

Prof. dr. ing. Cristina Ioana MUREȘAN

Nr.crt.	Titlu lucrare	Scurta descriere	Cerinte	Nivel (licenta/master)
1	Modelling and control of the hemodynamic system	Analysis of the hemodynamic system (MIMO system, interaction, pairing) – generalization of a nominal model to multiple patients, design of MIMO IMC controller, discrete-time implementation, Matlab simulation testing and validation, analysis of results	System theory Control engineering I/ II Matlab	Licenta/Master
2	Event-based control of the hemodynamic system	Analysis of the hemodynamic system (MIMO system, interaction, pairing) – generalization of a nominal model to multiple patients, design of MIMO IMC controller, discrete-time implementation, Matlab simulation testing and validation, analysis of results	System theory Control engineering I/ II Matlab	Licenta/Master
3	Modelling and fractional order control of the hemodynamic system – decentralised approach	Analysis of the hemodynamic system (MIMO system, interaction, pairing) – generalization of a nominal model to multiple patients, design of MIMO decentralised fractional order IMC controller, discrete-time implementation, Matlab simulation testing and validation, analysis of results	System theory Control engineering I/ II Matlab	Licenta/Master
4	Multivariable control in pharma	Analysis of pharma process, design of MIMO decentralised	System theory Control engineering I/ II	Licenta/Master

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		control strategies, discrete-time implementation, Matlab simulation testing and validation, analysis of results	Matlab	
5	Multivariable control in pharma	Analysis of pharma process, design of MIMO decoupled control strategies, discrete-time implementation, Matlab simulation testing and validation, analysis of results	System theory Control engineering I/ II Matlab	Licenta/Master
6	Validation of a novel IMC controller on a vertical take off and landing (VTOL) system https://www.ni.com/en-us/support/model.quanser-qnet-vtol-board-2-0-for-ni-elvis-ii-ii-.html	Study of the basic IMC method and the new version for improved disturbance rejection. Comparisons for a vertical take off and landing unit (Matlab simulation). Implementation and validation on the VTOL system. Analysis of results	System theory Matlab programming skills are required, excellent knowledge of CE 1 and 2.	Licenta/Master
7	Fractional order models in anesthesia	Analysis of existing PK-PD models in anesthesia (hypnosis), comparison with clinical data from the VitalDB database, development of fractional order PK models and validation with clinical data, parameter estimation, Matlab simulation testing and validation, analysis of results	System theory Control engineering I/ II Matlab	Licenta/Master
8	Fractional order models in anesthesia	Analysis of existing PK-PD models in anesthesia (neuromuscular blockade),	System theory Control engineering I/ II Matlab	Licenta/Master

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		comparison with clinical data from the VitalDB database, development of fractional order PK models and validation with clinical data, parameter estimation, Matlab simulation testing and validation, analysis of results		