Technology
Arts Sciences
TH Köln

Course Manual SM

Software Management

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— General information

Long name	Software Management
Approving CModule	SM_BaTIN
Responsible	Prof. Dr. René Wörzberger Professor Fakultät IME
Valid from	winter semester 2022/23
Organisation and materials	Ilu course
Level	Bachelor
Semester in the year	winter semester
Duration	Semester
Hours in self-study	78
ECTS	5
Professors	Prof. Dr. René Wörzberger Professor Fakultät IME
Requirements	(1) advanced programming skills in Java (2) experiences with development projects in teams (3) basic knowledge in software engineering
Language	German, English if necessary

Literature

wird in Vorlesung bekannt gegeben

Final exam

Details	The final exam is either written or oral. Guided by stepwise assignments, students have to demonstrate how they develop a system in a team, automate build steps, implement automated tests and how to build a system cluster in the cloud.
Minimum standard	Some basic knowledge in the aforementioned topics must be demonstrated. Usually, in written exams 50% of all exam points suffice.
Exam Type	EN Klausur

| **Separate final exam** | Yes |

− Lecture / Exercises

Learning goals

Goal type	Description
Knowledge	inner workings of the source code management systems Git
Knowledge	organizing teams with GitLab functions
Knowledge	automate builds with Apache Maven
Knowledge	continuous integration and delivery (CICD) with GitLab Runner
Knowledge	test automation with JUnit
Knowledge	developing mocks with Mockito
Knowledge	automating web ui tests with Selenium
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Knowledge	measuring code quality with Sonarqube
Knowledge	on-prem and cloud infrastructures
Skills	creating a system cluster in the Google Cloud
Knowledge	container virtualization with Docker
Knowledge	container orchestration with Kubernetes

Special requirements

Accompanying material	(1) lecture slides (2) lecture notes (tbd) (3) assignment sheets
Separate exam	No

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	2
Exercises (whole course)	1
Exercises (shared course)	0
Tutorial (voluntary)	0

− Practical training

Learning goals

Goal type	Description
Skills	how to develop in teams with GitLab
Skills	adding and developing a code base with Git
Skills	creating build scripts with Maven
Skills	Implementation of tests with JUnit, Mockito, Selenium, and JMeter
Skills	containerization and deployment with Docker and Kubernetes
Skills	set-up of a system cluster in the Google Cloud including (continuous) deployment of releases

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	1
Tutorial (voluntary)	0

Special requirements

Accompanying material	assignment sheets for the prepared part (home work) of the lab course, assignment sheets for the on-site part of the lab course
Separate exam	Yes

Separate exam

Exam Type	EN Projektaufgabe im Team bearbeiten (z.B. im Praktikum)
Details	Solutions of the home work and on-site part of the lab course have to be demonstrated by the student teams and to be discussed with supervisors. In case of sufficient solution quality members of the respective team get a pass for the lab course part. There are about 3 to 4 lab course parts in each term.
Minimum standard	Solutions must work in the sense of the assignment.