Tárgyleírás angol nyelvű képzés tárgya esetén

Tárgy neve: System and control theory

Tárgyfelelős neve: Weisz Ferenc

Tárgyfelelős tudományos fokozata: DSc

Tárgyfelelős MAB szerinti akkreditációs státusza: AT

Az oktatás célja angolul / Aim of the subject:

Knowledge

- Possession of complex and up-to-date knowledge in the following areas of system and control theory: state-space models, properties of state-space models, design and control of systems.
- Practice in Matlab based numerical solution of problems.
- Detailed and expert-level knowledge of the technical terms and expressions of computer science in English.

Abilities:

- Ability of identification, investigation and construction of systems for various problems.
- Expertise in designing the method of solutions.
- Expertise in design, development, operation and management tasks in the domain of system and control theory.
- 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

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, 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.
- In the case of operational critical IT systems, he/she can be assigned responsibility for development and operation, according to his/her professional competencies.

Az oktatás tartalma angolul / Major topics:

Dynamic system models, linearity, time-invariance. State-space models. Continuous- and discrete-time models. SISO/MIMO systems. Stability, observability, controllability of LTI systems, canonical forms. Transfer function, poles and zeros of SISO/MIMO systems. Minimal and balanced state-space realization. System norms. Interconnected systems and feedback: stability, and performance. Stabilization: state feedback, optimal LQ control. Observers, model-based controllers. Robustness, robust performance and structured singular value function. H^2 and H^∞ control.

A számonkérés és értékelés rendszere angolul / Requirements and evaluation: E+P

Irodalom / Literature:

- J. Doyle, B. Francis, A. Tannembaum, Feedback Control Theory, Macmillan Publishing Co., 1992 (original), Dover Publications, 2013 (reprint), ISBN-13: 978-0486469331, ISBN-10: 0486469336
- K.J. Aström, R.M. Murray, Feedback Systems – An Introduction for Scientists and Engineers, New Princeton University Press, 2010. ISBN: 1400828732, 9781400828739