

# Cpt S 422: Software Engineering Principles II

## Testing levels – System Testing

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# System testing

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- ❑ Goal: ensure that the system performs according to the requirements (functional and non-functional)
- ❑ Black box
- ❑ Useful documents: requirements, use cases, user manuals, ..
- ❑ Rehearsal for user testing
- ❑ Best case scenario: the testing team is an independent group

# System testing (cont.)

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## ❑ Types of system testing

- Functional testing
- Performance testing: Non-functional requirements such as memory use, response time, etc.
- Stress testing: testing the software with a maximum amount of load. The goal is to find when the system will break.
- Configuration testing: for software that must handle several configuration such as different sensors.

# System testing (cont.)

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## ❑ Types of system testing (cont.)

- Security testing: relates to the availability, integrity, and confidentiality of the system data and services
- Recovery testing: test if the system can recover properly after resource losses
- Reliability testing: test whether the software behaves under stated conditions for a stated period of time
- Usability testing: test for the effort required to learn and operate the software

# Requirement Traceability Matrix

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- ❑ Used to trace which requirements are tested and by which tests
- ❑ Examples:

Requirement identifier	Requirement description	Priority (scale 1–10)	Review status	Test ID
SR-25-13.5	Displays opening screens	8	Yes	TC-25-2 TC-25-5
SR-25-52.2	Checks the validity of user password	9	Yes	TC-25-18 TC-25-23

	...	TC-25-2	TC-25-3	TC-25-4	TC-25-5	...
...						
SR-25-13.5		1			1	
...						

# User testing

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- ❑ Goal: Allow the user to evaluate the software in terms of their expectation
- ❑ Types of user testing
  - Acceptance
  - Alpha/beta

# Acceptance testing

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- ❑ Performed when the software is developed for a specific user/client.
- ❑ Based on requirements
- ❑ User provides the input/test data
- ❑ The software runs in real conditions
- ❑ If the client is satisfied this is where the final payment is typically made and **installation** testing is performed, i.e., installing the system at the client's site and retesting to make sure that the software works as required in the client's environment

# Alpha/Beta Testing

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- ❑ When the software is developed for the mass market
- ❑ Step 1: Alpha testing
  - Takes place at developer's site
  - Potential users are invited to use the software; developers observe and note problems
- ❑ Step 2: Beta testing
  - The software is sent to selected users for installation and use under real conditions
  - Users send back logs/problems



# Tasks for today

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1. Identify functional/non-functional requirements for the Calendar example
2. Test and fix the code when the requirements are not met