Module Name	
Empirical Software Engineering	

Type of Module	Module Code
Advanced Module	AM-ESE

Identification Number	Workload	Credit Points	Term	Offered Every	Start	Duration
MSc-I-ESE	180 Hours	6 CP	1. – 3. Semester	WiSe	Winter term only	1 Semester

1	Course Types	Contact Time	Private Study	Planned Group Size
	a) Lecture	20 h	50 h	20 students
	b) Project	10 h	100 h	

2	Module Objectives and Skills to be Acquired
	The students...
	... have an awareness of the importance of scientific approaches to practical issues in software engineering.
	... know quantitative and qualitative empirical methods and their possible applications in software engineering.
	... are able to design, conduct, and evaluate empirical studies in application areas of software engineering.
	... have specific knowledge regarding quantitative research methods (especially controlled experiments)

3	Module Content
	The main focus of the course is on the use of empirical methods to answer questions in software engineering. Typical questions are e.g. "How do I find errors in program code?", "How can I develop software faster?", "How can I write down requirements better?" or "How can I use the resources for testing optimally?".
	The course introduces both qualitative (interviews, field studies, ...) and quantitative (controlled experiments, surveys, ...) empirical methods. It will be shown how these types of studies are designed, conducted and evaluated. Techniques from descriptive as well as from inferential statistics are used (e.g. hypothesis testing).
	The contents of the lecture include:
	• Theories in Software Engineering: How is knowledge actually created?
	• Research strategies and measurements
	• Descriptive statistics
	• Controlled experiments and hypothesis testing
	In addition to the lecture, students conduct their own empirical study on a self-selected software engineering question in a guided project.

4	Teaching Methods
	Lecture, Project

5	Prerequisites (for the Module)
	Formally: None
	Recommended: Basic module in computer science (programming course), advanced module in computer science II (software engineering), focus module in programming

6	**Type of Examination** Presentation and final report
7	**Credits Awarded** Passing the exam (70% final report, 30% presentation).
8	**Compatibility with other Curricula** Master of Science Informatik
9	**Proportion of Final Grade** 6/114
10	**Module Coordinator** Prof. Dr. Andreas Vogelsang
11	**Further Information**