

Name: Service Robots. Medical Robotics		NEPTUN-code: NBXCIISMNE	Number of periods/week: full-time: 2 lec + 0 sem + 0 lab
Credit: 3 Requirement: exam	Prerequisite: NBXIK1SMNE Kinematics and Dynamics of Industrial Robots		
Responsible: Tamás HAIDEGGER, Ph.D.	Position: associate professor	Faculty and Institute name: John von Neumann Faculty of Informatics Institute of Biomatics	
Way of assessment: – mid-term exam – written and oral exam			
Competences			
Course description:			
<p>Robotics, and service robotics within are the most rapidly developing technological areas, and according to the predictions, there will be a service robot in every household by 2020. Moreover, most of the Y generation will have a robotic surgery during their lifetime. The structure, kinematics, control methods and application challenges of service robots are completely different that of the industrial ones, therefore special attention should be paid to these.</p> <p>Topics of the course: Human-centered robotics: introduction to service applications. Special application requirements, control theory and safety issues. Standardization of medical robots, their use in hospital and home care. Automating the basic tasks around a human patient. Design and implementation of safe medical robots. The patient as operator, human-machine interfaces. Safe manipulation techniques in the close proximity of the human, the role of navigation. Employment of accurate patient data, medical images and diagnostics for medical robots. Safety-driven design and validation of systems.</p>			
Literature			
<p>T. Haidegger: "The conquest of robot-assisted surgery - successes, failures, challenges ", Orvosi Hetilap, vol. 151, no. 41, pp. 1690–1696, 2010 (in Hungarian)</p> <p>Assorted chapters of: Handbook of Robotics (Editors: Siciliano, Bruno, Khatib, Oussama) Springer, 2016</p> <p>Assorted chapters of: Handbook of Robotics (Editors: Siciliano, Bruno, Khatib, Oussama) Springer, 2016</p>			