



Programação Avançada para a Internet

Mestrado em Engenharia de Software

Internet Programming Technologies

- Web Server
- Database Server
- Server-side Software
- Client-side Software

Interaction

- **User-Centered Development**
- **Multimodal Interaction**
- **Usability & Accessibility**
- **User Experience**

Objectives

This course unit aims to provide students with comprehensive training in the area of web programming, covering both client and server levels (full-stack).

It is intended that students acquire intermediate to advanced knowledge, skills and competencies in:

- **Client-Side Development**
- **Server-Side Development**

Objectives

Study of the **APIs associated with modern HTML5**, such as:

- Websockets
- Web Workers
- Local Storage
- Drag/Drop Events
- Offline Web Applications
- Web Components

Focus on visualization mechanisms through **templates, DataBinding, and modern component-based frameworks (e.g., React, Angular, Vue.js, Astro)** for building complex user interfaces.

Objectives

Explore frameworks and development methodologies based on:

- Event-driven architectures
- Asynchronous programming
- Real-time web with high scalability

Develop skills to:

- Implement the **REST architecture** and develop web services for an application data layer.
- Interconnect with **relational and/or NoSQL** database systems.
- **Usability & Accessibility:** Mastery of their requirements, standards and implementation processes.

Program Content

1. Most recent **APIs associated with HTML5**.
2. **Node.js Environment**: essential modules and the concept of asynchronous programming.
3. Introduction to the **Express.js framework**.
4. **UI Development**: From traditional **Template Engines** (e.g., Pug, Mustache) to modern **component-based frameworks** (e.g., React, Next.js, Vue).
5. **REST Architecture**.
6. Access to **Document-Oriented databases**: MongoDB, CouchDB, among others.
7. **Usability & Accessibility** Requirements and Adequacy of Systems.

Continuous Evaluation:

- **Theoretical Component**
 - **30%:** Individual Test (Minimum Grade: 9.5)
 - **20%:** Presentation of a Topic (Short Paper + Presentation)
 - Groups of 2 (very exceptionally, another number may be possible)
 - Minimum Grade: 7.5
- **Practical Component**
 - **50%:** Group Project (Minimum Grade 9.5)
 - Groups of 2 (very exceptionally, another number may be possible)

Group members' grades may differ based on their discussion of the work and project.

Evaluation

Exam Evaluation:

- **Theoretical Component**
 - **50% * Exam** (Minimum Grade: 9.5)
- **Practical Component**
 - **50% * Project** (Minimum Grade 9.5)
 - Individual unless its an improvement of Continuous Evaluation project

The Structure of PAI-MES 2025-2026

Moodle:

- Name: Programação Avançada para a Internet
- Key: PAI+2526

Teams:

- Programação Avançada para a Internet (2025-2026):

Join Code: **3f5zqdj**

Instructor

- Pedro Albuquerque Santos [RUC]
 - pedro.albuquerque@estsetubal.ips.pt
 - Office F-311

Bibliography:

- It will be provided along with other teaching materials