Efrei Undergraduate Programs Catalogue 2019-20

Version 2020.05.05

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Introduction

This catalogue offers a detailed overview of the Efrei Paris undergraduate curriculum by teaching department, including major learning objectives, course evaluation methods, and the progression of the program over the course of the three years.

The description of each department will be followed by a list of courses, including the number of hours of instruction, ECTS credits per course unit and the weights per unit modules.

Undergraduate study at Efrei Paris is organized via the following tracks :

- ✓ The Classic Undergraduate section: L1, L2, L3
- ✓ The International section: L1INT, L2INT, L3INT (Courses taught in English)
- ✓ The Bio-Informatics section: L1BN, L2BN, L3BN (Launching for L3 in September 2019)
- ✓ The Reinforcement section (for non-scientific high school graduates and holders of a technological baccalaureate such as STI2D): L1R, L2R
- ✓ The Spring Intake section: L1D and L1DBN (February matriculation)

The curriculum is divided into two primary sections: Scientific and Technical Training (STT) and the General Eduation Program (GEP).

Scientific and Technical Training (STT)

The courses in this section cover the scientific and technical skills necessary for future engineers. It is composed of three areas of study that, together, create an essential foundation for students who wish to succed in both their graduate studies and their future careers.

The three subsections are:

Mathematics
Computer Science
Physics and Electronics

In addition to the three core scientific blocks, there is a fourth block specifically for Bio-Informatics students:

Biology

General Education Program (GEP)

The courses in this section are non-scientific courses aimed at preparing students to become company managers in France or abroad, successful communicators, and citizens. The curriculum focuses on culture, communication, and languages, as well as business courses (management, economics, law).

Departments

Mathematics

Head of Department: Helen Kassel

Program Description

Acting as a bridge between high school and the Master's level, the undergraduate Mathematics program has a triple objective: to provide tools, teach concepts, and develop skills.

An observation of the skills students acquired in secondary school shows the need to reinforce the techniques of calculation, to teach structured methods for acquisition of knowledge, and to lay the foundations for the application of knowledge and autonomous critical thinking.

The primary objective of the "Numbers and Structures," "Finite and Infinite Sums," and "Functions and Variations" modules is to complete and consolidate the mathematical concepts acquired in high school by providing students with a stable conceptual framework open to future developments. The Linear Algebra, Probability and Statistics, Data Analysis and Real Mathematics (functions of several variables) modules complete these initial modules by extending in to "less immediate" but essential areas of Mathematics applications.

In the second and third year of the undergraduate cycle, Mathematics modules for computing, Group Theory and Applications, Discrete Optimization and Graph Theory are introduced in order to complement the range of students' mathematical tools.

In addition to learning essential mathematical theories and applications, students will learn how to use software tools specific to mathematics: Maxima for formal and algebraic calculations, Matlab, etc.

Since the goal is to train engineers, the acquisition of concepts systematically targets new methods and modes of application. For example, the linear algebra module ends with the study of elementary Markov chains in the context of matrix diagonalization and group theory is used to understand RSA encryption.

Key learning objectives:

- ✓ To be able to structure reasoning and argumentation: discover, analyze, transform or simplify a problem, and experiment on examples.
- ✓ To be able to calculate, using symbolic language: manipulate expressions containing symbols, organize the various stages of a complex calculation, perform automated calculations by hand or with a tool (calculator, software ...), verify the results.
- ✓ To be able to communicate orally and in writing: including an understanding of mathematical statements written by others, writing a rigorous problem solution, present and defend mathematical work.

Keywords :

Logic and algorithmic reasoning, arithmetic, algebra, linear algebra, diagonalization, analysis, multivariate functions, probability, continuous random variables, data analysis, cryptography, Dijkstra's algorithm, Bellman algorithm, Prim algorithm, automated machines, Kleene's theorem, regular expressions, Turing machine, optimization, Markov processes, linear programming.

Physics / Electronics

Department Head: Ziad Adem

Program Description

The objective of these courses is to develop a broad scientific background in the fields of physics and electronics with a particular focus on experimentation (projects, lab work) as well as theoretical foundations (structured classes, tutorials). The program is designed to progressively master the different components of the physical sciences that are essential for a digital technology engineer or computer scientist. The program courses are primarily focused on the definition of information (electrical form, electromagnetic, acoustic, optical, light, ...) its processing, its multiple modes of propagation and its storage.

Electronics is an applied branch of physics, based mainly on electricity and using particular materials. It is the basis of information science technologies in the sense that it makes it possible to materialize the representation of analog and logical signals (sensors, coders), to facilitate processing (filters, processors), and to allow communication (emission, transmission, reception) and storage (registers, memories) of information.

Key learning objectives:

- ✓ Ability to solve theoretical problems in the classic fields of physics (electricity, mechanics, thermodynamics, quantum physics ....) and electronics.
- ✓ Capacity to analyze information (modeling, processing and transport); design logic circuits and electronic systems (CAD); analyze emission systems, transmission and reception of electromagnetic waves ...;
- ✓ Capacity to analyze and exploit acoustic and visual signals

Keywords

From atoms to micro-chips; General Electricity; optics; voice and image; electromagnetic fields and propagation; transmission channels; Quantum physics ; thermodynamics; Mechanics; Digital electronics; Analog Electronics, Information Transmission; linear systems; Information theory.

Computer Science

Department Head: Faten Chakchouk

Program Description

Computer Science, or the science of information processing, performs algorithmic processing on data organized in structured sets. These treatment processes are programs, written with programming languages, and implemented on technical architectures (machines, network, computing resources). The programs and applications are designed in accordance with these structures as well as the expected results. Thus, depending on the particular problem, analysts will adapt the structures, the methods and the technical choices of language and platforms in order to produce a program, an application.

The computer science department offers students a wide range of modules that allow them to tackle complex problems. At the end of the undergraduate cycle, students will become designers and developers capable of solving a diverse range of problems using appropriate algorithms and programming languages, particularly object-oriented languages.

Students are introduced to group work and projects, which involve all steps of the process, from the technical specifications to the production of software. All projects end with a defense during which the instructor plays the role of the client.

The undergraduate Computer Science modules consolidate the basic mastery of various domains of computing (algorithmic and data structures, databases, networks, operating systems, Web programming, object-based programming ...) allowing students to choose a major specialization at the end of their undergraduate program.

Key learning objectives:

- ✓ Ability to analyze a problem
- ✓ Capacity to develop a problem resolution strategy
- ✓ Demonstrate an ability to formalize this strategy in an algorithm

These core skills will enable students to gain a broad understanding of coding in and of itself, while thinking in terms of solutions and IT performance.

At the end of the undergraduate cycle, students will have mastered several programming languages: Python, C, C ++, Java, HTML, SQL ... They will also have mastered object-oriented programming and will be able to use classes, inheritance, and polymorphism.

Students will be able to navigate the technological universe and the protocols that form the basis of Web programming in a client-server, and will master in particular HTML and CSS standards.

Students will understand the internal mechanisms of an operating system (in particular the algorithms used for process, memory, and file system management), and will master the use of IP data networks and switching technologies.

Students will be able to design a standardized database scheme and use a DBMS to fully exploit and administer the database. Students will understand the principles governing the internal organization of computers and will have notions in assembly programming. They will understand the interactions between hardware and software, and will be better able to grasp the concepts of Concurrent Programming and Parallel Programming.

Finally, students will be introduced to the main concepts of cybersecurity.

Keywords :

Algorithms, data structures, tables, linked lists, stacks, files, trees, ABR, sorting methods, Python, C, C ++, Java, SQL, HTML, cybersecurity, networks, protocols, databases, web programming, computer architecture, assembly, operating systems, object-oriented programming, classes, inheritance, polymorphism, top-down analysis, bottom-up analysis, process management, memory, software development.

Humanities and Communications

Head of Department: Jean Soma

Program Description

The Humanities and Communications courses offered by Efrei Paris are part of the General Education Program, which is mandatory for all undergraduate students.

The courses rely on interactive learning and revolve around two main aspects: verbal and non-verbal communication. They therefore aim to develop students' human qualities and skills, in other words, their ability to express, analyze, and formalize complex realities and phenomena in writing. Students will also learn to express themselves orally and to defend positions as well.

Consequently, an important part of these courses is devoted to methodology and developing creativity. In addition, the various individual and group projects that are integrated into the curriculum engage and stimulate students, develop their teamwork skills, and inspire their creativity and senstivity.

As entering the workforce is the long-term goal, students complete investigations which allow them to visit and discover companies, and to meet engineers on-site.

Additionally, as entering the workforce is the long term goal: the students complete surveys that allow them to go to companies and learn about the workplace practices. Learning how to use their professional skills and communicate their expertise through their CV, codification of professional online platforms, pitch, PPT as well as prepare for different aspects by completing reports, presenting oral defenses and associated projects.

The department has put in plade methology workshops (L1) and a Science History class (L2) since September 2018.

Lastly, the department manages different the Volaire Project, which allows students to have online training to improve their spelling and grammar to the satisfactory level: 600 points/ 1000. This level confirms the grammar skills of advanced technician and business engineer.

Key learning objectives:

By the end of this program, the students will be able to:

- ✓ Demonstrate intellectual curiosity, adaptability
- ✓ Effectively communicate
- ✓ Effectively analyze and synthesize information
- ✓ Demonstrate capacity to use critical thinking skills
- ✓ Demonstrate openmindedenss, social, cultural and emotional intelligence
- ✓ Demonstrate innovative and creative skills
- ✓ Work effectively with a sense of commitment and responsabilities

Keywords

Social skills, soft skills, intercultural communication, corporate culture, business, social responsibility in business, developmental durability, communication techniques, clear expression of ideas, effective analysis, projects, project management, common sense, cultural history, study cultural phenomenons, scientific experience, personal development, ethical knowledge, fluent in the French language, creativité, values, prospering sense of self…

Management

Head of Department: Agnès Béhar

Program Description

The Management Department groups the academia centered on the problems that extend across management in the technology field as well as economics, finance, law and business organisation.

A particular aspect is the focus on the awareness of the global economy dynamics.

Key learning objectives:

By the end of this program, the student will be able:

- ✓ To be able to adapt to the professional workplace
- ✓ To understand the functionality and organisation of business
- ✓ To know how to manage and motivate a team
- ✓ Demonstrate a driving force, analytical ability and critical thinking

Keywords

Economics - Organization and business processes - Financial Analysis - Corporate and contracts - Professional Project - Management control - Processes - Audit - Professional project

Language Department

International Relations and Languages
Head of Department: Christiane Michel

Program Description

English as a Foreign Language

The English foreign language program for the L Cycle with the main objective of promoting international education for our engineering students and progressively help them achieve operational in their target languages.

Our programs focus not only on developing their written and oral language skills, but also learning about the culture and introducing them to professional and intercultural communication. The program begins with audiovisual and written classwork and progressively brings the students to become familiar with specific linguistic dialect such as: standard, scientific and technical. This allows students to expand their understanding of institutions, history, social and economic issues as well as current events around the world. Globally, the language course reinforces analytical and reflective skills as well as gaining new methodologies (essays, synthesis, target report, professional communication skills, CV, oral presentation techniques…).

The English LV1 Module is part of the mandatory curriculum. At the begininng of each acadamic year taking the blank TOEIC allows the groups to be divided equally. Each semester the focus and objectives will be distinctive to each group level.

During the L Cycle, the modules for LV2 (Spanish, German, Chinese, Japanese) are offered, but optional, from the beginner to advanced levels. The students are divided into small groups to be divided equally. An additional course of English is proposed in the LV2 program for students who tested as a low level of English.

The courses of French as a Foreign Language are offered to non-French speaking students joining the program for the L Cycle.

Key learning objectives:

- ✓ Capacity to use specialized vocabulary and language registers varied and adapted to the context
- ✓ Ability to demonstrate use of syntax and logical connectors in order to structure coherent sentences, paragraphs and ideas
- ✓ Demonstrate good use of the punctuation codes of the target language.
- ✓ Ability to communicate orally with standard and appropriate pronunciation and intonation
- ✓ Capacity to formulate, summarize, compare, contrast and contrast facts, opinions and points of view
- ✓ Ability to structure an essay, a discussion or an oral presentation around a specific problem and using a constructed argumentation
- ✓ Ability to rephrase, paraphrase, introduce a quote and cite its sources
- ✓ Demonstrate capacity to select, evaluate and synthesize relevant information
- ✓ Deep understanding of context clues to infer the meaning of unfamiliar words or non-explicit ideas
- ✓ Ability to identify LV1 English, LV2 German, Spanish, Chinese, Japanese, FLE language registers. Beginner, Intermediate and Advanced levels. Standard, scientific and technical registers. Written and oral skills, cultural approaches, intercultural communication

Semester Program Courses

L1-Classic Undergradute Track Semester 1

UE		Course Code	Course Title											Hours	ECTS Credits	Weighting
UE11	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	120,25	8	
		SM100	Introduction to Superior Mathematics		1,75	1,75	10	15						27,75	0	2
		SM101	Analysis	17,5	0,75	1,75	19,25	0	0	0	0	7	0	46,25	0	3
		SM103	General Algebra	17,5	0,75	1,75	19,25	0	0	0	0	7	0	46,25	0	3
UE13	Computer Science													86,5	8	
		TI101	Python Programming	0	0	0	0	0	0	24,5	17,5	0	0	42	0	3
		TI102	Fundamentals of Algorithms 1	17,5	0,75	1,75	24,5	0	0	0	0	0	0	44,5	0	4
UE15	Physics and Electronics													109	8	
		SP101	From Atoms to Microchips	12,25	0,75	1,75	12,25	0	0	0	0	3,5	0	30,5	0	3
		SP106	General Electronics	12,25	0,75	1,75	10,5	0	7	0	0	0	0	32,25	0	2
		TE101	Digital Data Information	12,25	0,75	1,75	10,5	0	14	0	7	0	0	46,25	0	3
UE17	General Education													78,75	6	
		FH101	Academic Writing and Public Speaking	0	1,75	1,75	0	0	0	0	0	0	24,5	28	0	3
		FL101	English 1-Technology and Society	0	0	1,75	0	0	0	0	0	0	24,5	26,25	0	3
		PAVE	Participation in Student Life	0	0	0	0	0	0	0	0	0	0	0	0	1
		LV2FAC	Foreign Language 2	0	0	0	0	0	0	0	0	0	17,5	17,5	0	1
		FHT101	Methods	1,75	0	0	5,25	0	0	0	0	0	0	7	0	0

L1-Classic Undergradute Track Semester 2

UE		Course Code	Course Title											Hours	ECTS Credits	Weighting
UE21	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	89	7	
		SM202	Linear Algebra	15,75	0,75	1,75	15,75	0	0	0	7	7	0	48	0	3,5
		SM204	Finite and Infinite Sums	15,75	0,75	1,75	15,75	0	0	0	0	7	0	41	0	3,5
UE23	Computer Science													76	6	
		TI201	Technical Programing 2 : in C	0	0	0	0	0	0	24,5	14	0	0	38,5	0	3
		TI202	Algorithms 2	17,5	0,75	1,75	17,5	0	0	0	0	0	0	37,5	0	4
UE25	Physics and Electronics													105,5	7	
		SP202	Voice and Image	12,25	0,75	1,75	10,5	0	0	0	0	7	0	32,25	0	2
		SP204	Mechanics	12,25	0,75	1,75	8,75	0	0	0	0	0	0	23,5	0	2
		TE202	From System to Function	12,25	0,75	1,75	10,5	0	14	0	10,5	0	0	49,75	0	3
UE28	Interdisciplinary Project L1													10,5	2	
		TI250	Interdisciplinary Project L1	0	0	0	0	0	0	0	10,5	0	0	10,5		
UE27	General Education													94,5	6	
		FE201	Business Economics	7	0	1,75	0	14	0	0	0	0	0	22,75	0	2
		FH201	Argumentation et Critical Writing	0	0,75	1,75	0	0	0	0	0	0	24,5	27	0	2
		FL201	English 2-Issues in the English Speaking World	0	0	1,75	0	0	0	0	0	0	24,5	26,25	0	2
		PAVE	Participation in Student Life	0	0	0	0	0	0	0	0	0	0	0	0	1
		LV2FAC	Foreign Language 2	0	0	0	0	0	0	0	0	0	17,5	17,5	0	1
UE29	Professional Training	ST101													2	
		ST101	Internship/Practicum											140	0	

L1 INT : L1 International Track-Semester 1

UE		Course Code	Course Title										Hours	ECTS Credits	Weighting
UE11	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	120,25	8	
		SM1001	Mathematics		1,75	1,75	10	15						27,75	0	2
		SM101I	Calculus	17,5	0,75	1,75	19,25	0	0	0	0	7	0	46,25	0	3
		SM103I	General Algebra	17,5	0,75	1,75	19,25	0	0	0	0	7	0	46,25	0	3
UE13	Computer Science													93,5	8	
		TI101I	Python Programming	0	0	0	0	0	0	24,5	17,5	0	0	42	0	3
		TI102I	Algorithms 1	17,5	0,75	1,75	24,5	0	0	0	0	0	0	44,,5	0	4
UE15	Physics and Electronics													109	8	
		SP101I	From Atoms to Microchips	12,25	0,75	1,75	12,25	0	0	0	0	3,5	0	30,5	0	3
		SP106I	Fundamentals of Electronics	12,25	0,75	1,75	10,5	0	7	0	0	0	0	32,25	0	2
		TE101I	Digital Data Information	12,25	0,75	1,75	10,5	0	14	0	7	0	0	46,25	0	3
UE17	General Education													78,75	6	
		FH101	Academic Writing and Public Speaking	0	1,75	1,75	0	0	0	0	0	0	24,5	28	0	3
		FL101	English 1-Technology and Society	0	0	1,75	0	0	0	0	0	0	24,5	26,25	0	3
		PAVE	Participation in Student Life	0	0	0	0	0	0	0	0	0	0	0	0	1
		LV2FAC	Foreign Language 2	0	0	0	0	0	0	0	0	0	17,5	17,5	0	1
		FHT101	Methods	1,75	0	0	5,25	0	0	0	0	0	0	7	0	0

L1 INT : L1 International Track-Semester 2

UE		Course Code	Course Title											Hours	ECTS Credits	Weighting
UE21	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	89	7	
		SM202I	Linear algebra	15,75	0,75	1,75	15,75	0	0	0	7	7	0	48	0	3,5
		SM204I	Finite and infinite sums	15,75	0,75	1,75	15,75	0	0	0	0	7	0	41	0	3,5
UE23	Computer Science													76	6	
		TI201I	Programming in C - 1	0	0	0	0	0	0	24,5	14	0	0	38,5	0	3
		TI202I	Algorithms 2	17,25	0,75	1,75	17,5	0	0	0	0	0	0	37,5	0	4
UE25	Physics and Electronics													105,5	7	
		SP202I	Voice and Image	12,25	0,75	1,75	10,5	0	0	0	0	7	0	32,25	0	2
		SP204I	Mechanics	12,25	0,75	1,75	8,75	0	0	0	0	0	0	23,5	0	2
		TE202I	From System to Function	12,25	0,75	1,75	10,5	0	14	0	10,5	0	0	49,75	0	3
UE28	Interdisciplinary Project													10,5	2	
		TI250	Interdisciplinary Project	0	0	0	0	0	0	0	10,5	0	0	10,5		
UE27	General Education													94,5	6	
		FE201I	Business Economics	7	0	1,75	0	14	0	0	0	0	0	22,25	0	2
		FH201	Argumentation et Critical Writing	0	0,75	1,75	0	0	0	0	0	0	24,5	27	0	2
		FL201	English 2-Issues in the English Speaking World	0	0	1,75	0	0	0	0	0	0	24,5	26,25	0	2
		PAVE	Participation in Student Life	0	0	0	0	0	0	0	0	0	0	0	0	1
		LV2FAC	Foreign Language 2	0	0	0	0	0	0	0	0	0	17,5	17,5	0	1
UE29	Professional Training	ST101													2	
		ST101	Internship/Practicum											140	0	

L1BN : L1 Bio-Informatics Track-Semester 1

UE		Course Code	Course Title											Hours	ECTS Credits	Weighting
UE11	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	120,25	8	
		SM100	Introduction to Superior Mathematics		1,75	1,75	10	15						27,75	0	2
		SM101	Analysis	17,5	0,75	1,75	19,25	0	0	0	0	7	0	46,25	0	3
		SM103	General Algebra	17,5	0,75	1,75	19,25	0	0	0	0	7	0	46,25	0	3
UE13	Computer Science													86,5	8	
		TI101	Python Programming	0	0	0	0	0	0	24,5	17,5	0	0	42	0	3
		TI102	Algorithms 1	17,5	0,75	1,75	24,5	0	0	0	0	0	0	44,5	0	4
UE15BN	Physics and Electronics													62,75	4	
		SP101	From Atoms to Microchips	12,75	0,75	1,75	12,75	0	0	0	0	3,5	0	30,5	0	3
		SP106	Beginning Electronics	12,25	0,75	1,75	10,5	0	7	0	0	0	0	32,25	0	2
UE16BN	Biologie													38,25	4	
		SB101	Fundamentals of Biology	10,5	0,75	1,75	7	0	0	0	0	0	0	20	0	2
		SB102	Basics of Biochemistry and Chemistry	8,75	0,75	1,75	7	0	0	0	0	0	0	18,25	0	2
UE17	General Education													70,75	6	
		FH101	Academic Writing and Public Speaking	0	0,75	1,75	0	0	0	0	0	0	24,5	27	0	3
		FL101	English 1-Technology and Society	0	0	1,75	0	0	0	0	0	0	24,5	26,25	0	3
		PAVE	Participation in Student Life	0	0	0	0	0	0	0	0	0	0	0	0	1
		LV2FAC	Foreign Language 2	0	0	0	0	0	0	0	0	0	17,5	17,5	0	1
		FHT101	Methods	1,75	0	0	5,25	0	0	0	0	0	0	7	0	0

L1BN : L1 Bio-Informatics Track-Semester 2

UE		Course Code	Course Title											Hours	ECTS Credits	Weighting
UE21	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	89	7	
		SM202	Linear Algebra	15,75	0,75	1,75	15,75	0	0	0	7	7	0	48	0	3,5
		SM204	Finite and Infinite Sums	15,75	0,75	1,75	15,75	0	0	0	0	7	0	41	0	3,5
UE23BN	Computer Science													81,25	6	
		TI201	Technical Programing 2 : in C	0	0	0	0	0	0	24,5	14	0	0	38,5	0	3
		TI202	Algorithms 2	17,5	0,75	1,75	17,5	0	0	0	0	0	0	37,5	0	4
UE25	Physics and Electronics													105,5	7	
		SP202	Voice and Image	12,25	0,75	1,75	10,5	0	0	0	0	7	0	32,25	0	2
		SP204	Mechanics	12,25	0,75	1,75	8,75	0	0	0	0	0	0	23,5	0	2
		TE202	From Systems to Functions	12,25	0,75	1,75	10,5	0	14	0	10,5	0	0	49,75	0	3
UE26BN	Biology													50,5	3	
		SB204	Cellular Biology 1	8,75	0,75	1,75	5,25	0	0	0	0	0	0	16,5	0	2
		SB103	Molecular Biologie 1	8,75	0,75	1,75	5,25	0	0	0	0	0	0	16,5	0	2
		SB205	Molecular Biologie Lab 1	0	0	0	0	0	17,5	0	0	0	0	17,5	0	2
UE28	Interdisciplinary Project L1													10,5	2	
		TI250	Interdisciplinary Project L1	0	0	0	0	0	0	0	10,5	0	0	10,5		
UE27BN	General Education													71,75	4	
		FH201	Argumentation et Critical Writing	0	1,75	1,75	0	0	0	0	0	0	24,5	28	0	2
		FL201	English 2-Issues in the English Speaking World	0	0	1,75	0	0	0	0	0	0	24,5	26,25	0	2
		PAVE	Participation in Student Life	0	0	0	0	0	0	0	0	0	0	0	0	1
		LV2FAC	Foreign Language 2	0	0	0	0	0	0	0	0	0	17,5	17,5	0	1
UE29	Professional Training	ST101													2	
		ST101	Internship/Practicum											140	0	

L1R : L1 Reinforcement Track-Semester 1

UE		Course Code	Course Title											Hours	ECTS Credits	Weighting
UE11R	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	139,75	8	
		SM101R	Analysis	0	0,75	1,75	0	70	0	0	0	7	0	79,5	0	4
		SM103R	General Algebra	0	0,75	1,75	0	50,75	0	0	0	7	0	60,25	0	4
UE13R	Computer Science													86,5	8	
		TI101R	Python Programming	0	0	0	0	0	0	24,5	17,5	0	0	42	0	3
		TI102R	Algorithms 1	0	0,75	1,75	0	42	0	0	0	0	0	44,5	0	5
UE15R	Physics and Electronics													169,25	8	
		SP002	Energy and Waves	0	0,75	1,75	0	47,25	0	0	0	0	0	49,75	0	2
		SP003	Optics	0	0,75	1,75	0	26,25	0	0	0	7	0	35,75	0	2
		SP106R	Beginning Electronics	0	0,75	1,75	0	24,5	0	7	0	0	0	34	0	2
		TE101R	Digital Data Information	0	0,75	1,75	0	26,25	0	14	7	0	0	49,75	0	3
UE17	General Education													70,75	6	
		FH101	Academic Writing and Public Speaking	0	1,75	1,75	0	0	0	0	0	0	24,5	28	0	3
		FL101	English 1-Technology and Society	0	0	1,75	0	0	0	0	0	0	24,5	26,25	0	3
		PAVE	Participation in Student Life	0	0	0	0	0	0	0	0	0	0	0	0	1
		LV2FAC	Foreign Language 2	0	0	0	0	0	0	0	0	0	17,5	17,5	0	1
		FHT101	Methods	1,75	0	0	5,25	0	0	0	0	0	0	7	0	0

L1R : L1 Reinforcement Track-Semester 2

UE		Course Code	Course Title											Hours	ECTS Credits	Weighting
UE21R	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	155,5	7	
		SM201R	Analysis 2	0	0,75	1,75	0	77	0	0	0	7	0	86,5	0	3,5
		SM202R	Linear Algebra	0	0,75	1,75	0	59,5	0	0	0	7	0	69	0	3,5
UE23R	Computer Science													77	6	
		TI201R	Technical Programing 2 : in C	0	0	0	0	0	0	24,5	14	0	0	38,5	0	3
		TI202R	Algorithms 2	0	0,75	1,75	0	36	0	0	0	0	0	38,5	0	4
UE25R	Physics and Electronics													131,8	7	
		SP201R	From Atoms to Microchips	0	0,75	1,75	0	29,75	0	0	0	7	0	39,25	0	2
		SP202R	Voice and Image	0	0,75	1,75	0	28	0	0	0	7	0	37,5	0	2
		TE202R	From System to Function	0	0,75	1,75	0	28	14	0	10,5	0	0	55	0	3
UE28	Interdisciplinary Project													10,5	2	
		TI250	Interdisciplinary Project	0	0	0	0	0	0	0	10,5	0	0	10,5		
UE27	General Education													70,75	6	
		FH201	Argumentation et Critical Writing	0	0,75	1,75	0	0	0	0	0	0	24,5	27	0	2
		FL201	English 2-Issues in the English Speaking World	0	0	1,75	0	0	0	0	0	0	24,5	26,25	0	2
		PAVE	Participation in Student Life	0	0	0	0	0	0	0	0	0	0	0	0	1
		LV2FAC	Foreign Language 2	0	0	0	0	0	0	0	0	0	17,5	17,5	0	1
UE29	Professional Training	ST101													2	
		ST101	Internship/Practicum													

L1D : L1 Transfers Classic Undergaduate Track-Semester 1

UE		Course Code	Course Title											Hours	ECTS Credits	Weighting
UE22D	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	126	16	
		SM201D	Analysis	0	0	1,75	0	47,25	0	0	0	0	0	49	0	7
		SM202D	Linear Algebra	0	0	1,75	0	31,5	0	0	0	0	0	33,25	0	4,5
		SM203D	Numbers and Structures	0	0	1,75	0	42	0	0	0	0	0	43,75	0	6,5
UE23D	Computer Science													61,25	8	
		TI203D	Algorithms and Technical Programming in C -1	0	0	1,75	0	0	0	59,5	0	0	0	61,25	0	8
UE24D	Computer Science													59,5	8	
		TI204D	Algorithms and Technical Programming in C - 2	0	0	1,75	0	0	0	40,25	17,5	0	0	59,5	0	8
UE25D	Physics and Electronics													68,25	11	
		SP201D	From Atoms to Microchips	0	0	1,75	0	21	0	0	0	0	0	22,75	0	3
		SP202D	Computer Science: Voice and Image	0	0	1,75	0	21	0	0	0	0	0	22,75	0	3
		SP206D	Introduction to Electronics	0	0	1,75	0	14	7	0	0	0	0	22,75	0	3
UE26D	Electronics													66,5	9	
		TE201D	Digital Data Information	0	0	1,75	0	19,25	12,25	0	0	0	0	33,25	0	4,5
		TE202D	From System to Function	0	0	1,75	0	19,25	12,25	0	0	0	0	33,25	0	4,5
UE27D	General Education													47,25	8	
		FH201D	Academic Writing and Public Speaking	0	1,75	1,75	0	0	0	0	0	0	24,5	28	0	4
		FL201D	English 2-Issues in the English Speaking World	0	0	1,75	0	0	0	0	0	0	17,5	19,25	0	4

L1D-BN : L1 Transfers Bio-Informatics Track-Semester 1

UE		Course Code	Course Title											Hours	ECTS Credits	Weighting
UE22DBN	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	126	15	
		SM201D	Analysis	0	0	1,75	0	47,25	0	0	0	0	0	49	0	7
		SM202D	Linear Algebra	0	0	1,75	0	31,5	0	0	0	0	0	33,25	0	4,5
		SM203D	Numbers and Structures	0	0	1,75	0	42	0	0	0	0	0	43,75	0	6,5
UE23DBN	Computer Science													61,25	7	
		TI203D	Algorithms and Technical Programming in C -1	0	0	1,75	0	0	0	59,5	0	0	0	61,25	0	8
UE24DBN	Computer Science													59,5	7	
		TI204D	Algorithms and Technical Programming in C - 2	0	0	1,75	0	0	0	40,25	17,5	0	0	59,5	0	8
UE25DBN	Physics													61,25	9	
		SP201D	From Atoms to Microchips	0	0	1,75	0	21	0	0	0	0	0	22,75	0	3
		SP202D	Voice and Image	0	0	1,75	0	21	0	0	0	0	0	22,75	0	3
		SP206DB	Introduction to Electronics	0	0	1,75	0	14	0	0	0	0	0	15,75	0	2
UE26DBN	Electronics													33,25	5	
		TE201D	Digital Data Information	0	0	1,75	0	19,25	12,25	0	0	0	0	33,25	0	4,5
UE28DBN	Biology													61,25	9	
		SB201DB	Fundamentals of Biology	0	0	1,75	0	10,5	0	0	0	0	0	12,25	0	2
		SB203DB	Molecular Biology I	0	0	1,75	0	14	0	0	0	0	0	15,75	0	2
		SB204DB	Cellular Biology 1	0	0	1,75	0	14	0	0	0	0	0	15,75	0	2
		SB205DB	Molecular Biology Lab 1	0	0	0	0	0	17,5	0	0	0	0	17.5		1
UE27D	General Education													47,25	8	
		FH201D	Academic Writing and Public Speaking	0	1,75	1,75	0	0	0	0	0	0	24,5	28	0	4
		FL201D	English 2-Issues in the English Speaking World	0	0	1,75	0	0	0	0	0	0	17,5	19,25	0	4

L2-Classic Undergraduate Track-Semester 3

UE		Course Code	Course Title											Hours	ECTS CREDITS	Weighting
UE31	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	96	8	
		SM301	Probabilities	19,25	0,75	1,75	19,25	0	0	0	0	7	0	48	0	4
		SM302	Functions and Variables	19,25	0,75	1,75	19,25	0	0	0	0	7	0	48	0	4
UE33	Computer Science													91,75	8	
		TI301	Algorithmic Data Structures 3	19,25	0,75	1,75	19,25	0	0	0	0	0	0	41	0	4
		TI303	Data Programming Structure C - 2	1,75	0	0	0	0	0	28	21	0	0	50,75	0	4
UE35	Physics and Electronics													98,5	8	
		SP301	Electromagnetic Fields	10,5	0,75	1,75	12,25	0	0	0	0	3,5	0	28,75	0	3
		SP302	Quantum Physics	10,5	0,75	1,75	7	0	0	0	0	0	0	20	0	2
		TE301	Transmission Systems	14	0,75	1,75	12,25	0	14	0	7	0	0	49,75	0	3
UE37	General Education													104,25	6	
		LV2FAC	Foreign Language 2	0	0	0	0	0	0	0	0	0	17,5	17,5	0	1
		FE301	Corporate Accounts	7	0	1,75	12,25	0	0	0	0	0	0	21	0	1
		FH301	Argumentation and Journalistic Writing	0	1,75	1,75	0	0	0	0	0	0	24,5	28	0	2,5
		FHS301	Science History	10,5	0	1	0	0	0	0	0	0	0	11,5	0	1
		FL301	English 3-Scientific and Technical English	0	0	1,75	0	0	0	0	0	0	24,5	26,25	0	2,5
		PAVE	Participation in Student Life											0	0	1

L2-Classic Undergraduate Track-Semester 4

UE		Course Code	Course Title											Hours	ECTS CREDITS	Weighting
UE41	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	79,5	6	
		SM405	Mathematical Models	0	0	1,75	0	0	0	29,75	0	7	0	38,5	0	3
		SM403	Data Analysis	15,75	0,75	1,75	15,75	0	0	0	0	7	0	41	0	3,5
UE43	Computer Science													79,5	6	
		SM402	Mathematics for Computer Science	10,5	0,75	1,75	15,75	0	0	0	7	0	0	35,75	0	3
		TI401	C++ Programming Language	0	0	1,75	0	0	0	21	0	0	0	22,75	0	3
		TI402	WEB Programing	3,5	0	0	0	0	10,5	0	7	0	0	21	0	2
UE44	Interdisciplinary Projects													15,75	2	
		TI450	L2 Interdisciplinary Project	1,75	0	0	0	0	0	0	14	0	0	15,75	0	1
UE45	Physics and Electronics													100,3	6	
		SP401	Electromagnetic Wave Propagation	10,5	0,75	1,75	0	0	0	0	0	7	0	20	0	1
		SP402	Thermodynamics	14	0,75	1,75	10,5	0	0	0	0	7	0	34	0	2
		TE401	Digital Systems	12,25	0,75	1,75	10,5	0	10,5	0	10,5	0	0	46,25	0	3
UE47	General Education													80,5	6	
		LV2FAC	Foreign Language 2	0	0	0	0	0	0	0	0	0	17,5	17,5	0	1
		FE401	Business Processes	0	0	1,75	0	19,25	0	0	7	0	0	28	0	1
		FH401	Argumentation and Rhetoric	0	1,75	1,75	0	0	0	0	0	0	22,75	26,25	0	2
		FL401	English 4 - Preparation for the Study Abroad Program	0	0	1,75	0	0	0	0	0	0	24,5	26,25	0	2
		PAVE	Participation in Student Life											0	0	1
UE29	Professional Training													140	4	
		ST102	Commercial Internship												0	

L2 INT : L2 International Track-Semester 3

UE		Course Code	Course Title											Hours	ECTS Credits	Weighting
UE31	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	96	8	
		SM301I	Probability and Statistics 1	19,25	0,75	1,75	19,25	0	0	0	0	7	0	48	0	4
		SM302I	Multivariable Analysis	19,25	0,75	1,75	19,25	0	0	0	0	7	0	48	0	4
UE33	Computer Science													91,75	8	
		TI301I	Algorithmic Data Structures 3	19,25	0,75	1,75	19,25	0	0	0	0	0	0	41	0	4
		TI303I	Data Programming Structure C - 2	1,75	0	0	0	0	0	28	21	0	0	50,75	0	4
UE35	Physics and Electronics													98,5	8	
		SP301I	Electromagnetic Fields	10,5	0,75	1,75	12,25	0	0	0	0	3,5	0	28,75	0	3
		SP302I	Quantum Physics	10,5	0,75	1,75	7	0	0	0	0	0	0	20	0	2
		TE301I	Transmission Systems	14	0,75	1,75	12,25	0	14	0	7	0	0	49,75	0	3
UE37	General Education													104,25	6	
		LV2FAC	Foreign Language 2										17.5	17,5	0	1
		FE301	Corporate Accounts	7	0	1,75	0	12,25	0	0	0	0	0	21	0	2
		FH301	Argumentation and Journalistic Writing	0	1,75	1,75	0	0	0	0	0	0	24,5	28	0	2,5
		FHS301	Science History	10,5	0	1	0	0	0	0	0	0	0	11,5	0	1
		FL301	English 3-Scientific and Technical English	0	0	1,75	0	0	0	0	0	0	24,5	26,25	0	2,5
		PAVE	Participation in Student Life											0	0	1

L2 INT : L2 International Track-Semester 4

UE		Course Code	Course Title											Hours	ECTS Credits	Weighting
UE41	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	79,5	6	
		SM401I	Mathematical modeling	0	0	1,75	0	0	0	29,75	7	0	0	38,5	0	3
		SM403I	Data Analysis	15,75	0,75	1,75	15,75	0	0	0	0	7	0	41	0	3,5
UE43	Computer Science													79,5	6	
		SM402I	Mathematics for Computer Science	10,5	0,75	1,75	15,75	0	0	0	7	0	0	35,75	0	3
		TI401I	C++ Programming Language	0	0	1,75	0	0	0	21	0	0	0	22,75	0	3
		TI402I	WEB Programming	3,5	0	0	0	0	10,5	0	7	0	0	21	0	2
UE44	Interdisciplinary Projects													15,75	2	
		TI450	L2 Interdisciplinary Project	1,75	0	0	0	0	0	0	14	0	0	15,75	0	1
UE45	Physics and Electronics													100,3	6	
		SP401I	Electromagnetic Wave Propagation	10,5	0,75	1,75	7	0	0	0	0	0	0	20	0	1
		SP402I	Thermodynamics	14	0,75	1,75	10,5	0	0	0	0	7	0	34	0	2
		TE401I	Digital Systems	12,25	0,75	1,75	10,5	0	10,5	0	10,5	0	0	46,25	0	3
UE47	General Education													80,5	6	
		LV2FAC	Foreign Language 2										17.5	17,5	0	1
		FE401	Business Processes	0	0	1,75	0	19,25	0	0	7	0	0	28	0	1
		FH401	Argumentation et Rhetoric	0	1,75	1,75	0	0	0	0	0	0	22,75	26,25	0	2
		FL401	English 4-Preparation for the Study Abroad Program	0	0	1,75	0	0	0	0	0	0	24,5	26,25	0	2
		PAVE	Participation in Student Life											0	0	1
UE29	Professional Training													140	4	
		ST102	Commercial Internship												0	

L2BN : L2 Bio-Informatics Track-Semester 3

UE		Course Code	Course Title										Hours	ECTS Credits	Weighting
UE31	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	96	8	
		SM301	Probability and Statistics 1	19,25	0,75	1,75	19,25	0	0	0	0	7	0	48	0	4
		SM302	Functions and Variables	19,25	0,75	1,75	19,25	0	0	0	0	7	0	48	0	4
UE33	Computer Science													91,75	8	
		TI301	Algorithmic Data Structures 3	19,25	0,75	1,75	19,25	0	0	0	0	0	0	41	0	4
		TI303	Programming C - 2	1,75	0	0	0	0	0	28	21	0	0	50,75	0	4
UE35BN	Physics and Electronics													48,75	4	
		SP301	Electromagnetic Fields	10,5	0,75	1,75	12,25	0	0	0	0	3,5	0	28,75	0	3
		SP302	Quantum Physics	10,5	0,75	1,75	7	0	0	0	0	0	0	20	0	2
UE36BN	Biology													56,5	4	
		SB303	Molecular Biology 2	7	0,75	1,75	7	0	0	0	0	0	0	16,5	0	2
		SB304	Cellular Biology 2	7	0,75	1,75	7	0	0	0	0	0	0	16,5	0	2
		SB306	Genomics	8,75	0,75	1,75	12,5	0	0	0	0	0	0	23,5	0	2
UE37	General Education													104,25	6	
		LV2FAC	Foreign Language 2	0	0	0	0	0	0	0	0	0	17.5	17,5	0	1
		FE301	Corporate Accounts	7	0	1,75	12,25	0	0	0	0	0	0	21	0	2
		FH301	Argumentation and Journalistic Writing	0	1,75	1,75	0	0	0	0	0	0	24,5	28	0	2,5
		FHS301	Science History	10,5	0	1	0	0	0	0	0	0	0	11,5	0	1
		FM301	English 3 – Scientific and Technical English	0	0	1,75	0	0	0	0	0	0	24,5	26,25	0	2,5

L2BN : L2 Bio-Informatics Track-Semester 4

UE		Course Code	Course Title										Hours	ECTS Credits	Weighting
UE41BN	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	38,5	3	
		SM401	Mathematical Models	0	0	1,75	0	0	0	29,75	7	0	0	38,5	0	3
UE43	Computer Science générale													79,5	6	
		SM402	Mathematics for Computer Science	10,5	0,75	1,75	15,75	0	0	0	7	0	0	35,75	0	3
		TI401	C++ Programming Language	0	0	1,75	0	0	0	21	0	0	0	22,75	0	3
		TI402	WEB Programing	3,5	0	0	0	0	10,5	0	7	0	0	21	0	2
UE44	Interdisciplinary Projects													15,75	2	
		TI450	L2 Interdisciplinary Project	1,75	0	0	0	0	0	0	14	0	0	15,75	0	1
UE45	Physics and Electronics													100,3	6	
		SP401	Electromagnetic Wave Propagation	10,5	0,75	1,75	7	0	0	0	0	7	0	20	0	1
		SP402	Thermodynamics	14	0,75	1,75	10,5	0	0	0	0	7	0	34	0	2
		TE401	Digital Systems	12,25	0,75	1,75	10,5	0	10,5	0	10,5	0	0	46,25	0	3
UE46BN	Biology													37,5	3	
		SB407	Structural and Metabolic Biology	10,5	0,75	1,75	7	0	0	0	0	0	0	20	0	2
		SB405	Molecular Biologie Lab 2	0	0	0	0	0	17,5	0	0	0	0	17,5	0	2
UE47	General Education													114,5	6	
		LV2FAC	Foreign Language 2	0	0	0	0						17.5	17,5	0	1
		FE401	Business Processes	0	0	1,75	0	19,25	0	0	7	0	0	28	0	1
		FH401	Argumentation et Rhetoric	0	0,75	1,75	0	0	0	0	0	0	22,75	25,25	0	2
		FL401	English 4-Preparation for the Study Abroad Program	0	0	1,75	0	0	0	0	0	0	24,5	26,25	0	2
		PAVE	Participation in Student Life											0	0	1
UE29	Professional Training													140	4	
		ST102	Commercial Internship												0	

L2R : L2 Reinforcement Track-Semester 3

UE		Course Code	Course Title											Hours	ECTS Credits	Weighting
UE31R	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	113,5	8	
		SM301R	Probability	0	0,75	1,75	0	42	0	0	0	7	0	51,5	0	4
		SM302R	Functions and Variables	0	0,75	1,75	0	52,5	0	0	0	7	0	62	0	4
UE33R	Computer Science générale													88,25	8	
		TI301R	Fundamentals of Algorithms 3	0	0,75	1,75	0	35	0	0	0	0	0	37,5	0	4
		TI303R	Programming C - 2	0	0	0	0	0	0	28	21	0	0	50,75	0	4
UE35R	Physics and Electronics													116	8	
		SP301R	Electromagnetic Fields	0	0,75	1,75	0	28	0	0	0	7	0	37,5	0	3
		SP302R	Quantum Physics	0	0,75	1,75	0	22,75	0	0	0	0	0	25,25	0	2
		TE301R	Transmission Systems	0	0,75	1,75	0	29,75	14	0	7	0	0	53,25	0	3
UE37	General Education													104,25	6	
		LV2FAC	Foreign Language 2	0	0	0	0	0	0	0	0	0	17.5	17,5	0	1
		FE301	Corporate Accounts	7	0	1,75	12,25	0	0	0	0	0	0	21	0	2
		FH301	Argumentation and Journalistic Writing	0	1,75	1,75	0	0	0	0	0	0	24,5	28	0	2,5
		FHS301	Science History	10,5	0	1	0	0	0	0	0	0	11,5	26,25	0	1
		FL301	English 3-Scientific and Technical English	0	0	1,75	0	0	0	0	0	0	24,5	0	0	2,5

L2R : L2 Reinforcement Track-Semester 4

UE		Course Code	Course Title											Hours	ECTS Credits	Weighting
UE41R	Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	84,75	6	
		SM403R	Data Analysis	0	0,75	1,75	0	0	0	36,75	0	7	0	46,25	0	35
		SM405R	Mathematical Models	0	0	1,75	0	0	0	29,5	0	0	0	38,5	0	2
UE43R	Computer Science													79,5	6	
		SM402R	Mathematics for Computer Science	0	0,75	1,75	0	0	0	33,25	7	0	0	42,75	0	3
		TI401R	C++ Programming Language	0	0	1,75	0	0	0	21	0	0	0	22,75	0	3
		TI402R	WEB Programing	3,5	0	0	0	0	10,5	0	7	0	0	21	0	2
UE44	Interdisciplinary Projects													15,75	2	
		TI450	L2 Interdisciplinary Project	1,75	0	0	0	0	0	0	14	0	0	15,75	0	1
UE45R	Physics and Electronics													119,5	6	
		SP401R	Electromagnetic Wave Propagation	0	0,75	1,75	0	24,5	0	0	0	0	0	27	0	1
		SP402R	Thermodynamics	0	0,75	1,75	0	36,75	0	0	0	7	0	46,25	0	2
		TE401R	Digital Systems	0	0,75	1,75	0	22,75	10,5	0	10,5	0	0	46,25	0	3
UE47	General Education													114,5	6	
		LV2FAC	Foreign Language 2	0	0	0	0	0	0	0	0	0	17.5	17,5	0	1
		FE401	Business Processes	0	0	1,75	0	19,25	0	0	7	0	0	28	0	1
		FH401	Argumentation et Rhetoric	0	1,75	1,75	0	0	0	0	0	0	22,75	25,25	0	2
		FL401	English 4-Preparation for the Study Abroad Program	0	0	1,75	0	0	0	0	0	0	24,5	26,25	0	2
		PAVE	Participation in Student Life											0	0	1
UE29	Professional Training													140	4	
		ST102	Commercial Internship												0	

L3 Classic Undergraduate/International Track-Semester 5 (International Mobility)

UE		Course Code	Course Title	Hours	ECTS Credits	Weighting
UE51MOB	International Mobility Scientific Fundamentals			120	12	
		TI501M	Operating Systems	40	0	4
		TI502M	Networks and Protocols	40	0	4
		TI503M	Databases	40	0	4
UE52MOB	International Mobility Scientific Applications			80	10	
		TI504M	Introduction to Web Programming	40	0	4
		TI505M	Java 1	40	0	5
UE53MOB	International Mobility General Education			80	5	
		FH502	Cultural Exchange/International Mobility Report	0	0	1,5
		FI501M	English for Technologists	40	0	2,5
		FI502M	Profitability and Performance	40	0	2,5
UE50MOB	International Mobility – Mathematics				5	
		SM505M	International Mobility International - Mathematics	40		
UE59	Professional Training			13,5		
		FE501	Career Orientation Seminar	13,5		

L3 Classic Undergraduate/International Track Africa – Semester 6

UE		Course Code	Course Title										Hours	ECTS Credits	Weighting
UE61	Applied Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	73,5	5	
		SM601	Graph Theory	10,5	0	1,75	10,5	0	3,5	0	7	0	0	29,75	0	2
		SM603	Group Theory and Its Applications	10,5	0	1,75	8,75	0	0	0	0	0	0	21	0	2
		SM604	Optimisation	12,25	0	1,75	8,75	0	0	0	0	0	0	22,75	0	2
UE62	Computer Science													36,75	5	
		TI606	Computer Architecture	10,5	0	1,75	3,5	0	3,5	0	0	0	0	19,25	0	2
		TI630	Introduction to Cybersecurity	7	0	1,75	5,25	0	3,5	0	0	0	0	17,5	0	1
UE62	Computer Science	UE68														
		TI650	Interdisciplinary Projet	0	0	0	0	0	0	0	17,5	0	0	17,5	0	2
UE63	Physics and Electronics													89,25	6	
		SP601	Transmission Channels	14	0	1,75	10,5	0	0	0	0	0	0	26,25	0	2
		TE601	Signals Processing 1	8,75	0	1,75	7	0	7	0	0	0	0	24,5	0	2
		TE603	Linear Systems	8,75	0	1,75	7	0	0	0	0	0	0	17,5	0	1
		TE604	Programmable Logic	8,75	0	1,75	3,5	0	7	0	0	0	0	21	0	2
UE64	Electives - Computer Science													49	4	
		TI613	Data Bases 2	0	0	1,75	0	0	0	22,75	0	0	0	24,5	0	2
		TI615	Java-2	0	0	0	0	0	0	17,5	7	0	0	24,5	0	2
UE65	Electives – Signals and Systems													49	4	
		TE602	Signals Processing 2	10,5	0	1,75	5,25	0	7	0	0	0	0	24,5	0	2
		TE605	VHDL	5,25	0	1,75	3,5	0	14	0	0	0	0	24,5	0	2
UE67	General Education													77	5	
		FE603	Financial Analysis	3,5	0	1,75	10,5	0	0	0	0	0	0	15,75	0	1
		FE604	Business Law and Contracts	3,5	0	1,75	5,25	0	0	0	0	0	0	10,5	0	1
		FH601	Culture and Communication	0	1,75	1,75	0	0	0	0	0	0	22,75	26,25	0	2
		FL601	English 6-Business English	0	0	1,75	0	0	0	0	0	0	22,75	24,5	0	2
		PAVE	Participation in Student Life	0	0	0	0	0	0	0	0	0	0	0	0	1
		LV2FAC	Foreign Language 2										17.5	17,5		1
UE69	Professional Training													16,75	4	
		FE601	Professional Orientation Seminar								12			12	0	2
		FE602	Corporate Encounters								4.75			4,75	0	0

L3 – BN – Semester 6

UE		Code	Module											Hours	ECTS credits	Weighting
UE61BN	Applied Mathematics			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	103,25	6	
		SM601	Graph Theory	10,5	0	1,75	10,5	0	0	0	7	0	0	29,75	0	2
		SM603	Group Theory and Applications	10,5	0	1,75	8,75	0	0	0	0	0	0	21	0	2
		SM604	Optimization	12,25	0	1,75	8,75	0	0	0	0	0	0	22,75	0	2
			Data Analysis			1,75		28						29,75	0	2
UE62	Computer Science													36,75	5	
		TI606	Computer Architecture	10,5	0	1,75	3,5	0	3,5	0	0	0	0	19,25	0	2
		TI630	Introduction to Cybersecurity	7	0	1,75	5,25	0	3,5	0	0	0	0	17,5	0	1
UE62	Computer Science	UE68												17,5	3	
		TI650	Interdisciplinary Project	0	0	0	0	0	0	0	17,5	0	0	17,5		
UE66BN	Biology													61	5	
		SB601	Immunology		0,75	1,75		21						23,5		2
		SB602	Statistics and Bio-statistics		0,75	1,75		35						37,5		2
UE64	Computer Science													49	4	
		TI613	Database-2	0	0	1,75	0	0	0	22,75	0	0	0	24,5	0	2
		TI615	Java-2	0	0	0	0	0	0	17,5	7	0	0	24,5	0	2
UE67	General Education													77	4	
		FE603	Financial Analysis	3,5	0	1,75	10,5	0	0	0	0	0	0	15,75	0	1
		FE604	Business and Contract Law	3,5	0	1,75	5,25	0	0	0	0	0	0	10,5	0	1
		FH601	Dissertation and Creative Writing	0	1,75	1,75	0	0	0	0	0	0	22,75	26,25	0	2
		FL601	English 6-Business English	0	0	1,75	0	0	0	0	0	0	22,75	24,5	0	2
		PAVE	Participation in Student Life	0	0	0	0	0	0	0	0	0	0	0	0	1
		LV2FAC	Foreign Language 2										17.5	17,5		1
UE69	Professional Training													16,75	3	
		FE601	Orientation								12			12	0	2
		FE602	Business Introduction								4.75			4,75	0	0

L3 – Africa – Semester 5

UE		Code	Module											Hours	ECTS Credits	Weighting
UE51AF	Computer Science Coordination			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	91	12	
		TI501	Operating systems	14	0	1,75	14	0	0	0	0	0	0	29,75	0	3
		TI502	Networks and protocols	12,25	0	1,75	12,25	0	14	0	0	0	0	40,25	0	4
		TI503CA	Database-1	5,25	0	1,75	7	0	7	0	0	0	0	21	0	2
UE53AF	Computer Science Programming													64,75	9	
		TI504A	Web Programming	0	0	0	0	7	3,5	0	5,25	0	0	15,75	0	2
		TI505	Programming in JAVA	0	0	0	0	0	0	29,75	0	0	0	29,75	0	3
		TI525	JAVA Project	0	0	0	0	0	0	0	19,25	0	0	19,25	0	2
UE57AF	General Education													86,5	9	
		FH501A	Culture and Communication	0	0,75	1,75	0	0	0	0	0	0	19,25	21,75	0	3
		FH502AF	Cultural Project	0	0	0	8,75	0	0	0	0	0	0	8,75	0	1
		FL501A	English 5-Technology and Society	0	0	0	0	0	0	0	0	0	38,5	38,5	0	3
		LV2FAC	Foreign Language 2	0	0	0	0	0	0	0	0	0	17,5	17,5	0	1
UE59	Professional Training													13,5		
		FE501	Career Orientation Seminar	3	0	0	10,5	0	0	0	0	0	0	13,5	0	0

L3 New-Semester 5

UE		Course Code	Course Title											Hours	ECTS Credits	Weighting
UE51N	Science			CM	CE	DE	TD	CTD	TP	CTP	PRJ	TAI	TD20	94,5	8	
		SM501	Graphs and Theories	8,75	0	1,75	8,75	0	0	0	7	0	0	26,25	0	2
		SM503	Group Theory and Applications	10,5	0	1,75	8,75	0	0	0	0	0	0	21	0	2
		SM504	Optimization	12,25	0	1,75	8,75	0	0	0	0	0	0	22,75	0	2
		TE501	Signal Theory-1	8,75	0	1,75	7	0	7	0	0	0	0	24,5	0	2
UE53C	Computer Science													91	12	
		TI503	Data Base-1	5,25	0	1,75	7	0	7	0	0	0	0	21	0	2
		TI505N	Programming in JAVA	0	0	0	0	0	0	21	0	0	0	21	0	2
		TI506	Computer Architecture	10,5	0	1,75	3,5	0	3,5	0	0	0	0	19,25	0	2
		TI530	Introduction to Cybersecurity	7	0	1,75	5,25	0	3,5	0	0	0	0	17,5	0	1
UE54N	Scientific Harmonisation													63	4	
		SM502	Computer Science Mathematics	10,5	0	1,75	17,5	0	0	0	0	0	0	29,75	0	3
		TE503	Digital Electronics	12,25	0	1,75	7	0	0	0	0	0	0	21	0	2
		TI507	Introduction to Algorithms	0	0	1,75	0	10,5	0	0	0	0	0	12,25	0	1
UE55N	Computer Science – Electives													73,5	6	
		TI508	Algorithm and Data Structures	0	0	1,75	0	22,75	0	0	0	0	0	24,5	0	2
		TE504	Databases-2	0	0	1,75	0	0	0	22,75	0	0	0	24,5	0	2
		TE505	Java 2	0	0	0	0	0	0	17,5	7	0	0	24,5	0	2
EU56N	Signals and Systems – Electives													73,5	6	
		TE502	Signal Theory	10,5	0	1,75	5,25	0	7	0	0	0	0	24,5	0	2
		TE504	Programmable Logic	10,5	0	1,75	3,5	0	8,75	0	0	0	0	24,5	0	2
		TE505	VHDL	5,25	0	1,75	3,5	0	14	0	0	0	0	24,5	0	2
UE57C	General Education													91	8	
		FE503	Financial Analysis	3,5	0	1,75	10,5	0	0	0	7	0	0	15,75	0	1
		FE504	Business and Contract Law	3,5	0	1,75	5,25	0	0	0	0	0	0	10,5	0	1
		FH501	Culture and Communication	0	1,75	1,75	0	0	0	0	0	0	21	24,5	0	1,5
		FL501	English 5-Preparation for the Study Abroad Program	0	0	1,75	0	0	0	0	0	0	21	22,5	0	1,5
		PAVE	Participation in Student Life	0	0	0	0	0	0	0	0	0	0	0	0	1
		LV2FAC	Foreign Language 2	0	0	0	0	0	0	0	0	0	17,5	17,5	0	1
UE59	Professional Training													18,25		
		FE501	Career Orientation Seminar	3	0	0	10,5	0	0	0	0	0	0	13,5	0	0
											4,75	0	0	0	0	0

L3 NEW-Semester 6 (International Mobility)

UE		Course Code	Course Title	Hours	ECTS Credits	Weighting
UE63MOB	International Mobility Scientific Fundamentals			120	8	
		TI601M	Operating Systems	40	0	4
		TI602M	Networks and Protocols	40	0	4
		TI615M	Object-Oriented Methods with UML	40	0	4
UE60MOB	International Mobility Scientific Applications			80	6	
		TI604M	Introduction to Web Programming	40	0	4
		TI609M	C++ Programming	40	0	5
UE64MOB	International Mobility General Education			80	4	
		FH602	Cultural Exchange/International Mobility Report	0	0	1,5
		FI601M	English for Technologists	40	0	2,5
		FI602M	Profitability and Performance	40	0	2,5
UE69N	Professional Training			12	4	
		FE601	Career Orientation Seminar	12	0	1
UE69S	Professional Training – Internship				4	
		ST103	Internship			