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Technische Universität Darmstadt

Software Engineering

Organization

TECHNISCHE UNIVERSITÄT DARMSTADT

The Lecture's Goal

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The goal is to enable you to systematically carry out small(er) commercial or open-source software projects.

Basic Goals

- To get a brief overview of “all” areas of software engineering
- To understand agile software development processes
- To get first hands-on experience and to learn to use basic software development tools
- To be able to perform object-oriented analysis and design
- To be able to read and create basic UML diagrams
- To be able to use basic design patterns
- To perform basic software quality assurance

Basic programming skills *are required*.

- Basic knowledge of object-oriented programming concepts is necessary
  I.e., you should readily understand the following terms:
  - **(inner) class, interface**
  - **object**
  - **inheritance**
  - **polymorphism**
  - **virtual method**
- Working knowledge of the Java programming language (Java 8)
- We may use further languages to discuss more advanced ideas

The Lecture's Structure

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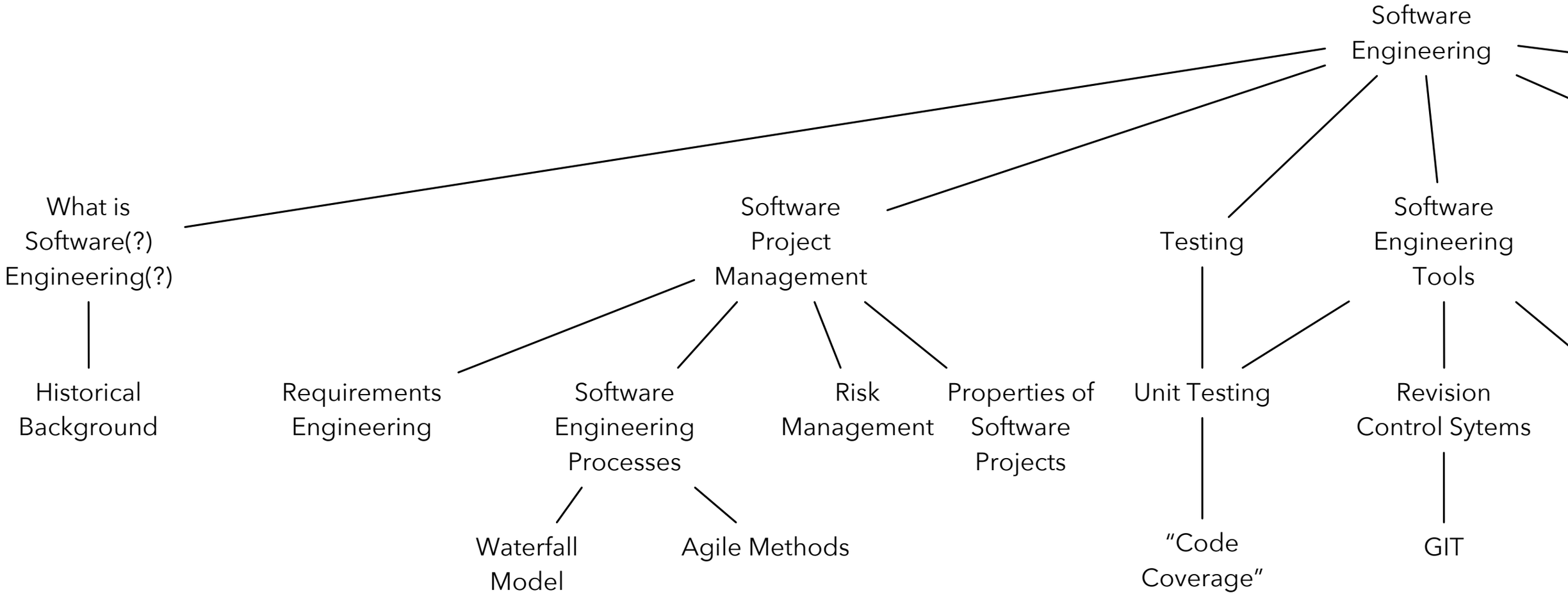
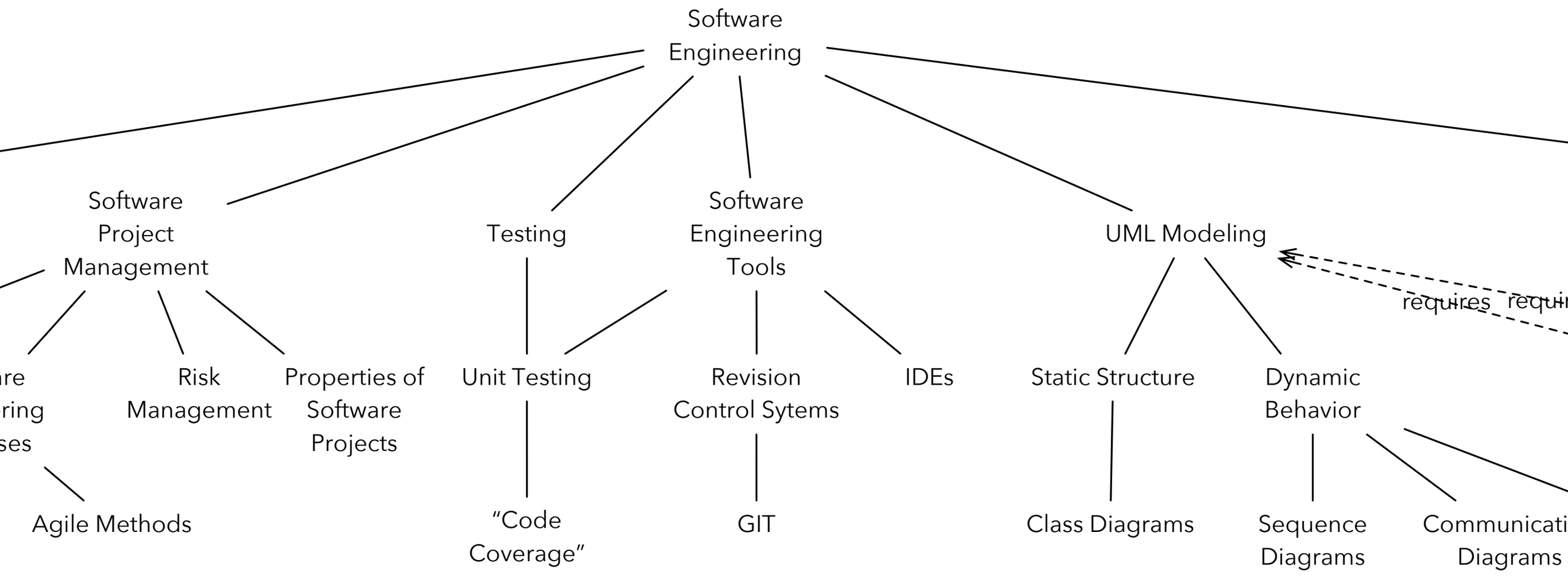

Software Engineering
What is Software(?) Engineering(?)
Historical Background
Software Project Management
Requirements Engineering
Software Engineering Processes
Waterfall Model
Agile Methods
Risk Management
Properties of Software Projects
Testing
Unit Testing
"Code Coverage"
Software Engineering Tools
Revision Control Sytems
GIT


Software Engineering
Software Project Management
Testing
Software Engineering Tools
UML Modeling
requires
requi
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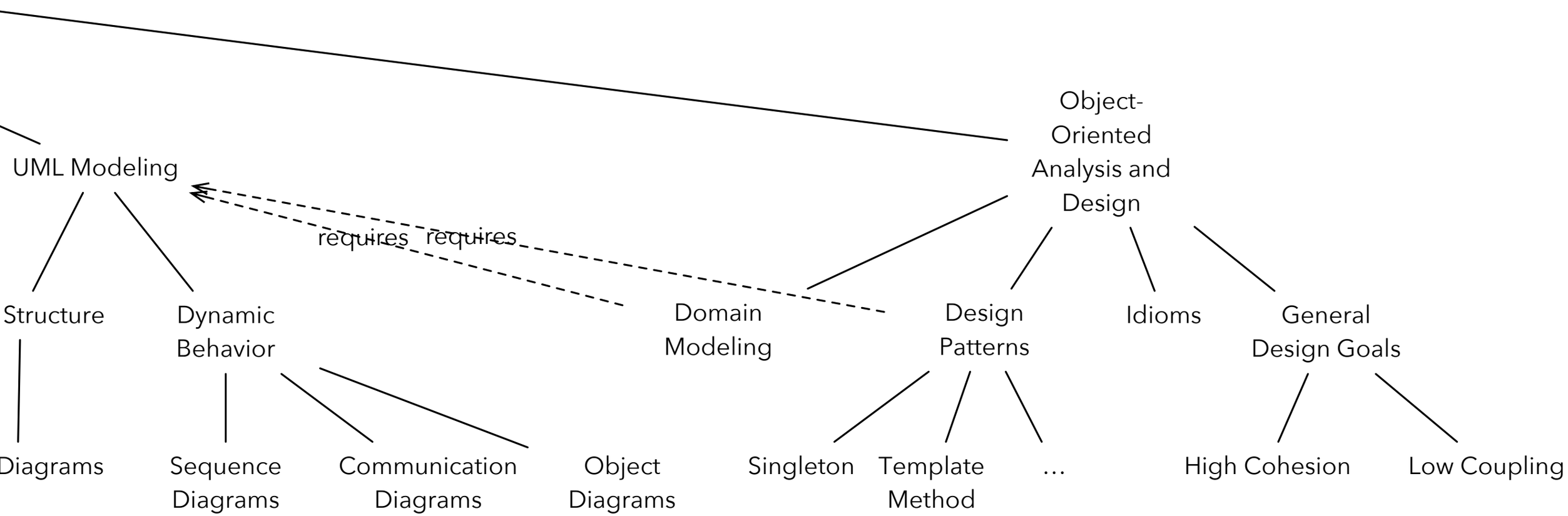
Risk Management
Properties of Software Projects
Unit Testing
Revision Control Sytems
IDEs
Static Structure
Dynamic Behavior
Agile Methods
"Code Coverage"
GIT
Class Diagrams
Sequence Diagrams
Communicati Diagrams


UML Modeling
Object-Oriented Analysis and Design
requires
requires
Structure
Dynamic Behavior
Domain Modeling
Design Patterns
Idioms
General Design Goals
Diagrams
Sequence Diagrams
Communication Diagrams
Object Diagrams
Singleton
Template Method
…
High Cohesion
Low Coupling

Organization

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The Team

Dr. Michael Eichberg

Dominik Helm

Contact

Forum (D120 - Software Engineering)

https://www.fachschaft.informatik.tu-darmstadt.de/forum/viewforum.php?f=198

Lecture

- Fridays 13:30-15:00 in S1 01 | A01 and S1 01 | A03
- The slides are in English
  (Key terms will be translated into German.)
- The slides will generally be available after the lecture
  (I will try hard to make a preliminary version available the day before the lecture.)
- The slides can be found at
  http://stg-tud.github.io/eise/

Exercises

- Fridays 15:15-16:00 in S1 01 | A01 and S1 01 | A03
- Every week, we will have an exercise, starting next week
- Exercises are expected to be solved in teams of 3 students
- The content of the exercise is relevant for the exam
- The exercises are the best way to prepare for the exam; do them on your own!
- Sign-up as a team; if you don’t have a team, we will assign you to a team

Exercises - Bonus

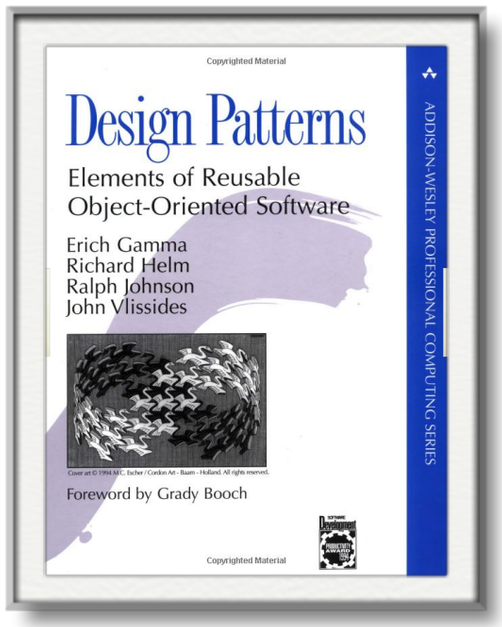
- You can get a bonus by successfully completing the exercise.
- Exercise points will be converted to exam points as follows:
  - $$r = \frac{\text{gained exercise points}}{\text{all exercise points}}$$

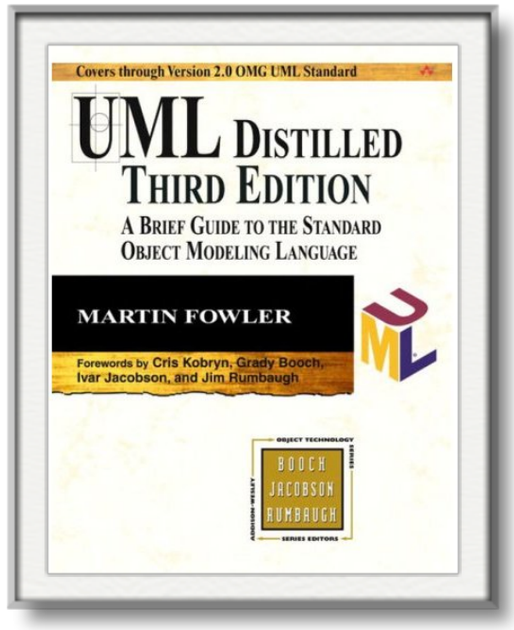
    gained exam points = $r \times$ exam points required to get a full grade better
  - I.e., the maximum bonus is equivalent to getting the exam points necessary to get a full grade better (e.g., 2,0 => 1,0).
- The bonus cannot be used to pass the exam.

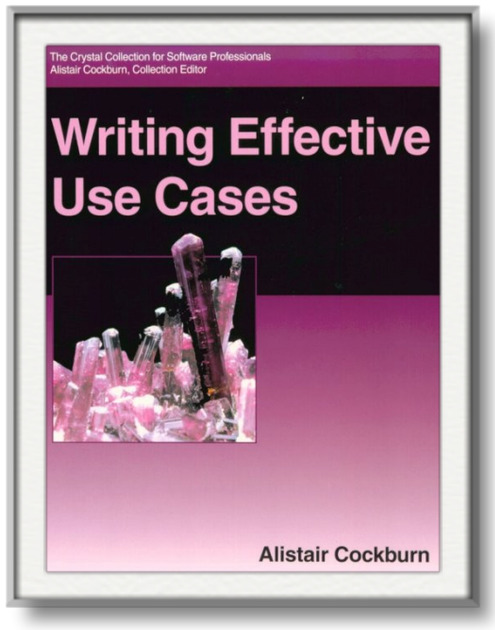
Written Exam

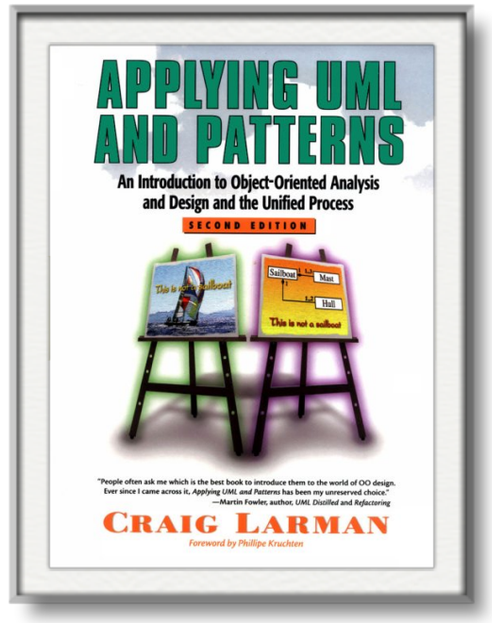
- The data of the exam will be determined in due time.
  (The rooms will be announced in the forum. The exam will take 90min.)
- You need to register for the exam in TUCaN.
  (There are no further prerequisites; “everyone” can attend the exam.)
- (Only) the very best students are expected to be able to solve the entire exam.

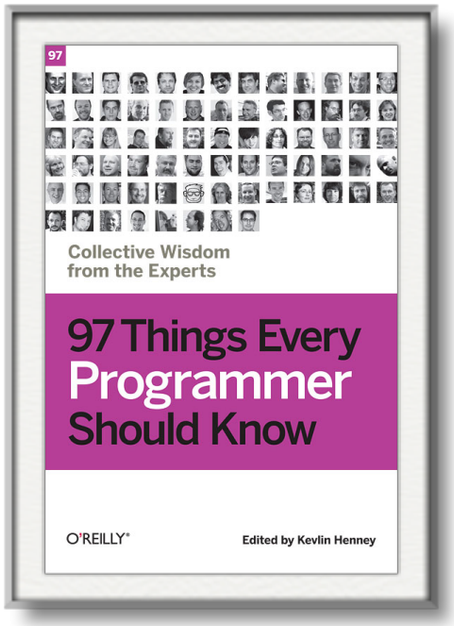
Related Bibliography

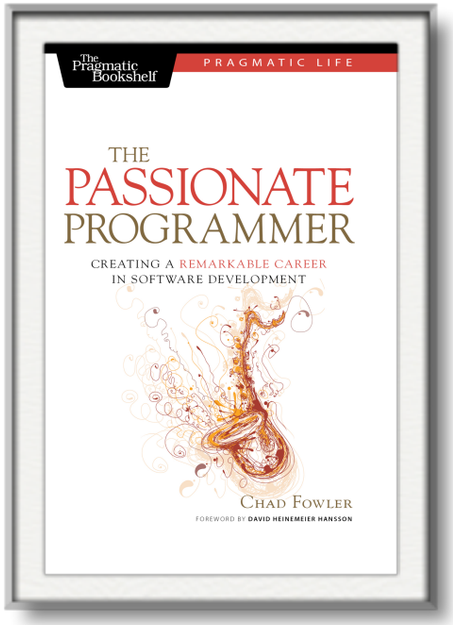








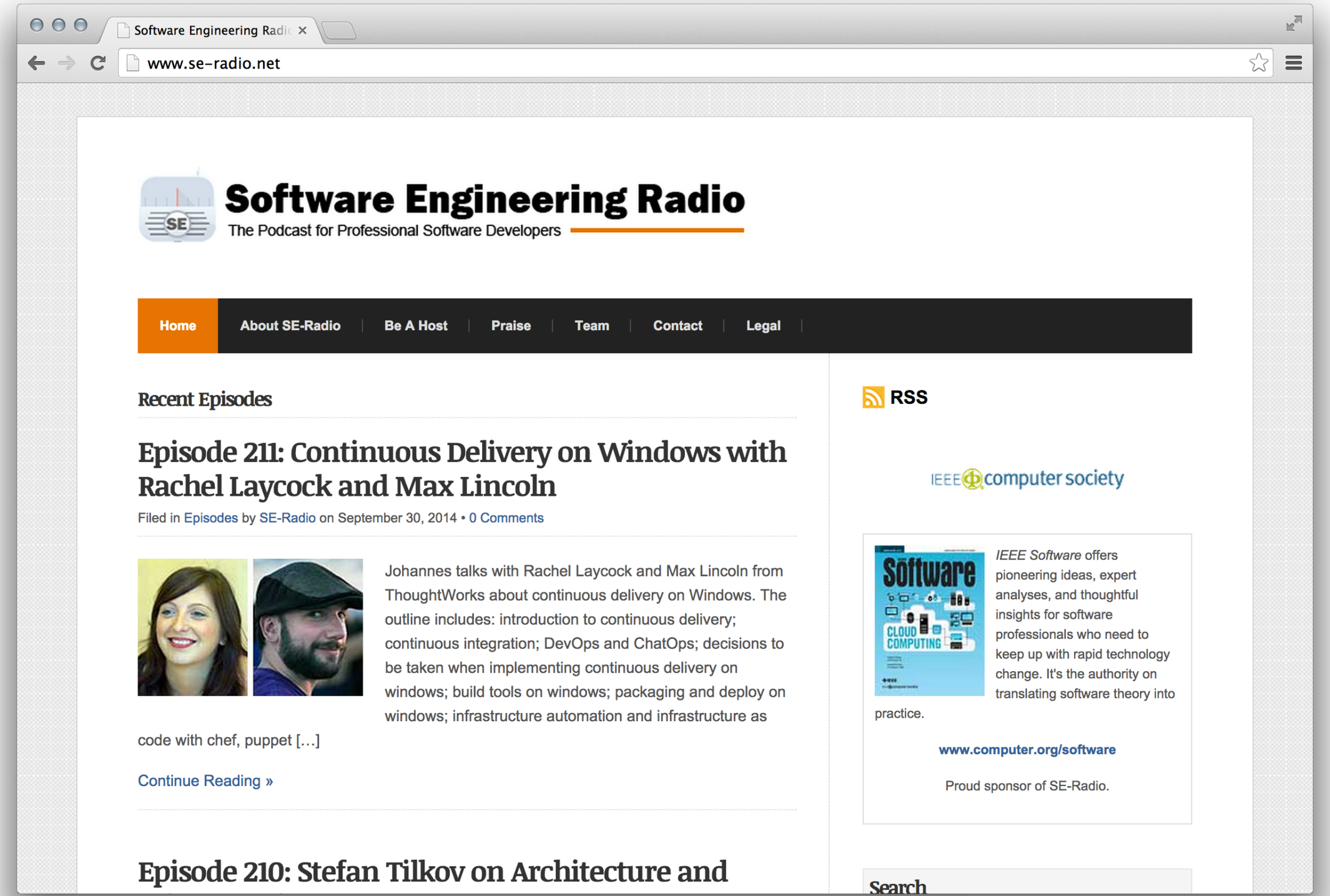


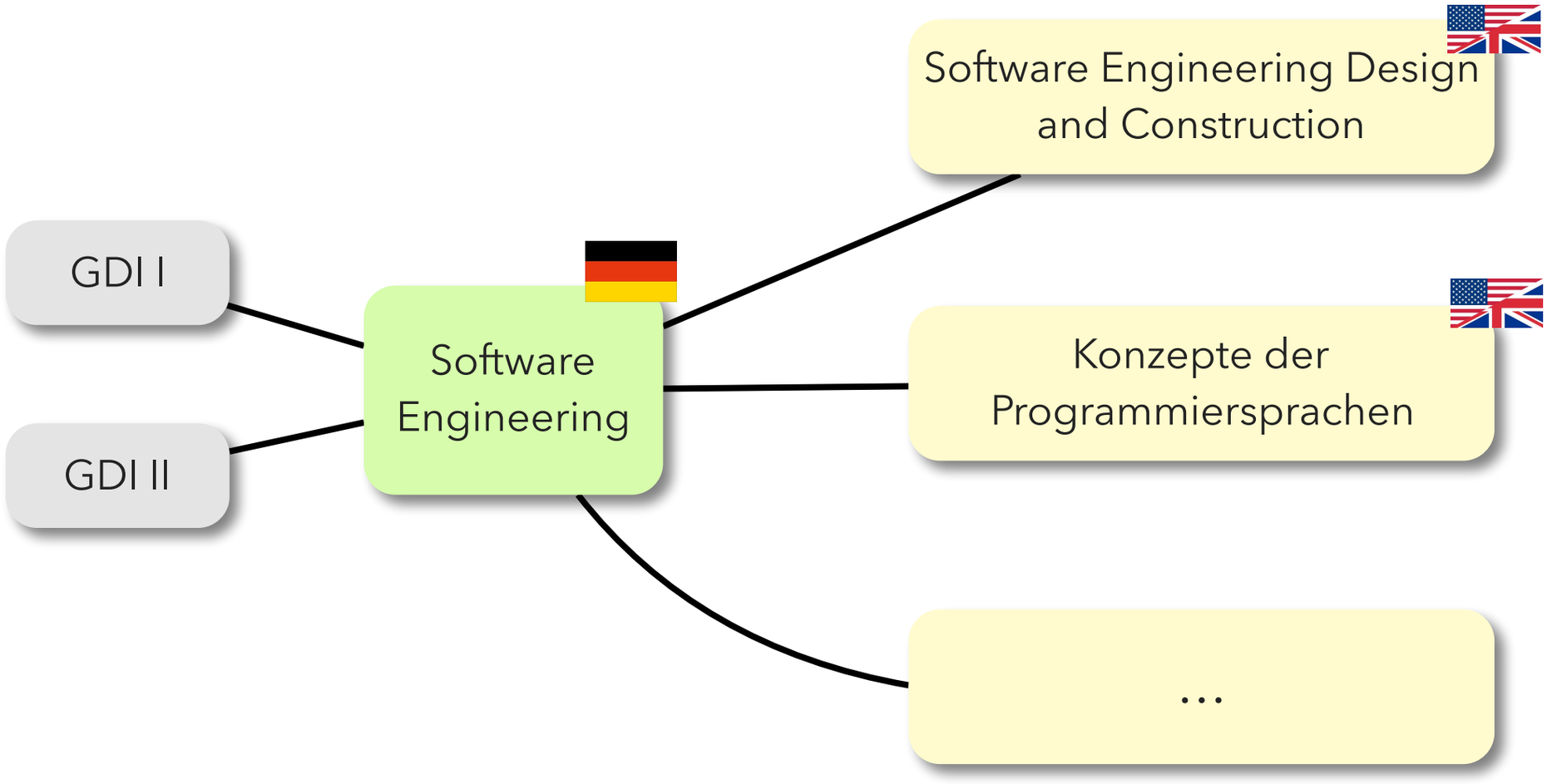


Essential Bibliography

- **Design Patterns - Elements of Reusable Object-Oriented Software**; Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides; Addison-Wesley, 1995
- **Applying UML and Patterns - An Introduction to Object-oriented Analysis and Design**; Craig Larman; Prentice Hall

A Recommended / Very Useful Podcast




Software Engineering Design and Construction
GDI I
Software Engineering
Konzepte der Programmiersprachen
GDI II
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