Modulelement Modeling and Optimization of Energy Systems					Abkürzung MOE
Studiensemester	Regelstudiensemester	Turnus	Dauer	SWS	CP/ ECTS
2	2	SoSe	1 Sem	5	6

Modulverantwortliche*r	Frey			
Dozent*in	Frey			
Zuordnung zum Curriculum	Master Systems Engineering, Kernbereich SSE Master Sustainable Material Sciences and Engineering			
Zulassungsvoraussetzungen	none			
Lehrveranstaltungen	Lehr- und Lernform	Bezeichnung	SWS	CP
	Lecture with integrated exercise		4	6
	Seminar and Mini Projects		1	
Leistungskontrollen	Contribution to Mini Projects, Seminar Presentation (Talk and Report) [Formats will be adapted based on the number of students.]			
Arbeitsaufwand	Lecture with integrated exercises: in Presence 15 weeks (4 SWS): 60h Presentation and Discussion of Mini Projects and Seminar in Presence 15 weeks (1 SWS): 15h Preparation of Seminar Contributions and Mini Projects: 105h [Distribution of workload will be adapted based on number of students.] SUM 180h = 6 CP			
Zusammensetzung der Modulnote	Grades on Mini Projects and Seminar Presentation			
Lernziele/ Kompetenzen	Students know how to set up simulation models of energy systems and how to combine them with state-ot-the-art optimization tools to find optimal parameters under given conditions.			
Inhalt(e)	• Overview Energy Systems (Recap from "Sustainable Energy Systems") • Basics of component-based modeling (Introduction to the Modelica Language) • Detailed modeling of some exemplary systems • Implementation in Dymola/Modelica • Basics of current optimization approaches • Modeling in Python (Introduction to Pyomo) • Application of optimization using state-of-the-art tools and libraries			
Weitere Informationen	Language of Instruction: Englisch Literature: Will be announced/distributed in the course.			