

Data-Based Dynamic Modeling					AR-206
Rota	Duration	Semester	SWS	Credit Points	Workload
annually SS	1 Term	2nd (Semester)	2 SWS	3	90 h
1	Modul structure				
	Course (Abbreviation)	Type/ SWS	Presence	Self study	Credits
	a) Data-Based Dynamic Modeling (DDM)	Lecture/ 1 SWS	15 h	30 h	2
	b) Data-Based Dynamic Modeling (DDM)	Tutorial/ 1 SWS	15 h	30 h	1
2	Language English				
3	Content <ol style="list-style-type: none"> 1. Identification of simple models from step responses. 2. Parameter identification: Basic idea, mathematical description of sampled systems, ARX, ARMAX and OE estimation. 3. Modeling using nonlinear black box models (perceptron neural nets, radial-basis-function nets), training, dynamic models, quality of neural net models. 4. Model errors: Sources of errors, limits of model accuracy, model accuracy and controller performance. <p>The course takes place in the second half of the semester.</p> Literature: <ul style="list-style-type: none"> • Slides • Handouts 				
4	Goals The students can identify the dominant dynamics of a process from step responses and can apply modern methods and algorithms to identify the parameters of linear process models from measured data. They know the structure of nonlinear black box models and can judge the quality and the limitations of data-based models.				
5	Examination Requirements The final exam will be an oral (30 minutes) or written (2 hours) exam, depending on the number of participants (form will be announced in the second week of course). In addition, there will be a graded homework.				
6	Formality of Examination <input checked="" type="checkbox"/> Module Finals <input type="checkbox"/> Accumulated Grade				
7	Module Requirements (Prerequisites) Basic knowledge of dynamic systems as e.g. provided by the course Control Theory and Applications.				
8	Allocation to Curriculum: Program: Automation & Robotics, Field of study: Process Automation Robotics, Cognitive Systems				
9	Responsibility/ Lecturer Prof. Dr. S. Engell/Prof. Dr. S. Engell				