EURECOM's Master of Science Diploma (DNM)

RULES AND REGULATIONS

2021-2022

Table of contents

1 GENERAL INFORMATION

1.1 Spezialisations

These Rules and Regulations apply to both Masters of Science Diplomas delivered by EURECOM:
- o Spezialisation in Computer Science
  - ▪ Digital Security track
  - ▪ Data Science track
- o Spezialisation in Networks and Telecommunications
  - ▪ Intelligent communication Systems track
  - ▪ Internet of Things track

1.2 Language

All courses are taught in English.

1.3 Recruitment

The jury tasked with selecting students for the Master of Science programs reviews the applications and may interview candidates, regardless of the duration of the program (18 or 24 months).

1.4 Registration

Each student must register each year with Academic Affairs. Registration is confirmed after payment of the year's tuition fees.

1.5 Curriculum duration

The total duration of the Master's program is usually 24 months, divided into three semesters at EURECOM (S7, S8, S9) and one semester devoted to the Master thesis/internship (S10) in a corporate or academic research lab. However, this can be reduced if students are directly admitted in Semester 8, in which case they do 2 semesters at EURECOM (S8 and S9) and one semester for the Master thesis/internship.

1.5.1 Repeating a year

Students may repeat one year. This requires registration with Academic Affairs.

1.5.2 Voluntary suspension of studies

Students may request to suspend their studies for a maximum of one year. The request must be made in writing to Academic Affairs.

The suspension may be motivated by a personal project, i.e. setting up a business or carrying out a civic/volunteer project. Students are notified of the decision in writing. If their request is granted, no enrollment is required but the school can support their projects if they are deemed in line with the overall objectives of the curriculum. At the end of the year, students resume their course of study, and keep their credits as well as their requirements to repeat a course or a year.

1.5.3 Study leave

Academic Affairs will review the situation of students who had to stop their studies for duly justified reasons (illness, accident, maternity leave, etc.). It may decide to consider that the student is on "study leave" for all or part of the academic year. It may invite the student to re-register for the incomplete academic year. This new registration may be subject to the authorization of a medical doctor. Study leave is different from repeating a year.

At the end of the leave, students resume their course of study and keep their credits and their requirements to catch up or repeat a year.

1.5.4 Double degree opportunities in France and abroad

With bilateral agreements, students can opt for a double degree, with one period at EURECOM and another at the other institution. At the end of the training, and if successful, students graduate from EURECOM with a Master of Science degree and from the second institution, or receive a joint degree. The criteria to obtain a double degree are described in the bilateral agreements.

1.6 Teaching formats

Several teaching formats may be used: lectures or conferences, tutorials, practical work, tutored self-training, asynchronous tutored self-training, planned personal work (supervised projects), visits, and internships. Students are informed of the number of hours devoted to each course. This is the supervised part, duly posted on the timetable. Students' personal work is not indicated, but is integrated in the attribution of ECTS credits.

2 ACADEMIC PROGRAM

2.1 Semesters – ECTS credits - Teaching units

Each academic year is made up of inseparable and compulsory Teaching Units representing a total of 60 ECTS credits per year. Each year is made up of two semesters of 30 ECTS credits each. Except for the 18-month curriculum in which the first year corresponds to Semester 9 (S9).

Courses are presented in the form of teaching units (TU) with Components (CPTU). The names of the teaching units and components as well as the names of the relevant professors are clearly identified.
A set of ECTS credits is granted for each type of teaching unit (technical courses, non-technical courses, language courses), as well as for the project teaching unit and the internship.

Each component (CPTU) is allocated a number of ECTS credits and a coefficient which is used to calculate the weighted average for the teaching unit.

The list of teaching units and the corresponding ECTS credits are set for each semester of each academic year.
At the beginning of the year, students are informed of all the teaching units and the validation requirements.

2.1.1 Study tracks: semesters 7, 8, and 9

Both Master's programs include technical and non-technical courses as well as tutored projects in Semesters 7, 8, and 9.

2.1.2 Final-year Project (semester 10)

The final-year project takes the form of a professional thesis based on an internship and a dissertation which students defend before a jury.
The Master thesis/ internship covers at least 20 weeks (outside holidays) over six months, and is carried out in a university or corporate R&D lab.

2.2 Timetable

For each semester, a timetable is set by Academic Affairs and communicated to students, professors and outside contributors before the beginning of each semester. The assessment tests of the 1st and 2nd exam sessions are explicitly mentioned.

3 ASSESSMENTS

3.1 Assessment of teaching units

3.1.1 Methods

At the beginning of the year, the faculty of each teaching unit provides students with a list of the learning outcomes (knowledge, abilities and/or skills).

For each teaching unit, the evaluation of the learning outcomes may include a continuous assessment and/or a final assessment. It can also include an assessment of the practical work, and/or of a tutored project or personal work related to the teaching unit.

Based on the faculty decision, the validation of teaching units can be done in two different ways:
- Grades or
- An assessment of learning outcomes

Whatever the method, the principle of compensation within the teaching unit applies.

3.2 Assessment of internships and projects

3.2.1 Assessment of projects

Projects are evaluated on the basis of a written report and an oral defense, according to the following criteria:
- Analysis of the subject / associated challenges (coefficient 2)
- Outcomes (coefficient 2)
- Project management (coefficient 1)
- Written report (coefficient 1)
- Oral exam (coefficient 1)

3.2.2 Assessment of the final-year internship

Final internships are defended before an internship panel.

Internships are assessed based on five criteria: time management, conceptual work, outcomes, report and presentation. The five scores are combined and weighted as follows:

- Project management (coefficient 1)
- Oral exam (coefficient 1)
- Report (coefficient 1)
- Conceptual work (coefficient 2)
- Outcomes (coefficient 2)

3.3 Validation of teaching units

The academic year includes two examination sessions.

At the end of the first session, the teaching unit jury meets to evaluate the learning outcomes of students.. The assessment is defined by the four following levels:
- "Mastered": the student masters all the learning outcomes of the teaching unit (grade between 15 and 20).
- "Achieved": the student has acquired the key expected learning outcomes(grade between 10 and < 15).

- "Partially acquired": the student has acquired some of the expected outcomes, but shows gaps in knowledge (grade between 8 and < 10).
- "Not acquired": the student shows important gaps(grade between 0 and < 8).

Students who receive a grade equal to or greater than 10/20 obtain the "Acquired" or "Mastered" status, when grades are used for the assessment.

Students who receive the "Acquired" and "Mastered" status get their teaching unit validated and the corresponding ECTS credits. The validation of teaching units and credits is definitive and the corresponding ECTS credits are definitely owned.

3.3.1 Results of the first assessment session

- From the numerical grades obtained in the components of the same teaching unit, and by applying the coefficients, an average is calculated for the 1st session of the teaching unit: If the average mark of the teaching unit is greater than or equal to 10/20, the student receives the ECTS credits of said teaching unit.

- In case the average of the teaching unit is below 10/20, the student is authorized to take the tests at the 2nd session for the components with a grade below 10/20.

3.3.2 Results of the second assessment session

The 2nd session tests only take place for the components, which a student did not pass during the 1st session. The component grades higher than or equal to 10/20 received at the 1st session are maintained for the calculation of the 2nd session grade average.

Following the tests of the 2nd session, the teaching unit jury meets again as it does after the 1st session. If the average grade of the teaching unit is higher than or equal to 10/20, the student receives the ECTS credits of said teaching unit.

The level of the teaching unit obtained at the end of the 2nd session becomes "Acquired".

In the case where the average of the teaching unit is below 10/20, the jury, after deliberation, may propose to validate the teaching unit if it deems the missing learning outcomes as sufficient. In this case, the level of the teaching unit becomes "Acquired" and the student obtains the ECTS credits allocated to this TU..

If, at the end of the 2nd session a teaching unit is not validated, the student's report shows this unit as "With a debt" (see 3.7.2).

3.4 Validation of projects

For the teaching unit project to be accepted, students must obtain a final grade of at least 10/20. Even if realized as a group work, the grades are individually given to each student (and grades can be different within a group)
Semester projects can be made up based on the terms set by the Teaching Committee.

3.5 Validation of internships

3.5.1 Summer internships

The report from the summer internship must be validated by the internship supervisor in the research or corporate lab. However, students do not get credits for it, but it will be mentioned in their grade/skill transcript delivered with the diploma.

3.5.2 Final-year internships

To obtain ECTS credits for the internship teaching unit, students must obtain a final grade of at least 10/20.

Only one professional thesis defense is allowed.

If the professional thesis work is deemed insufficient, the internship jury (cf. 4.2.2) may request that it be further developed in a manner to be decided at the Teaching Committee meeting. A complete repetition of the internship is also possible, in which case the student will do a new internship.

3.6 Semi-annual pedagogical assessment

A pedagogical assessment is organized at the end of each semester. It is held by class or track if necessary, with faculty members and student representatives present.

3.7 Validation of the academic year

3.7.1 Criteria

The year is validated if students obtain 60 ECTS credits, i.e. if they validate all the teaching units. This does not apply to students who are enrolled in the 18-month program and who advance to the second year if they receive 30 credits during the semester.
The jury may propose that a student who does not have 60 credits (or 30 credits for the 18-month curriculum) still dvances to the second year.
In this case, the student will have "debts" and will need to validate the missing teaching units in the following year(s).
After advice of the year's juries, the teaching committee will define the terms under which the validation of a TU "with a debt" is to be conducted.

3.7.2 Teaching units with a debt

- First-year students who have teaching units with a debt and who advance to the second year keep all the components' grades higher than or equal to 10 that they received at the 1st or 2nd session. In the second year, they will only retake the exams for which the mark was still below 10 after the 2nd session, including practical work: (TPs) and guided studies (TDs) (oral if necessary). The average of the teaching unit with a debt is then calculated with the new grades, and the maintened grades.

- Students with a teaching unit with a debt who repeat the year (complete repetition of the year) retake all the components of said teaching unit that was not validated. No grade of a teaching unit with a debt is maintained. The ECTS credits acquired in the other teaching units are definitively maintained.

In all cases (advancing to the next year with one or several debt(s) or repeating the year), a learning agreement specifying the courses to be passed will be issued by Academic Affairs and co-signed by the student.

4 EXAMS AND JURIES

4.1 Examination sessions

For each semester of the academic year, two examination sessions are organized.

Only students registered in the components of a teaching unit will be able to take an exam.
For each component, a retake exam is possible at the second session.

Students who did not attend the first examination session without a valid reason will not be able to attend the second examination session of the relevant component.

The schedule of examination sessions is communicated each semester by Academic Affairs.

Only one professional thesis defense is allowed, except in the case of a medical reason duly justified by a doctor.

4.1.1 Absences

Students must attend the examination sessions of the courses in which they are registered. Absences from exams without a medical certificate written in French or English sent to Academic Affairs will result in the cancellation of the relevant credits without the possibility of a make-up session.
Any unjustified absence from an exam will result in a grade of zero (when the assessment is based on grades).

For students with a valid absence to one or several tests, the exam taken during the 2nd session will serve as the first session exam. The result of the test will then replace the results of the tests not taken by the student. The terms of any make-up session are decided on a case-by-case basis.

4.1.2 Frauds

The terms for the examinations as well as the consequences of any fraud (including plagiarism) are specified to students by Academic Affairs for each teaching component before each examination session.

Any misbehavior during exams will result in the nullification of the exams and disciplinary sanctions may be taken by the Disciplinary Board and communicated to Academic Affairs and the Teaching Committee.

4.2 Juries

4.2.1 Teaching unit juries

Teaching unit juries are made up of the academic supervisors and professors/lecturers of the units. These juries decide on the awarding of ECTS credits after each examination session, and propose opinions to the Teaching Committee.
A semi-annual assessment is made by Academic Affairs to identify students who may face difficulties at the earliest.

4.2.2 Juries of final-year internships

These juries are made up of the academic supervisor and the representative of the host company or, failing that, an outside specialist.

4.2.3 Yearly Juries

A jury is set up per year. It is made up of the academic supervisors of the year's teaching units.

The jury reviews all students who have not obtained 60 ECTS credits.
The jury may decide to set up individual hearings with students who have failed.

For each of these students, the jury submits a proposal to the Teaching Committee:
- Validation of the teaching units whose level is "partially acquired"
- Admission with a teaching unit with a debt

- Authorization to repeat the year, or exclusion

Academic Affairs informs these students of the Teaching Committee's proposals.

For students who do not meet the criteria to advance to the next year, the jury may propose to the Teaching Committee that they be allowed to repeat the year or that they be excluded. Exclusions require a motivated decision by the jury to the Teaching Committee.

4.2.4 Appeals

Following the juries' recommendations, students have 48 hours to submit a written request for appeal to Academic Affairs who reviews it in the presence of the students' elected representatives.

4.2.5 Teaching Committee

The Teaching Committee reviews the results of all students who are administratively registered in the year, and the juries' proposals. It monitors in particular the equal treatment of the students of each track and is sovereign in its decisions The Teaching Committee is made up of EURECOM's permanent research professors, a representative of Academic Affairs, a representative of the founding member, and representatives of the academic members. Four students (including the President of the Students Association [BDE] and three students elected by the student body) also attend the meetings but without voting rights. The committee is chaired by the scientific and academic director.

The Teaching Committee makes the final decision on:
- The validation of the year
- The possible validation of one or several teaching units with the level "Partially acquired"
- The admission with a teaching unit with a debt
- The terms to repeat an internship
- The possibility to repeat a year or the exclusion of failing students

The decisions of the Teaching Committee are communicated to students by Academic Affairs. For students who repeat a year, a learning agreement specifying the teaching unit to be passed is issued by Academic Affairs and co-signed by the student.
The Teaching Committee may decide to exclude a student, after auditioning him/her and following the recommendations of the juries.

4.2.6 Disciplinary Board

The permanent members of the Disciplinary Board are the School Director, the Head of Academic Affairs and the professors in charge of the study tracks.The board decides on possible sanctions to be taken
- following cases of examination fraud,
- more generally, in case a student did not comply with the responsibilities set out in the Academic Charter.

The Disciplinary Board may decide to exclude a student for failure to comply with the above and after auditioning him/her.

5 GRADUATION REQUIREMENTS

The Teaching Committee takes into account the following elements when deciding whether or not to grant a diploma:

- The academic program must be validated.
- The internship obligations must be validated.
- Proof of a proficient level of English (cf. 5.2)
- Proof of successful French level for non-French speaking students (cf. 5.2).

The Teaching Committee is sovereign and as such has full authority over the awarding of the diploma.

5.1 Validation of the academic program

Students must have obtained 30 ECTS credits per semester, i.e.:
- 90 credits for the 18-month curriculum
- 120 credits for the 24-month curriculum

5.2 Level of English and French

A certain level of proficiency in English is required for all graduating students.

Non-French speaking students must justify of a certified level in French based on the below criteria:

Required English level for admission:
- Cambridge: Level B1 minimum: 140
- Grade C for the Cambridge Preliminary English test (PET)
- TOEFL ITP: 460
- TOEFL IBT: 42
- TOEIC: 550
- IELTS: 4

English level to graduate:
- Cambridge : Level B2.2 minimum: 174
- Grade B for the Cambridge English First Certificate
- Grade C for the Cambridge English Advanced or Proficiency Certificate

- TOEFL ITP: 567-570
- TOEFL IBT: 88
- TOEIC: 870
- IELTS: 6.5

Required level of French for non-French graduating students

- DELF B1
- DCL FLE B1
- TCF B1

In the event that the language requirements are not met by the end of the second year before graduation (through an external test of the student's choice), the Teaching Committee will suspend the issuance of the diploma for a maximum of 2 years. After said period, the student will no longer be able to graduate from EURECOM. If the required level is reached, the diploma will be issued immediately as long as the other conditions are met.

Date: 30/09/2021

Ulrich Finger
Director
EURECOM

Intelligent Communication systems

Semester 7 [30 ECTS]

TU Wireless Communications: Principles and Trends [10 ECTS] – 84 hours

- ATWireless - Advanced topics in wireless communications (5)
- MobSys - Mobile communication systems (5)

TU Mobile Networks and Models [10 ECTS] – 100 hours
- DigiCom - Digital communications (5)
- NetMod - Network Modeling (5)
- InfoTheo - Information theory (5)
- MobCom - Mobile communication techniques (5)
- SSP - Statistical signal processing (5)

TU Opening [5 ECTS] – 50 hours
- Long technical course (5)
- Short technical course (2,5)
- AwaRe - Awareness-raising to research (1,5)

TU Social and Human Sciences [4 ECTS] – 42 hours
- Property - Intellectual property law (2)
- B_INNOV: How to adopt the right posture and move from idea to market! (4)
- ManagIntro - Introduction to Management (4)
- RDI - Responsible Digital Innovation: Risks, Ethics and Technology (2)
- TeamLead - Personal Development and Team Leadership (4)
- CSE - The challenges of a sustainable economy

TU Languages [1 ECTS] – 22 hours

Semester 8 [30 ECTS]

TU <u>Networks and Optimization</u> [10 ECTS] – 100 hours
- Radio - Radio engineering (5)
- Malcom - Machine Learning for Communication systems communication (5)
- MobAdv - Mobile Advanced Networks (2,5)
- NetSoft - Network Softwerization (2,5)

TU <u>Mathematical and Algorithmic Methods</u> [10 ECTS] – 100 hours
- ASI - Advanced Statistical Inference (5)
- CompMeth - Computational Methods for digital communications (5)
- MobWat - Wireless Access Technologies (2,5)
- AML - Algorithmic Machine Learning (2,5)
- DeepLearning - Deep Learning (2,5)
- SP4Com - Signal Processing for Communications (5)
- WebSem - Semantic Web and Information Extraction technologies (2,5)
- WiSec - Wireless Security (2,5)

TU Opening [5 ECTS] – 50 hours
- Long technical course (5)
- Short technical course (2,5)
- AwaRe - Awareness-raising to research (1,5)
- ResProj - Research Project (5)

TU <u>Social and Human Sciences</u> [4 ECTS] – 42 hours
- Business - Business simulation (4)
- Law - General introduction to law : contracts, setting up a business (2)
- ProjMan – Project Management (4)
- SATT - Sociological Approaches of Telecom Technologies (2)
- TeamLead - Personal Development and Team Leadership (4)

TU <u>Languages</u> [1 ECTS] – 22 hours

Semester 9 (30 ECTS)

TU <u>Mobile Services and Applications</u> [10 ECTS] - 100 hours
- MobServ - Mobile application and services (5)
- Optim - Optimization Theory with Applications (2,5)
- MobiSec - Mobile Systems and Smartphone Security (5)
- Malis - Machine Learning and Intelligent System (5)
- Clouds - Distributed Systems and Cloud Computing (5)
- Stats - Foundations of Statistical Inference (2,5)
- NetMod - Network Modeling (5)
- Quantis - Quantum Information Science (2,5)
- Stand - Standardization activities (2,5)
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TU <u>Opening</u> [5 ECTS] – 50 hours
- Long technical course (5)
- Short technical course (2,5)

TU <u>Project</u> [10 ECTS] – 200 hours
TU <u>Social and Human Sciences</u> [4 ECTS] – 42 hours
- Property - Intellectual property law (2)
- B_INNOV: How to adopt the right posture and move from idea to market! (4)
- ManagIntro - Introduction to Management (4)
- RDI - Responsible Digital Innovation: Risks, Ethics and Technology (2)
- TeamLead - Personal Development and Team Leadership (4)
- CSE - The challenges of a sustainable economy

TU <u>Languages</u> [1 ECTS] – 22 hours

Semester 10 [30 ECTS]
<u>6 months internship</u>

Data Science

Semester 7 [30 ECTS]

TU Basics in data science [15 ECTS] – 147 hours
- Clouds - Distributed Systems and Cloud Computing (5)
- Malis - Machine Learning and Intelligent System (5)
- DBSys - Database Management System Implementation (5)

TU Web Science and mathematical methods [5 ECTS] – 50 hours

- ImCod - Image & Video Compression (2,5)
- Quantis – Quantum Information Science (2,5)
- SofDev - Software development methodologies (2,5)
- WebInt - Interaction Design and Development of Modern Web Applications (2,5)
- BigSec - Security and privacy for Big Data and Cloud (2,5)

TU Opening [5 ECTS] – 50 hours
- Long technical course (5)
- Short technical course (2,5)
- AwaRe - Awareness-raising to research (1,5)

TU Social and Human Sciences [4 ECTS] – 42 hours
- Property - Intellectual property law (2)
- B_INNOV: How to adopt the right posture and move from idea to market! (4)
- ManagIntro - Introduction to Management (4)
- RDI - Responsible Digital Innovation: Risks, Ethics and Technology (2)
- TeamLead - Personal Development and Team Leadership (4)
- CSE - The challenges of a sustainable economy

TU Languages [1 ECTS] – 22 hours

Semester 8 [30 ECTS]

<u>TU Advanced in Machine Learning</u> [10 ECTS] – 120 hours
- ASI - Advanced Statistical Inference (5)
- AML - Algorithmic Machine Learning (2,5)
- DeepLearning - Deep Learning (2,5)

<u>TU Applications in Data Science</u> [10 ECTS] – 100 hours

- 3DGraph - 3-D and virtual imaging (analysis and synthesis) (5)
- Malcom - Machine Learning for Communication systems communication (5)
- AppIOT- Iot Application Protocols (2,5)
- Forensics - Cyber-crime and Computer Forensics (2,5)
- FormalMet - FormalMethods-Formal specification and verification of systems (2,5)
- ImSecu - Imaging Security (2,5)
- Speech - Speech and audio processing (2,5)
- WebSem - Semantic Web and Information Extraction technologies (2,5)

<u>TU Opening</u> [5 ECTS] - 50 hours
- Long technical course (5)
- Short technical course (2,5)
- AwaRe - Awareness-raising to research (1,5)
- ResProj - Research Project (5)

<u>TU Social and Human Sciences</u> [4 ECTS] – 42 hours
- Business - Business simulation (4)
- Law - General introduction to law: contracts, setting up a business (2)
- ProjMan – Project Management (4)
- SATT - Sociological Approaches of Telecom Technologies (2)
- TeamLead - Personal Development and Team Leadership (4)

<u>TU Languages</u> [1 ECTS] – 22 hours

Semester 9 [30 ECTS]

TU Applications [10 ECTS] – 100 hours
- STATS- Foundations of Statistical Inference (2,5)
- ImProc - Digital Image Processing (2,5)
- SysSec - System and Network Security (5)
- Optim - Optimization Theory with Applications (2,5)
- MPC - Multiparty Computation and Blockchainsblockchains (2,5)
- MobServ - Mobile application and services (5)
- InfoTheo - Information theory (5)

TU Opening [5 ECTS] – 50 hours
- Long technical course (5)
- Short technical course (2,5)

UE Project [10 ECTS] - 200 hours

TU Social and Human Sciences [4 ECTS] – 42 hours
- Property - Intellectual property law (2)
- B_INNOV: How to adopt the right posture and move from idea to market! (4)
- ManagIntro - Introduction to Management (4)
- RDI - Responsible Digital Innovation: Risks, Ethics and Technology (2)
- TeamLead - Personal Development and Team Leadership (4)
- CSE - The challenges of a sustainable economy

TU Languages [1 ECTS] – 22 hours

Semester 10 [30 ECTS]
6 months internship

Internet of things

Semester 7 [30 ECTS]

TU <u>Basics in IOT</u> [10 ECTS] – 112 hours
- Malis - Machine Learning and Intelligent System (5)
- SysSec - System and Network Security (5)

TU <u>Software: Engineering, Security & Networking I</u> [10 ECTS] – 100 hours
- OS – Operating systems (5)
- CompArch – Computer architecture (5)
- SoftDev - Software development methodologies (2,5)
- MobServ - Mobile application and services (5)
- Optim - Optimization Theory with Applications (2,5)
- MobMod – Mobility Modeling (2,5)

TU <u>Opening</u> [5 ECTS] – 50 hours
- Long technical course (5)
- Short technical course (2,5)
- AwaRe - Awareness-raising to research (1,5)

TU <u>Social and Human Sciences</u> [4 ECTS] – 42 hours
- Property - Intellectual property law (2)
- B_INNOV: How to adopt the right posture and move from idea to market! (4)
- ManagIntro - Introduction to Management (4)
- RDI - Responsible Digital Innovation: Risks, Ethics and Technology (2)
- TeamLead - Personal Development and Team Leadership (4)
- CSE - The challenges of a sustainable economy

TU <u>Languages</u> [1 ECTS] – 22 hours

Semester 8 [30 ECTS]

TU Advanced in IOT [10 ECTS] – 84 hours
- AppIOT - Iot Application Protocols (2,5)
- ProtIOT Iot Communication Protocols (2,5)
- DeepLearning – Deep Learning (2,5)
- WebSem - Semantic Web and Information Extraction technologies (2,5)

TU Software: Engineering, Security & Networking II [10 ECTS] – 100 hours
- WiSec – Wireless Security (5)
- HWSec - Hardware Security (2,5)
- Malcom - Machine Learning for Communication systems communication (5)
- MobAdv - Mobile Advanced Networks (2,5)
- MobWat - Wireless Access Technologies (2,5)
- Netsoft - Network Softwerization (2,5)

TU Opening [5 ECTS] – 50 hours
- Long technical course (5)
- Short technical course (2,5)
- AwaRe - Awareness-raising to research (1,5)
- ResProj - Research Project (5)

TU Social and Human Sciences [4 ECTS] – 42 hours
- Business - Business simulation (4)
- Law - General introduction to law : contracts, setting up a business (2)
- ProjMan – Project Management (4)
- SATT - Sociological Approaches of Telecom Technologies (2)
- TeamLead - Personal Development and Team Leadership (4)

TU Languages [1 ECTS] – 22 hours

Semester 9 [30 ECTS]

TU <u>Software & Systems</u> [10 ECTS] – 100 hours
- Clouds - Distributed Systems and Cloud Computing (5)
- MobSys - Systèmes de communications mobiles (5)
- UMLEmb - Conception de systèmes embarqués avec UML (2,5)
- Stand - Standardization activities (2,5)
- NetMod - Network Modeling (5)
- MPC – Multiparty Computation and Blockchains (2,5)
- MobiSec - Mobile Systems and Smartphone Security (5)

<u>TU Opening</u> [5 ECTS] – 50 hours
- Long technical course (5)
- Short technical course (2,5)

TU <u>Project</u> [10 ECTS] – 200 hours
TU <u>Social and Human Sciences</u> [4 ECTS] – 42 hours
- Property - Intellectual property law (2)
- B_INNOV: How to adopt the right posture and move from idea to market! (4)
- ManagIntro - Introduction to Management (4)
- RDI - Responsible Digital Innovation: Risks, Ethics and Technology (2)
- TeamLead - Personal Development and Team Leadership (4)
- CSE - The challenges of a sustainable economy

TU <u>Languages</u> [1 ECTS] – 22 hours

Semester 10 [30 ECTS]
     <u>6 months internship</u>

Digital Security

Semester 7 [30 ECTS]

TU <u>Fundamentals of Computer Security</u> [10 ECTS] - 94 hours
- SecCom - Secure communications (5)
- SysSec - System and Network Security (5)

TU: <u>Systems and network programming</u> [10 ECTS] -100 hours
- MobiSec - Mobile Systems and Smartphone Security (5)
- Quantis – Quantum Information science (2,5)
- SoftDev - Software development methodologies (2,5)
- Malis - Machine Learning and Intelligent System (5)
- ImProc - Digital Image Processing (2,5)

TU <u>Opening</u> [5 ECTS] - 50 hours
- Long technical course (5)
- Short technical course (2,5)
- AwaRe - Awareness-raising to research (1,5)

TU <u>Social and Human Sciences</u> [4 ECTS] - 42 hours
- Property - Intellectual property law (2)
- B_INNOV: How to adopt the right posture and move from idea to market! (4)
- ManagIntro - Introduction to Management (4)
- RDI - Responsible Digital Innovation: Risks, Ethics and Technology (2)
- TeamLead - Personal Development and Team Leadership (4)
- CSE - The challenges of a sustainable economy

TU <u>Languages</u> [1 ECTS] - 22 hours

Semester 8 [30 ECTS]

TU <u>Advanced Courses in Security I</u> [10 ECTS] – 100 hours
- Forensics - Cyber-crime and Computer Forensics (5)
- HWSec - Hardware Security (2,5)
- ImSecu - Imaging Security (2,5)
- WiSec – Wireless Security (2,5)

TU <u>Analysis and Design of Computer System Interfaces</u> [10 ECTS] – 100 hours
- Speech - Speech and audio processing (2,5)
- FormalMet - FormalMethods-Formal specification and verification of systems (2,5)
- Netsoft - Wireless Access Technologies (2,5)
- AppIOT - Iot Application Protocols (2,5)
- ProtIOT - Iot Communication Protocols (2,5)

TU Opening [5 ECTS] – 50 hours
- Long technical course (5)
- Short technical course (2,5)
- AwaRe - Awareness-raising to research (1,5)
- Research Project (5)

TU <u>Social and Human Sciences</u> [4 ECTS] – 42 hours
- Business - Business simulation (4)
- Law - General introduction to law : contracts, setting up a business (2)
- ProjMan – Project Management (4)
- SATT - Sociological Approaches of Telecom Technologies (2)
- TeamLead - Personal Development and Team Leadership (4)

TU <u>Languages</u> [1 ECTS] – 22 hours

Semestre 9 [30 ECTS]

TU Advanced Courses in Security II [5 ECTS] – 50 hours

- BigSec - Sécurité pour les Big Data et le Cloud (2,5)
- MPC - Calcul multipartite et blockchains (2,5)
- MobiSec - Sécurité des systèmes mobiles et des smartphones (5)

TU Opening [5 ECTS] – 50 hours
- Long technical course (5)
- Short technical course (2,5)

UE Project [10 ECTS] – 200 hours
TU Social and Human Sciences [4 ECTS] – 42 hours
- Property - Intellectual property law (2)
- B_INNOV: How to adopt the right posture and move from idea to market! (4)
- ManagIntro - Introduction to Management (4)
- RDI - Responsible Digital Innovation: Risks, Ethics and Technology (2)
- TeamLead - Personal Development and Team Leadership (4)
- CSE - The challenges of a sustainable economy

TU Languages [1 ECTS] – 22 hours

Semester 10 [30 ECTS]
6 months internship