

Tárgyleírás angol nyelvű képzés tárgya esetén

Tárgy neve: Design of Distributed Systems L. and Pr.

Tárgyfelelős neve: Dr. Horváth Zoltán

Tárgyfelelős tudományos fokozata: PhD, egyetemi tanár

Tárgyfelelős MAB szerinti akkreditációs státusza: AT

Az oktatás célja angolul / Aim of the subject:

Knowledge

Students have comprehensive and up-to-date knowledge of general mathematical and computing principles, rules and relationships, particularly in formal models and tools in computing science. They have comprehensive and up-to-date knowledge of the principles, methods, and procedures for designing IT processes, in the areas of program design methods; design, construction and management of complex software systems. They have comprehensive and up-to-date knowledge of distributed and parallel systems. They have a high level of fluency in the language of IT – including its professional vocabulary and its characteristic features of expression and composition – both in their mother tongue and in English, at least.

Abilities:

- They are able to formalize complex IT tasks, to identify and study their theoretical and practical background and then to solve them.
- They are able to perform design tasks when operating complex software systems.
- They are able to analyse and apply new problem-solving methods and procedures.

Attitude:

- They follow professional and technological developments in their IT field.
- They are committed to having quality requirements met and to analysing them with IT tools.

Autonomy, responsibility:

- They take responsibility for their professional decisions made in their IT-related activities.
- They bear responsibility for their own work as well as for the work of their colleagues they work together with in a project.
- Regarding mission critical IT systems, they can be entrusted with developing and operational responsibilities that are in accordance with their professional competencies.

Az oktatás tartalma angolul / Major topics:

Students will be able to express and verify the properties of the distributed programs using formal methods, apply different ways to create advanced compositions of simple programs, and solutions for interesting and difficult problems in a distributed way.

- Dining/drinking philosophers,
- formal specification of distributed problems,
- properties of distributed systems, safety and progress properties of distributed programs,
- verification of safety critical properties,
- program compositions from components with proven properties,
- message channels,
- pipelined networks.
- Programming exercises where the students apply the learned methods in the practice.

A számonkérés és értékelés rendszere angolul / Requirements and evaluation:

Colloquium and practice mark. Students have to submit programming assignments and solve problems to get the practice mark.

Irodalom / Literature:

- Misra, J.: A discipline of multiprogramming: programming theory for distributed applications (Springer, 2001)
- K. Mani Chandy and Jayadev Misra: Parallel Program Design: A Foundation (Addison-Wesley, Reading, MA, Reading, Mass., 1988)
- Lamport, L.: Specifying Systems: The TLA+ Language and Tools for Hardware and Software Engineers (Addison-Wesley 2002)
- Schmidt, D., C. et al.: Pattern-Oriented Software Architecture: Patterns for Concurrent and Networked Objects (Wiley & Sons, 2000)