Course objectives:

- Give students a basic understanding of software architecture as well as best practices
- Introduce students to tools that they will use to create better software more efficiently

Course Content

Chapter 1: Git and GitLab

1. Presentation of Git and Gitlab
2. Basic functioning of Git
3. Repositories
4. Branches
5. Merging and rebasing
6. GitHub

Chapter 2: APIs

1. Anatomy of APIs
2. Web services
3. HTTP
4. XML
5. JSON
6. SOAP
7. REST
8. GrapQL
9. Example of an API

Chapter 3: Docker Technology

1. Definition
2. Virtualization vs Containerisation
3. Containers
4. Installation
5. Functioning and manipulation of Docker images
6. Functioning and manipulation of containers
7. Functioning and manipulation of volumes

8. Docker compose
9. Network with docker

Chapter 4: Software (unit) tests

1. Introduction
2. What is a software test?
3. Use of testing applications
4. Types of tests
5. Test levels
6. Black box vs white box testing
7. Unit tests
8. JUnit

Chapter 5 : Design Patterns

1. Introduction
2. Why use design patterns ?
3. Les types de design patterns
    - Creational design patterns
    - Structural design patterns
    - MVC (Model View Controller)
    - HMVC (Hierarchical Model View Controller)
    - MVVM (Model View ViewModel)
    - Behavioral

Chapter 6: 3-tier architecture

1. What is a 3-tier architecture?
2. The details of the different levels
3. Advantages of the 3-tier architecture
4. 3-tier architecture in web development
5. Other multi-level architectures