Bachelor degree in computer science

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Overall presentation of computer science bachelor degree

Requirements to enter second year :

- Notions in programming (preferably object-oriented programming)
- Basic knowledge in computer architecture and operating systems
- Notions in algebra, calculus and discrete structures

Available courses :

- **Computer science :** understanding the mathematical, scientific and engineering principles underlying every kind of computing systems
- **Mathematics and computer science :** balanced course emphasizing the theoretical aspects of both sciences
- **Computer Science Technology applicable to the Management of Businesses**

Second year of computer science course

- Object-oriented programming and initiation to software engineering
- Imperative programming and systems
- Computer Architecture
- Relational databases (relational algebra, SQL, design, . . .)
- Initiation to the design of web applications
- Finite automata and formal languages
- Data structures and algorithms
- Discrete probabilities

Third year of computer science course

- Object-oriented design (design patterns and SOLID principles)
- Design of algorithms
- Operating systems and computer networks
- Compiler : theory and practice
- Logic (propositional and predicate logic)
- Computability (Turing machine and fundamental theorems)
- Advanced relational databases (complex queries, transactions, concurrency, . . .)
- Research options : machine learning, quantum computer science, model checking, 3D modeling, signal and image processing, intelligent systems, distributed computing, natural language processing, modeling into algorithmic problems
- Engineering options : android development, advanced web applications
- Project or internship of one month

Second year of mathematics and computer science course

- Object-oriented programming
- Data structures and algorithms
- Computer architecture and operating systems
- Finite automata and formal languages
- Linear algebra
- Analysis (series, differentiation and integration of real functions)
- Probabilities and statistics

Third year of mathematics and computer science course

- Initiation to relational databases
- Compiler : theory and practice
- Design of algorithms and graph theory
- Computability and semantic
- Abstract algebra or advanced probabilities and statistics
- Mathematical modeling
- Topology and differential calculus
- Project in computer science and mathematics
- Research options of the computer science course
- Option focusing in applied mathematics, fundamental mathematics or computer science