Software Development Management

Welcome to the Software Development Management (SDM) course. This course is mainly designed for first-semester M.Sc. information systems students interested in professional software development. Through a series of lectures and labs, you will build a strong foundation in modern software engineering practices, with emphasis on agile methods and industry-standard frameworks.

Course Overview

The course provides a brief, but all-rounding introduction to the principles and practices of modern software engineering. You will gain insights into the entire software development lifecycle, starting from initial concept and requirements gathering, through design and implementation, to testing, delivery, and ongoing maintenance. The course places special emphasis on agile methodologies, particularly Scrum, which has become a standard in the industry.

Throughout the semester, you will explore various aspects of software project management, including user story creation, product backlog management, sprint planning, and team dynamics. You will also learn about scaling agile practices for larger organizations through an introduction to the Scaled Agile Framework (SAFe). This course bridges theoretical knowledge with practical application, preparing you for the realities of professional software development.

Course Objectives

The primary objective of this course is to equip you with the knowledge and skills necessary to participate in and eventually lead software development projects. By the end of the course, you should be able to:

- Understand and apply key software engineering concepts
- Use agile methodologies to manage projects
- Make informed decisions about software development processes
- Develop critical thinking skills to analyze software development challenges and propose solutions
- Foster teamwork and communication skills essential in the software industry

Additionally, the course aims to prepare you for future roles in software development teams and for industry certifications such as the Professional Scrum Master™ I and Professional Scrum Product Owner™ I.

Course Structure

This course is structured to provide both theoretical knowledge and practical experience. It consists of:

- 14 lectures, one per week
- 7 labs, held every two weeks

The lectures cover the following topics:

1. Software Engineering and Software Processes I
2. Software Engineering and Software Processes II
3. Agile Software Development and Intro to Scrum
4. Requirements and User Stories
5. Product Backlog
6. Estimation and Velocity
7. Product Owner & Scrum Master
8. Development Team & Scrum Team Structures
9. Multilevel Planning I
10. Multilevel Planning II
11. Sprint Planning and Execution
12. Sprint Review and Retrospective
13. SAFe I
14. SAFe II

The labs are designed to reinforce the concepts learned in lectures through hands-on exercises and practical applications. They provide an opportunity to apply theoretical knowledge to real-world scenarios and develop practical skills essential for software development management.

Learning Outcomes

After completing this course, you will:

- Understand professional software development principles
- Know various software processes and their applications
- Have a solid understanding of agile methodologies, especially Scrum
- Be able to create and manage user stories and product backlogs
- Understand the responsibilities within agile teams
- Know how to plan and execute sprints effectively
- Understand how to apply agile practices in larger organizations

Furthermore, we expect students to gain the knowledge and skills necessary to pass the Professional Scrum Master™ I Certification and the Professional Scrum Product Owner™ I Certification. These industry-recognized certifications will further validate your expertise in Scrum methodologies and enhance your professional credentials in the field of software development management.

Prerequisites

The course content is structured to introduce all necessary concepts from the ground up, making it suitable for students with diverse backgrounds. There are no specific prerequisites for enrolling in this course. In particular:

- No programming experience is required.
- Basic computer literacy and familiarity with general technology concepts are sufficient.
- No particular knowledge of software development methodologies is assumed.

No prior software development experience is needed, but an interest in technology and willingness to learn are important.

Course Materials

The course is 100% self-contained. Attending lectures and labs and studying from the slides (and notes) covers all that is needed. Slides contain references where needed.

While no textbook purchase is required, the major sources for the course content are:

- Rubin, K. S. (2012). Essential Scrum: A practical guide to the most popular Agile process. Addison-Wesley.
- Sommerville, I. (2016). Software Engineering (10th Edition). Pearson Education Limited.
- Knaster, R., & Leffingwell, D. (2020). SAFe 5.0 distilled: achieving business agility with the scaled agile framework. Addison-Wesley Professional.

The slides contain references to further sources where needed.

Who Should Take This Course

This course is suitable for first-semester information systems students who:

- Want to work in software development or IT project management
- Are interested in how modern software teams operate
- Want to learn industry-standard practices and frameworks
- Aim to develop skills valued in the tech industry
- Want to teach these concepts to others, or train them

Course Evaluation

The evaluation for this course is based on a final written exam.

Contact Information

The course is held by:

- Prof. Dr. Daniel Graziotin, graziotin |AT| uni-hohenheim |DOT| de, lecturer, examiner, and responsible for the module
- M.Sc. Verena Ebert, verena |DOT| ebert |AT| uni-hohenheim.de, lab lecturer

We look forward to exploring Software Development Management with you!