

# Recap of Semester 1

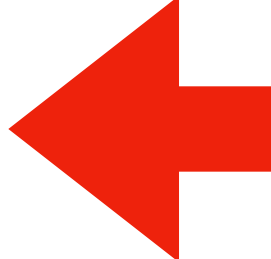
COMPSCI5059 - Software Engineering

H. Gül Calikli, Ph.D.

# Overview

- ☐ Topics Covered in Semester 1
- ☐ Possible Exam Question Types (for Semester 1 topics)
- ☐ Tips for the Exam Study (for Semester 1 topics)

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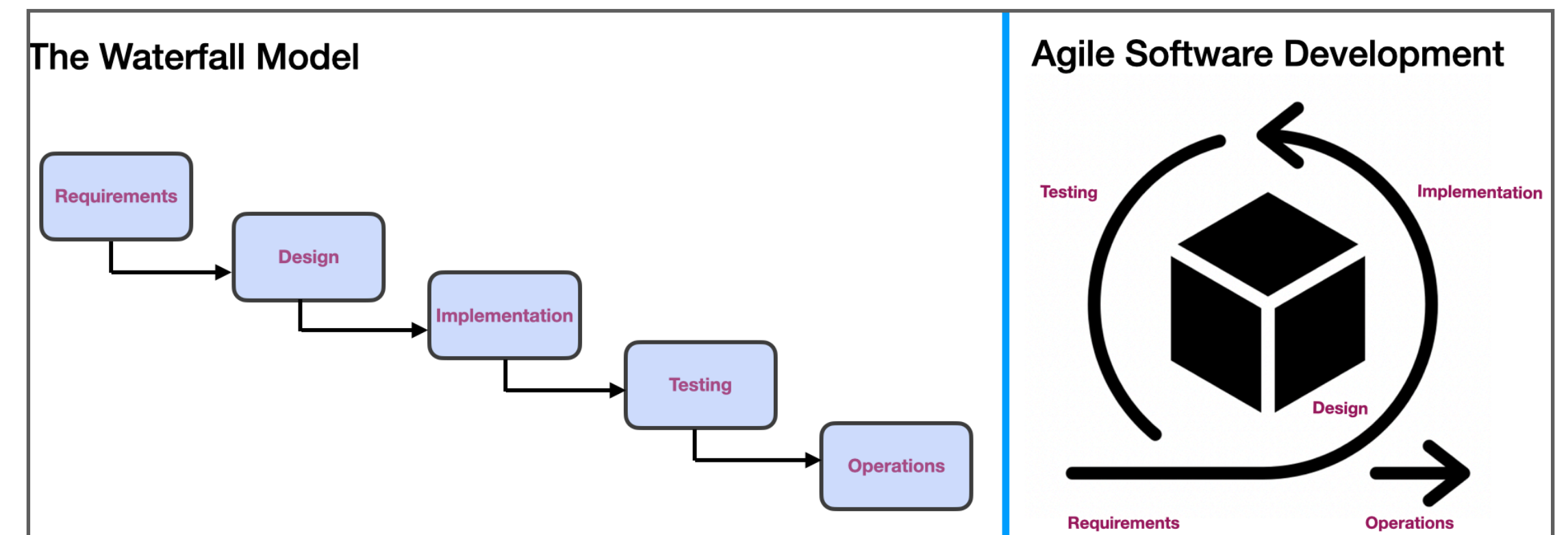
# Topics Covered in Semester 1

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Week 2 (4 <sup>th</sup> November 2022)	<ul style="list-style-type: none"><li>● Scrum</li></ul>
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- Differences between agile & waterfall



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- Lean software development principles
  - For instance: What is (not) a waste?

## 7 Principles of Lean Software Development

1. Eliminate Waste
2. Amplify Learning
3. Decide Late
4. Deliver Fast
5. Empower the Team
6. Build Integrity in
7. See the Whole

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- What is a **user story/epic/constraint/spike**? How do they differ from each other?

## Some User Story Examples

As a **registered user**  
I want to **change my password** so that I can keep my account **secure**.

As a **website visitor**  
I want to **subscribe the mailing list** for a product so that I can get **product updates**.

As an **admin user**  
I want to **disable an ex-employee** so that I can prevent **unauthorised logins**.

## Epics

- An **epic** is a large user story with little detail.
- One aim of generating epics is to avoid making all analysis and design decisions at the start of the software development project.

As a **marketing manager** I want to **review the performance of historical promotional campaigns** so that I can **identify and repeat profitable campaigns**.

## Non-functional Requirements (Constraints)

- Not everything can be expressed as a user story. These are nonfunctional requirements, which are expressed as **constraints** as follows:

The system must be able to support 100 simultaneous users.

The app must be able to run on mobile phones with a screen resolution of 750x1334 to 1080x1920.

## Non-user Roles: Spikes

- It can be useful to have internal stories.
- Developers generate **spikes**.
- A **spike** is a story for gathering information (e.g., how much work will be required to work around a software issue?)
- Development team conducts a small experiment (e.g., a prototype) that is not part of the actual development but makes future development easier.

**Example:**

As a **developer**  
I want to **record all login attempts**.



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- INVEST criteria for good user stories

## Features of Good User Stories

- **I**ndependent of other stories to avoid confusion.
- **N**egotiable, a reminder to talk later.
- **V**aluable to users or customers but not developers.
- **E**stimable.
- **S**mall but not too small
  - A matter of judgement and experience.
  - The right size to be able to make good estimates.
- **T**estable.
  - If a story can't be tested, how do we know when it is finished?





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- Roles in Scrum (e.g., product owner, scrum master)

## The Scrum Team



**Product Owner:** responsible for the business value of the product (customer). Selects what gets done and when



**Scrum Master:** ensures the team is motivated and productive.

- Removes obstacles.
- Ensures proper processes are followed.



**The Scrum Team:** Between 3 and 9 people in total, including **product owner** and **scrum master**.

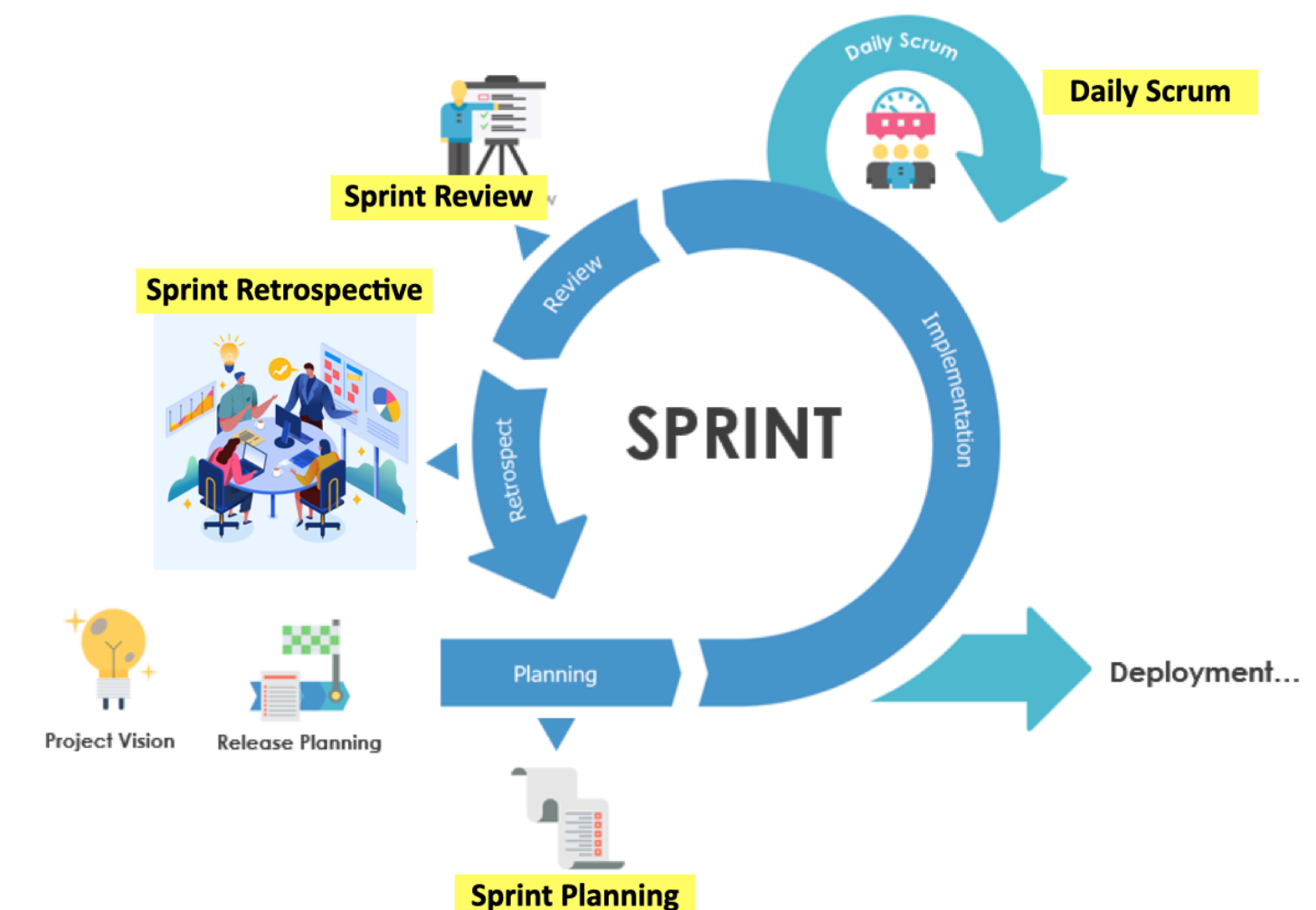
- Developers and Testers.
- User Experience analyst, if appropriate.

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- Scrum meetings (sprint planning, daily scrum, sprint review, sprint retrospective)

## The Scrum Meetings



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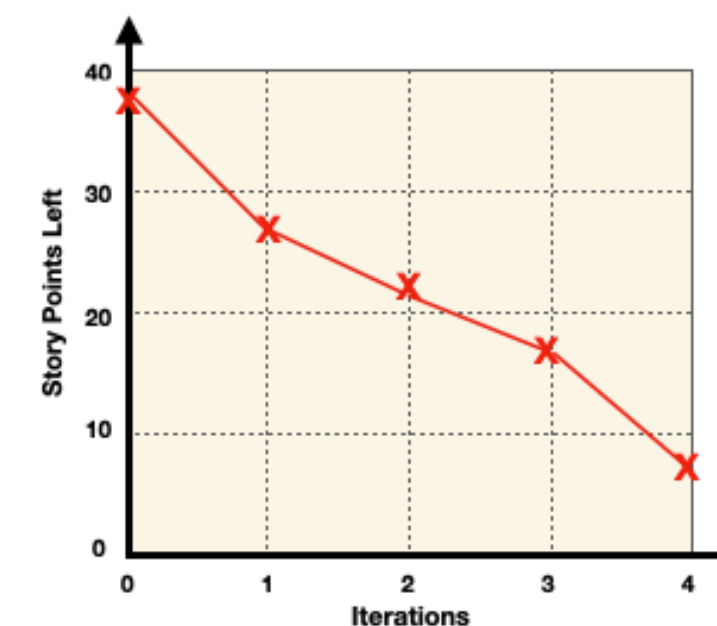
- Monitoring progress (e.g., calculate **Iteration Hit Rate**, draw **burndown chart**)

## Example - Iteration 4

- We finish all user stories in iteration 4.

Iteration	User Stories	Total Effort (SPs)
4	F, G, K	10

Iteration 4 finishes normally, so 10 SPs are completed.



- Burndown chart goes from **17 SPs** to **7 SPs** since we completed 10 SPs (i.e.,  $17 \text{ SPs} - 10 \text{ SPs} = 7 \text{ SPs}$ ).
- We could not finish J, L and M, hence  $1 \text{ SP} + 4 \text{ SPs} + 2 \text{ SPs} = 7 \text{ SPs}$  are left.
- However, J, L, M were not planned for iteration 4 any more. Hence, Iteration Hit Rate =  $10 / 10 \times 100 = 100 \%$

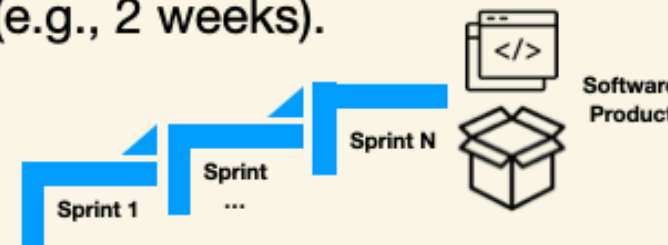
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- Differences & similarities between **Kanban** and **Scrum**

## Scrum vs. Kanban

**Cadence:** Fixed length sprints (iterations) vs. continuous flow

Scrum	Kanban
<p>Regular, <b>fixed length sprints</b> (e.g., 2 weeks).</p>  <p>Fixed iteration cycles in scrum also limits the number of user stories that are in progress and satisfies the <u>lane limit</u> so that there are not many incomplete user stories.</p>	<p>There is <b>continuous flow</b>, but the number of cards that can be put in a <u>lane</u> are <u>limited</u>.</p>



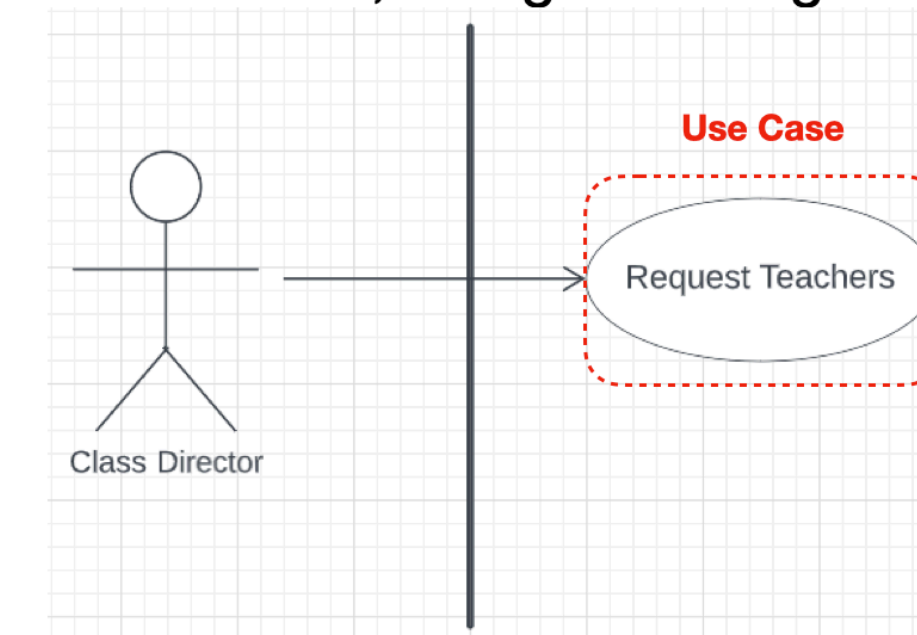
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- Differences & similarities between a **use case** and a **user story**

## Use Cases - Introduction

- A **use case** is equivalent to a **user story**.
- We find the use cases by looking at the actor and seeing what activity they initiate.
- Use cases should be short, doing one thing well to prevent ambiguity.



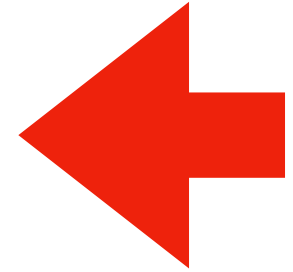
### User Story

As a class director, I want to request teachers, so that ...

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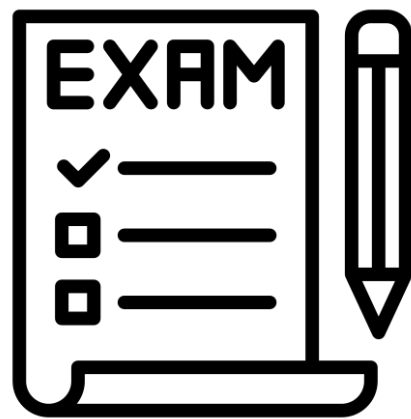
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# Short Answer Questions



- True/False questions
  - Given a set of statements identify which ones are True/False (beware that you must **justify** your answer):

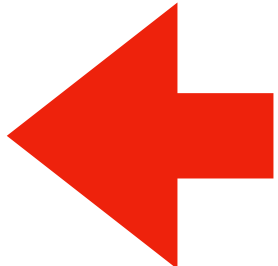


- Other short answer questions (beware that you must **justify** your answers)
  - Given a list of statements identify which ones are **user story**, **epic**, **constraint**, or **spike**.
  - Given a list of user stories identify which ones comply with the INVEST criteria, which ones violate the INVEST criteria

# Other Question Types: Examples

- Divide a given epic into user stories and justify your answer
- Given a set of user stories, make iteration and release plans
- Draw burndown chart and calculate iteration hit rate for a given software development scenario
- Draw use case diagram for a given requirements specification

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# Exam Study Tips

- Go through:
  - Lecture slides
  - Mentimeter quizzes
  - Questions at the end of the slides of each lecture topic