

*Successful candidates of the MSc in Big Data degree will have a solid background in the following Computer Science subjects:*

### **Programming**

- **Basic programming skills:** Writing and compiling a program, debugging programs, input/output using files, use of variables, control structures and loops, use functions, methods, procedures, use of data structures such as arrays, lists, trees, exception handling
- **Advance programming skills:** Models of programming language evaluation and compilation, analyzing program performance and correctness  
*Recommended knowledge in:* recursive and higher-order procedures, type systems, and garbage collection, pointers and memory management,
- **Object-oriented Programming:** Objects and classes, encapsulation, composition, inheritance (simple and multiple), and delegation, polymorphism, abstract classes  
*Recommended knowledge in:* dynamic dispatch/message passing  
*\*\*Main language used in this degree will be Java*
- **Design and Modelling:** Knowledge of UML (diagram understanding and design)  
*Recommended knowledge in:* notion of design patterns (such as factory, singleton, decorator, composite...)
- **Statistical programming:** Basics on statistical programming language such as R (basics, optimisation, packaging, C-bundles) or SAS (data management, import, export, SAS macro, SAS-SQL, output page-setting and plots)