Dynamic Models					AR-221
Rota annually SS	**Duration** 1 Term	**Semester** 2nd (Semester)	**SWS** 2 SWS	**Credit Points** 3	**Workload** 90 h

1	**Modul structure**				
	Course (Abbreviation)	**Type/ SWS**	**Presence**	**Self study**	**Credits**
	c) Dynamic Models (DM)	Lecture/ 1 SWS	15 h	30 h	2
	d) Dynamic Models (DM)	Tutorial/ 1 SWS	15 h	30 h	1
2	**Language** English				
3	**Content** • Modeling and simulation of dynamic distributed parameter systems: fundamental equations, initial and boundary conditions, solution of partial differential equation systems by spatial discretization and orthogonal collocation. • Differential algebraic equation systems: origin of DAE systems, index of a DAE system, numerical solution. • Model simplification. The course takes place in the first half of the semester. **Literature** • Slides • Handouts				
4	**Goals** The students can formulate PDE models of processing systems and can discretize the models and apply suitable numerical algorithms for their solution. They know the specific problems related to the solution of DAE models and can reduce dynamic models tailored to the purpose of the model.				
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** ☒ Module Finals ☐ 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				