UNIVERSITÉ DE TECHNOLOGIE
TROYES

Doctoral School No. 361
Sciences for Engineers

PhD Students' Guide

3rd Edition

Preamble

Congratulations! You are reading this preamble because you have decided to undertake high-level doctoral training at UTT to extend your skills according to your own career plan.

Following on from your Master's degree, and provided that your previous training attests to your aptitude for research, your doctoral project will be your first professional research experience, permitting you to undertake three full research years in university laboratories, research institutes or industrial research laboratories. This doctoral project will culminate in the defense of a PhD thesis before an examining panel and, ultimately, a PhD degree from Université de Technologie de Troyes.

From the 2018-2019 academic year, the UTT Doctoral School bears the name **"Sciences for Engineers (Sciences pour l'Ingénieur - SPI)".** It offers PhD students the opportunity to carry out their doctoral project in one of the following three disciplinary fields (commonly called "specialties"):

- Sociotechnical Systems (Systèmes SocioTechniques - SST)
- Materials, Mechanics, Optics and Nanotechnology (Matériaux, Mécanique, Optique et Nanotechnologie - M^2ON)
- Optimization and Systems Safety (Optimisation et Sûreté des Systèmes - OSS)

Doctoral project can only be undertaken after identifying (i) the scientific program for your doctoral project, (ii) one or more doctoral supervisor(s) (iii) a funding to cover the full duration of the doctoral project and a research team that welcomes you inside or outside UTT and (iv) a research team that welcomes you inside or outside UTT.

The role of the Doctoral School (ED) is to organize PhD research training and to prepare the PhD students for professional life after their PhD degree. The Doctoral School offers PhD students training activities that promote interdisciplinarity and the acquisition of a broader scientific culture, including the soft skills and the knowledge of the international research context. After accepting a PhD student's application, the Doctoral School will thus offer him or her a comprehensive training package that includes high-level science and technology training (Formations Scientifiques et Technologiques - FST) and soft skills including the employability-focused training (Formation à l'Insertion Professionnelle - FIP) with a strong awareness of research ethics and scientific integrity.

The Doctoral School SPI ensures a global quality approach to doctoral training by setting up individual monitoring committees (CISs) for each PhD student and offers doctoral supervisors specific support, if necessary, to improve the quality of the doctoral supervision. It gives the PhD student the means and conditions to build skills according to his professional project by creating and updating, throughout his doctoral project, a portfolio of acquired skills.

The Doctoral School is also responsible for guaranteeing the overall success of every PhD student's project, involving all interested parties, starting with the PhD student and his/her doctoral supervisor(s). The terms, rules, duties and obligations of each doctoral project participant are defined in the "**Doctoral Charter**", signed at the first registration by the PhD student him/herself, the doctoral supervisor(s), the head of research team and, where appropriate, the industrial partner.

The aim of this "PhD Students' Guide" is to introduce you to how your Doctoral School is organized and provide you with essential administrative and academic information related to your doctoral project, as well as the organization of research and support services for UTT's research and innovation activities.

K. Saanouni

Doctoral School Director

(September 2018)

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Presentation of research at UTT

Science policy at UTT is defined by the Research Department (Direction à la Recherche), in cooperation with the Charles Delaunay Institute ICD) and the research teams. This policy is presented discussed and validated by the UTT's Scientific Council. The Doctoral School is a structuring element of the institution's research strategy and contributes to the implementation of this policy. The Charles Delaunay Institute brings together all UTT's research stakeholders in the major fields of engineering science and of information science and technology.

The main aim of this policy is to enable researchers to:

- Develop high-level scientific activities in their field, often in partnership with other research institutes and economic stakeholders;
- Maximize synergies between disciplines to implement large-scale transdisciplinary programs.

The ICD's scientific equipment are also an asset when it comes to enhancing scientific and industrial partnerships.

The ICD is made up of eight teams whose research topics are:

- Autonomous Networks Environment (ERA)
- Mesh Generation and Advanced Methods (GAMMA3)
- Life Assessment of Structures, Materials, mechanics and Integrated Systems (LASMIS)
- Light, nanomaterials, nanotechnologies (L2n)
- Logistics and Optimization of Industrial Systems (LOSI)
- Modeling and Safety of Systems (M2S)
- Interdisciplinary research on the transition to sustainability of sociotechnical systems (CREIDD)
- Technologies for Cooperation, Interaction and Knowledge in Collectives (Tech-CICO)

ICD hallmark (2014 – 2017 data):

- 320 total staff, 120 research lecturers
- 215 international cooperative scientific projects with partners in 42 countries
- 120 PhD theses defended
- 470 articles in leading scientific journals
- 400 articles in international conference proceedings
- €18 M in research contracts, €3.5 M of which pertains to research partnerships with businesses
- High-tech equipment in all ICD fields: 7 technical platforms dedicated to research: NANOMAT, NUM3D, CAPSEC, CyberSec, EcoCloud, Living Lab ActivAgeing, Adhere
- Approximately 40 patents filed (INPI (French Patent and Trademark Office), EPO)

The structure of the Doctoral School and the disciplinary fields offered for doctoral research projects are perfectly consistent with this research set-up.

Application for a PhD

To prepare a PhD thesis at UTT, prospective students must submit an application file to the secretariat of the Doctoral School "Sciences for Engineers" (ED SPI). This document, available on the UTT website and digital workspace (ENT), is required in order to examine all the data allowing you to be considered for admission to a PhD in one of the three Doctoral School specialties.

The application file provides information about your previous education, skills and motivation. It also allows the Doctoral School to verify the quality of supervision for the expected doctoral project, its type ('traditional', CIFRE Industrial Research Training Convention, international joint PhD, etc.) and how it will be funded. It consists of the following documents:

- A detailed breakdown of training in progress or leading to the highest qualification obtained (for training courses taken abroad)
- An official list of grades obtained, with a ranking if possible
- A summary, in French or in English, of the PhD project written for this qualification (if applicable)
- List of scientific publications (if applicable)
- Two recommendation sheets written by individuals **not directly related to the doctoral project**
- Current CV and letter of motivation
- Subject description (written by the doctoral supervisor(s)) for doctoral projects outside the scope of the Doctoral School grant allocation campaign
- The funding envisaged to cover the full duration of the doctoral project

The first registration in PhD

Once you have been notified of admission to a PhD, you can register for the current academic year. This first registration can be processed at any time during the academic year, without any impact on the amount of tuition fees payable. These are, indeed, defined annually by the applicable government ministry.

To proceed with your registration, you must complete the corresponding file issued to you by the Doctoral School once your admission has been approved. You will need to fill in it fully and submit it to the Doctoral School secretariat, signed by yourself and your doctoral supervisor(s) and validated by all the appropriate rights holders.

The duration of the doctoral project is normally 3 years (see Article 14 of the Decree of 25 May 2016 on doctoral training). Its funding, including the salary of the PhD student and the cost of the project, must be guaranteed by the doctoral advisor(s) and secured throughout its full duration.

Start of the doctoral year

On the last Monday of September (the first day of the first week of the academic year), all PhD students (whether registering for the first time or re-registering) are called to a COMPULSORY information meeting. The first registrations will then take place, by appointment, over the next few days. When you register, your administrative and pedagogical data will be recorded, along with scientific information related to your doctoral project.

Doctoral Charter and Training Agreement

The doctoral charter is one of the provisions of the decree of 25 May 2016 establishing the national training framework and procedures leading to the awarding of the national doctoral degree. It meets the recommendations of the European Charter for Researchers. A contractual document that sets out the conditions under which doctoral projects are undertaken and PhD students supervised and monitored. It must be co-signed, upon first registration, by the PhD student and his/her doctoral supervisor(s) and approved by all the right holders.

Although it is filled out and signed during the initial registration, it can nevertheless be modified where necessary, through a simple amendment as part of the annual re-registration process.

Appendix 1 of the Doctoral Charter is the PhD students' "Training Agreement", through which the various individuals involved in the doctoral project commit themselves to respecting the principles set out in Article 12 of the decree of 25 May 2016. It takes into account any other agreements relating to the doctoral project and can be modified as needed, during the re-registration process, through a signed agreement between the parties. The institution registering the PhD student is responsible for overseeing its implementation.

This PhD student "Training Agreement" addresses the following points:

- Identification of the doctoral project, specifying the title of the project, the doctoral supervisor(s), the institution(s) registering the PhD student and the host research team(s). There will also be an indication of whether the doctoral project is being undertaken as part of an external co-supervision or an international joint PhD arrangement
- The professional status of the PhD student at each of the host institutions, specifying whether the doctoral project is conducted on a full-time or part-time basis
- The financial conditions of the doctoral project, specifying the type(s) of funding, the respective amounts and durations and the type(s) of associated contract(s)
- The material conditions in which the doctoral project is taking place, specifying its operational budget, the office equipment, the computer and scientific equipment required and any specific access or the working safety conditions
- The terms of supervision and integration into the research team, specifying:
    - The expected scientific program and provisional schedule of the research work
    - The specific terms under which the PhD student is being supervised
    - How the PhD student is being integrated into the research team?
- The procedures for monitoring the training set-up and progress of the PhD student's research
- The PhD student's career plans and how these fit in with the provisional training pathway they have chosen in accordance with their professional project
- The objective of the research work valorization and the expected industrial benefit.

This agreement must be filled by the advisor(s), completed by the recruited PhD student, and signed by the signatories prior to the first registration. It can be, if necessary, updated by amendment on the occasion of each re-registration.

The charter and its appendices can be downloaded from the digital workspace (ent.utt.fr) > Documents tab > UTT Documents > Doctoral School > Administrative documents > Doctoral Charter.

Information system charter

The purpose of the UTT Information System Charter is to set out the conditions for accessing and using the university's information system, describing users' rights and duties in accordance with French and international rules. It must be signed by all users when they first register. The Information System Charter can be downloaded from the digital workspace (ent.utt.fr) > Documents tab > UTT Documents > Computer Resource Centre > Charter > UTT IT Charter.

The doctoral training rules

This document defines the framework in which studies are pursued at the Doctoral School. In particular, it sets out the conditions for admission to the doctoral program, the length of doctoral projects and the way in which they are organized, along with the cases in which these studies can be suspended for a gap period. It indicates the procedures through which the doctorate certificate is awarded. Finally, it presents the various forms of funding available to new researchers: grants from government ministries or local authorities and other forms of funding. These regulations can be downloaded from the digital workspace (ent.utt.fr) > Documents tab > UTT Documents > Doctoral School > Official Documents > Doctoral Training rules.

Funding a doctoral project

Registration in PhD is conditional, among other things, on obtaining funding for the full duration of the doctoral project (3 years in principle). You will find below a non-exhaustive summary of the main types of funding available to prospective PhD students.

Doctoral contract: every year, UTT is awarded financial support for a certain number of PhD students (see information related to specific situations) from the French Ministry of Higher education and Research, local authorities (Grand Est Regional Council, Aube Departmental Council, Troyes Champagne Metropolitan Council), or in the context of research programs (ANR, CPER, etc.). It should be noted that the majority of doctoral projects are actually co-funded by two or more organizations.

Each beginning of the academic year, UTT (through its scientific bodies) issues a call for projects to its doctoral faculty. The Directorate for Research in collaboration with research teams and the Scientific Council of the institution, selects projects for funding. The ED manages the recruitment campaign to select the best PhD candidate for projects selected for funding. In May, each research team must submit the applications of the candidates they have shortlisted and ranked. The quality of the applications is evaluated by an ad hoc committee called the “Mixed Committee”, composed of the internal members (lecturers) of the Scientific Council along with members of the Doctoral School Council. The procedure results, generally at the middle of June, in the awarding of “doctoral contracts” by the Doctoral School Council.

Scientific organizations (CNRS, CEA, ADEME, ANDRA, INRIA, etc.) fund or co-fund doctoral projects. Refer to their websites for more information.

CIFRE projects: The CIFRE (Industrial Research Training Agreements) scheme provides grants to any French company taking on a PhD student as a central part of a research collaboration with a public laboratory. This work will culminate in the defense of a PhD thesis after three years. CIFREs are fully funded by the French Ministry of Higher education and Research, which has entrusted their implementation to the National Association for Research and Technology – ANRT – (see website www.anrt.asso.fr/index.jsp).

This is a tripartite collaboration involving a company, an academic team (in this case UTT) and a PhD student selected in advance by the company and/or doctoral project supervisor(s). In parallel,

- The PhD student submits his/her application form to the Doctoral School, which examines it with a view to admission;
- The company and the research lecturer get in touch with the UTT Companies Relations Direction (DRE) to set up the collaboration agreement to be signed between the two entities. The DRE informs the Doctoral School of its agreement for the implementation of the CIFRE project. The Doctoral School then provides the candidate’s certificate of admission (if approved), as requested by the ANRT and required for submission of the file;
- The company submits this file to the ANRT, which gives notification of its decision within two to three months;
- Upon receiving the ANRT’s agreement, the PhD student will then be able to proceed with his/her registration.

The Doctoral School can only proceed with registering the PhD student:

- Upon presentation of ANRT’s approval as regards the CIFRE agreement or upon presentation of the company's commitment to take charge of fully remunerating the PhD student in case of a negative response from ANRT;
- Once UTT’s DRE has approved the agreement (see support contract).

Once CIFRE funding has been confirmed, the PhD student is then an employee of the company, which will receive a grant from ANRT.

Employer-funded projects: There are two main cases excepting the CIFRE projects (discussed above):

- The doctoral candidate is already an employee of a company that approves his/her commitment to a PhD;
- A company selects a doctoral candidate as part of a research project.

The company pays the PhD student during the 3 years of the doctoral project.

In both cases, just like the CIFRE project, this is a tripartite collaboration involving a company, a university team, in this case UTT, and a PhD student.

Before any agreement is entered into, the candidate must submit his/her application file to the Doctoral School, which will study his/her possible admission.

The company and research lecturer will get in touch with UTT's DRE to draw up the collaboration agreement to be signed between the two entities. The DRE will inform the Doctoral School of its agreement on the funding set up for the doctoral project.

The PhD student is an employee of the company (fixed or open-ended contract) or, in some cases, UTT (doctoral contract).

PhD students of foreign nationality: PhD students of foreign nationality may apply for:

- A grant from the government of their own country (steps to be taken directly by the PhD student with the applicable organizations, or via UTT within the framework of the Doctoral School's international programs: China, Lebanon, Tunisia, Argentina, etc.)
- A scholarship from the French Ministry of Foreign Affairs (see calls for applications issued by French embassies in countries of origin - steps to be taken by the candidate)
- In the case of a joint PhD, a grant from the government of their country of origin or other funding that may take different forms (steps to be taken by UTT's Doctoral Director along with the Doctoral School)
- etc.

The funding of doctoral projects (including PhD students' salary) is an essential point for UTT that must be clearly defined from the beginning of the project. The minimum remuneration for PhD students is set each year by the UTT Doctoral School Council (CED). It currently amounts to the salary of a part-time ATER (Temporary Lecturer and Research Assistant) undertaking half the total full-time hours.

To conclude, we would like to specify that self-funding (personal, family, etc.) is not accepted.

Some useful addresses: Below are some addresses providing useful information for PhD students.

French National Association of Doctors of Science (ANDès): this brings together doctors of all disciplines, whatever their age or professional status, whether they reside in France or abroad. Their website (www.andes.asso.fr) includes a funding guide and summary of almost all the financial support available to PhD students.

Association Bernard Grégory (https://www.abg.asso.fr): its mission is to promote training through research in the socio-economic world and help young doctors in all disciplines enter the workplace. Doctoral project offers, including from UTT, can be consulted in the EMPLOYMENT section of their website.

Doctoral project organization and thesis defense

Doctoral project organization

Let's remember first and foremost that the PhD qualifications are the highest degree awarded by higher Education institutes to PhD students who complete an original and significant new scientific contribution in their subject. Conducted under the management of one or more (generally not more than two) doctoral supervisors, it validates three years of high-level research work. The PhD work is performed at a qualified institution. It involves several individuals, including the PhD student and his/her doctoral supervisor(s), who are the main stakeholders. The Doctoral Charter, with its appendix entitled “Doctoral Training Agreement”, sets out the rights and duties of each of its parties.

The doctoral project is a real professional project and PhD students must manage it as such. It supports the development of their scientific expertise, as well as related skills that the Doctoral School helps them to identify, acquire and enhance.

The doctoral project begins with the signing of the Doctoral Charter and its appendix, the “Doctoral Training Agreement”, setting out the context and conditions under which each PhD student’s project is being organized. In particular, the program and provisional schedule of the research work must be defined by the doctoral supervisor(s) and given to the PhD student as soon as he/she registers for the first time (see Article 5.1 of the Doctoral Training Agreement).

As soon as they first register, PhD students admitted to the Doctoral School are notified of an individual monitoring committee (CIS), the role of which is to oversee the successful organization of their project in accordance with the Doctoral Charter and Doctoral Training Agreement therein (see next paragraph).

In general, and in very broad terms, the first few months of a doctoral project are devoted to finalizing an appraisal of the state of the art and really taking ownership of the research project and its scientific aims. This period will enable you to perfectly define your role within the research project and its associated aims. Your main task is to make a personal contribution to solving the problem introduced by the doctoral project. It is a period of training in research and for research. The role of your doctoral supervisor(s) is to help you achieve the defined aims by advising and supporting you in this exercise.

Right up until the end of the doctoral project, you will move forward with your research in accordance with the previously defined work plan and leverage your contribution to the progress of the work and results obtained (publications, patents, thesis, etc.). As part of this, you will present your work in the form of laboratory seminars, conference oral or poster presentations, etc.

In addition, it is important to note that writing your thesis is a very special exercise, which is far from trivial and requires a minimum of 6 months’ full-time work. **You are therefore strongly advised to organize the document as soon as possible and write some parts of it as your research work progresses.** This is really the main way to optimize your final writing up time and defend your doctoral thesis within the allotted deadline.

Personalized monitoring throughout the doctoral project

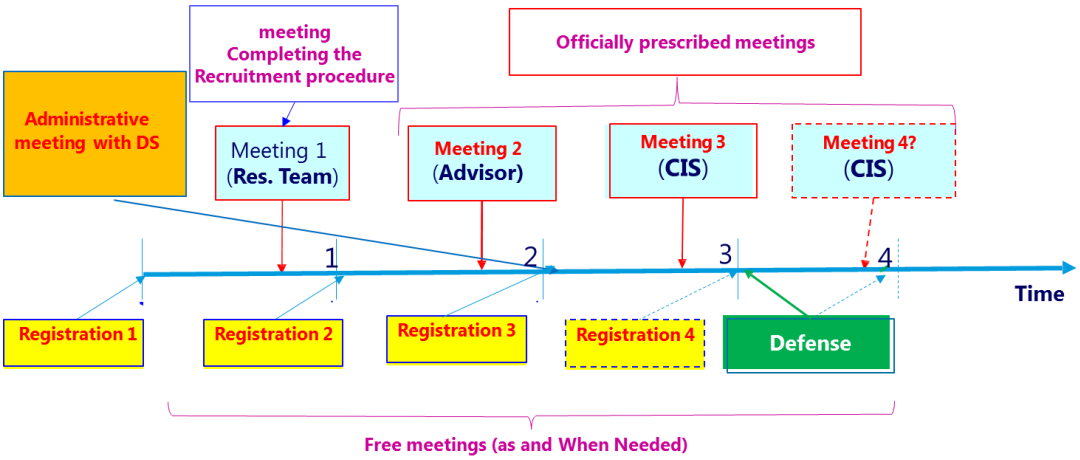
In accordance with Article 13 of the Decree of 25 May 2016 (see also Article 5 of UTT's Doctoral Training Regulations), the Doctoral School will issue every PhD student enrolled on its doctoral program with an “Individual Monitoring Committee” (CIS) for the duration of his/her doctoral project. This CIS oversees the successful organization of the PhD student's project in accordance with the Doctoral Charter and Doctoral Training Agreement therein. Through annual meetings with the PhD student, it evaluates the conditions of his/her training and the progress of his/her research. It makes recommendations and sends an interview report to the Doctoral School Director. In particular, it seeks to prevent any form of conflict, discrimination or harassment.

The Doctoral School sends the CIS’s final report to the PhD student, his/her doctoral supervisor(s), to the responsible of the doctoral school specialty and, if necessary, the head of the PhD student’s host research team.

The practical modalities of composition, organization and working of the CIS at the UTT were defined by the CED of 28 June 2017 as follows:

A CIS is made up of three Research Lecturers (RLs): two senior RLs and one junior RL (if possible), aside from the doctoral supervisor(s), for each PhD student and for the duration of his/her doctoral project, including any exemption periods. At UTT, CISs are formed by cohort under the responsibility of the Doctoral School's three heads of specialties, in cooperation with the directors of the three departments.

The following scheme shows the way in which CIS meetings are organized for PhD students undertaking a typical 36-month doctoral project:



For the duration of the doctoral project, at least an annual plenary meeting is organized between the PhD student and his/her CIS, after which a report is drawn up validating the continuation of the doctoral project. These reports are prepared on specific sheets made up of three main parts. The first part is dedicated to the supervisor(s)' opinions. The second part is reserved for the CIS's remarks, recommendations and opinions. While the third and last part is dedicated to the PhD student's observations, in which he/she must certify that he/she has read all the applicable remarks and recommendations. A PhD students' **reenrollment is always subject to the favorable opinion of his/her CIS**.

Very broadly speaking, the way CISs work on a practical level is as follows (see the detailed instructions on the workings of CISs available from the Doctoral School):

- The first meeting between the PhD student and his/her CIS takes place during the first year of the doctoral project, approximately **6 to 8 months after the initial registration date**. Its aim is to ensure that the PhD student's skills match the scientific requirements of his/her doctoral project. That is to say, to make sure that the PhD student is well aware of the project's scientific aims and issues, has the necessary skills to carry out his/her work within the allotted timeframe and has presented a suitable provisional work schedule for the entire duration of his/her doctoral project. **The organization of this first meeting is free under the responsibility of the research team in coordination with the responsible of the specialty, the advisor(s) and the PhD student**.
- The second meeting takes place during the 2nd year of the doctoral project (typically in the spring) **between 20 and 24 months after the initial registration date**. It is organized by the doctoral supervisor(s) in the form of a mid-term mini-defense of the doctoral project in the presence of a scientific expert from outside UTT. The PhD student gives a presentation on how his/her work is progressing, along with the schedule of work remaining to be done before he/she can defend his/her thesis, and answers questions asked by the CIS and external member in the presence of his/her doctoral supervisor(s).
- The third meeting takes place in the middle of the third (and last) year of the doctoral project typically **30 months after the initial registration date**. Its aim is to take stock of how the doctoral project is gearing up for the defense of a doctoral thesis. This final meeting must take place no later than 6 months before the doctoral project's end date. The PhD student presents his/her thesis plan and discusses how he/she is progressing with writing it. He/she also gives information on when he/she plans to defend it and his/her chosen examining panel. The CIS must give a clear opinion on the feasibility of the thesis being defended before the end date of the doctoral project

funding. If it looks like this will be difficult to organize within the stipulated timeframe, it issues recommendations upon which the PhD student must draw in order to request an exemption and apply to re-register for an additional period. This can only be granted provided that the doctoral supervisor(s) can guarantee the availability of funding to cover the required additional period.

If, during this third and last meeting, the CIS considers that the PhD student will be able to defend his/her thesis within the deadline, its opinion is used by the Doctoral School to authorize this as soon as the PhD student submits his/her thesis defense application file.

If the PhD student is allowed to re-register for additional time, the same type of meeting with his/her CIS must be organized.

In addition to these prescribed and regulated annual meetings, PhD students can call meetings of their CIS as and when needed.

Finally, it is important to note that, at the beginning of the last PhD year, you will be interviewed by the Doctoral School. This interview aims to:

- discuss with you the procedure with regard to defending your PhD thesis and give you the necessary administrative information and advises to ensure you will be able to do this within the prescribed timeframe;
- inform you about what you have to do, before the defense of your PhD thesis, in order to effectively prepare your professional insertion immediately after your PhD defense .

Reenrollment in PhD

Since the legally established duration of a doctoral project is 3 years, your registration must be renewed, subject to approval by your CIS, at the start of each academic year, until you are ready to defend your thesis. The re-registration file and additional documents can be downloaded from the digital workspace (ent.utt.fr) > Documents tab > UTT Documents > Doctoral School > Administrative documents > Re-registration file.

PhD students may be granted an exemption authorizing them to extend their doctoral project and thus enroll for a fourth doctoral year (or more), subject to approval by their CIS and the Doctoral School Council, at its June meeting. In this case, they may be exempted from paying the registration fee if they defend their thesis before 31 December of that calendar year.

It is reminded that the maximum duration of the doctoral project is six years (3 registrations of right and a maximum of three derogatory registrations), according to the article 14 of the decree May 25, 2016 setting the national training framework and the procedures leading to the award of the national doctoral degree.

Start of academic year

During the final week of September, ALL PhD students (whether registering for the first time or re-registering) are called to a **COMPULSORY** information meeting (on the first day of the first week of the academic year). Your re-enrolment will be processed from September 1st by the Doctoral School on simple submission of your file.

As part of the year-start welcome day, a conference-type event is organized (debate, round table, etc.) to tackle a specific problem certain to be of interest to PhD students. This is a good opportunity for PhD students to complete their EDSEM requirements, a compulsory element of their doctoral studies (see the doctoral training program).

STEP registration of your project subject

From the beginning of the second year of their doctoral studies, PhD students are encouraged to register the subject of their doctoral project under progress on the STEP application (**S**ignalement des **T**hèses **E**n **P**réparation), developed by the ABES (Agence Bibliographique de l'Enseignement Supérieur - Higher education Library Agency). The aim is to ensure that all PhD theses being prepared are registered in order to guarantee their referencing and indexing in the **theses.fr** search engine.

Since the STEP application is interconnected with the STAR application (**S**ignalement des **T**hèses et **AR**chivage), entry into STEP automatically facilitates the subsequent registration in STAR, which is an obligation for all PhD theses defended according to Articles 24 and 25 of the Decree of 25 May 2016.

PhD students enrolled in the second year of their PhD can therefore contact the Doctoral School to request the posting of their doctoral project subject on **theses.fr** website. To this end, the Doctoral School provides them with a form to fill in and sign in order to declare the initial subject of their doctoral project in progress. PhD students should return this along with their re-enrolment file in order to trigger the STEP registration process.

Doctoral training

The doctoral degree is conditioned by the validation, by the PhD student, of a minimum of 120 hours of training with at least 60 hours in FST (Scientific and Technological Training) courses and 60 hours in FIP (Training for Professional Integration) courses. The aim of the FST offer is to deepen the PhD student's scientific knowledge and/or broaden his scientific and technical culture. The aim of the FIP offer, is to help the PhD student in developing his "business" knowledge of a future doctor. To teach him how to disseminate scientific and technical information, to guide him in thinking about his professional project and to give him adequate tools to help his professional integration including his awareness of the ethics and the scientific integrity. UTT's FST and FIP doctoral training, organized into packages or "Bunches" and "specialized pathways", is described in detail in the following chapter (see page 17).

Two specialized pathways are also offered to interested PhD students:

Business Skills Pathway (**PCPE**) offered to PhD students who are destined to economic fabric and the business world based on the CDEFI (Conference of Directors of French Engineering Schools) program.

Teaching in Higher Education Skills pathway (**PCES**) offered to PhD students interested in a career in higher education.

In addition to the validation of the 120h FST and FIP, the PhD student must provide proof, via his passport of seminars, provided by the Doctoral School at its first registration, that:

- he has attended at least 15 scientific seminars (5 per year on average over the duration of the 3 years' doctoral project), and
- made an oral presentation (poster, oral presentation, demonstration …) to at least one event organized by the Doctoral School (PhD students' forum or What's Up Doc!, E.D. re-entry day, Science Feast or other from UTT or from outside).

In order to encourage their outward international mobility, PhD students may have a maximum of 20 hours' training (10h of FST type and 10h of FIP type) validated for any stay abroad lasting a minimum of 2 months, taken together or separately (excluding joint PhD programs).

The Doctoral School "Sciences for Engineers" offers the PhD students the possibility of validating training completed outside UTT. This option is available to all PhD students if deemed necessary for their training program, as defined by the PhD students together with their supervisor(s). It also takes into account the many geographical limitations linked to PhD students' research locations (CIFRE project, joint PhD, etc.). The validation requires approval to be obtained **prior to enrolment on the course** from the head of specialty (for FST) or from the Doctoral School Director (for FIP). Attendance at a summer or winter schools, for example, may be validated as FST training.

The training offered by the Doctoral School comes under the administrative responsibility of either the responsible of the specialty under concern (for the FST category) or the Doctoral School Director (for the FIP category).

The number of hours in each category is validated by the jury of each Bunch/Pathway under the responsibility of its coordinator.

Gap period

In exceptional circumstances, PhD students may request **one** gap period, lasting for a **maximum of one year**, during the funded duration of their doctoral project. They must provide good reasons for that and the head of the institution make the final decision.

During this period, the PhD student's training, research and funding will be temporarily suspended, but he/she may remain enrolled at the University if he/she so wishes. This period will not be taken into account when calculating the total duration of the doctoral project. The funding corresponding to the duration of the requested gap period will be frozen until the end of this period. The institution

guarantees to the PhD student who suspends his doctoral activity, his enrollment in the doctoral training at the end of the gap period, if funding is available to continue the doctoral project.

PhD thesis defense

The thesis defense is the result of three years of research undertaken during the doctoral project as part of the university or company research team, culminating in the writing of a doctoral thesis. If the work has been carried out in a collaborative research context, the personal contribution of each PhD student is evaluated by means of a thesis written and presented by each individual PhD student to the examining panel.

The defense adheres to a specific administrative procedure defined in detail by Articles 17, 18 and 19 of the Decree of 25 May 2016 relating to doctoral training, summarized as follows:

- Authorization to defend a doctoral thesis is granted by the head of the institution upon recommendation of the Doctoral School Director and the proposal of the doctoral supervisor(s).
- The PhD students work is first examined by **at least two referees** designated by the head of the institution **qualified to lead research or belonging to one of the categories mentioned in 1° and 2° of Article 16 of the Decree of 25 May 2016**, proposed by the Doctoral School Director based on the doctoral supervisor(s)' recommendation. Where research involves individuals from socio-economic world outside of the academic world, **a third referee, known for his competence in the domain, may be appointed**, proposed by the Doctoral School Director based on the doctoral supervisor(s)' recommendation.
- The two referees should be external to the Doctoral School and the institution attended by the PhD student (except where not permitted by the subject field or research content). They may belong to other higher education or international research institutions or other international organizations.
- The referees should not be involved in the PhD student's work. They submit their views in written reports at least three weeks before the planned date for the thesis defense. The head of the institution authorizes the defense on this basis. These reports are communicated to the examining board and the PhD student before the defense.

After the Doctoral School receives the referees' reports in favor of organizing the thesis defense, the Doctoral School organizes the defense event in accordance with the following principles:

- The thesis defense examining panel is appointed by the head of the institution following a proposal by the Doctoral School Director based on the doctoral supervisor(s)' recommendation. Examining panel members number should be between four and eight. At least half the examining panel should be made up of French or foreign nationals **not belonging to the Doctoral School or the institution at which the PhD student is registered** and chosen for their scientific or professional skill in the research field under concern, subject to the provisions relating to international joint PhD programs.
- The examining panel must allow for a **balanced representation of men and women**. At least half the examining panel must be composed of university professors or similar, or teachers of equivalent rank not under the responsibility of the ministry of higher education.
- Before the start of the defense session, the members of the examining panel choose which one of them shall act as Chair and, if required, thesis referee. The Chair must be a professor or similar, or a teacher of equivalent rank.
- The doctoral supervisor(s) sit(s) on the examining panel **but do(es) not take part in the decision**. When several institutions are accredited to jointly confer the doctorate, the jury panel is appointed by the heads of institutions accredited to confer doctoral degrees.
- The thesis defense is public, **except where an exemption has been granted on an exceptional basis** by the head of the institution, based on the recommendation of the Doctoral School Director, **due to the proven confidential nature of the doctoral project, as explicitly mentioned** in the agreement previously signed by the various partners involved.
- As part of its deliberations, the examining panel assesses the quality of the PhD student's work, its innovative character, the PhD student's ability to frame it in a scientific context and his/her presentation skills. The examining panel may request corrections, which must be made by the

PhD student within 3 months after the defense day, in accordance with Article 24 of the Decree of 25 May 2016.

- Exceptionally, members of the examining panel (other than the Chair) may participate in the defense session by Visio conference or other means of electronic communication. This must allow for their identification and effective participation in a collegiate decision and meet technical requirements to guarantee continuous and simultaneous transmission of the debates.
- The candidate's outright pass or required adjustments are announced after the examining panel's deliberations. The Chair of the examining panel signs the thesis defense report, countersigned by the other members of the examining panel present at the viva. The thesis defense report is sent to the PhD student in the month following the viva.

The deadlines imposed by this procedure seem very tight when the moment comes. You are therefore recommended to seek information from the Doctoral School one year before the date you plan to defend your thesis. Your meeting with Doctoral School Director at the start of the last year of your doctoral project is the perfect opportunity to familiarize yourself with the thesis defense procedure.

The CED of 15/11/2018 set up a new Defense Committee (CdS). It is made up of the specialties responsible, the Deputy Director and / or Director of the Doctoral School (who chairs it). The CdS meets regularly with a periodicity ranging from 1 to 3 months depending on the needs. The dates of the meetings are decided and published in advance by the Doctoral School.

The procedure for preparing the defense takes place in two steps:

- Step 1 : At the latest 2 working days before the date of the meeting of the CdS, the PhD student submits the first part of his defense file which includes the 4 following documents, duly completed and signed by the entitled persons:
  - The file "Proposal of rapporteurs and jury members"
  - The file "Presentation of the candidate"
  - The file "Research Products"
  - The EDSEM passport duly completed and signed by all the signatories.

  The Doctoral School verifies the admissibility and the conformity of these documents and transmits the files to the CdS which examines it in order to decide on its conformity with the requested conditions.
- Step 2 : If the opinion of the CdS is favorable, the Doctoral School asks the PhD student to submit, at the latest 8 weeks before the expected defense date:
  - The file entitled "Bordereau de thèse" duly completed and signed by the PhD student and his / her doctoral director(s).
  - The final manuscript of the thesis validated by the doctoral director(s).

Based on this procedure the university head authorizes your thesis defense.

The rules pertaining to the constitution of the examining panel are very specific and are governed by law (see above). Any examining panel member proposals subject to exemption requests must be accompanied by the prospective member's CV. This CV allows for an HDR (Research Supervision Accreditation) exemption request to be submitted to the Scientific Committee for a referee (process to be undertaken directly by the doctoral supervisor(s) with the UTT's Research Management Department) or a request made to the Doctoral School Director for "University Professor" assimilation.

N.B. Organizing and funding thesis defense logistics (booking rooms for the viva and deliberation, hosting and briefing the examining panel, etc.) is the doctoral supervisor(s)' responsibility. It is important to perform these practical aspects at the very latest when submitting your thesis defense file to the Doctoral School (Step 2).

Remark: the thesis should normally be written in French (see Law of 4 August 1994 relating to the use of the French language - Article 11). However, if one or more members of the examining panel are foreigners, the doctoral thesis may be written in English, on the express condition that the thesis contains a substantial summary in French. This applies in particular to doctoral research projects undertaken as part of a joint PhD. Any PhD student wishing to write their thesis in English must present a written request setting out their reasons to the Doctoral School Director, who shall examine their request and issue a written response. This request must be made before starting to write the thesis.

After the thesis defense

Doctoral thesis submission, reporting, distribution and archiving

In accordance with Articles 24 and 25 of the Decree of 25 May 2016, all Doctoral Theses submitted to the Doctoral School to be defended are legally registered in electronic form in the STAR application (Theses Reporting and Archiving - **S**ignalement des **T**hèses **AR**chivage). This electronic version of the thesis is deemed to be the original - any printed version is considered a simple copy. To this end, a charter for the electronic submission and distribution of theses, prepared jointly by the Doctoral School and the University Library (BU). The Doctoral School Council adopted it in November 2018 (see the Doctoral School documents available on the website).

To this effect, the PhD student is given a “post defense” file on the day of their viva, which must be completed and returned to the Doctoral School within a strict three-month deadline. The file returned by the newly qualified doctor must include:

- An information sheet on their “future” from the Ministry;
- Two copies of the ABES (Agence Bibliographique de l’Enseignement Supérieur - Higher education Library Agency) registration form;
- A black and white printed version of the final doctoral thesis (one-sided, unbound copy);
- An electronic version of the final doctoral thesis in PDF format.

Once the newly qualified doctor has supplied these documents, the Doctoral School, in collaboration with the BU, files the validated version of the thesis in its distribution and archive formats, as well as the submission receipt in the national STAR application, managed by ABES, which performs the following functions:

- Registering the distribution and archive version of the thesis and its metadata;
- Listing it in the SUDOC (University Documentation System) catalogue;
- Allocating it a permanent identifier;
- Sending the archive version, including theses that cannot be distributed, to CINES (the National Computing Centre for Higher education);
- Where applicable, at the institution’s request, sending the metadata or the distribution version of the thesis to their designated website(s).

Unless the doctoral project is of a proven confidential nature (as noted in the training agreement), the resulting thesis is guaranteed to be distributed within the institution where the thesis was defended, and to the academic community as a whole. Online distribution of the thesis beyond this is contingent upon the authorization of its author (the PhD student), subject to the absence of any confidentiality clauses.

PhD degree award

Doctorate certificates are awarded to new doctors in the calendar year following the defense of their thesis. An official joint ceremony is generally organized for the end of the first semester of each year by the Doctoral Schools of the University of Reims Champagne-Ardenne and UTT, under the supervision of the Rector of the Academy Chancelier des Universités.

Doctoral graduates who move abroad may contact UTT’s Doctoral School secretariat directly in order to collect their certificate in person, upon presentation of proof of their identity, or through one of the following options:

- Giving another individual power of attorney to collect their certificate for them, upon presentation of their request in writing (original signed copy) along with proof of identity of both themselves and the individual in question.
- Providing the Doctoral School with a self-addressed, prepaid envelope from a courier company providing a home-delivery service (Chronopost, DHL, etc.) in order to have their certificate mailed, upon presentation of their written request (original signed copy) and proof of identity. PhD

students are advised to complete this procedure **before leaving UTT** as Chronopost envelopes are not available abroad and DHL is not available to individuals in all countries.

These options are also applicable after the graduation ceremony to any newly qualified doctors who were unable to attend.

After the PhD thesis defense

Here follows a simple explanation of the various ways in which a doctorate can be leveraged. We shall only look at the situation in France: higher education and research systems vary considerably from one country to another, along with the characteristics of the socio-economic fabric.

If you are interested in teaching in higher education, you will probably wish to apply for a lecturer position (Maître de Conférences - MdC). This requires prior MdC "qualification" for the section(s) of the National Council of Universities (Conseil National des Universités - CNU) in which your research is registered. Although the qualifying criteria for the office of MdC depend on the section of the CNU concerned, you will need to:

- Have had your work promoted in quality publications (leading respected international journals, selective international conferences with reading committees and proceedings...);
- Have taught during your doctoral research project (less than one hundred hours, but this depends to a large degree on the section of the CNU concerned) by following, for example, the VES (Graduate Studies Validation) pathway (Skills for Teaching in Higher Education).

It is advisable to check with the section(s) of the CNU concerned (www.cpcnu.fr/cnu.htm). Please note that there are two stages to the qualification procedure: (i) Pre-registration online (from September to October) at www.galaxie.enseignementsup-recherche.gouv.fr/ensup/candidats.html. (ii) At a later stage (beginning of September), filing your completed application for the qualification. The result will be announced during the first term of the calendar year following your application.

Once you have qualified and have taken note of the list of MdC jobs offered through competitive recruitment examinations, which are published in the Journal Officiel de la République Française (www.legifrance.gouv.fr), you may apply for any MdC job of your choice - the recruitment process is organized by the institution concerned.

Higher education and research institutions may also recruit contractual employees. There is no legal requirement to qualify for the office of MdC, but this would be an advantage, since institutions generally request this qualification. There is no information point listing all available offers. It is advisable to monitor the websites of institutions you are interested in and carefully follow the mailing lists of your scientific communities.

There are many research institutions in France (CNRS, INRIA, INSERM, ONERA, INRA, INRETS, IFREMER, etc.) and it is difficult to summarize their recruitment methods for newly qualified researchers. Your doctoral supervisor(s) will be able to help you identify which ones you can apply. Here again, it is worth noting that your scientific output will be the magic key to unlock a successful recruitment.

Finally, and whatever your personal career objectives, it is important to emphasize that you will be preparing to enter the workplace throughout the duration of your doctoral research project (well before you defend your doctoral thesis). Some Doctoral School training packages (FIP offering) are dedicated to workplace integration and two specialized professional pathways (CPE and CES) are offered to successfully prepare you for the world of work (see doctoral course offering below).

Doctoral training program

Main rules

The training offered by UTT's Doctoral School for Engineering Sciences (ED SPI) in its three doctoral specialisms is based upon the scientific fields covered by UTT's research teams. It allows PhD students to acquire an additional high-level scientific education alongside their first professional experience, their doctoral research project, while effectively improving their employability.

The training offered mainly comprises the following two categories:

- Science and Technology Training (Formation Scientifique et Technologique - FST)
- Employability-Focused Training (Formation à l'Insertion Professionnelle - FIP).

The FST packages aim to deepen the PhD student's knowledge and develop a thirst for more. These packages may also contribute to broadening their scientific literacy.

The FIP packages have been designed to improve the employability of newly qualified doctors, whether in further education, public-sector research or industry. These packages promote the acquisition of "job-related" skills, encouraging much reflection on career objectives, identifying competencies related to, and developed during the doctoral project and teaching the PhD students how these can be marketed to potential employers.

During their doctoral research project, PhD students must follow a minimum of 120 hours of taught courses, distributed equally between FST and FIP, as shown in the table below along with the equivalence between the number of hours and ECTS credits:

	FST	**FIP**	**Research**	**Total for the doctorate**
Doctoral research project	60h (6 ECTS*)	60h (6 ECTS*)	168 ECTS	180 ECTS

*1 ECTS = 10h of taught doctoral training

With the prior approval of the Doctoral School, it may be possible to validate FST or FIP courses taught outside UTT. This option is available to all PhD students if necessary to their training program, as defined between the PhD student and their supervisor(s). This possibility takes into account the many geographical limitations linked to research locations (CIFRE, co-supervision, etc.). In order to benefit from this option, PhD students must present their proposal to the Doctoral School and have it validated in advance (**before the start of the course**).

These courses may be taught by partner institutions in a location near to where the doctoral research project is being conducted, with the prior approval of Doctoral School SPI. In particular, and since 2018, PhD students enrolled at Doctoral School SPI have the option of attending courses or conferences offered by the Collège de France in Paris free of charge. The list of courses and conferences offered by the Collège de France for each academic year may be found at http://www.college-de-france.fr/site/program/index.html. Any PhD student interested in enrolling freely for one of these courses should first contact Doctoral School SPI to find out which procedures to follow.

In addition to these 120h, **the PhD students must complete their EDSEM** (scientific seminar) requirements by:

- Attending at least 15 scientific and technical seminars over the entire duration of the doctoral research project (an average of 5 seminars per year for a 3-year doctoral research project). These seminars may be held by different UTT teams or outside UTT.
- Participating in an event organized by UTT's Doctoral School, such as the PhD students' Forum or Doctoral School year-start welcome day, or actively contributing to Science Day (hosting a stand or a presentation on research studies). It is also possible to have other similar events organized outside UTT, subject to prior approval by Doctoral School management.

All PhD students are given an EDSEM passport when they first enroll at the Doctoral School, in which they must record the seminars and events they attend over the course of their doctoral research project (with the seminar/event organizer's signature). This EDSEM passport is one of the items that will be consulted by their IMC at each annual meeting and must be appended to the thesis defense file presented to the Doctoral School at the end of the doctoral research project.

In order to encourage the outward international mobility of PhD students, Doctoral School SPI offers the possibility of validating a maximum of 20h of training (10h of FST and 10h of FIP) for any stay abroad with a minimum duration of 2 months, taken together or separately (excluding the joint PhD programs). PhD students must submit a **prior** authorization request to the Doctoral School in order to have this stay approved in principle and find out about the practicalities of validating these 20h of training.

Alongside the FST and FIP courses offered, Doctoral School SPI also offers two accredited pathways allowing its PhD students to obtain a certified professional qualification. PhD students may follow one and/or both of these two pathways in accordance with their personal career objectives.

The first pathway, **"Skills for Higher Education" (Compétences pour l'Enseignement Supérieur** - **PCES**) is intended for PhD students interested in a career in academia and provides the opportunity to learn about the pedagogical and ethical aspects related to the structuring, transmission and dissemination of scientific knowledge. Any PhD student can apply for the PCES pathway by following the procedure described later.

The second professional pathway, **"Skills for Business"** (**Compétences pour l'Entreprise** - **PCPE**), accredited by the CDEFI (Conférence des Directeurs des Ecoles Françaises d'Ingénieur) since 2013. It is intended for PhD students interested in a career in research with public or private industrial sector and/or in an economic valuation of their doctoral projects by the creation of their own company. Any PhD student can apply for the PCPE pathway by following the procedure described later.

As far as language courses are concerned, PhD students wishing to follow any language courses of their choice, including English, may draw from the offering proposed by the UTT's University Language Teaching Service (SUEL). The Doctoral School will support them in this process and provide them all the necessary information.

Finally, and in accordance with Article 15 of the Decree of 25 May 2016, PhDl students are required to create their own skills portfolio as of the first year of their doctoral research project and update it every year during their doctoral studies. Access must be given to the members of their CIS, who will consult it and check that it has been updated with the increase of their scientific and technical skills.

Training courses organization

The Doctoral School organizes the doctoral training courses in the following three disciplinary fields (specialties):

- Materials, Mechanics, Optics and Nanotechnology (M2ON), managed by Pascal LAFON
- Systems Optimization and Security (OSS), managed by Mitra FOULADIRAD
- Sociotechnical Systems (SST), managed by Pascal SALEMBIER

FST and FIP courses offered by the Doctoral School are available to all PhD students. They are organized into packages (termed here bunches) with a given number of hours, each composed on n (with n>=1) sections. Each bunch has a coordinator and teaching team. Each bunch/pathway is divided into one or several sections (S1, S... Sn). Every year, PhD students select the sections they wish to follow in each package/pathway using an ad hoc education sheet. They can choose these sections freely from the 10 bunches under the 3 specialties and the 2 pathways, with the agreement of their doctoral supervisor and according to their previously acquired skills and specific career-focused requirements.

Together with their teaching staff, the coordinator of each package/pathway organizes an examining panel to validate the number of course hours followed in their bunches/pathways. Unless explicitly stated otherwise by the package supervisor, the validation of the number of hours followed in each section is conditional upon continued attendance of these courses. PCPE and PCES pathways are nevertheless already subjected to an adequate certification process.

It is possible to follow doctoral training outside UTT. This must be approved in advance by the Doctoral School (following the opinion of the doctoral supervisor(s)), upon presentation of the program and number of training hours proposed. The Doctoral School is responsible for validating external FIP training, whereas FST training will be validated by the responsible of each specialty.

FIP training program

The FIP training program is composed on four packages (BFIP1, BFIP2, BFIP3, BFIP4) and two specialised pathways (PCPE, PCES), all of which aim to actively improve the employability of future doctors. The two specialized pathways result in the accreditation of skills developed by the PhD student in the field of business (PCPE) or teaching in higher education (PCES). The courses offered within the framework of the PCES pathway are open to all PhD students, regardless of whether or not they wish to have PCES validated.

- **FIP Bunches**

Bunch	Title (number of hours)	Sections (hours)	Coordinator
BFIP1	Entrepreneurial culture (25h)	S1 (8h): Social dialogue S2 (8h): Job marketing S3 (9h): Project management	E. CARQUIN
BFIP2	Scientific information and communications (20h)	S1 (7h): information and documentation S2 (6h): Scientific and technical communication S3 (7h): Oral presentation in English	M. MARCOCCIA
BFIP3	Valorization and employability (20h)	S1 (14h): Preparing for integration into the workspace S2 (6h): Job interview simulation	H. ATIFI
BFIP4	Ethics and scientific integrity (15h)	This bunch is not divisible and is **mandatory for all the PhD students**	R. LENGELLE

BFIP1: Entrepreneurial culture

Skills sought:

- Knowing how to work independently; harnessing your versatility, showing initiative, reporting on progress made, drawing up a thorough assessment of skills and achievements...
- Knowing how to adapt to your professional and cultural environment: context, employees, methods, multiculturalism...
- Knowing how to manage and lead a project or event
- Knowing how to work within a team and manage staff while respecting ethics and safety concerns: working together, ability to listen, organize and manage a team to achieve the goals set...
- Knowing how to draw upon networks

Program:

- Section 1 (8h): Social dialogue, fighting harassment, preventing accidents and illnesses at work, knowledge of employee representative institutions (E. CARQUIN)
- Section 2 (8h): Job marketing: CV, cover letter, interviews, HR questions, targeting... (L. LAMBERT)
- Section 3 (9h): Management of projects, people and teams, skills assessment (B. Bouland)

BFIP2: Scientific information and communications

Skills sought:

- Documentary research and monitoring
- Expertise in scientific and technical information
- Rights management
- Dissemination of work
- Written and oral communication in a scientific context (articles, thesis, conferences, posters)
- Structuring scientific texts

Program:

- Section 1 (7h): Information and documentation (J.B. VU VAN)
  - Preparing your thesis: state of the art (resource breakdown)
  - Building and sharing a knowledge base (Zotero)
  - Monitoring tools and strategies
  - Positioning your research
  - Copyright and image rights (specialized social networks)
  - Disseminating research findings, bibliometric, open access
- Section 2 (6h): Scientific and technical communication methods (M. MARCOCCIA)
  - Scientific approach and communication
  - Structuring scientific texts (IMMRID, SPRI plans)
  - Written and oral communication in a scientific context (articles, thesis, conferences, posters).
- Section 3 (7h): Skills for giving oral presentations in English (A. BENOIST)
  - Oral presentation in English in a scientific context: choice of register and lexical and grammatical structures
  - Answering questions: expressing opinions, comparisons, evaluating ideas
  - Necessary prerequisite level: PhD students must have at least a B2 level in English

BFIP3: Scientific information and communications

Skills sought:

- Improving the employability of PhD students
- Highlighting scientific, technical and relational skills
- Writing CVs and cover letters, preparing for job interviews, psychometric tests, etc.
-

Program:

- Section 1 (14h): Preparing to join the workforce (H. ATIFI, N. GAUDUCHEAU, M. MARCOCCIA)
  - Doctors' employability: how can their skills be brought to the fore?
  - Preparing job applications: basic rules for CVs, cover letters and interviews

- Psychometric tests and recruitment methods
- CV and letter workshop

– Section 2 (6h): Job interview simulation (A. BOUVIER)

BFIP4: Ethics and scientific integrity

Skills sought:

The aim of this package is to raise researchers' awareness of ethics, the study of which covers the progress of science and its repercussions on society, and scientific integrity, which examines the rules governing the practices of the research profession, the implications of which are linked to the trust that society places in science, whatever the potential field of application.

Program:

– General introduction: questionable research practices and fraud (R. LENGELLE)
  - Introduction to ethics and scientific integrity, history
  - Embellishing data, omitting results
  - Fabrication, falsification of results
  - Conflicts of interest
  - Signing scientific publications
  - Plagiarism
  - Institutions' response
– Participation in seminars offered by the Doctoral School (ED) or its partners (external providers)
  - Systematic approach to scientific integrity
  - Ethics and integrity
  - Ethics in the publication process
  - …

This bunch is not divisible and is mandatory for all PhD students.

- **Specialized pathways**

PhD students interested in one of both of these courses must inform the Doctoral School as quickly as possible after enrolment in the doctoral program (within the first 3 months of their doctoral research project). All candidates interested in one or both of these pathways will have an interview with the Doctoral School management (with the Director for PCES and with the Deputy Director for PCPE).

Pathway	Title (number of hours)	Sections (hours)	Coordinator
PCPE	Business Skills (20h)	Taken from sections in BFIP1, BFIP2, BFIP3, BFIP4 and in GE18.	E. CARQUIN
PCES	Skills for higher education (20h)	S1 (7h): General aspects S2 (7h): Elements of teaching S3 (6h): Method for creating a teaching plan	T. TOURY

PCPE (with certification, accredited by the CDEFI since 2013)

Skills sought: Dedicated to PhD students interested in the world of business, including those starting their own company. Developing specific skills for the industrial sector including: project management, team management, human resources management, time management, communication in the English language, knowledge of socio-economic backgrounds, image promotion, interculturalism... These skills are taught in FIP packages (BFIP1, BFIP2, BFIP3, BFIP4) and other UTT teaching units (GE18) as proposed by the pathway coordinator.

Immersion in the business world **is compulsory**, whether through regular presence in a company (CIFRE or industrial contract) or by multiple stays in a company within the framework of the doctoral

research project (minimum 1-week placements cumulated throughout the duration of the doctoral research project).

Certification: This course shall be certified after:
- Following 20h course chosen from bunches BFIP1, BFIP2, BFIP3 and from GE18
- Writing a 12-page report
- Defending this orally before an examination panel (15 mn presentation and 30 mn discussion)

If approved, the PCPE certificate shall be solemnly awarded to the PhD student by the chair of the PhD examining jury immediately after the final deliberation.

PCES (with certification)

Skills sought: This course is mainly aimed at PhD students wishing to follow an academic career as a research lecturer or interested in education or teaching.
- Positioning your teaching in education and its global context; situating this in relation to the progression of learning, choosing teaching and assessment methods that correspond to the qualifications targeted
- Planning and preparing sequences; identifying epistemological obstacles, choosing and implementing appropriate subject materials and teaching methods; designing tools to monitor learning
- Conducting a teaching session with confidence: supporting PhD students in a learning situation, interacting and managing the unexpected; adopting an appropriate approach
- Developing teaching practice with the aim of continuous improvement; maintaining a reflective approach to practice and taking on board feedback from the ecosystem (inside and outside the University)

Program:
- Section 1 (7h): General aspects (Timothée TOURY)
  - General knowledge of the higher education system
  - European standard guidelines and tutor expectations, the PhD student at the heart of the teaching system
  - General teaching (teaching: transmissive, behavioral, socio-constructive, connectivist, mixed... critical thinking)
  - The concept of epistemological and didactic barriers
  - Statutory and legal aspects of teaching; the concept of teachers' ethics
- Section 2 (7h): Elements of teaching (Dominique BARCHIESI)
  - The role of digital technology (knowledge of tools, critical approach). Educational measurement (assessing and monitoring learning outcomes, game rules, assessment scale and relativity, evaluation as a tool for learning and improving practices, teaching assessments, ethics)
  - Inclusion: disability management; differentiation
  - Teaching and professional development; promoting teaching: SoTL (Scholarship of Teaching and Learning)...
- Section 3 (6h): Method for creating a teaching plan (Peggy Touvet)
  - Program approach and skills systems
  - Creating a teaching sequence; fixing learning goals
  - Group/class management, PhD student interaction, attitudes and approaches

Certification: This pathway is validated by:
- Following 20 hours of pathway-specific training and completing any additional online modules (Moocs)
- Ensuring a minimum of 96 UTPs and a maximum of 144 UTP of teaching on the total duration of his doctoral project without exceeding a maximum service of 48 UTP per semester, at a level L1 or L2 at the UTT or in another institution. This teaching service may include the supervision of a "TITS Recherche";
- Writing and submitting a report (7 pages maximum):
  - Describing a skills-focused teaching unit
  - Explaining the format, teaching methods and analysis of a sequence
- Teaching a sequence before an examination panel, followed by a discussion

The last two points shall be evaluated according to an observation sheet given in advance to the PhD students.

If approved, the PCES certificate shall be solemnly awarded to the PhD student by the chair of the PhD examining jury immediately after the final deliberation.

FST training program

The FST offering is made up of 10 packages in total, comprising 1 transversal package (BTrans) and 3 packages for each of the 3 specialisms (M2ON, OSS, SST). PhD students are fee to select their 60 h' training from the 10 packages, with the agreement of their doctoral supervisor(s), in accordance with their specific scientific and technical requirements at the desired level (further or basic).

- **M2ON FST bunches**

Bunch	Title (number of hours)	Sections (hours)	Coordinator
BMON1	Development and characterization Multi-scale materials (38h)	S1 (8h): Thin film deposition S2 (8h): Atomic-force microscopy S3 (13h): Scanning electron microscope (SEM) S4 (2h): Clean room and chemistry S5 (7h): X-ray diffraction or nanoindentation	C. COUTEAU
BMON2	Mechanical and physical advanced modelling and numerical methods (38h)	S1 (12h): Simple and general continuum mechanics S2 (8h): Micro-macro modelling in physics S3 (10h): Space discretization and adaptation S4 (4h): Mechanical optimization S5 (4h): Practical training on ABAQUS	L. MOREAU
BMON3	Nano-optics and nanophotonics (18h)	S1 (4h): Laser use S2 (7h): Nano-optics and plasmonics S3 (7h): Spectroscopy	A. VIAL

BMON1

Skills sought: Acquire operational skills related to techniques and experimental methods at the nanometer to millimeter scales, in relation with the development and characterization of materials.

Teaching team: J. BEAL, **C. COUTEAU**, R. DETURCHE, M. FRANCOIS, B. GUELORGET, S. JRADI, L. Le Joncour, J. PROUST.

Program:

- Section 1 (8h): Thin film deposition: scientific basis, examples of applied exercises and practical work (with 20 of mandatory practice in order to obtain the certificate of competence).
- Section 2 (8): Atomic-force microscopy: scientific basis, examples of applied exercises and practical work (with 20h of mandatory practice in order to obtain the certificate of competence).

- Section 3 (13h): Scanning electron microscope (SEM) training: scientific basis, examples of applied exercises and practical work (with 40h of mandatory practice in order to obtain the certificate of competence).
- Section 4 (2h): Clean room and chemistry training: concept, standards, methods (with an additional 3h of mandatory practice).
- Section 5 (7h):
  - X-ray diffraction, nanoindentation, digital microscope, mechanical testing: (with 10h of mandatory practice in order to obtain the certificate of competence)
    or
  - Nanoindentation, digital 3D microscope and mechanical testing.

BMON2

Skills sought: Learning concepts and advanced modelling tools within the general framework of thermodynamics in continuum mechanics and completed transformations, learning the associated numerical methods (solving differential equations, space and time discretization, optimization), learning how to model scale transitions in materials.

Teaching team: H. BOROUCHAKI, C. LABERGERE, P. LAFON, **L. MOREAU**, B. PANICAUD, K. SAANOUNI.

Program:
- Section 1 (12h): Simple and general continuum mechanics in completed transformations; formulating admissible thermodynamic behaviour and associated numerical methods.
- Section 2 (8h): Modelling of micro-macro aspects, scale transitions for physical problems.
- Section 3 (10h): Space discretization and adaptation.
- Section 4 (4h): Mechanical optimization.
- Section 5 (4h): Practical training on ABAQUS

BMON3

Skills sought: The aim of this course is to provide PhD students with the basic practical knowledge required to use LASERS safely under real experimental conditions. This course is completed by an overview of numerical methods allowing the study of light-matter interaction, along with an overview of the different characterization techniques applicable to this interaction (near-field, spectroscopy, STM, AFM, NSOM, Rama, SERS) and microscopy.

Teaching team: JL BIJEON, C. COUTEAU, R. DETURCHE, G. LERONDEL, **A. VIAL**

Program:
- Section 1 (4h): Laser use - 2h of theory + 2h of practical
- Section 2 (7h): Nano-optics (electromagnetic simulation, plasmonics, near-field optics)
- Section 3 (7h): Spectroscopy (theory and practice).

- **OSS FST Bunches**

Bunch	Title (number of hours)	Sections (hours)	Coordinator
BOSS1	Systems optimization and security - methods and tools (40h)	S1 (12h): Advanced optimization methods S2 (8h): Stochastic process S3 (10h): Shape recognition S4 (10h): Prognostics (PHM)	M. FOULADIRAD
BOSS2	Systems optimization and security - implementation (40h)	S1 (8h): Data management S2 (8h): Data processing S3 (8h): Simulations S4 (8h): Performance	M. FOULADIRAD

		assessment S5 (8h): Intelligent transport	
BOSS3	Scientific activities and workshops (14h)	S1 (14h): software workshops. Initiation and development.	T. ARBAOUI

BOSS1

Skills sought:
Ability to model an optimization and systems security problem. Ability to optimize a problem taking into account existing constraints and hazard models. Ability to manipulate stochastic models and apply them to engineering problems. Ability to undertake a statistical study in the presence of a priori data and information, knowledge of the basic tools to predict the behaviour of a random phenomenon.

Teaching team: H. CHEN, **A. DUHAMEL**, M. FOULADIRAD, A. GRALL, E. GRALL.

Program:
- Section 1 (12h): Advanced optimization methods
  - Linear methods, non-linear methods
  - Deterministic processes, stochastic processes
  - Metaheuristics
- Section 2 (8h): Stochastic processes
  - Modelling a natural phenomenon or systems operation through random models
  - Deepening knowledge of probability and stochastic models
  - Presentation of several stochastic models used for systems security
- Section 3 (10h): Shape recognition
  - Intelligent data processing
  - Statistic classification methods such as Bayesian decision theory, parametric or non-parametric methods, Bayesian, decision trees and neural network.
- Section 4 (10h): Prognostics (PHM)
  - Prediction of the useful life of the system
  - Implementing maintenance policies
  - Stochastic modelling and the study of conditional probabilities on the system status. Combined use of statistical methods and stochastic modelling for decision-making.

BOSS2

Skills sought: Knowledge of different types of data, knowledge of basic data management tools. Ability to undertake a statistical study on large-volume data and to simulate systems operations. Occurrence of an event or the evolution of a random phenomenon with numerical methods, knowledge of the main random processes of numerical resolution, ability to evaluate the performance of numerical methods and optimization, knowledge of the necessary tools to operate an intelligent production or transport system.

Teaching team: L. AMODEO, P. BEAUSEROY, **B. BIRREGAH**, M. FOULADIRAD, F. HNAIEN.

Program:
- Section 1 (8h): Data management
  - Processing heterogeneous, unclassified and not-directly-usable data.
  - Presentation of the different existing and operating formats.
  - Data recovery and storage methods.
  - Data quality - the essential element for functionality and reliability.
- Section 2 (8h): Data processing
  - Statistical analysis of data
  - Presentation of conventional data processing tools such as regression, analysis of main components, factor analysis, data mining.
  - Specific methods for the analysis of large-volume data.
- Section 3 (8h): Simulations

- Methods based on Monte Carlo simulation, such as bootstrap, resampling, importance sampling, MCMC, particle filtering methods.
- Other methods as required.

– Section 4 (8h): Performance assessment
  - Markov models. Modelling of queues.
  - Petri-net, deterministic or stochastic modelling, steady state calculations and cycle times.
  - Lower and upper bounds of cycle times for stochastic networks.
  - Use of discrete event simulation.
  - How to calculate the lower bounds and worst-case analysis.
  - Interior point method, cutting-plane method, Lagrangian relaxation method
  - Column generation
– Section 5 (8h): Intelligent transport
  - Application of new information technology and communication to the field of transport and production systems.
  - Taking into account continuously updated information available with the goal of real-time optimization and efficient decision-making.

BOSS3

Skills sought: Knowledge of the software's basic functions and its different fields of application, knowing how to access the software more advanced capabilities.

Teaching team: M. AFSAR, **T. ARBAOUI**, B. BIRREGAH, A. DUHAMEL, A. SMOLARZ

Program:
– Section 1 (14h): Software workshop. Introduction and advanced training on a choice of different software such as: Latex, Matlab, R, Cplex …

- **SST FST Bunches**

Bunch	Title (number of hours)	Sections (hours)	Coordinator
BSST1	Methods and tools for research on complex sociotechnical systems (34h)	S1 (10h): Epistemology of sociotechnical systems S2 (8h): Simulations S3 (6h): Qualitative analysis and methodology of the investigation S4 (10h): Scientific activities and workshops	A. BENEL
BSST2	Transitions/changes in technology, society and media (30h)	S1 (10h): Transitions S2 (10h): New media dynamics S3 (10h): Scientific activities and workshops	T. REYES CARRILLO
BSST3	Interdisciplinary targets and themes (OTI) (30h)	S1 (10h): Cooperation, knowledge and data management S2 (10h): Networks and new network organizations S3 (10h): Scientific activities and workshops	D. GAÏTI

BSST1

Skills sought: Revising/learning the epistemological basis of conducting scientific research in the field of complex sociotechnical systems. Becoming familiar with several approaches of simulation as a research paradigm in different disciplines and fields (intelligent networks, crisis management etc.). Knowledge of qualitative analysis methods and associated IT tools.

Teaching team: **A. BENEL**, M. ESSEGHIR, Ch. LEJEUNE, L. MERGHEM, P. SALEMBIER

Program:

- Section 1 (10h): Epistemology of sociotechnical systems (A. BENEL)
  - Philosophy of mankind and science
  - Explanatory talk, science and myths
  - Problem of induction, processing universals, refutation
  - Technology and science artefacts
- Section 2 (8h): Simulation(s) (M. ESSEGHIR)
  - Simulation approaches in sociotechnical systems
  - Application in the field of autonomous networks
  - Simulation tools (digital, SMA, dedicated to an application field)
- Section 3 (6h): Qualitative analysis and methodology of the investigation (Ch. LEJEUNE)
  - Principles of qualitative analysis procedures
  - Methods of qualitative analysis
  - Tools (CAQDAS, etc.)
- Section 4 (10h): Scientific activities and workshops (A. BENEL, M. ESSEGHIR, P. SALEMBIER)
  - Guest lectures
  - Round tables
  - Workshops

BSST2

Skills sought: Awareness of the technological and social challenges of contemporary scientific research in the field of sociotechnical systems. Encouraging new researchers to reflect on their position when facing these challenges. Learning about several current research themes that challenge researchers' individual and social responsibility.

Teaching team: H. ATIFI, S. DERMINE-BRULLOT, N. GAUDUCHEAU, M. MARCOCCIA, **T. REYES-CARRILLO**, N. TROUSSIER

Program:

- Section 1 (10h): Transition(s) (T. REYES-CARRILLO)
  - Environmental and energy transitions
  - Digital transition
- Section 2 (10h): New media dynamics (H. ATIFI)
  - Digital communication
  - Social networks
  - Emerging media
- Section 3 (10h): Scientific activities and workshops (N. TROUSSIER, H. ATIFI, T. REYES-CARRILLO)
  - Guest lectures
  - Round tables
  - Workshops

BSST3

Skills sought: Learning about the subjects of interdisciplinary research. Fostering a multidisciplinary understanding of current themes in the field of sociotechnical systems. Developing conceptual tools allowing for interaction with researchers in other disciplines having the same theoretical and/or technological focus.

Teaching team: **D. GAÏTI**, other RLs in this specialism

Program:

- Section 1 (10h): Cooperation, knowledge and data management
- Section 2 (10h): Networks and new network organizations: risk, trust, resilience, acceptability
- Section 3 (10h): Scientific activities and workshops
  - Guest lectures
  - Round tables, Workshops …

- **Cross-cutting Bunch**

This package offers training on interdisciplinary methods and tools common to the Doctoral School's three specialisms.

Bunch	Title (number of hours)	Sections (hours)	Coordinator
BTrans	Interdisciplinary methods and tools (18h)	S1 (6h): IT and mathematic models for engineering S2 (6h): Epistemology S3 (6h): Tools and methods	A. GRALL

Skills sought:
Learning some practical applications for optimization tools and decision-making. Understanding and mastering the fundamental concepts and notions for conducting a scientific project. Becoming familiar with the IT tools necessary to carry out research.

Teaching team: **A. GRALL**, other RLs from the various teams

Program:
- Section 1: IT and mathematic models for engineering (6h)
  - Optimization
  - Decision-making methods
- Section 2: Epistemology (6h)
  - Scientific approach and methodology
  - Historical dimension of science and technology
- Section 3: Tools and methods (6h)
  - Programming environment: Matlab, Python, …
  - LaTeX: advanced use and graphic library
  - Knowledge management tools

General Information

Doctoral School Organization

To work efficiently, the Doctoral School has the following functions and structures:

- **Doctoral School Director**: appointed by the head of the institution after consulting the Scientific Committee and Doctoral School Council. Responsible for implementing the Doctoral School's action program and presenting an annual Doctoral School activity report to the Doctoral School Council and UTT Scientific Committee. Makes proposals on the allocation of research allowances received by the Doctoral School.
- **Deputy Director**: assists the Doctoral School Director and is in charge of a number of specific actions defined jointly with him or her. Responsible, in particular, for coordinating the non-academic aspects of life at the Doctoral School.
- **International Program Director:** in charge of developing and managing international programs for UTT's Doctoral School for Engineering Sciences. In particular, this includes organizing recruitment panels for PhD students undertaking a joint PhD program with the Doctoral School's' international partners and managing the agreements associated with these international programs. He or she presents an overview of all international programs at each CED meeting.
- **Doctoral School Council – CED** (Article 9 of the Decree of 25 May 2016 amended by Article 1 of the Decree of 1 July 2016). CED meets three times a year to assess Doctoral School reports and propose broad orientations with regard, in particular, to its organization, functioning, grant allocation policy and monitoring policy for PhD students and doctors. The Doctoral School Director chairs these meetings.

  In accordance with Article 9 of the Decree of 25 May 2016 on doctoral training, the rules pertaining to the composition of the Doctoral School Council (CED) and the appointment of its members are defined in accordance with the procedures adopted by the institution's governing board.

  In its plenary meeting of 13 March 2018, the UTT Board adopted the following procedures for CED's composition and the appointment of its members:

  a. 23 members with voting rights, broken down as follows:

  - 14 members (i.e. 60%) representing the research teams and the institution (co-opted members)
    - 1 institution representative (the Director of Research)
    - 8 UTT research team representatives
    - 2 BIATSS representatives
    - 3 UTT researchers representing the College of Humanities, CIP and Science & Technology for Risk Management (STMR) topics
  - 4 members (i.e. 20%) representing the PhD students elected by their peers along with their stand-ins
  - The remaining 5 members are external individuals recognized for their scientific skills:
    - 3 from the academic world representing UTT's partner higher education institutions (SU, UTC, URCA)
    - 2 members from the industrial and socio-economic sectors concerned with UTT's research topics

  b. Guest members:

  - Permanent guest members: one representative of each UTT department working on projects related to the Doctoral School
  - Occasional guest members: any UTT or outside expert whose advice would be useful to the council on specific issues

c. The terms of appointment of the members of the Doctoral School Council, as defined by the UTT board in its decision of 25 March 2018, are as follows**:**

- UTT research team representatives are appointed by the UTT Director following proposals made by the research teams and advice from the Doctoral School Director
- PhD students' representatives are elected by the PhD students registered at the Doctoral School as of the voting day. They are elected by a first past the post system in a single round of voting. A relative majority is enough
- External members are appointed by the UTT Director based on proposals made by the Doctoral School Council

Each member of the council is appointed for the duration of their accreditation, with the exception of PhD students' representatives, who are elected for 2 years. This term may be renewed once, provided that this will not exceed the duration of the PhD student's accreditation. Any members no longer working in the capacity for which they were admitted to council will automatically vacate their seats, in which case a new member will be appointed or elected according to the above nomination or election rules, for the remainder of their term.

- **Specialties manager**: responsible for managing and coordinating the organization and monitoring of doctoral training related to their specialty. They contribute to the scientific coordination of the Doctoral School and the progress of doctoral projects related to their specialty. They are ex-officio members of the Doctoral School Bureau (BurED) and hold regular meetings with the Doctoral School Director to deal with day-to-day issues and decide on those to be discussed by the Doctoral School Council. They report to the Doctoral School Council, of which they are permanent guest members.
- **Administrative organization of the Doctoral School**: The Doctoral School is managed by an administrative unit organized around the Doctoral School Bureau (BurED):
  - The administration of UTT's Doctoral School handles its logistics and day-to-day operation. It also manages the Doctoral School budget to finance all the necessary means of communication, specific teaching, various events organized by the Doctoral School, PhD students' integration assistance and the publication of various documents. It also oversees the establishment and successful functioning of IMCs (individual monitoring committees) for all PhD students. It registers theses at the national level together with the Joint Documentation Service.
  - The Doctoral School' Head of International Relations collaborates closely with the UTT's International Relations Department to manage the Doctoral School's international programs.
  - The BurED is made up of the Doctoral School Director (who chairs it), the Deputy Director, the three Heads of Specialism, a representative of the PhD students' association (ElliDoc) and the Doctoral School's head of administrative management and training monitoring. It meets once a month (except August). It manages the Doctoral School's day-to-day business and prepares CED meetings.

Contacts

Director:	Khemais SAANOUNI (Extension: 5654)
Deputy Director:	Antoine GRALL (Extension: 5679)
Head of International Relations:	Régis LENGELLÉ (Extension: 5681)

Heads of Specialism:

- Materials, Mechanics, Optics and Nanotechnology (M2ON): Pascal LAFON (Extension: 5655)
- Systems Optimisation and Security (OSS): Mitra FOULADIRAD (Extension: 8072)
- Socio-Technical Systems (SST): Pascal SALEMBIER (Extension: 9677)

ED Administration:

Administrative management, training monitoring, registration, PhD defense organization …	Isabelle LECLERCQ	Extension: 7624
PhD students' cooperation, partnerships and funding, registration …	Pascale DENIS	Extension: 7614
CIS, Doctoral School indicators and data …	Thérèse KAZARIAN	Extension: 8573

Doctoral School Events

The Doctoral School organizes the following annual events in close collaboration with the ELLIDOC association:

- **The PhD students' forum** (also called **What's Up Doc**?): a day organized by the PhD students throughout their association ELLIDOC during which all PhD students are encouraged to present their research activities to their colleagues, UTT staff and partners, in the form of lectures or demonstrations. This event gives PhD students the opportunity to learn how to popularize and enhance their doctoral work, as well as to present it in public as a training for future conferences, seminars, monitoring the work of the doctoral project, etc. The logistics of this event are entrusted to the Ellidoc association, with the support of the Doctoral School
- **ED year-start welcome day**: this takes place every year on the last Monday of September to mark the start of the academic year at the Doctoral School. The afternoon of this day is used to tackle a specific problem certain to be of interest to PhD students with the participation of experts invited for the occasion. The theme is chosen in agreement with the ELLIDOC association, which is strongly involved in the organisation of this event.

  Every PhD student enrolled at Doctoral School SPI is required to participate actively at least once during his/her doctoral project in one of these two events as part of EDSEM.
- **Les Doctoriales**® are likely to be organized in cooperation with doctoral schools belonging to other institutions in the Grand Est Region. These 3 to 5-day residential seminars focus on preparing PhD students for life after their doctorate. They aim to encourage PhD students to firm up their career plans and become more aware of the realities of new doctors entering the world of work. The Grand Est Region is still discussing the possibilities of organizing these events with the Doctoral Schools of various regional institutions. PhD students are therefore invited to contact the Doctoral School for further information.

Joint doctoral project arrangements (Articles 20 to 23 of the Decree of 25 May 2016)

International joint PhD programs aim to consolidate the construction of a European Higher Education and Research Area, allow doctoral schools to develop their international dimension, promote the mobility of PhD students in different scientific and cultural spaces and develop scientific cooperation between French and foreign research teams.

French higher Education institutions accredited to deliver doctorates may enter into agreements with one or more foreign higher education institutions benefiting from the same prerogatives in their countries of origin to organize the international joint doctoral projects. The co-contracting institutions are bound by a principle of reciprocity. The agreement in question can be either a framework agreement accompanied, for each doctoral project, by an application agreement, or a specific agreement drawn up for each doctoral project. For every doctoral project concerned, the doctoral supervisors and PhD student sign the application agreement or, in the absence of a framework agreement, the project-specific agreement.

The agreement specifies the conditions for the alternation of training periods in the countries concerned. It determines the procedure through which the examining panel will be formed and material, pedagogical and linguistic support provided to the PhD student. In particular, it specifies:

- The title of the doctoral project, the name of the doctoral supervisors, the name of the contracting higher education institutions and the nature of the diploma being prepared;
- The language in which the thesis will be written; when this language is not French, it should be accompanied by a substantial summary in French;
- The procedures for recognizing training activities carried out in one or other of the joint PhD partner institutions;

- The rules for the payment of tuition fees, avoiding the PhD student having to pay fees to several institutions at the same time;
- The conditions for the PhD student's social security, accommodation and any financial support he/she can receive to assist with his/her mobility;
- The subject protection, report filing and theses reproduction procedures, as well as, how the joint research results of the laboratories involved will be managed, published and used, are drawn up in accordance with the legislation specific to each country involved in the co-supervision.

The PhD students work under the responsibility, in each of the countries concerned, of a Doctoral Supervisor, who undertakes to fully exercise his/her supervisory functions in collaboration with the other doctoral supervisor(s).

Doctoral projects carried out as part of a joint PhD arrangement culminate in the defense of a single thesis, giving rise to a single defense report.

The academic authorities authorized to do so, on the proposal of the examining panel, after the thesis has been defended will issue the doctoral diploma.

(External) co-supervision of doctoral projects

It is possible to have a doctoral project co-supervised. Indeed, this is actually recommended in the case of a doctoral project carried out in partnership with an associated institution. This co-supervision will be governed by a binding agreement between the two institutions concerned, based on the principle of reciprocity. Unlike international joint PhD programs, the examining panel awards only UTT doctorates.

Residence authorization

Université de Technologie de Troyes has signed an agreement with the Prefecture of Aube entrusting UTT with the responsibility of monitoring all residence permit files relating to its foreign students.

When registering a foreign PhD student, the Doctoral School will systematically make a point of verifying his/her rights to reside on French soil. The Doctoral School will take charge of all the necessary procedures to obtain and/or renew his/her residence permit.

As such, throughout their doctoral project, foreign PhD students have a duty to inform the Doctoral School, as soon as possible, of any change of situation (address, family situation, etc), right up until they leave UTT.

PhD students must ensure that they apply to the Doctoral School to renew their residence permit **at least two months** before it is due to expire.

Please consult the Doctoral School website (www-ecoldoc.utt.fr or via the digital workspace) to see the list of documents to be provided.

PhD students' health insurance

Health insurance is mandatory for anyone residing in France.

In the wide majority of cases, PhD students are covered by one of the following two "compulsory" social security schemes: the student health insurance scheme or the employee health insurance scheme.

Except in specific cases, whatever the chosen scheme, you will depend on the FRENCH PRIMARY HEALTH INSURANCE FUND.

If you depend on the STUDENT scheme, (i.e. you are not an employee):

- You were already in France the previous year: your rights are automatic. more information in https://www.ameli.fr/assure/droits-demarches/etudes-emploi-retraite/etude-stages/etudiant
- If you are a foreigner and arrive in France: you should then register on the dedicated website from September 1st: https://etudiant-etranger.ameli.fr

There is no longer a membership fees.

If you depend the employee health insurance scheme, (i.e. you will sign a contract with UTT or with company): When you register, please contact Pascale DENIS from the Doctoral School who will

indicate the steps to be performed. Any way, the contribution is part of the charges applied to your salary.

This compulsory health coverage for all covers your health costs between 15% and 70% on average. It should be noted that the coverage of medical expenses varies according to the expenses concerned (dental, consultation, optical, etc.) and according to the reimbursement base serving as a reference for Social Security.

It is therefore important to also subscribe to a COMPLEMENTARY HEALTH, which will supplement the difference by fully or partially reimbursing the costs remaining at your expense.

In the department of Aube, two main organizations exist for students, whether or not you are an employee:

- The LMDE mutual: https://www.lmde.fr/
- The MGEL mutual: https://www.mgel.fr/

but you have free choice among all the offers in the insurance market.

Complementary insurance coverage is not compulsory. However recommended, it is the decision of each PhD student. He can choose the mutual or complementary insurance of his choice, regardless of his compulsory health coverage scheme.

Note that if you are an employee, your company will probably offer you “its” complementary health insurance at a preferential contribution rate.

The Doctoral contract

Contractual PhD student status was created in 2009 with a view to:

- Establishing a single contractual framework (employee working under a public law contract);
- Bringing together each PhD students’ research activities, along with any ancillary activities entrusted to him/her and of interest for his/her career prospects, together in a single contract;
- Establishing a single remuneration framework (defining the lower limit);
- Guaranteeing full social security cover.

Contractual PhD student status is not accessible to Public Institutions of an Industrial and Commercial nature (ADEME, ANDRA, INERIS, RATP, etc.).

The employment contract is a fixed-term contract under public law with a 3-year duration. It may be extended for a period of one year in exceptional circumstances related to the research work. It may also be extended in the event of sick or maternity leave or an accident at work. Beneficiaries do not have to meet any conditions related to age or Master’s date.

Contractual PhD students can devote 100% of their time to research. They can also, in return for extra remuneration, be entrusted with teaching assignments (of no more than 96 UTPs per year), the provision of scientific expert opinions, the dissemination of scientific and technical information or research promotion. These tasks should not represent more than 1/6 of their annual working hours.

The allocation of teaching allowances at UTT is based on the following procedure. A call for applications is launched each semester. Candidates are selected on their aptitude and motivation to teach. This allocation takes place on an annual basis and is renewed, in general, over the period of the doctoral project compatible with teaching activities. No teaching contracts are awarded during the first semester or the last semester of a doctoral project. Teaching contract beneficiaries are required to follow specific training (see the CES pathway).

Any PhD student enrolled in a PhD program at the UTT may do teaching (TP or TD) during his doctoral project under the following conditions:

- Must have the agreement of his/her Doctoral Director(s) (mentioned on his/her training agreement)
- **Cannot teach either in the first semester of his doctoral project** (dedicated to the start of his doctoral project) or in the **last semester of his doctoral project** (devoted to the completion of his thesis and the preparation of his defense**)**
- **Must register in the PCES pathway** by entering this choice on his annual pedagogical form that he gives to the ED (see the PhD Stuendt’s Guide).

- If he wishes to validate the PCES pathway with certification, he must follow all steps of the PCES pathway including the certification process (the 4 steps of the certification procedures described above)
- If he does not wish to validate the PCES pathway, he must at least follow the 20h of the PCES course without being obliged to follow all steps of the PCES pathway.

The procedure for selecting doctoral candidates for a teaching activity is in two distinct steps. The first one, more educational, aims at the "internal qualification" of candidates and is fully managed by the Doctoral School based on the PCES pathway. The second step, more administrative, is managed by the DFP, department heads, teaching programs managers and the DRH.

Step 1: The leader of the PCES pathway and his teaching team attribute the "qualification" for teaching in French or in English (or in both languages) to the PhD students enrolled in the PCES pathway:

- From October, launch of the call for registration to the PCES pathway
- Presentation of the PCES pathway to PhD students (Doctoral School information, PhD Student's Guide, information meeting organized by the PCES team)
- Before any teaching activity, the doctoral student must:
  - have taken the 7h course of PCES-S1(Section S1)
  - had a pedagogical interview with the PCES team. During which, the doctoral student must specify whether he wishes to follow the PCES as a mere pedagogical training or whether he wishes to obtain certification.
- At the end of this interview, the list of "qualified" PhD students for teaching at the UTT is sent to the Doctoral School (P. Denis) who issues to each the ad hoc certificate.

It should be noted that any "qualified" PhD student agrees to take the PCES-S2 (7h) courses as soon as offered and PCES-S3 (6h) after teaching practice for at least one semester.

Step 2: This step is the responsibility of the DFP, Department Directors, teaching programs Managers and the DRH who organize the assignment teaching services to each selected PhD student "qualified" in Step 1.

- The PhD student on the qualification list provided by the Doctoral School and selected to participate in a teaching activity, according to his assignment, provides the assistants of the teaching programs with the documents necessary for the establishment of his contract.
- The teaching program assistants transmit to the DRH the required documents to establish the amendment to the doctoral contract or for the payment of the vacations.

It is important to note that these additional activities liable to be entrusted to PhD students (teaching, research promotion, and dissemination of scientific and technical information, expert opinions) **must not be allowed to interfere with the progress of their doctoral project**.

Temporary Lecturer and Research Assistant (ATER) positions (decree 87-889 of 29/10/1987)

Establishments may have Temporary Lecturer and Research Assistant (Attaché Temporaire d'Enseignement et de Recherche - ATER) positions to offer PhD students coming to the end of their doctoral project or recently qualified doctors. This is one way to facilitate the transition from PhD student to research lecturer for PhD students wishing to apply for a higher education recruitment examination whilst, at the same time, working as a contracted lecturer. They will need to carry out 128 hours of lectures, 192 hours of tutorials or 288 hours of practice per year. It is also possible to work as a part-time ATER (undertaking half the number of hours).

To become an ATER, it is necessary to:

- Either be registered as preparing a doctorate, in which case the doctoral Director must confirm that you will defend your thesis within one year;
- Or already have achieved a doctorate and be committed to applying for a higher education recruitment examination.

The total duration, even in the event of interruption, cannot exceed two years. The gross monthly salary of an ATER is around €2000 (€1400 for part-time ATERs). ATER positions are offered annually by the institutions.

Our relevant ministry has set up a national platform via which to apply for an ATER position: galaxie.enseignementsup-recherche.gouv.fr/antares/can/astree/index.jsp.

UTT's university library

UTT's university library (BU) supports PhD students at various stages of their doctoral work by offering:

- Resources: In addition to some 40,000 printed documents (human and social sciences, management, languages and, above all, science and technology), the BU is developing a policy for researchers to promote electronic access. Some 40 databases, including the main international research references, constitute an essential source for researchers to carry out their work, wherever they are based. 90% of the online resources are indeed accessible remotely via the document portal.
- Needs-driven services: In addition to borrowing library documents for a semester, there is also a PEB service allowing PhD students to access books or articles from other libraries in France or around the world.

As part of FIP doctoral training, the BU contributes to the BFIP2 package on "Scientific Information and Communications", taking charge of the 7-hour S1 section on Information and Documentation. The aim is twofold: to give all PhD students the keys to understanding current issues surrounding scientific publication and to offer them techniques and methods to make the most of their documentary research (information gathering and processing, literature monitoring, bibliographies). In addition to this training, the BU systematically invites PhD students to database presentations given several times a year by tool publishers or specialists.

The BU provides all PhD students with support when submitting their thesis to facilitate its reporting and dissemination: keywords search, integration into the STAR database.

Find out more at: www-scd.utt.fr. Online information service accessible via the 'Question? Answer!' tab.

Contact: UTT BU on +33 (0)3 25 56 71 00

Computer Resource Centre

After they have signed the computer charter at their initial administrative registration, all PhD students receive a login and password allowing them to access their email and various other tools/resources.

Here is a brief description of the resources managed by the Computer Resource Centre (CRC) and made available to PhD students:

ONE EMAIL ADDRESS PER PERSON

The CRC manages nearly 3,000 accounts allowing all members of UTT (teachers, researchers, administrators and students) to have their own email address in the format *firstname.lastname@utt.fr*

DIGITAL WORKSPACE (ENT): All UTT staff and students have the use of a digital workspace at ent.utt.fr. This portal is intended to facilitate access to information and applications, as well as providing a backup space.

- By clicking on the "Home" tab, you'll find general announcements for UTT members, as well as ads published by clusters and departments, to which you'll be able to subscribe;
- By clicking on the "My Space" tab, you'll be able to access your calendar, mailing lists, messages and storage space, as well as change your password and manage your favorites;
- By clicking on the "Tools" tab, you'll be able to access professional applications such as: the trombinoscope, resource management (GRR), student monitoring, examination procedures, documentary portal and publication management;
- By clicking on the "Documents" tab, you'll be able to access the "UTT Documents" space or dedicated spaces related to your profile;

- By clicking on the "Help" tab, you'll be able to enter your support requests and access help.

INTERNET: UTT is connected to the INTERNET through the French RENATER network (REseau NAtional de Télécommunications pour l'Enseignement et la Recherche - national telecommunications network for teaching and research), with a speed of 200Mbps.

A WIFI NETWORK: UTT students and staff can connect their laptops to the UTT wireless network. All the information can be found on the digital workspace in the help section, or by emailing wifi.utt.fr directly.

IT FACILITIES WITH OVER 1000 WORKSTATIONS: UTT's IT facilities are made up of around one hundred servers and 1,300 workstations. PhD students can access these workstations through welcome points managed by the CRC. Any faults can be flagged up by signing in to the digital workspace (ent.utt.fr) and sending a support request via the help section.

CONTACT

Computer Resource Centre

+33 (0)3 25 71 76 28

Members of the CRC can be contacted by emailing cri@utt.fr

Educational Innovation Centre

"The EIC: a venue, skills, methods and tools!"

UTT's educational Innovation Centre, a center for the research and development of ICT for Learning and Teaching, has been tasked with developing e-learning within UTT. This profound and lasting evolution in teaching modes is gradually changing the ways in which we teach and the ways in which students of all levels follow courses and learn: distance learning, access to scripted, media-ready content, self-study, collaborative working, etc.

Are you a PhD student? Do you wish to present your work on a website, give a multimedia presentation for a conference or create an animation of one of your diagrams or models? Are you an ATER? Do you wish to put your classes or practices online?

You're welcome to attend the EIC's Cyberspace (M202-203) to benefit from its skills and services, accessing technical support, advice, training, etc. in the following areas:

- Multimedia… (loan equipment, software and tools available)
- Scripted, media-ready content (skills transfer, training, popularizing your work)
- Access/posting of documents, activities, etc. for your teaching assignments at UTT (Moodle administration, collaborative working tools, etc.)

Visit us to use the room or receive advice/training, or contact **lucas.mercier@utt.fr** if you'd like an equipment loan or have a specific support request.

Finally, the EIC is in charge of training PhD students to use the MAHARA tool for building their skills portfolio (compulsory for PhD students since autumn 2016 pursuant to the Decree of 25 May 2016.

Contact: cip@utt.fr - +33 (0)3 25 71 84 31

Companies Relations Direction

Leveraging UTT's research activities for greater economic value is a natural progression, echoed in the industrial and societal environment. **The projects carried out by this department bring together several different activities:**

- Developing partnerships with companies by offering them directly operational solutions in the form of:

- **Long-term research partnerships:** companies entrust research work to UTT laboratories over several years to develop a new product or process.
- **Provision of research and training services:** UTT provides companies with its skills and resources in terms of consulting, expertise, continuing education, studies, tests, specific laboratory equipment analysis, bibliographical research, etc.

- **Supporting UTT students and researchers with business creation:** identifying emerging projects, consolidating and guiding them towards the business incubator within the Technopole.
- **Leveraging individual research results:** this applies to the results of research carried out by the laboratories. This might include **protecting technology**, through filing patents where necessary and then **transferring them to a company** (patent or software licence, etc.)
- **Supporting researchers seeking funding for their research projects**.

Partner companies also benefit from the high-level equipment used in the University's research laboratories.

The department distributes and manages laboratory notebooks, the use of which is highly recommended.

Contact: germain.malnoury@utt.fr

International Relations Direction

The International Relations Department (IRD) works closely with the Doctoral School. It provides PhD students, as part of their education, with support on two main levels: on the one hand, international mobility for PhD students from UTT and, on the other, hosting of non-French speaking PhD students from abroad at UTT.

- **International mobility**:
  PhD students have the opportunity to spend a few months abroad working in a laboratory at a partner university (in Europe or outside Europe). The IRD can help with the practical organization of this stay.
- **French as a Foreign Language (FLE)**

  For coherency reasons, the CRD is in charge of FLE teaching to benefit PhD students staying at UTT. Intensive 80-hour courses are offered in August and February, along with a program of side activities (sport, cultural and business visits, etc.). In addition, PhD students can devote four hours per week during university semesters to honing their French skills.

Contacts:

FLE:	dominique.masson@utt.fr
Outgoing mobility:	outgoing@utt.fr
Incoming mobility:	ingoing@utt.fr

Communication Department

The Communication Department manages UTT's internal and external communications. It can offer PhD students support with their communication requirements and solicit their testimonials. It oversees the promotion of UTT's image and validates the graphic charter for documents issued in UTT's name.

The Communication Department can provide support to promote PhD students' research work drawing on the communication media it employs: internally, through the digital workspace, and externally, through the UTT website, press relations (press releases, interviews, etc.) and the institution's magazine, "Ellipse". PhD students can send the magazine (which is published in French and English versions) to their academic and industrial contacts.

The Communication Department may ask PhD students to provide statements on their work and research projects for UTT's communication needs (particularly in the press or UTT news magazine). These testimonials are strictly voluntary.

The Communication Department oversees UTT's image and visual identity (graphic charter). Any use of the UTT logotype requires its prior approval. Document templates that comply with the UTT graphic charter are available on the digital workspace ("Documents" tab / UTT Documents / Communication / Document templates).

The department can lend out banners, internal signage and other equipment for events, subject to prior reservation. It can also provide photos to illustrate presentations, posters and other media.

Contact: office L018 - tel +33 (0)3 25 71 76 16 - communication@utt.fr

ELLIDOC - the Association for UTT PhD students and doctors

ElliDoc, the Association for UTT PhD students and doctors, aims to promote exchanges between PhD students at Université de Technologie de Troyes, in all teams and research fields. In addition, ElliDoc is there to support you in various aspects of your day-to-day life, i.e. seeking and disseminating information on the progress of doctoral projects, discussing any difficulties related to your doctoral project, whether of a technical or human nature. Moreover, ElliDoc also aims to organize various scientific activities, such as the PhD students' forum, as well as extra-curricular events (themed evenings, sports meets, outings, excursions in the region, etc.). For more information, do not hesitate to contact us directly on ellidoc@utt.fr or via our Facebook page, where you'll find an overview of the various **events** we organize, as well as practical information / links about life at UTT and in Troyes.

There are many other clubs and associations at UTT covering a broad spectrum of activities and events. The Students' Office (BDE) brings these together and looks after student life at UTT, with the help of the other associations listed on the etu.utt.fr website.

Useful Links

UTT Doctoral School website: www-ecoldoc.utt.fr

All the information on the Doctoral School online.

Agence Bibliographique de l'Enseignement Supérieur: www.abes.fr

Access to millions of bibliographical records available on the internet, as well as Docthesis databases, French theses, etc.

Agence Nationale de la Recherche Technique: www.anrt.asso.fr

Improving the efficiency of the French research and innovation system, encouraging consultation and developing cooperation at both European and national level. CIFRE (Industrial Agreements for Training through Research) Agreements, etc.

Association Bernard Grégory (https://www.abg.asso.fr)

Jobs for doctors in all disciplines. CV bank. Thesis offers. Recruitment of newly qualified scientists with doctorate degrees.

Association Nationale des Docteurs ès Sciences: www.andes.asso.fr/

Getting doctorates recognised as valid professional experience; communicating the relevance of the skills acquired during a doctorate for a wide range of professions outside the academic sector, taking action to improve the professional training of newly qualified doctors.

Conseil National des Universités www.cpcnu.fr/accueil.htm

UTT Computer Resource Centre: local.utt.fr/cri/presentation.htm

UTT's IT resources, Information System Charter, IT support requests…

'**Ellidoc', the Association for UTT PhD students and doctors: ellidoc.utt.fr**

Research at UTT: www.utt.fr/fr/recherche.html

Scientific Policy, research topics at UTT, research structures, Partnership Policy.

UTT Library: www-scd.utt.fr

UTT's library resources.

Innovation-Transfer Department: www.utt.fr/fr/relations-entreprises.html

Partnership research, service provision, business creation support, leveraging individual research results, intellectual property.

UTT educational Innovation Centre blog: tice.utt.fr/

Here you'll find announcements, course lists, available tools, etc.