Maurin Gilles's Transcript

This document presents all the courses I attended during my academic cursus. I made the first two years of a 3-year BSc programme (Year 1, Year2). I then entered a selective school 3-year MEng programme, the first year of which allowed me to get my BSc degre by « equivalency » (Year 3). I carried on with the MEng (Year 4, Year5), and during the last year I began a 1-year MSc programme that I will pass simultaneously with the MEng (Year 5).

Grades in France range from 0 to 20. A minimum of 10 is required to pass, usually averaged from several courses. According to my university's guidebook for foreign students, notes over 13 are good, notes over 14 are very good, and notes over 16 are excellent.

ECTS Scale	Definition	Percentage of successful students normally achieving the grade	UCA Grades Equivalents
A	EXCELLENT - outstanding performance with only minor errors	9,96 %	16 to 20
B	VERY GOOD - above the average standard but with some errors	9,80 %	14 to 15,99
C	GOOD - generally sound work with a number of notable errors	10,43 %	13 to 13,99
D	SATISFACTORY- fair but with significant shortcomings	26,31 %	11 to 12,99
E	SUFFICIENT - performance meets the minimum criteria	16,84 %	10 to 10,99
FX	FAIL - some more work required before the credit can be awarded	12,13 %	8 to 9,99
F	FAIL - considerable further work is required	14,54 %	0 to 7,99

Source: https://www.calameo.com/universite-clermont-auvergne/books/000887930370of90df76e

Year 1: BSc, 1st year

Global rank: 4/300

Semester 1

Course: Mathématiques 1 **Translation:** Mathematics 1	**Grade (/20):** 18.123
Description: Introduction to linear algebra, complex numbers, polynomials.	
Course: Outils Mathématiques 1 **Translation:** Tools for mathematics 1	**Grade (/20):** 20
Description: Multivariate functions and partial derivation.	
Course: Initiation au Shell **Translation:** Initiation to Shell	**Grade (/20):** 17
Description: History of Unix Shell, main commands and Vim.	
Course: Algorithmique et programmation en Python **Translation:** Algorithmics and programming in Python	**Grade (/20):** 19.6
Description: Introduction to algorithmic and imperative programming in Python.	

Course: Représentation en binaire	**Grade (/20):** 18.5
Translation: Binary representation	
Description: Boolean logic, logic gates, number representations in binary.	
Course: Rédaction mathématique et informatique	**Grade (/20):** 17.75
Translation: Mathematical and computer writing	
Description: Presentation of LaTeX anf Git, including a 15-page report assessment.	
Course: Méthodologie, bureautique	**Grade (/20):** 14,8
Translation: Methodology, Office softwares	
Description: Scientific writing and Microsoft Office.	

Semester 2

Course: Projet informatique	**Grade (/20):** 17.3
Translation: Computer science project	
Description: Development of a simple videogame in Python with a Tkinter UI and a basic bot.	
Course: Mathématiques 2	**Grade (/20):** 17.6
Translation: Mathematics 2	
Description: Vector spaces, sequences, asymptotics.	
Course: Outils Mathématiques 2	**Grade (/20):** 20
Translation: Tools for mathematics 2	
Description: Introduction to proof theory and set theory.	
Course: Algorithmique 1	**Grade (/20):** 18
Translation: Algorithmics 1	
Description: Recursion and introduction to time complexity.	
Course: Programmation en C	**Grade (/20):** 19.375
Translation: C programming	
Description: Presentation of the C programming language.	
Course: Outils informatiques 2	**Grade (/20):** 19.15
Translation: Tools for computer science 2	
Description: Relational databases and SQL.	
Course: Anglais	**Grade (/20):** 16.75
Translation: English	
Description: Listening, speaking, reading and writing in English.	

Year 2: BSc, 2nd year

Global rank: 7/155

Semester 3

Course: Système d'information et bases de données	**Grade (/20):** 18.099
Translation: Information systems and databases	
Description: Entity-Relationship model, translation to SQL, modelisation on a software named « Looping MCD ».	
Course: Méthodes discrètes	**Grade (/20):** 14.5
Translation: Discrete methods	

Description: Formal languages and inductive reasoning.	
Course: Logique	**Grade (/20):** 14.05
Translation: Logic	
Description: First-order logic, programming in Prolog.	
Course: Programmation avancée	**Grade (/20):** 17.9
Translation: Advanced programming	
Description: Focus on structures, variadic functions, pointers and I/O in C.	
Course: Applications en ingénierie et programmation numérique	**Grade (/20):** 16.955
Translation: Applications in engineering and numerical programming	
Description: Computational methods for resolution of linear systems, and polynomial interpolation and approximation.	
Course: Mathématiques à l'usage des informaticiens	**Grade (/20):** 18,45
Translation: Mathematics for computer scientists	
Description: Arithmetic for cryptography and error-correcting codes.	
Course: PPP *(Projet Professionnel Personnalisé)* Informatique	**Grade (/20):** 14.75
Translation: Informatic PPP *(Custom career plan)*	
Description: Presentation of career opportunities in computer science.	
Course: Anglais	**Grade (/20):** 16.5
Translation: English	
Description: Listening, speaking, reading and writing in English.	

Semester 4

Course: Algorithmique	**Grade (/20):** 15
Translation: Algorithmics	
Description: Abstract Data Types (lists, stacks, queues, trees, maps…)	
Course: POO (Programmation Orientée Objet)	**Grade (/20):** 10.758
Translation: OOP (Object-Oriented Programming)	
Description: Presentation of the OOP concepts with lab works and final project in Java.	
Course: Technologie Web Client	**Grade (/20):** 12.125
Translation: Client-side web	
Description: HTTP, HTML, CSS, JS, with a static page to create.	
Course: Technologies Web Serveur	**Grade (/20):** 15.25
Translation: Server-side web	
Description: Presentation of the Model-View-Controller design pattern, and server-side scripting and database management. Final project: creation of a web application using Java freemarker, and Apache Spark to manage a Postgres database.	
Course: Implémentation Bases de Données	**Grade (/20):** 15.75
Translation: Database implementation	
Description: PL/SQL and locks.	
Course: Algorithmique géométrique	**Grade (/20):** 19.5
Translation: Geometric algorithmics	
Description: Polygonal and paremtric modeling in 2D and 3D; algorithms for clustering, convex hulls, tiltings… Lab works in Python.	

Course: Introduction à la programmation système	**Grade (/20):** 12
Translation: Introduction to systems programming	
Description: Programming with files and processes in C.	
Course: Projet informatique	**Grade (/20):** 15.4
Translation: Computer science project	
Description: Introduction to stochastic simulation and pseudo-random number generators. Final project: simulating the evolution of a rabbit population in C.	
Course: Anglais	**Grade (/20):** 16.75
Translation: English	
Description: Listening, speaking, reading and writing in English.	

Year 3: MEng, 1st year

Global rank: top 15% (no more precise information provided)

Semester 5

Course: Langage C et Unix	**Grade (/20):** 11,3
Translation: C language and Unix	
Description: Theory of compilation; lab works using bash and C.	
Course: Algorithmique et structure de données	**Grade (/20):** 11,64
Translation: Algorithmics and data structures	
Description: Writing efficient algorithms in pseudo-code using abstract data types.	
Course: Programmation fonctionnelle	**Grade (/20):** 20
Translation: Functional programming	
Description: Functional programming; lab works in Scheme.	
Course: Automates	**Grade (/20):** 17.75
Translation: Finite-state machines	
Description: Formal languages, finite-state machines, Turing machines.	
Course: Physique	**Grade (/20):** 14.36
Translation: Physics	
Description: Semiconductor physics and introduction to quantum physics.	
Course: Transmission de données	**Grade (/20):** 12.78
Translation: Data transmission	
Description: Theory of analogue to digital conversion, Shannon theorems, spectral density estimation.	
Course: Traitement du signal	**Grade (/20):** 10.5
Translation: Signal processing	
Description: Laplace transform, Fourier transform, filters.	
Course: Architecture des processeurs et ordinateurs	**Grade (/20):** 16.5
Translation: Processor and computer architecture	
Description: Logic circuits, processor design, assembly language. Lab works using the software « Logissim Evolution ».	
Course: Théorie des graphes	**Grade (/20):** 15
Translation: Graph theory	

Description: Introduction to graph theory: vocabulary, types of graphs, main problems and algorithms.	
Course: Probabilités	**Grade (/20):** 15.1
Translation: Probability	
Description: Exercices with discrete and continuous distributions with univariate random variables.	
Course: Analyse numérique	**Grade (/20):** 12.5
Translation: Numerical analysis	
Description: Matrix classes and decompositions, iterative methods for linear system resolution, spectral theory.	
Course: Soutien mathématique	**Grade (/20):** 14.72
Translation: Mathematics support	
Description: Revision of the fundamentals of calculus.	
Course: Anglais	**Grade (/20):** 16.47
Translation: English	
Description: Listening, speaking, reading and writing in English.	
Course: Allemand débutant	**Grade (/20):** 17.5
Translation: German for beginners	
Description: It is a mistake from administration, I actually took classes of Spanish.	
Course: Management et organisation des entreprises	**Grade (/20):** 18
Translation: Business management and organisation	
Description: Theory of different organisational structures and management methods in companies.	

Semester 6

Course: Algorithmique et structures de données	**Grade (/20):** 17.15
Translation: Algorithmics and data structures	
Description: Implementing data structures in C.	
Course: Bases de données	**Grade (/20):** 14
Translation: Databases	
Description: Implementing relational databases for « real world » problems; revision of SQL.	
Course: Sensibilisation à la cybersécurité	**Grade (/20):** 15.43
Translation: Cybersecurity awareness	
Description: Presentation of the common types of cyberattack and the « good habits » to protect from them.	
Course: Systèmes d'exploitation	**Grade (/20):** 13.5
Translation: Operating systems	
Description: Deep dive into how UNIX works: files, processes, scheduling, memory…	
Course: TP Physique	**Grade (/20):** 14.7
Translation: Lab works in physics	
Description: Making electric circuits and measuring things with oscilloscopes.	
Course: Automatique	**Grade (/20):** 8.9
Translation: Control systems engineering	
Description: Modeling systems with block diagrams, presentation of different control loops with a focus on PID controllers and Ziegler-Nichols method.	
Course: Optimisation Non Linéaire	**Grade (/20):** 10.4
Translation: Non-linear optimisation	
Description: Solving optimisation problems with Newton's method and the gradient descent.	

Course: Calcul différentiel	**Grade (/20):** 11.8
Translation: Differential calculus	
Description: Parametrisation and study of curves and surfaces in 2D and 3D.	
Course: Programmation linéaire	**Grade (/20):** 11.45
Translation: Linear programming	
Description: Modeling problems as linear optimisation problems and solving them with the Simplex algorithm.	
Course: Analyse de données	**Grade (/20):** 11
Translation: Data analysis	
Description: Introduction to descriptive statistics; presentation and implementation of data reduction algorithms (Principal Compnent Analysis, Correspondence Analysis...).	
Course: Probabilités	**Grade (/20):** 17
Translation: Probabilities	
Description: Problems with multivariate random variables. Low of large numbers. Introduction to statistics: estimators and confidence intervals.	
Course: Soutien mathématiques	**Grade (/20):** 12.5
Translation: Mathematics	
Description: Revision of the fundamentals of calculus.	
Course: Anglais	**Grade (/20):** 16.44
Translation: English	
Description: Listening, speaking, reading and writing in English.	
Course: Allemand débutant	**Grade (/20):** 15.64
Translation: German for beginners	
Description: It is a mistake from administration, I actually took classes of Spanish.	
Course: Expression écrite et communication	**Grade (/20):** 16.3
Translation: Written expression and communication	
Description: Summarising documents and presenting them in front of the class.	

Year 4: MEng, 2nd year

No information provided about the ranking.

Semester 7

Course: Anglais	**Grade (/20):** 17.64
Translation: English	
Description: Listening, speaking, reading and writing in English.	
Course: Conduite de projets informatiques	**Grade (/20):** 14
Translation: Project management	
Description: Presentation of management techniques, practical application through playful activities.	
Course: Expression commnucation	**Grade (/20):** 15
Translation: Expression and communication	
Description: Making a CV and a cover letter, using LinkedIn, presenting oneself with an elevator pitch.	
Course: Gestion	**Grade (/20):** 14.25
Translation: Administration	
Description: Accounting: analysing balance sheets and income statements.	

Course: C++	**Grade (/20):** 11
Translation: C++	
Description: Introduction to the language ant its features. Lab works consisting in small projects.	
Course: Java	**Grade (/20):** 15.8
Translation: Java	
Description: Theory of OOP, design patterns and implemention in Java.	
Course: Réseaux	**Grade (/20):** 14.5
Translation: Networks	
Description: Presentation of the network layers, their main protocols and components. Lab works with Cisco Packet Tracer.	
Course: UML	**Grade (/20):** 17
Translation: UML	
Description: Use case diagrams, Class diagrams, Activity diagrams, State machine diagrams, Sequence diagrams, Interaction overview diagrams.	
Course: Apprentissage statistique	**Grade (/20):** 10.5
Translation: Machine learning	
Description: Supervised learning algorithms for regression and classification.	
Course: Bases de données et fouille de données	**Grade (/20):** 16
Translation: Databases and data mining	
Description: Database paradigms (Relational, document, key-value, graph); relational algebra.	
Course: Matlab	**Grade (/20):** 15
Translation: Matlab	
Description: Presentation of Matlab and many lab works doing classic things (Mandelbrot set, Lorenz attractor, Lotka-Volterra equations…)	
Course: Méthode pour l'IA	**Grade (/20):** 13.75
Translation: Methods for AI	
Description: Revision of first-order logic. Fuzzy logic. Presentation of neurosymbolic AI models.	
Course: Elements finis	**Grade (/20):** 12.8
Translation: Finite element method	
Description: Sobolov spaces, Lax-Milgram theorem, week formulation of ODEs, approximation and resolution with the Finite element method. Lab works that I was allowed to do in Julia.	
Course: Intégration	**Grade (/20):** 3.3*
Translation: Integrals	
Description: Lebesgue integrals, convolution, dominated convergence theorem.	
* *I broke up the day before the exam, it did not help…*	
Course: Méthodes de différences finies	**Grade (/20):** 18
Translation: Finite difference method	
Description: Solving ODEs with finite difference method. Lab works that I was allowed to do in Julia.	
Course: Recherche opérationnelle TP	**Grade (/20):** 14.5
Translation: Operations research lab works	
Description: Solving linear optimisation problems combining branch & bound, simplex and local search methods. Lab works in C and CPLEX.	
Course: Recherche opérationnelle Théorie	**Grade (/20):** 18
Translation: Operations research theory	
Description: Algorithms to solve optimisation problems with graphs.	
Course: Programmation dynamique	**Grade (/20):** 13.6
Translation: Dynamic programming	
Description: Markov decision processes, resolution with dynamic programming (Bellman equations).	
Course: Optimisation	**Grade (/20):** 15
Translation: Optimisation	

Description: Methods to solve unconstrainted optimisation problems. Implementation during lab works that I was allowed to do in Julia.

Semester 8

Internship.

Year 5: MEng, 3rd year / MSc, unique year

Ongoing.

Semester 9 (MEng)

Course: Anglais	**Grade (/20):** Not received yet
Translation: English	
Description: Listening, speaking, reading and writing in English.	
Course: Expression communication	**Grade (/20):** Not received yet
Translation: Expression and communication	
Description: Using LinkedIn, presenting projects, writing a thesis.	
Course: Méthodes et outils de développement logiciel	**Grade (/20):** Not received yet
Translation: Methods and tools for software develoment	
Description: C++20 and metaprogramming. Many lab works.	
Course: RSE	**Grade (/20):** Not received yet
Translation: Corporate social responsability	
Description: Raising awareness of sustainable development and the impact of computer engineering work.	
Course: Apprentissage par renforcement	**Grade (/20):** Not received yet
Translation: Reinforcement learning	
Description: Important algorithms for reinforcement learning, mathematical background and implementation during lab works that I was allowed to do in Julia.	
Course: Étude de cas en RO	**Grade (/20):** Not received yet
Translation: Case study in operations research	
Description: Studying real-world complex operations research problem, in particular freight transport and frequency allocation.	
Course: Programmation convexe	**Grade (/20):** Not received yet
Translation: Convex programming	
Description: Solving constrained convex optimisation problems with methods with algorithms based on gradient descent or augmented lagrangian. Included lab works that I was allowed to do in Julia.	
Course: Programmation non linéaire	**Grade (/20):** Not received yet
Translation: Non-linear programming	
Description: Primal-dual algorithms to solve constrained non-linear optimisation problems. Included lab works that I was allowed to do in Julia.	
Course: Distribution	**Grade (/20):** Not received yet
Translation: Distribution	
Description: Distributions, differentiation of distributions, and uses for solving partial differential esuations.	

Course: Équations aux dérivées partielles	**Grade (/20):** Not received yet
Translation: Partial differential equations	
Description: Spectral theory, and particularly spectral decomposition of compact self-adjoint bounded operators. Parabolic and hyperbolic problems.	
Course: Calcul parallèle	**Grade (/20):** Not received yet
Translation: Parallel computing	
Description: Parallelised algorithms and implementation with MPI – in my case, of course, in Julia.	
Course: Applications de l'IA	**Grade (/20):** Not received yet
Translation: Applications of AI	
Description: Case studies of how AI is used in real-world engineering work.	
Course: Apprentissage profond	**Grade (/20):** Not received yet
Translation: Deep learning	
Description: Presentation of several neural networks architectures with mathematical background. Implementation during lab works that I was allowed to do in Julia.	
Course: Introduction au big data	**Grade (/20):** Not received yet
Translation: Introduction to big data	
Description: Presentation of data warehouses, lakes, lakehouses… Introduction to cloud computing including lab works with Microsoft Azure.	
Course: CUDA	**Grade (/20):** Not received yet
Translation: CUDA	
Description: GPU programming with CUDA. Included lab works that I was allowed to do in Julia.	
Course: Méthodes pour l'IA 2	**Grade (/20):** Not received yet
Translation: Methods for AI 2	
Description: Representation learning algorithms.	

Semester 9 (MSc)

All classes are taught in English

Course: Algorithms and complexity	**Grade (/20):** Not received yet
Description: Computational complexity theory; proving complexity classes with reduction.	
Course: Machine learning and data mining	**Grade (/20):** Not received yet
Description: Cluster analysis, sequential pattern mining and association rule learning.	
Course: Fundamentals of optimisation	**Grade (/20):** Not received yet
Description: Gradient descent, simplex, duality (redundant with courses from my MEng programme).	
Course: Advanced topics in machine learning and data mining	**Grade (/20):** Not received yet
Description: Pattern mining and supervised learning on complex data (graphs, time-dependent)	
Course: High performance computing	**Grade (/20):** Not received yet
Description: History and trends in HPC.	
Course: Knowledge representation and reasoning	**Grade (/20):** Not received yet
Description: Description logic, RDF graphs and semantic web. Included lab works in Datalog and a project which I was allowed to do in Julia.	

Semester 10

Internship