

CS3733-B04 Midterm Exam Study Guide

This study guide contains information that should help you prepare for the exam. All questions on the exam will be taken from the material presented or referenced here. I have provided some sample questions in the different areas and for some of them, provided answers. If you understand the material here, you should have no trouble with the exam. I've reference pages in the text by placing them in parentheses.

Reading material you are responsible for knowing

Textbook, chapter 1, 4.1, 4.2, 4.4, 7.1-7.4, chapter 8, 9.1-9.3.

Additional readings: People, Process, and Tools; Test Before You Code

General Software Engineering

- What is a software development lifecycle? **The events that occur when producing a software product**
- What are the two main forms of software lifecycle? **Waterfall and spiral**
- Which SDLC is the most effective for most projects? Why?
- Discuss the role of change and risk in software development.
- What is software engineering?
- How is software engineering different than other engineering disciplines? **Continual change is the big difference. Software is soft. There are no fundamental laws that define software.**
- Of the three components to a software project: people, process, and tools, which is most important and why?
- What are the three main components of a process? **Roles, activities, and artifacts.** Describe each.
- How does an iterative, incremental approach to software development address risk and manage change?
- What are the four phases of the Rational Unified Process? **Inception, Elaboration, Construction, and Transition.** Describe each?
- Given an example problem, identify risks associated with trying to create a system to solve it.

Requirements

- What is a stakeholder? **Anyone who has an interest (stake) in the outcome of a project or product.** How is a stakeholder different than the customer? Give two examples of stakeholders that are not customers.
- What makes a good requirement? **It is specific, unambiguous, and testable.**
- What is a vision? What is it used for?
- What are feature requirements? Given a context, identify some feature requirements.
- The acronym FURPS is used to describe the type of requirements. What does FURPS mean? **Functional, Usability, Reliability, Performance, Supportability.** Give examples of each type of requirement.
- What is a use case? **A complete set of actions, performed by the system, initiated by an actor, that provides visible results (to the actor).**
- What is a user story?
- How are user stories and use cases different? How are they related?

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- Given a situation, write a use case for it. Write a set of user stories for it?
- Besides describing functional requirements, what are use cases used for?
Determining the boundaries of the system.
- What are the parts of a use case? **Name, brief description, actors, preconditions, postconditions, basic or main flow of events, alternate or exception flows of events.**
- What is a scenario? **A single path through a use case.**
- Given a use case or example, create a sequence diagram for a specific scenario.

Project Management

- What is an iteration? **A time interval that is used in project planning.**
- Describe the “planning game” approach to project planning.
- When planning a project, how do you decide what features get implemented, and in what order?
- What is the difference between a task and a milestone? (p. 117)
- In project scheduling, what are: delay dependencies, overlap dependencies? (p. 119)
- What is finish-to-start, start-to-start, finish-to-finish, and finish-to-start dependencies? (p. 119)

Analysis (& design)

- What is the purpose of analysis? **To understand the problem to a degree that you can design a solution.**
- What are the three types of analysis classes defined by Jacobson? **Boundary, Control, Entity.** Describe the purpose of each of them.
- What is textual analysis? **Analyzing descriptive text from requirements and other sources in order to identify classes and operations in the problem domain.**
- Given a use case or some other text, perform a textual analysis on it to identify classes and operations.
- What are CRC cards? How do you use them? What does CRC stand for? **Class, Responsibility, Collaboration.**
- What are some advantages and disadvantages of CRC cards?
- Instead of the three analysis classes that Jacobson defined, the textbook uses the PCEMF classification. What does PCEMF stand for and what are each of the parts?

Testing

- What is unit testing?
- What is JUnit?
- Describe Test-First Programming? What are the advantages that is supposedly gives? Do you agree or disagree?
- Given a simple specification, write a JUnit test that tests one method.
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UML

- In UML, how do you specify an object? **Rectangle with the name underlined.**

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- What UML diagram is used to describe scenarios? **Sequence diagrams.**
- What is the UML representation for use cases and actors?
- What is the main purpose of UML? **Communication.**
- Who are the “three amigos” of UML fame? **Grady Booch, Ivar Jacobson, James Rumbaugh.**
- What are the parts of sequence diagrams? **Objects, lifelines, messages.**
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