Level: bachelor

Course title: Formal methods engineering (I171)

Status: elective

ECTS: 7,5

Requirements: None

Learning objectives

The course will enable the students to understand and evaluate the formal methods and to give fundamental details of certain techniques based on automata theory and software tools based on industry-strength tools like “Statemate”.

Learning outcomes

Minimal: Students will be able to evaluate the need to establish reliability in large-scale computer systems and to appreciate fundamentals of formal methods. Students should accept the basic conclusions on using the formal techniques in a lifetime cycle of the system, especially in requirements and architecture design phases.

Desirable: Students should be able to show capability to evaluate different kinds of large-scale systems and different kinds (transforming to hybrid) of systems. In addition, they will appreciate the role of tools and methods for the formal engineering methods.

Syllabus

Theoretical instruction

Theoretical foundations of large-scale systems, classification of formal methods, transforming, reactive and hybrid systems, automata theory, state-oriented development methods, state diagrams, activity diagrams, real-time aspects.

Practical instruction

Introduction to semantics and the “*Statemate”* tool. Development of real-time system. Analysis and development of several case studies.

Weekly teaching load				Other: -
Lectures: 2	Exercises: 3	Other forms of teaching: -	Student research: -	