseignement du Français pour Etudiants Etrangers - C.U.E.F.E.E.)