

Name of the course: Distributed Systems	Total credits: 2+2+1=5
IPM-AUTEDSEG	
Type: Optional	
Total hours of per semester: lecture: 26 practice: 26 consultation: 13 Other: project	
Type of testing: exam Other: project, tests	
Semester: 1, 2, 3, 4th	
Description	
Architectures for distributed systems. Synchronous and asynchronous systems. Communication and coordination. Time. Distributed algorithms. Service-oriented architecture. Middleware. Multi-tier applications. Cloud computing. Formal description and modeling of distributed systems. Safety and liveness properties. Fault tolerance.	
Literature	
Compulsory <ul style="list-style-type: none"> Andrew S. Tanenbaum, Maarten van Steen: Distributed Systems: Principles and Paradigms. Prentice Hall, 2nd Edition, 2007. ISBN: 0-13-239227-5 Kai Hwang, Jack Dongarra, Geoffrey C. Fox: Distributed and Cloud Computing. From Parallel Processing to the Internet of Things. Morgan Kaufmann, 2011. ISBN-13: 978-0123858801 	
Recommended <ul style="list-style-type: none"> Fred Hebert: Learn You Some Erlang for Great Good! No Starch Press, 2013. ISBN-13: 978-1-59327-435-1 Jadaye Misra: A discipline of multiprogramming: programming theory for distributed applications. Springer, 2001. ISBN: 978-1-4612-6427-9 	
Competencies	
Knowledge <ul style="list-style-type: none"> Possession of complex and up-to-date knowledge in software technology, regarding the design, implementation, operation and maintenance of software, in the following areas: software architectures and design patterns; model-driven software development; UML and its application in object-oriented and component based design; embedded and real-time systems; reliability and validation of software; testing techniques. Knowledge of the principles of business and enterprise processes, information, data, software and technology architectures, and knowledge on the methods of architecture description and design. Detailed and expert-level knowledge of the technical terms and expressions of computer science in English. 	

Competencies

- Expertise in the application of the concepts and methods of software technology in modeling of complex software and architecture design. Ability to develop applications with real-time requirements.
- Ability to formalize complex technical problems, to analyze theoretical and practical background, and to provide adequate solutions.
- Expertise in design, development, operation and management tasks in the domain of complex software systems and database management systems.
- Skills for cooperation and team work, and ability to take leading role.
- Ability for written and oral communication in English, using the technical terms and expressions of computer science. Ability to argue, to prepare reports, to read, understand and exploit scientific and technical material (e.g. books and papers).
- Expertise in utilizing sources of technical information, their critical interpretation and evaluation, and the extraction of information relevant to the solution of a specific problem.
- Ability to perform supervised scientific research, and skills required for post-graduate studies.

Attitude

- Attends professional, technological development related to their qualification.
- Commitment to critical feedback and self-assessment.
- Commitment to lifelong learning and receptivity to new IT competencies.
- Adopts and coordinates the ethical principles of work, organizational culture and research.
- Shares professional knowledge, mediates professional results.
- Mediates and implements eco-conscious behavior and social responsibility, helping them with IT tools.
- Commitment to quality standards and its IT tools.
- Open to initiate collaboration with IT and other specialists.

Autonomy and responsibility

- a) Takes responsibility for his professional decisions taken during his professional activities.
- b) Takes responsibility for observing and enforcing deadlines.
- c) Takes responsibility for own and fellow workers' work.
- d) In the case of operational critical IT systems, he/she can be assigned responsibility for development and operation, according to his/her professional competencies.