

Lecture / week #	Date	Summary	Theme
1	23-09	<ul style="list-style-type: none"> ➤ Intro & UC structure, WoWs, GAP & IAP overview ➤ Software Agile Development Methodologies 	Theme #1 – Software Architecture & Development Methodologies
2	30-09	<ul style="list-style-type: none"> ➤ Software Agile Development Methodologies (Cont.) ➤ Group Assignment Project (GAP): Application scope definition 	
3	07-10	<ul style="list-style-type: none"> ➤ Software Architecture: User Stories ➤ Group Assignment Project (GAP): Backlog & sprint Creation 	
4	14-10	<ul style="list-style-type: none"> ➤ Cloud Concepts, Advantages, Adoption frameworks ➤ Cloud Economics and Billing ➤ Cloud Global Network: Regions, Availability Zones and Security ➤ Cloud Networking Lab ➤ GAP: Project Sprint Review & Sprint Planning – Groups 1,3,5,7 	Theme #2: Cloud Foundations
5	21-10	<ul style="list-style-type: none"> ➤ Cloud Security Lab ➤ GAP: Project Sprint Review & Sprint Planning – Groups 2,4,6,8 	
6	28-10	<ul style="list-style-type: none"> ➤ Cloud Services: Compute Lab ➤ GAP: Project Sprint Review & Sprint Planning – Groups 1,3,5,7 	
7	04-11	<ul style="list-style-type: none"> ➤ Individual Assignment Project (IAP) lab ➤ GAP: Project Sprint Review & Sprint Planning – Groups 2,4,6,8 	Theme #3: Cloud Managed Services
8	11-11	<ul style="list-style-type: none"> ➤ Individual Assignment Project (IAP) Report and Presentation ➤ GAP: Project Sprint Review & Sprint Planning – Groups 1,3,5,7 	
9	18-11	<ul style="list-style-type: none"> ➤ Cloud Services: Serverless Architectures & Development Lab ➤ GAP: Project Sprint Review & Sprint Planning – Groups 2,4,6,8 	
10	25-11	<ul style="list-style-type: none"> ➤ Cloud Services: Storage Lab ➤ GAP: Project Sprint Review & Sprint Planning – Groups 1,3,5,7 	
11	02-12	<ul style="list-style-type: none"> ➤ Cloud Services: Database Lab ➤ GAP: Project Sprint Review & Sprint Planning – Groups 2,4,6,8 	
12	09-12	<ul style="list-style-type: none"> ➤ Cloud Well-Architected Framework ➤ Cloud Scaling and Monitoring Lab ➤ GAP: Project Sprint Review & Sprint Planning – Groups 1,3,5,7 	
13	16-12	<ul style="list-style-type: none"> ➤ GAP: Group Project Final Presentation 	
	11-01 a 24-01	N/A	
	26-01 a 08-02	➤ Época Recurso de Exames	

Objectives

This Unidade Curricular (UC) aims at developing and applying knowledge in two main themes:

1. Agile software development methodologies, addressing agile concepts, principles, and most used agile frameworks.
2. Cloud Computing and Cloud Adoption, to develop and deploy enterprise cloud architectures using cloud services provided by one of the cloud hyperscalers.

Individual labs and group assignments will be developed in the scope of this UC, to consolidate the main themes and to apply this acquired knowledge in real business challenges.

Key Learnings

At the end of this UC it is expected that you be able to

- Follow an agile development methodology for software development cycles, focusing on delivering value and exceed stakeholders' expectations. Apply correctly agile principles, artifacts and other key ceremonies.
- Learn key concepts and principles of cloud computing.
- Deploy cloud computing basic services: compute, storage, database
- Develop and deploy functions properly with Serverless frameworks.
- Apply cloud well-architecture framework to microservice architecture design.

You are not expected to know every little detail on every technology in the scope of this UC. We will focus a lot more on:

- High Level Concepts.
- Methodologies for software development and delivery
- Create a mind-set for continuous learning in computer science technology

Lectures

- Forum to discuss concepts, ideas and present examples.
- Homework on specific subjects can be required between lectures.

Labs & Group Assignment Project (GAP)

- Labs are intended to be simple examples in order to understand technology basics and enable progress on team project assignment objectives.
- Group Assignment Project (GAP) development
 - Backlog Refinement
 - Sprint Review, Planning and Retrospective
- Mentoring
- Address questions and open discussion

Individual Assignment Project (IAP)

- The individual project for the Software Engineering course is designed to provide students with hands-on experience in developing and deploying a web-based software solution on Amazon Web Services (AWS).

Evaluation

This UC has the following evaluation components:

1. – Group Assignment Project (GAP) - 65%

The main goal of the team assignment is to develop enterprise grade solutions to solve real business problems.

The UC key learnings will be consolidated by following best practices in software design, agile development and applying cloud services. Technologies and programming languages will be defined at the first project review and assignment classes.

The project scope (backlog) will be divided into several iterations (sprints) in order to achieve the Minimum Viable Prototype (MVP) envisioned and committed by the team. Increments in project/system's functionalities between sprints are mandatory.

The final grade of this component will be based on project's final demonstration, interim presentations and in the fulfilment of planning objectives defined for each sprint, observed through agile ceremonies and code review.

Additional info about assignment:

- Development team size: max 5 people depending on class size.
- Team set-up / team members identification: deadline on week #2. Not able to define: random selection will be applied.
- Project Start Date & Duration: review dates in lecture plan presented above on this document

Project key evaluation factors:

- Follow a microservice architecture whenever possible
- Group applied and Agile / Scrum development methodology for project implementation, planning and team alignment. Evidence of agile ceremonies and backlog grooming activities performed must be shared.
- Correct use of Source Code Management Tool (ex: Github / Gitlab) and branching strategy.
- Use of a CI/CD Tool (ex: Jenkins). Demo of CI/CD pipeline execution will be required.
- Use of cloud services (including serverless architectures) to support project delivery.
- Overall MVP delivery quality and value delivered in user stories implemented.

Individual grade will be based on individual performance:

- In Sprint Review presentations (and other agile ceremonies)
- Contribution in Project implementation and Delivery
- Peer feedback

2. – Individual Assignment Project (IAP) – 35%

Project Objective: Develop a cloud based Application

Core Components:

- RESTful API
- Web User Interface
- Relational Database Integration

Key Technical Requirements:

- AWS Deployment: Using EC2 or Elastic Container Service (ECS)
- Authentication and Authorization: Implement AAA mechanisms using an Identity Provider (IDP)
- Security: Follow best practices for secure deployment

Development Approach:

- Agile Methodology: Use epics and user stories
- Version Control: Git for source code management
- Project Management: JIRA for tracking sprints and user stories

Deliverables:

- Detailed architecture diagram
- Implemented user stories
- Application code (Git repository)
- System demonstration video
- Comprehensive project report

This project aims to simulate real-world software development scenarios, emphasizing AWS cloud deployment, secure coding practices, and agile project management.

Project key evaluation factors:

- Technical Implementation (40%) Assess the quality and completeness of the Application.
- Project Management and Documentation (30%): Evaluate the use of Agile methodology.
- Presentation and Demonstration (30%): Evaluate ability to effectively communicate

Contacts

Lecturer: Nuno Sá Couto

e-mail: nuno.sacouto@ua.pt

Assistant Lecturer: Rafael Direito

e-mail: rafael.neves.direito@ua.pt



"This restaurant has an app that lets you download parmesan cheese from the cloud!"