Lecture starts at 13:15

You are welcome to share a short break with us and discuss/ask questions

– L11 –
Exam Q&A
DAT232/DIT285 Advanced Requirements Engineering

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October 21, 2025

Examination

Hints for exam preparation

Specific Learning Objectives per Lecture

Outline

1 Examination

2 Hints for exam preparation

3 Specific Learning Objectives per Lecture

Examination

Three components:

1. Project grade, base grade per group with option for individual adjustment (Fail, 3, 4, 5)
2. Workshops (Fail, Pass); graded individually
3. Digital hall exam, individual (Fail, 3, 4, 5)

Digital hall exam

	Points	Grade
0%	< 40	F
50%	≥ 40	3
70%	≥ 56	4
85%	≥ 68	5

Final course grade

- Fail: Missed getting a passing grade on one or more of the three components
- Pass: Grade based on average of project and exam grade
  - ROUND((projectgrade * 3.5 + examgrade * 4) / 7.5)

Question types

- Multiple choice questions (40 Points)
  - We aim for a similar style as in the example exams, starting from the specific learning outcomes per lecture as listed below
  - We will carefully check for misleading questions and adjust acceptable answers if needed
- Skill questions (20 Points)
  - Aim to do something (order elicitation techniques, find problems in task description, ...)
- Essay question (2 x 10 Points = 20 Points)
  - One additional question type beyond the example exams:
  - We give a development scenario (e.g. small team develops an app based on agile approaches) and then ask to suggest a suitable approach for documenting requirements.
  - In this question type, points given for: Correct answer, good reason for correctness given, depth of knowledge demonstrated, Understandable

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Question types

1. Take any of the specific learning objectives below.
2. Locate the slide that best relates to the specific learning objective
3. Derive some multiple choice questions
   - Take a statement from the slides or course literature and make it your proposition
   - Extract the reason from the slides or course literature
   - Adjust proposition and / or reason to make A, B, C, D, or E the correct answer

A Requirement

is a condition or capability **needed** by a user to solve a **problem** or achieve an objective.

Proposition It must be possible to trace all requirements back to a user need.

Reason (IEEE 1990) defines a requirement as above.

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L1 – Introduction, Learning Objectives

What are key concepts and definitions of Requirements Engineering?

- Requirement
- Requirements Engineering
- Requirements Specification

What value does Reqts. Eng. provide?

- Systematic/shared understanding of problem
- (potential to find problems early)
- Foundation for project management, design decisions, development, testing, contracts, maintenance

Which activities does Reqts. Eng. entail?

- Analysis (Elicitation, Interpretation, Negotiation, Documentation, Verification&Validation)
- Management (Traceability, Change Management)
- Not in a particular order!

L2 – Elicitation, Learning Objectives

- What is E. / Why is E. difficult: Must know. (= Likely in Exam)
- Stakeholder Map and Analysis: Must know. (= Use in Project and likely in Exam).
- Overview of Elicitation Methods: Must know.
- Interviews and Strategies for Elicitation: Should know.
- Common interview mistakes: additional training if needed.
- Focus group: Must know. Read in book!
- Goal-Domain Tracing: Must know. Read in book!

L3 – Documentation, Learning Objectives

What are key concepts of requirements documentation and specification?

Theory and Definitions

given software development context.

with respect to a given software development context.

knowledge (challenge, principle, practice) and relate them to the framework in this

Why is requirements documentation important?

Audience and Purpose

context.

software development context.

K3 Compare suitability as well as

S3 Analyze the effect and quality of the

J3 Consider inter-team, program level and

What are the main challenges of requirements documentation?

Technical Writing for Mixed Audience, Conceptual Weaknesses

and research in requirements engineering.

of RE practices from the perspective of the

How to structure requirements documentation?

Being able to make a proposal

L4 – Interpretation, Learning Objectives

- Principles
  - Explain strengths and weaknesses of different approaches to document requirements (structured, feature based, model based, scenario based)
  - Propose ways to combine the above approaches for a given development scenario
- Challenges
  - Why is it difficult to write *good enough* requirements specifications?
- Practices
  - ...for data requirements (model, dictionary, expressions, virtual windows)
  - ...for functional requirements (context diagram, event and function list, feature requirements, task description)

L5 – Creativity, Learning Objectives

- Key Concepts
  - Creativity and Elicitation: Differences, Similarities, Relationship
  - Divergent thinking
  - Convergent thinking
  - Exploratory creativity
  - Combinational creativity
  - Transformational creativity
- Activities
  - Brainstorming
  - Assumption busting
  - Creativity triggers
  - Hall of Fame / BrightSparks

L6 – Interpretation, Learning Objectives

- Key concept
  - Quality framework and quality characteristics
- Practices
  - Planguage
  - Quality models
  - Quality grid
  - Open target / open metric
- Judgement
  - ...Risk for customer

L6 – Negotiation, Learning Objectives

- Prioritization
  - Prioritization objects
  - Prioritization criteria
  - Prioritization scales
  - Prioritization techniques

L7 (traceability) Learning objectives

What are key concepts and characteristics of traceability?

- The ability to relate artifacts during development of a system (horizontal/vertical traceability; artifact; pre-/post-requirements traceability

What principles and practices of traceability exist?

- Use Goal-Domain Tracing, Traceability Matrices, Traceability Information Models, Query Languages
- Rely on a Traceability Information Model to define which tracelinks can or must exist
- Use tools to maintain tracelinks

Which activities does traceability support?

- Apply traceability driven by a need (Change Impact Analysis, Requirements Elicitation or Requirements V&V, Coverage Analysis, ...)
- Often needed to prove compliance to a standard or regulation

Why is traeability challenging to achieve?

- Bad tracelinks worse than no tracelinks,
- ...expensive to create and maintain,
- Tracing often an after thought

L8 – Verification and Validation

Specific Learning Objectives

After this lecture, you should be able to...

- Describe consequences of poor requirements validation
- Describe which properties should be checked during verification or validation of requirements
- List verification and validation techniques for requirements
- Plan and execute the quality assurance of requirements as well as requirements documents
- Describe the difference between requirements verification and requirements validation
- Suggest and motivate relevant improvements on requirements quality assurance processes

L9 – Agile and at Scale

- Key concepts
  - Breadth first RE
  - Just-in-time RE
  - Practices of Agile RE (be able to name three)
  - Synergies and conflicts between Agile and RE
  - Reflect on role of RE (necessary / complete / needed / useful) in a given development scenario
- Practices
  - RE Practices on team level (user story, spikes, stakeholders, agile estimation, testing)
  - RE Activities on program level (nfr, analysis, roadmapping, prioritization)
  - RE Activities on portfolio level (epics, architecture)
- Judgement
  - Being able to interpret and critically reflect on Requirements Information Model

L10 – Ethics

- Key concepts
  - How can requirements tackle ethics?
  - How do ethics impact requirements activities?
  - EU guidelines for Trustworthy AI (autonomy, beneficience, nonmaleficence, justice, explicability) and their role in RE
  - Runtime stakeholder
- Skill
  - Be able to identify a runtime stakeholder, assess their risk and benefit, and derive functional requirements