Course Description   Software Architecture

Keywords: architectures, object-oriented modelling

Target Group:	**4th Semester SWB**	**Module Number:**	**SWB 436**

Workload:	**5 ECTS**	**150 h**
Divided into:	**Contact time**	**75 h**
	Self-study	**50 h**
	Exam preparations	**25 h**
Course language:	**German and English**	
Module director:	**Prof. PhD Hans-Gerhard Groß**	

Valid from: 01.03.2014

Requirements:

- Recording requirements and recognising constraints (Software Engineering)
- Efficient application of software building and management tools (Software Engineering)
- Object-oriented programming in Java (Object Oriented Systems 1-2)
- Knowledge of UML 2 (Software Engineering)

Overall Aims of the Module:

Students will acquire a thorough background in computer science and in programming.

The following courses contribute to the overall aims of this module:
- Programming 1-2
- Object Oriented Systems 1-2
- Software Engineering
- Software Architecture
- Algorithms and Data Structures
- Computer Architecture

Aim of this course:
Students will be able to implement the requirements of complex software architecture. They will be capable of applying design and architecture pattern, frameworks, and libraries when needed. Students will gain understanding of engineering approaches to problem-solving, including assessment/evaluation and technology selection.

Contents:

- Architecture and architects
- Approaches to architecture development
- Architecture views, UML 2 for architects
- Object-oriented design principles
- Architecture and design patterns
- Technical aspects, considering requirements and constraints
- Middleware, frameworks, reference architectures, model driven architecture
- Components, component technology, interfaces (API)
  Evaluating architectures
- Re-factoring, reverse engineering

Literature:

J. Goll: Methoden der Softwaretechnik, Vieweg-Teubner, 2012.
J. Goll, M. Dausmann: Architektur- und Entwurfsmuster, Vieweg-Teubner, tbp 2013.
G. Starke: Effektive Softwarearchitekturen, Hanser, 2011.

Offered:

Every semester

Submodules and Assessment:

Type of instruction/learning:	Lecture with homework/self-study
Type of assessment:	Written exam (90 minutes)
Hours per week:	4 SWS
Estimated student workload:	120 hours

Learning outcomes:

Students will be able to implement external requirements in complex software Architectures. With this, they will be able to apply design and architecture patterns, including frameworks and libraries. Students will gain understanding of engineering approaches to problem-solving, such as assessment and technology selection.

Type of instruction/learning:	Laboratory exercises
Type of assessment:	Attendance certificate
Hours per week:	1 SWS
Estimated student workload:	30 hours

Learning outcomes:

Students will be able to apply design and architecture patterns. They will also be able to program and use components (EJB) and web services (SOA).

Overall Assessment:

Written exam, non-graded attendance certificate