

Code: IVB197AN

Location: Lecture: Wednesday 13:15-14:45; A306
Seminar: Wednesday 15:00-16:30; A306

Title of the course: Control Engineering 1	ECTS Credit: 4
Allotment of hours per week: lecture / seminar / laboratory practice: 2/2/0	
Requirement (exam / term mark / etc): exam	
Semester: 3	
Prerequisite Courses (if any): Digital Logic Design 1	
Course description: course aims, program and learning outcomes (short and informative format)	
<i>Course aims:</i> The aim of this course is to provide insight into open loop control, formalism, representation, structure, operation and design principles of relevant devices: relays, semiconductor gates, latches and flip-flops. Methods of logical circuit and control design are presented and illustrated at seminars.	
<i>Course program:</i> Types of control: open-loop, closed-loop. Perturbation compensation. Combinational and sequential logic design. Control task description methods: textual, ladder diagram, timing diagram, function chart, state graph. Electromechanical relays, relay logic. Structure and operation of semiconductor logic TTL, MOSFET technology. Building blocks of logic circuits: gates, flip-flops, counters, signal generators, signal conditioning. Programmable Logic Controllers: hardware structure, cyclic operation mode. Configuration of PLC systems. PLC programming: ladder diagram, instruction list, function chart, structured language, step sequence.	
Required and recommended literature (3-5) with bibliographic data (author, title, publication data, ISBN)	
<ol style="list-style-type: none">1. U. Tietze, Ch. Schenk: Analogue and digital electronic circuits2. Norman S. Nise: Control Systems Engineering (2011) John Wiley & Sons, ISBN-13: 978-04709176953. G.C. Goodwin, S.F. Graebe and Mario E. Salgado: Control Systems Design (2002) Prentice Hall, Upper Saddle River, New Jersey 07458, 2001 ISBN 0-13-958653-94. Max Rabiee: Programmable Logic Controllers, Hardware and programming (2018) ISBN-13: 978-16312693255. Tony R Kuphaldt: Lessons In Electric Circuits, Volume IV – Digital (2007, Open Book) https://www.ibiblio.org/kuphaldt/electricCircuits/Digital/DIGI.pdf	
Academic in charge (name, position, highest scientific degree): János Füzi, professor, PhD	
Lecturers (name, position, highest scientific degree): János Füzi, professor, PhD	