Introduction to Software Engineering

UA.DETI.IES

Curricular Unit

- Scientific area
  - Programming Science and Technology
- Weekly classes
  - 2 hours of theoretical-practical classes
  - 2 hours of practical classes
- ECTS credits: 6
- Code: 40384

Goals

- **Understand the organization of a software project**, managed as an industrial process.
- **Select the best software architecture** for a given problem/product.
- **Build a software system as a team**, using a business framework.
- **Use corporate solutions and tools** for software development.

Contents

- Software engineering principles
  - Social, technical and economic perspectives
- Software process
  - Traditional models
  - Agile models
  - Methods and tools
- Software architectures
  - General templates
  - Microservices architecture
  - Message-oriented architecture
- Cloud models
  - SaaS, FaaS, BaaS
  - Containers, Serverless

Contents

- Development environments
  - For the server (Backend)
  - For the customer (Front-end)
- Spring Framework & Spring Boot
  - Core features, MVC, beans, annotations
  - Spring Data – ORM, JPA, Hibernate
  - Aspect-Oriented Programming (AOP)
  - Web server and logging
  - RESTful endpoints
- Software Certification
- Business and ethics

Bibliography

- Roger S. Pressman, Bruce Maxim, **Software Engineering: A Practitioner's Approach**, 7th Edition, McGraw-Hill Education, 2015

- Ian Sommerville, **Software Engineering**, 10th Edition, Pearson, 2016

- *.. and many (good) online resources*

Web resources

- **elearning.ua.pt**
  - Slides TP
  - Practical guides
  - Information and results
  - Work deliveries
    - For the first modules, individual

- **Git Repository**
  - GitHub, GitLab, BitBucket, ...
    - For team project

Grading

- The assessment of the subject will be discrete, with the following components:
  - (T) Final Theoretical-Practical Assessment [ATP: 35%]
    - ~~Exam in normal season~~ Quizzes nas aulas teóricas
  - (P) Practical Assessment [AP: 65%]
    - ~~3~~ 5 individual scripts (40%)
    - 1 group project (60%)
- The minimum grade for each of the components (T and P) is 7 points.

Grading (cont.)

- Attendance at TP classes is not mandatory.
- Under the ordinary regime, **practical classes are mandatory.**
  - Students should attend at least 70% of the TPs and 80% of the Ps, under penalty of failing (art. 18 of the REUA).
    - not being able to take any exam during the current academic year.
- Practical classes
  - In classes you will have to use a **personal laptop** with the necessary software for each module.
  - **Attendance**, **prior preparation**, discussion during class, and submission of all scripts are **important.**
  - **Regular delivery** of work
    - As it is expected in enterprises dedicated to software development

ECTS

- Education (T/TP/P): 0/2/2 - ECTS: 6
- The number of ECTS credits indicates the expected number of hours you must study for this subject.
  - 1 ECTS = 25-30 hours of study.
  - 6 ECTS = 150-180 hours of study.
- In a 15-week semester, at least 10 hours must be dedicated per week.
- These hours include: face-to-face classes, reading books, solving exercises, studying for tests and exams, etc.

Teaching staff

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- General service – IEETA
- Tutorial Guidance (also known as Ots) will work by appointment.
  - Please send an email to the teacher by 10am on the day before the OT you wish to schedule.

Enjoy the semester!