university of koblenz
Computer Science

Engineering Web and Data-intensive Systems

Module 04IN2012

Dr. Volker Riediger - Winter Term 2022/23

ist Institute for Software Technology

Organizational Topics

- Requirements and outcomes of this course
- Examination mode, deadlines
- Required software

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Chapter 0.
Organizational Topics

EWADIS Team

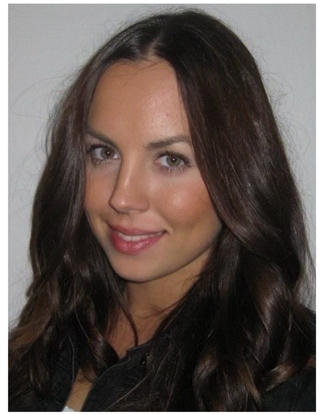
How to reach us

- ~~In my office (B 121)~~
  - ~~at any time when the door is open~~
  - ~~regular office hour is Tuesday, 13-14~~
  - ~~special appointments by mail~~

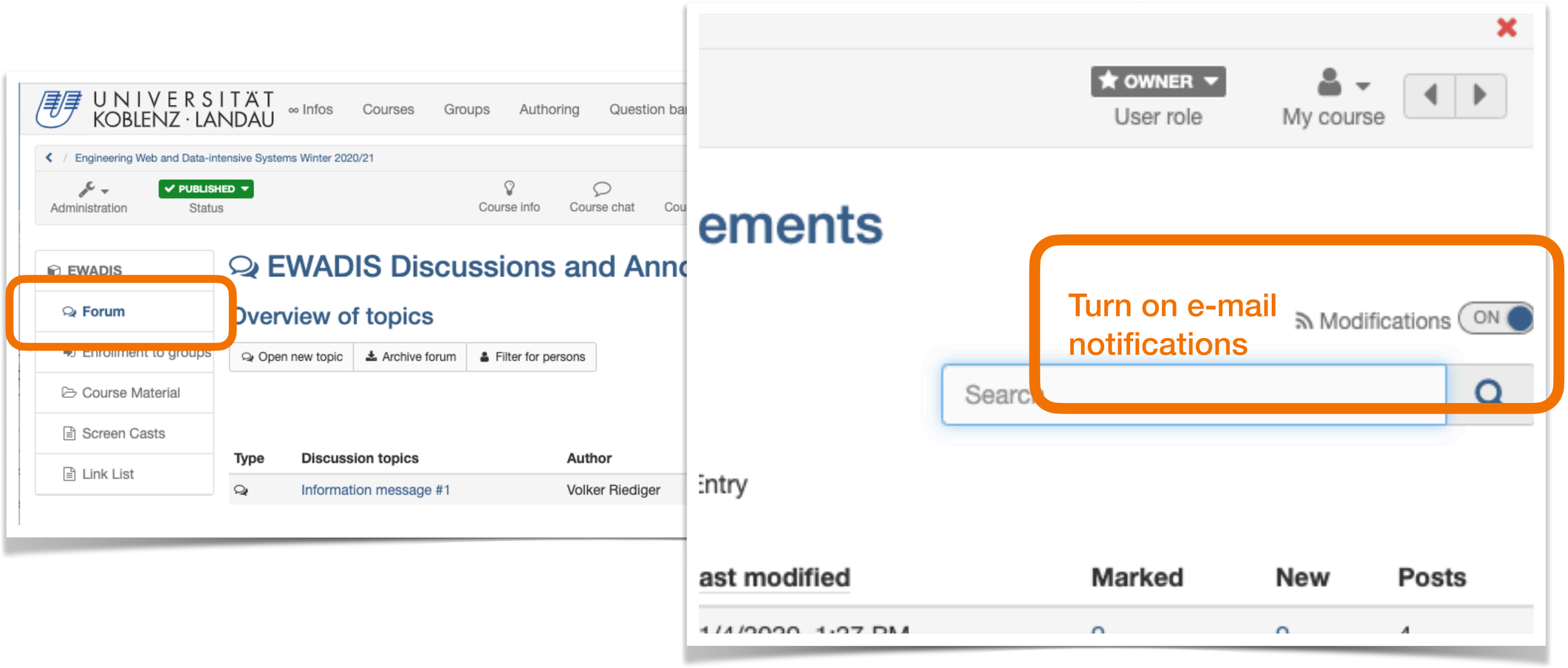
- **Via the OLAT forum (preferred)**
  - place for questions and clarifications
  - discussion about course content
  - notice about important events

- Via E-Mail to Volker Riediger
  - riediger@uni-koblenz.de
  - at any time, usually very quick response
  - response time is higher on weekends and during vacation…
  - you may be redirected to the forum

- You may also approach Veronika Vasileva and Mahmood Al-Doori
  - vvasileva@uni-koblenz.de (organization, assignments)
  - mahmoodaldoori@uni-koblenz.de (assignments, tutorials)
  - both support this course thank you :-)



Stay tuned!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Open new topic
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Information message #1
Volker Riediger
OWNER
User role
My course
ements
Turn on e-mail notifications
Modifications
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Format of the Course

- **Lecture** (2 hours per week)
  - sychronously Monday 10:15-11:45, BBB opens at 10:00
  - Recording of sessions
  - PDF slide decks
  - Screen casts
    you may watch/review the videos whenever and as often as you want
  - Examples (models, other files)
  - Links provided in OLAT

- **Tutorial** (2 hours per week, 3 groups)
  - synchronously via BBB (BigBlueButton)
  - will be recorded for asynchronous access
  - Friday 12-14 CET V. Riediger
  - Friday 14-16 CET M. Al-Doori
  - Friday 16-18 CET M. Al-Doori
  - **Tutorials start in week #45**
    Details on OLAT.

- **Self Study** (6…8 hours per week)
  - Homework, first assignment in week #46
  - You have one week to complete the assignment, provide solutions in OLAT group folder
  - Do own research
  - Conduct own experiments
  - Construct own examples

Lecture and Tutorial Sessions - BBB (BigBlueButton)

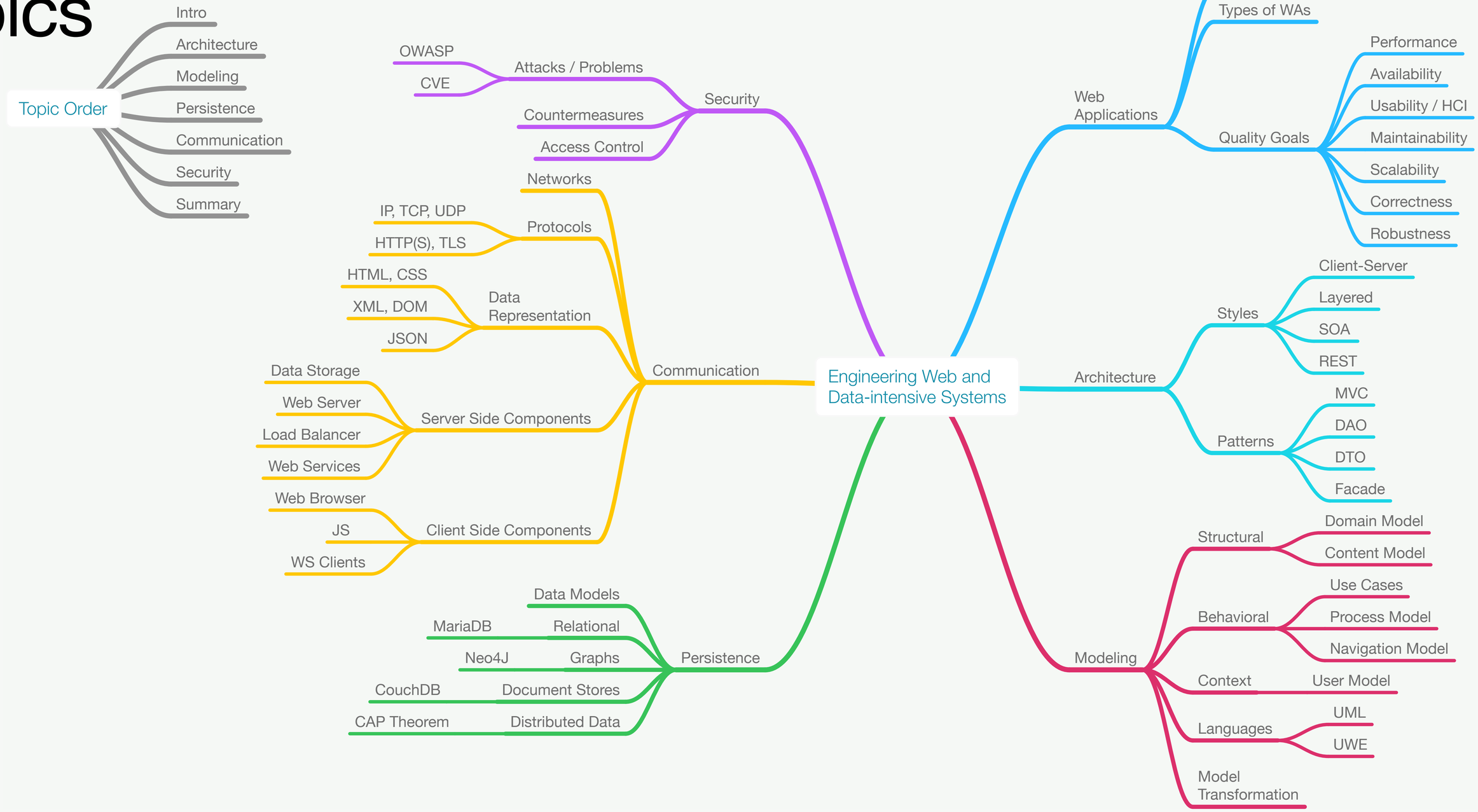
- Chrome or Chromium Browser
- WebCam (optional) and microphone/speakers, headset preferred
- Audio quality largely depends on individual “Echo Test”
  - Speak short words/sentences until you receive a clear echo, then accept

  - Test sessions will be conducted next week

- (At least one) tutorial session will be recorded weekly

- Tutorials start “c.t.” (hh:15)
- BBB sessions ready for login at hh:00
- Preparation
  - Review lecture slides/videos
  - Put your questions into the “Shared Notes” or the OLAT forum **before** the tutorial starts
  - More questions during the session via shared notes, audio, or chat

Topics


Topic Order
Intro
Architecture
Modeling
Persistence
Communication
Security
Summary
Engineering Web and Data-intensive Systems
Web Applications
Characteristics
Types of WAs
Quality Goals
Performance
Availability
Usability / HCI
Maintainability
Scalability
Correctness
Robustness
Architecture
Styles
Client-Server
Layered
SOA
REST
Patterns
MVC
DAO
DTO
Facade
Modeling
Structural
Domain Model
Content Model
Behavioral
Use Cases
Process Model
Navigation Model
Context
User Model
Languages
UML
UWE
Model Transformation
Security
Attacks / Problems
OWASP
CVE
Countermeasures
Access Control
Communication
Networks
Protocols
IP, TCP, UDP
HTTP(S), TLS
Data Representation
HTML, CSS
XML, DOM
JSON
Server Side Components
Data Storage
Web Server
Load Balancer
Web Services
Client Side Components
Web Browser
JS
WS Clients
Persistence
Data Models
Relational
MariaDB
Graphs
Neo4J
Document Stores
CouchDB
Distributed Data
CAP Theorem

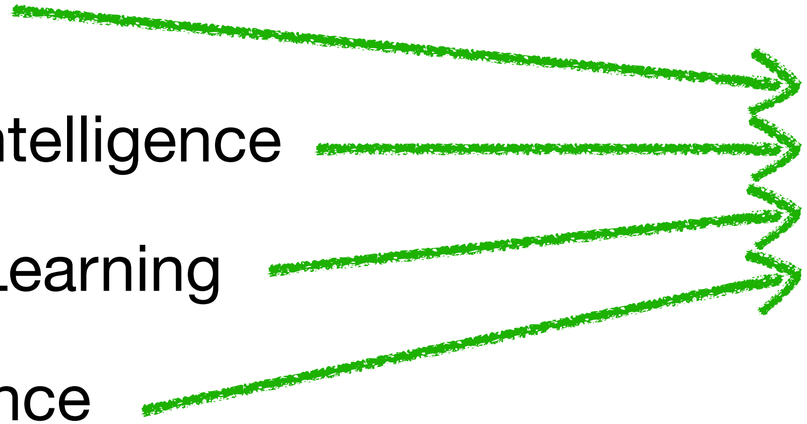
“Take home” outcomes from EWADIS

Compulsory course in Web & Data Science

- Think about Web systems from a general perspective independent from a concrete technology stack
- Learn reusable methods and patterns that survive technology hypes
- Learn principles for construction of understandable, maintainable, scalable, secure systems
- Learn variants of data storage paradigms, their properties, advantages, and drawbacks
- Use models as a central means to represent knowledge about a system
- Learn about semantics of models
- Use manual as well as (semi-)automatic model transformations to derive implementations
- Favor structured software engineering approaches in contrast to ad-hoc development

EWADIS is NOT…

- Big Data
- Artificial Intelligence
- Machine Learning
- Data Science



Please refer to special courses dedicated to those topics!

- About a specific framework
- Practical Web Development

Practical development is the main focus of my lecture in the summer term
“JavaEE Web Applications”

Learning Outcomes

- Level 0 - Know
  - specifics of web applications
  - modeling approaches
  - architectural models, styles, and patterns
- Level 1 - Understand
  - explain typical architectural decisions for web applications
  - gain insight by studying examples
  - compare differences in data storage approaches
- Level 2 - Apply
  - design models for (small) applications
  - realize and use data representations in various technologies
- Level 3 - Analyze
  - identify design flaws
  - determine performance measures
- Level 4 - Evaluate
  - compare and rate technologies
  - rate the quality of example applications
  - given requirements and possible solutions: select appropriate means to realize
- Level 5 - Create
  - (not a focus in this course)

- In summary:
  Apply Software Engineering to Web and Data-intensive Systems

Examination

- Written exam, 90 minutes
  - **Monday, March 6th, 2023 from 14:00 to 16:00**
  - in multiple rooms (will be announced timely, depends on number of participants and Corona measures)
- Registration for the examination in KLIPS is **mandatory**.
  - examination number **432012**
  - registration is open until **Monday, February 27th, 2023 (FIRM deadline!)**
  - if you change your mind, cancelling the registration is also possible until one day before the exam
- Students who are not registered will not be admitted to the exam
- Registered students not showing up will get a FAIL (5.0) mark

2nd Examination (Resit)

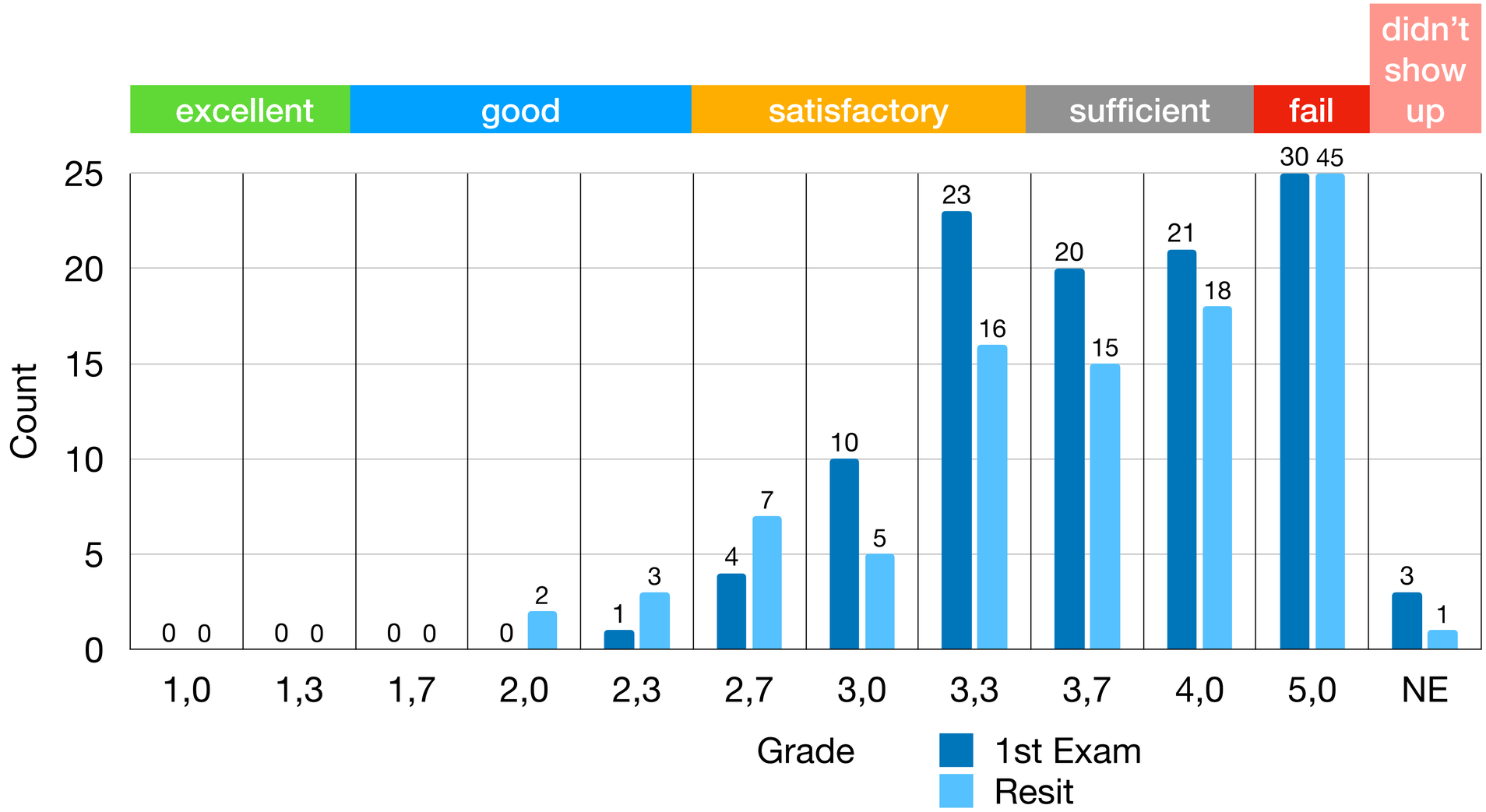
- Written exam, 90 minutes
  - takes place at begin of summer term 2023
  - roughly by end of April/early May
  - exact mode and date can only be announced later

Exam Tasks

- 40% **knowledge**
- Essay questions, e.g., on
  - Architectural patterns and decisions
  - Explain something by own examples
  - …
- 60% **modeling** and **applied knowledge**
  - Extend/build models
  - Explain semantics of a model
  - Design data schemas and queries for relational, graph, and document databases
  - Find errors
  - …

Last year’s results

Success rate: 1st exam 72% (79/109), resit 59% (66/111)



- **Don’t be shy!**
- **Don’t defer learning until a week before the exam!**
- **Don’t defer the complete exam!**

How to pass the exam (and get a good grade…)

- Review **all lectures**, participate in **all tutorial sessions** (one group per week, of course)
- Start **TODAY** to **STUDY** the presented material
- Conduct **your own research** for more, detailed, supporting information
  - if you feel something is missing
    ⇒ please let us know early
- Complete the **assignments**
- Install and **USE the recommended software**, conduct your own **experiments**

How to pass the exam (and get a good grade…)

- Ask **questions**
- Be **curious**
- **Object, disagree, and discuss!**
- You must be able to **present, explain, apply** the course content
- This means that you have to **form, and practice to express, our own opinion**

- This also means that **you can't pass the exam by (only) memorizing and reproducing lecture slides**

- In summary: **PARTICIPATE**

Required Software

- Chrome or Chromium Browser (BBB sessions)
- Astah Professional UML (and other) modeling tool
  - fresh faculty license available shortly
- MariaDB relational database alternatively SQLite online
- Neo4J graph database
- CouchDB no-sql database
- Links to the software download pages can be found in the link list in OLAT
- In case of trouble: We can assist!
- Raise problems and questions on the OLAT forum

Schedule

Date	Session #	Topic
week #44	1	Organizational Topics
week #45	2	Introduction
week #46	3	Software Architecture
week #47	4	Modeling I
week #48	5	Modeling II
week #49	6	Persistence - Distribution, Relational Databases
week #50	7	Graph Databases
week #2 2023	8	Document Databases
week #3	9	Communication - Networks, Server- and Client-Components
week #4	10	Communication - Data Representation
week #5	11	Web Services
week #6	12	Security
2023-03-06		Examination

What we have learned…

Organizational Topics

- ✓ Requirements and outcomes of this course
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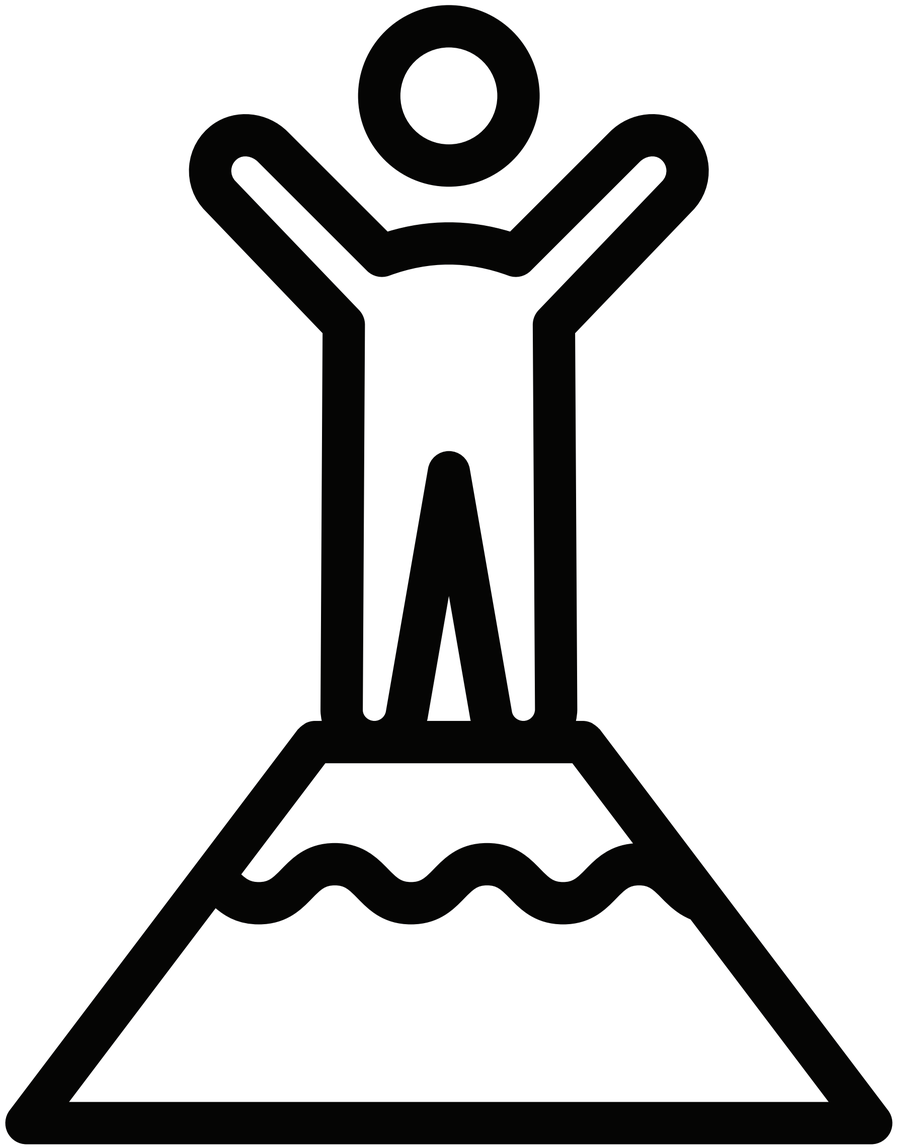

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