

Course catalog proposal – **Spring** semester (January – June):

Teaching Unit Code	Teaching Unit Title	Hours			ECTS
		Lectures	Tutorials	Project	
E3A6USE4	Introduction to Aquatic Ecology: Riverine, lake, and wetland ecosystems (COM 062)	24			2
E3A60FA4	Approaches and studies in aquatic ecology: Functional ecology of lakes, wetlands and rivers, ecophysiology of aquatic plants and animals ** (COM 063)		24		1
E3A6GEO4	Geomatics - Advanced GIS (COM 061)		24		1
E4A8UE34	Research methodology (COM 081)		24		2
E4A8ITI4 E4A8RES4	Workshop on: (UIT 082*) • International Territorial Engineering (ITI) • or Urban and Environmental Engineering (RESEAU)			120	8
Supervised projects in engineering	• Supervised projects 1 or • Supervised projects 2			600 or 400	30 or 20
Q1EORAL2 Q1ECLAE2	Oral and Written French ***		48		8
PFE	Research project (PFE)			84	6
EOUUE818	Research internship **** (TU 18)				25

\* Will run if open

\*\* E3A60FA4 (COM 063) requires E3A6USE4 (COM 062) as prerequisite except if studied before

\*\*\* 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. - <http://international.univ-tours.fr/cuefee>)

\*\*\*\* Will run during the next academic university year 2022-2023 if the [master's Planning and Sustainability](#) is open. [ EOUUE818 (TU 18) requires E9UUE318 (TU 13) as a prerequisite (one year student mobility) ]

<p><b>E3A6USE4 - Introduction to Aquatic Ecology: Riverine, lake, and wetland ecosystems (COM 062)</b></p> <p>Lectures: 24 h</p> <p>2 ECTS</p> <p><u>Contact:</u> <a href="mailto:karl.wantzen@univ-tours.fr">karl.wantzen@univ-tours.fr</a> / <a href="mailto:greulich@univ-tours.fr">greulich@univ-tours.fr</a></p>	<p><u>Prerequisites:</u> No prerequisite is necessary</p> <p><u>Course description:</u> This lecture informs future engineers about planning-relevant features of rivers, lakes, and wetlands as well as their ecosystem functions and biodiversity with a focus on environmental management. A system typology is given and the physical-chemical (abiotic) and organismic (biotic) variables are explained. It is necessary to know the complex interactions of these patterns and processes to understand how they change under the influence of human activities in the catchment basin and in the aquatic system itself. Aquatic ecosystems are the most threatened, although they are essential life-support systems of humanity.</p> <p><u>Course evaluation:</u> Final exam (written exam)</p> <p><u>Keywords:</u> Environment, water, biodiversity, human impact, restoration.</p> <p><u>Bibliography:</u> R. G. Wetzel, Limnology 3rd Ed Elsevier. J. D. Allan &amp; Castillo (2007), Stream Ecology, Elsevier. D. Dudgeon (2008) Tropical Stream Ecology, Elsevier. Wantzen, K. M., et al. (2016) River Culture: an eco-social approach to mitigate the biological and cultural diversity crisis in riverscapes. Ecohydrology &amp; Hydrobiology 16:7-18.</p>
<p><b>E3A60FA4 - Approaches and studies in aquatic Ecology: functional ecology of lakes, wetlands and rivers, ecophysiology of aquatic plants and animals (COM 063)</b></p> <p>Tutorials: 24 h</p> <p>1 ECTS</p> <p><u>Contact:</u> <a href="mailto:karl.wantzen@univ-tours.fr">karl.wantzen@univ-tours.fr</a></p>	<p><u>Prerequisites:</u> No prerequisite is necessary</p> <p><u>Course description:</u> Based on the general introduction on to processes and patterns in aquatic ecosystems (UE COM 062), this course (lectures and practical exercises) aims (i) to let students apply knowledge from UE COM 062 to case studies and (ii) to present aquatic ecosystems from a more organismic perspective. How do aquatic organisms (plants and animals) adapt to their environment? How do they shape their environment (act as engineers)? How do they cope with environmental variations, and where are the limits of adaptation? Can we transfer adaptive strategies by organisms to urban and landscape planning by humans? Based on this information, aspects of ecosystem management and restoration are introduced.</p> <p><u>Course evaluation:</u> Final exam (presentations and practical exercises)</p> <p><u>Keywords:</u> Organism, life-cycle strategies, adaptive traits, ecosystem management.</p> <p><u>Bibliography:</u></p>

<p><a href="mailto:greulich@univ-tours.fr">greulich@univ-tours.fr</a></p>	<p>J.D. Allen &amp; Melillo (2006). Stream Ecology - Structure and function of running waters. Chapman &amp; Hall.</p> <p>P.S. Giller &amp; B. Malmqvist (1998). The biology of streams and rivers. Oxford University Press (35 Dollar / 41,75 Euro LSL).</p> <p>Naiman R.J., Décamps H., Mc Clain M.E. 2005. Riparia. Ecology, conservation and management of streamside communities. Elsevier ED., 430 p <a href="http://www.univ-orleans.fr/mapmo/membres/khaoula/enseignement/cours-algebre.pdf">http://www.univ-orleans.fr/mapmo/membres/khaoula/enseignement/cours-algebre.pdf</a></p> <p>Brönmark, C. &amp; Hansson, L.A. 1998. The biology of lakes and ponds. Oxford University Press. 216 pp.</p>
<p><b>E3A6GE04 - Geomatics, Advanced GIS (COM 061)</b></p> <p>Tutorials: 24 h</p> <p>1 ECTS</p> <p>Contact: <a href="mailto:kamal.serrhini@univ-tours.fr">kamal.serrhini@univ-tours.fr</a></p>	<p><u>Prerequisites:</u> Basic knowledges on GIS, mapping and data management.</p> <p><u>Course description:</u> This courses focus on geographic data manipulation using a geographic information system (GIS). Complex spatial problems will be modeled and solved using geoprocessing tools (Model Builder). Students will work in pairs using <b>ArcGIS</b> software.</p> <p>These tutorials cover different topics including: Combine spatial data (intersect, union, clip, buffers, fusion...), Create and edit spatial data, Join tabular data (Excel) with spatial data, Translate spatial data into different coordinate reference systems, Collect, import and analyze GPS data, Make use of collaborative data (Open Street Map), Geocode addresses, Georeference raster dataset, Handle 3D Digital Elevation Models (DEM).</p> <p><u>Course evaluation:</u> Continuous assessment (at least two).</p> <p><u>Keywords:</u> GIS, spatial data, geolocation, spatial models, coordinate reference systems, geographic data acquisition, DEM.</p> <p><u>Bibliography:</u> David W. Allen, ArcGIS : Modelbuilder. ESRI Press. 2011, 320 p. Paul A. Zandberger, Python for ArcGIS. ESRI Press. 2013, 343 p. Meyer V., Kuhlicke C., Luther J., Fuchs S., Priest S., Dorner W., Serrhini K., and al., Recommendations for the user-specific enhancement of flood maps Natural Hazards and Earth System Science, Copernicus Publications on behalf of the European Geosciences Union, 2012, 12 (5), pp.1701 - 1716. <a href="https://www.nat-hazards-earth-syst-sci.net/12/1701/2012/">https://www.nat-hazards-earth-syst-sci.net/12/1701/2012/</a></p>
<p><b>E4A8UE34 - Research methodology (COM 081)</b></p> <p>Tutorials: 24 h</p>	<p><u>Prerequisites:</u> No prerequisite is necessary</p> <p><u>Course description:</u> This unit is designed to accompany the Master Thesis report elaborated during the semesters. It will explain and help the students step by step, from the research subject to the final findings. Concretely, The lessons will follow the different section of a academic article: Research Subject (1), Data &amp; Methods (2), State of art/ Literature review (3), theoretical Background (4) ; Results (5), and Discussion (6). This module</p>

<p>2 ECTS</p> <p><u>Contact:</u> <a href="mailto:mathilde.gralepois@univ-tours.fr">mathilde.gralepois@univ-tours.fr</a></p>	<p>aims to improve the research skills of students and to develop their critical evaluative skills in relation to the research conducted by other scholars.</p> <p><u>Course evaluation:</u> Report + oral presentation</p> <p><u>Keywords:</u> Research methods, state of art, empirical data, theoretical framework, findings.</p> <p><u>Bibliography:</u> Bell, Judith, “Doing your research project a guide for first-time researchers in education, health and social science”, Maidenhead : McGraw-Hill Open University Press, cop. 2014 6th ed. ISBN : 978-0-3352-6446-9 (br.) et 0-3352-6446-8 (br.) Farthing, Stuart, “Research design in urban planning a student's guide”, Los Angeles, CA: SAGE Publications, 2016. ISBN 978-1-446-29445-1 et 978-1-446-29444-4.</p>
<p><b>Workshop UIT 082 – (one among them):</b></p> <p><b>E4A8ITI4 Teamwork Project on “International Territorial Engineering (ITI)”:</b></p> <p>Project: 120 h</p> <p>8 ECTS</p> <p><u>Contact:</u> <a href="mailto:abdelillah.hamdouch@univ-tours.fr">abdelillah.hamdouch@univ-tours.fr</a></p>	<p><u>Prerequisites:</u> Basic french language level is required</p> <p><u>Course description:</u> ITI’s Workshop is conducted by groups of about ten students. It aims at the identification of relevant scale (neighborhood, city, agglomeration, region ...) to define spatial strategy elements. They cover many issues that articulate object and project in planning (places making, citizens in urban affairs, heritage and tourism, Master Plan’ orientations, economic development ...). Each workshop is supervised by 2 academics and 1 practitioner. The proposed exercise is field-oriented and calls for various analysis tools (data collection/analysis, interviews, surveys, sketching, mapping, graphing, photo, video...) to give a reliable diagnosis and introduce recommendations to solve a territorial problem (report/oral presentation).</p> <p><u>Course evaluation:</u> Report + oral presentation</p> <p><u>Keywords:</u> Diagnosis, recommendation, spatial planning, territorial issues, urban methods and engineering tools.</p>
<p><b>Workshop UIT 082 – (one among them):</b></p> <p><b>E4A8RES4 Teamwork Project on “Urban and Environmental Engineering (RESEAU)”:</b></p>	<p><u>Prerequisites:</u> Basic scientific knowledge is needed</p> <p><u>Course description:</u> The ecodesign workshop of NETWORK’s option aims to have students produce urban projects. These projects must respond to a mandate framed by an operational sponsor according to economic, social and environmental issues, and have to be materialized through an urban solution rigorously spatialized, sized and appropriately reported. In this training, the term “project” means on the one hand, the urban solutions sized thanks to several engineering models (energy, transport, water, waste...), and on the other hand, the process that makes it possible to produce them (“agile” methods). At</p>

<p>Project: 120 h</p> <p>8 ECTS</p> <p><u>Contact:</u> <a href="mailto:mindjid.maizia@univ-tours.fr">mindjid.maizia@univ-tours.fr</a></p>	<p>the conclusion of this process, students report scenarios of solutions (including the models they have designed) using innovative tools of communication (3D models, virtual reality, interactive GIS, web site, etc. - for an example, see <a href="https://sites.google.com/site/atelierecoconceptiondae">https://sites.google.com/site/atelierecoconceptiondae</a> )</p> <p><u>Course evaluation:</u> Report + oral presentation</p> <p><u>Keywords:</u> Agil method, network, energy, transportation systems, engineering models, urban design, environment.</p>
<p><b>E5A9UU14 - Research project (PFE)</b></p> <p>Project: 84 h</p> <p>6 ECTS</p> <p><u>Contact:</u> <a href="mailto:jose.serrano@univ-tours.fr">jose.serrano@univ-tours.fr</a></p>	<p><u>Course description:</u> This unit validates the research placement that will be conducted within the research laboratory Cities, Territories, Environment and Societies, and especially the research team "Urban and regional planning projects, landscape and environment". A tutor will advise each student and supervise his/her research and seminars will be organised.</p> <p><u>Course evaluation:</u> Report + oral presentation</p> <p><u>Keywords:</u> Research methods, research design, methodology: innovation, sustainable development, environment, agronatural space.</p> <p><u>Bibliography:</u> It depends on the topic considered</p>
<p><b>EOUUE818 - Research internship (TU 18)</b></p> <p>25 ECTS</p> <p><u>Contact :</u> <a href="mailto:christophe.demaziere@univ-tours.fr">christophe.demaziere@univ-tours.fr</a></p>	<p><u>Prerequisites:</u> Requires E9UUE318 (research methodology -TU 13) as a prerequisite (one year student mobility)</p> <p><u>Course description:</u> With the help of a supervisor, students develop a research question in relation to existing work and they conduct a state of the art literature review. They manage their research as a project (scheduling tasks, managing priorities and respecting deadlines). They write a thesis which sets out arguments, and links conclusions to data.</p> <p><u>Course evaluation:</u> Report + oral presentation</p> <p><u>Keywords:</u> Supervised research dissertation, documentary work, field work.</p> <p><u>Bibliography:</u> It depends on the topic considered</p>

**Supervised projects in engineering: Computer Sciences, Electronics and Energy Systems, Mechanics and System design, Urban and Territorial Planning and Environment**

The project will be of interest for foreign students who want to improve their skills in a specific field of engineering. Fields are detailed at:

<https://polytech.univ-tours.fr/english-version-/graduate-school-of-engineering-university-of-tours-france-468583.kjsp>

The project will be performed in a laboratory associated with the Graduate School of Engineering Polytech Tours under the supervision of a lecturer, assistant professor or professor of Polytech Tours. The language will be English or French. It is recommended that students interested attest a B1 level in English or in French (in some cases and exceptionally the A2 level can be OK).

Students can directly contact Professors of Polytech Tours or be recommended by a foreign colleague. They can choose a project proposed by a lecturer, assistant professor or professor of Polytech Tours or propose a topic to the professors of Polytech Tours (in co-supervision with a foreign colleague for instance). The students will be examined by a written report and an oral presentation (in English or in French). Because this course unit will be carried out within a laboratory, there will be less pressure regarding the students' level of French.

Two types of supervised projects are proposed:

- \* *Supervised project 1: 30 ECTS* on a single project (supervised at least by a professor of Polytech Tours, possibly in collaboration with a colleague from the home university of the student) that validates theoretical and/or technical skills in the field of engineering;
- \* *Supervised project 2: 20 ECTS* (project) completed by **10 ECTS** (disciplinary courses taught within Polytech Tours or French courses for foreign students).

<p><b>Supervised project in engineering 1</b></p> <p>Project: 600 h</p> <p>30 ECTS</p> <p>Level First or second year of Master</p>	<p><b>Supervised project in engineering: Urban and Territorial Planning and Environment</b></p> <p><b>Duration:</b> one semester (autumn [from September to the end of January] or spring [from the end of January to the end of June] semester)</p> <p><b>Application deadline:</b> before July, the 1<sup>st</sup>, for students coming for the autumn semester; before December the 1<sup>st</sup>, for students coming for the spring semester</p> <p><b>Content:</b> The project will be focused on one of the following fields: Computer Sciences, Electronics and Energy Systems, Mechanics and System design, Urban and Territorial Planning and Environment (aquatic and/or terrestrial). It must be carried out individually in a laboratory, under the supervision of a lecturer, assistant professor or professor of Polytech Tours (possibly in collaboration with another colleague). At the beginning of the project a work plan will be submitted by the student with the guidance of his/her supervisor at Polytech Tours.</p> <p><i>Caution: Before applying for this course all students must obtain the approval of their future supervisor. Students can also directly contact:</i></p> <p><a href="mailto:international.polytech@univ-tours.fr">international.polytech@univ-tours.fr</a></p> <p><b>Prerequisite</b></p> <p>For First year of Master students: 110 ECTS already validated in the specific scientific/ engineering field.</p> <p>For Second year of Master students: 145 ECTS already validated in the specific scientific/ engineering field.</p> <p><b>Assessment method</b></p> <p>- The project is examined by a written report (in English or French) completed by an oral presentation for 30 ECTS.</p>
<p><b>Supervised project in engineering 2</b></p> <p>Project: 400 h</p>	<p><b>Supervised project in engineering: Urban and Territorial Planning and Environment</b></p> <p><b>Duration:</b> one semester (autumn [from September to the end of January] or spring [from the end of January to the end of June] semester)</p> <p><b>Application deadline:</b> before July, the 1<sup>st</sup>, for students coming for the autumn semester; before December the 1<sup>st</sup>, for students coming for the spring semester</p>

<p>20 ECTS (i.e. 400 hours of work) + 10 ECTS (disciplinary courses taught within Polytech Tours or French courses for foreign students)</p> <p>Level First or second year of Master</p>	<p><b>Content:</b> The project will be focused on one of the following fields: Computer Sciences, Electronics and Energy Systems, Mechanics and System design, Urban and Territorial Planning and Environment (aquatic and/or terrestrial). It must be carried out individually in a laboratory, under the supervision of a lecturer, assistant professor or professor of Polytech Tours (possibly in collaboration with another colleague). At the beginning of the project a work plan will be submitted by the student with the guidance of his/her supervisor at Polytech Tours.</p> <p><i>Caution: Before applying for this course, all students must obtain the approval of their future supervisor. Students can also directly contact:</i> <a href="mailto:international.polytech@univ-tours.fr">international.polytech@univ-tours.fr</a></p> <p><b>Prerequisite</b> For First year of Master students: 110 ECTS already validated in the specific scientific/engineering field. For Second year of Master students: 145 ECTS already validated in the specific scientific/ engineering field.</p> <p><b>Assessment method</b> - The project is examined by a written report (in English or French) and an oral presentation for 20 ECTS; - Disciplinary courses taught within Polytech Tours and/ or French courses for foreign students (10 ECTS).</p>
<p><b>Q1EORAL2</b> <b>Q1ECLAE2 - Oral and Written French</b></p> <p>Tutorials: 48 h</p> <p>8 ECTS</p>	<p><u>Course description:</u></p> <p>French language and culture (in common with other courses at Polytech Tours).</p>