

Department	VI – Informatics and Media / <i>Informatik und Medien</i>
Degree level	Master's
Degree program	Data Science / <i>Data Science</i>
Type of instruction	Seminar plus computer exercises
Credits	5
Availability	Winter semester
Hours/week	4

Module Number	M02
English/German Title	Advanced Software Engineering / Fortgeschrittene Softwaretechnik
Credit Points	5 credits
Workload	150 hours: <ul style="list-style-type: none"> • Class attendance 3 h/w during the semester lecture period: 51 hours • Independent study: 99 hours
Subject Coverage	Subject-specific specialization
Learning Objectives / Outcomes	The students understand the fundamentals of software technology in order to design, implement and put large Big Data systems into production. They will become familiar with all relevant release-management tools. The application of frameworks and server technologies for major machine-learning applications is prepared and practiced on the basis of concrete examples.
Prerequisites	Recommendation: Basic computer science knowledge, initial experience in software development
Level	1st semester
Type of Module	Seminar plus computer exercises
Status	Required module
Semester when Offered	Winter semester
Method of Assessment / Type(s) of Examination	The method of assessment / type(s) of examination must be defined by the lecturer within the deadline determined in §19 (2) RSPO. Should the deadline pass without determination of the form of assessment in the module, the following method of assessment / type of examination applies: Examination 70%, exercises 30%.
Determination of the Grade	See study and examination regulations
Equivalent Modules	Modules of comparable contents
Contents	<ul style="list-style-type: none"> • fundamentals of programming in a major programming language, including IDE and Sequence Chain • Clean Code Development (CCD) • advanced build management • modern distributed version control • Continuous Delivery / -Integration (CI/CD) • concurrency • functional programming / reactive programming • software architectures (e. g. microservices) • cloud management • software engineering for data science
Reading List	<ul style="list-style-type: none"> • Robert C Martin, Clean Code: A Handbook of Agile Software Craftsmanship, Prentice Hall • Andrew Hunt und David Thomas, The Pragmatic Programmer.

	<p>From Journeyman to Master, Addison Wesley</p> <ul style="list-style-type: none">• Jez Humble und David Farley, Continuous Delivery: Reliable Software Releases Through Build, Test, and Deployment Automation, Addison Wesley• Paul Butcher, Seven Concurrency Models in Seven Weeks: When Threads Unravel, The Pragmatic Programmers• Neal Ford, Functional Thinking: Paradigm Over Syntax, O'Reilly
Further Information	This module is offered in English.