

E – Charakteristika studijního předmětu/Subject Specification				
Název studijního předmětu / Subject title	Control methods in applications			
Typ předmětu / Subject type	Elective compulsory		dopor. ročník / semester/ recommended year / semester	2/4
Rozsah studijního předmětu / Study load in hours and credits		hod. za týden / weekly load	Kreditů / Credits	5
Jiný způsob vyjádření rozsahu / Other expression of study load	2 hours of lectures and 2 hours of seminars or laboratory experiments per week			
Způsob zakončení / Assessment	Examination		Forma výuky / Form of teaching	Lectures, labs, seminar
Další požadavky na studenta / Other demands on students				
Vyučující / Lecturer	Doc. Dr. Ing. Mgr. Jaroslav Hlava			
Stručná anotace předmětu / Subject annotation				
This course is focused on practical applications of automatic control methods. Consequently, realistic case studies and not just illustrative examples of control design are presented. Particular emphasis is put on those features present in controlled plants and systems that complicate or even exclude the application of classical linear finite dimensional control theory. Such features include particularly time delays, non-linear behavior and interaction of continuous and logical controls. Thus the main topics of lectures cover control of time delay systems including systems with internal delays, application of simpler non-linear control approaches and hybrid control. An effort is made to explain all of the necessary theory and methods using examples of realistic control cases such as telemanipulation with time delay, communication delays in distributed control systems, overcoming strong non-linearity in pH control systems, hybrid control of combustion engines etc.				
Informace ke kombinované nebo distanční formě / Information for students in external form of study				
Rozsah konzultací (soustředění) / Consultations, study meetings		hodin za týden / hours per week		
Rozsah a obsahové zaměření individuálních prací studentů a způsob kontroly / Individual student work – type, load, content and way of checking				
Studijní literatura a studijní pomůcky / Reading list and study utilities				
Huang, S., & Tan, K.K. & Lee T., H. (2001), Applied Predictive Control, Springer Verlag Johansson, R., & Rantzer, A. (2003), Nonlinear and Hybrid Systems in Automotive Control, Springer Verlag Levine W. S. (1999), Control system applications, CRC Press Niculescu, S. I. (2001), Delay Effects on Stability: A Robust Control Approach, Lecture Notes in Control and Information Sciences, vol. 269, Berlin: Springer Silva, G., J., Datta, A., & Bhattacharyya, S., P. (2005), PID Controllers for Time-Delay Systems, Boston: Birkhäuser Wang, Z.H. & Hu, H.Y. (2002), Dynamics of Controlled Mechanical Systems with Delayed Feedback, Springer Verlag				