

Name of the course: Cognitive Robotic Systems	Total credits: 2+2+1=5
IPM-AUTECRSEG	
Type: Optional	
Total hours per semester: lecture: 26 practice: 26 consultation: 13 Other: project	
Type of testing: exam Other: project	
Semester: 1, 2, 3, 4th	
subject requirement: AI in Processes and Automation IPM-18AUTAIPAEG, Numerical Methods for Optimization IPM-18AUTNMEG Data Mining in Smart Systems IPM-18AUTDMSSEG	
Description	
After this course, students will be able to connect everyday cognitive principles to the mathematical models. They can design cognitive robotic systems from high level descriptions using simple sensors or deep networks. They can formulate the corresponding risks and cost, understand the need for workflow management under time constraints. They will be able to connect cognitive systems to data collection for developing Big Data and recommendations based on the collected data.	
Literature	
Compulsory Sebastian Thrun Artificial Intelligence for Robotics https://www.udacity.com/course/artificial-intelligence-for-robotics--cs373	
Recommended - John E. Laird, Christian Lebiere, Paul S. Rosenbloom, A Standard Model of the Mind. AI Magazin (in press, 2017): http://goo.gl/KF1VPc (pptx file) 1st Summer School on Cognitive Robotics Materials can be found here: http://cognitive-robotics17.csail.mit.edu/ - IEEE Technical Committee on Cognitive Robotics http://www.ieee-coro.org/ - EUCognition - European Society for Cognitive Systems http://www.eucognition.org/	
Competencies	
Knowledge - Possession of complex and up-to-date knowledge in AI, cognition, top-down design of cognitive robotic systems using bottom-up sensors, including deep learning tools. - Knowledge of the underlying mathematical and philosophical principles including design problems, pitfalls related to combinatorial explosion, knowledge on self-correcting cognitive architectures, methods of architecture description and design. - Detailed and expert-level knowledge of the technical terms and expressions of process automation and control in English.	
Competencies	

- Expertise and understanding of the concepts and methods of cognitive robotics in different application areas. Ability to take part in the development of applications with real-time requirements.
- Ability to formalize complex technical problems, to analyze theoretical and practical background, and to provide adequate solutions.
- 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.
- Open to initiate collaboration with IT and other specialists.

Autonomy and responsibility

- Takes responsibility for his professional decisions taken during his professional activities.
- Takes responsibility for observing and enforcing deadlines.
- Takes responsibility for own and fellow workers' work.