

DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGIES
COURSE SYLLABUS

Course Details						
Code			Academic Year		Semester	
EWT411			4		8	
Title			T	A	L	ECTS
Energy Systems Modeling and Simulation			2	1	0	6
Language		German				
Level		Undergraduate	X	Graduate		Postgraduate
Department / Program		Energy Science and Technologies				
Forms of Teaching and Learning		Face to face				
Course Type		Compulsory	X	Elective		
Objectives		Students who successfully complete this course; Successful students will be able to apply basic principles for modeling and simulation. Successful students will be able to apply statistical and theoretical modeling techniques. Successful students will be able to use various computer programs for modeling and simulation. Successful students will be able to create models using concepts of heat transfer, mass transfer, fluid mechanics and thermodynamics. Successful students will be able to use various optimization techniques for engineering problems.				
Content		An introduction to modeling, simulation and optimization issues in this course; to cover various statistical and theoretical modeling techniques; modeling and simulation with various computer programs; Modeling and simulation of energy systems problems is aimed. Topics covered in the course: statistical methods; simple linear regression; polynomial regression; multiple linear regression; Theoretical models based on concepts of heat transfer, mass transfer, fluid mechanics and thermodynamics; various optimization techniques.				
Prerequisites						
Coordinator						
Lecturer(s)						
Assistant(s)						
Work Placement		No				
Recommended or Required Reading						
Books / Lecture Notes		Probability & Statistics for Engineers & Scientists (9th Edition) – Walpole, ISBN 978-0-321-62911-1 Data Mining Methods and Models, Daniel T. Larose, Wiley, ISBN-13 978-0-471-66656-1 Discovering Knowledge in Data, Daniel T. Larose, Wiley, ISBN 0-471-66657-2				
Other Sources						
Additional Course Material						
Documents						
Assignments						
Exams						

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Course Composition			
Mathematics und Basic Sciences			%
Engineering			40%
Engineering Design			40%
Social Sciences			%
Educational Sciences			%
Natural Sciences			%
Health Sciences			%
Expert Knowledge			20%
Assessment			
Activity	Count		Percentage (%)
Midterm Exam			30
Quiz			
Assignments			
Attendance			
Recitations			
Projects			20
Final Exam			50
Total			100
ECTS Points and Work Load			
Activity	Count	Duration	Work Load (Hours)
Lectures	15	2	30
Self-Study	15	4	60
Assignments	4	10	40
Presentation / Seminar Preparation			
Midterm Exam	1	2	2
Recitations	15	1	15
Laboratory	15	2	30
Projects			
Final Exam	1	2	2
Total Work Load			179
ECTS Points (Total Work Load / Hours)			6
Learning Outcomes			
1			
2			

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12	

Weekly Content

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15	

Contribution of Learning Outcomes to Program Objectives (1-5)

	P1	P2	P3	P4	P5	P6	P7
1							
2							
3							
4							
5							
6							

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7							
8							
9							
10							
11							
12							
Contribution Level		1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High					
Compiled by:							
Date of Compilation:							