DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGIES
COURSE SYLLABUS

Course Details				
Code		**Academic Year**		**Semester**
EBT204		2		4
Title		**T**	**A**	**L**	**ECTS**
Thermodynamics		3	2	0	6

Language						
Level	**Undergraduate**	**X**	**Graduate**		**Postgraduate**	
Department / Program	Department of Energy Science and Technology (German)					
Forms of Teaching and Learning	Face to Face					
Course Type	**Compulsory**	**X**	**Elective**			
Objectives	The main aim of the course is to teach the basic concepts of thermodynamics and the first and second laws of thermodynamics. demonstrate the fundamentals of thermal design of engineering systems. To improve students' analysis, application and communication skills in this field.					
Content	Thermodynamic systems and their properties. Thermodynamic processes; work and heat interactions. Pure substances and thermodynamic properties. First Law; closed and open systems, flow processes. The Second Law; Heat machines, heat pumps and coolers. Entropy.					
Prerequisites						
Coordinator						
Lecturer(s)						
Assistant(s)						
Work Placement						

Recommended or Required Reading	
Books / Lecture Notes	Y. A. Çengel: Thermodynamics: An Engineering Approach
Other Sources	P. Stephan, K.-H. Schaber, K. Stephan, F. Mayinger: Thermodynamik, Grundlagen und technische Anwendungen H. D. Baehr, S. Kabelac: Thermodynamik K. Lucas: Thermodynamik

Additional Course Material	
Documents	
Assignments	
Exams	

Course Composition		
Mathematics und Basic Sciences		% 10
Engineering		% 80

Engineering Design		% 10
Social Sciences		% 0
Educational Sciences		% 0
Natural Sciences		% 0
Health Sciences		% 0
Expert Knowledge		% 0

Assessment

Activity	Count	Percentage (%)
Midterm Exam	1	% 40
Quiz	0	% 0
Assignments	0	% 0
Attendance	0	% 0
Recitations	0	% 0
Projects	0	% 0
Final Exam	1	% 60
	Total	**100**

ECTS Points and Work Load

Activity	Count	Duration	Work Load (Hours)
Lectures	14	3	42
Self-Study	14	5	70
Assignments	3	10	30
Presentation / Seminar Preparation			
Midterm Exam	1	2	2
Recitations	14	2	28
Laboratory			
Projects			
Final Exam	1	2	2
		Total Work Load	**174**
		ECTS Points (Total Work Load / Hours)	**6**

Learning Outcomes

1	To acquire sufficient knowledge about mathematics, science and mechanical engineering and to apply the theoretical and practical knowledge in these fields to model and solve engineering problems.
2	Ability to identify, define, formulate and solve complex engineering problems, and to select and apply appropriate analysis and modeling methods in mechanical engineering for this purpose.
3	Experiment design, experimentation, data collection, analysis and interpretation of results for engineering problems.
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Weekly Content	
1	Systems
2	Change of state
3	Thermodynamic equilibrium,
4	0, 1 and 2 law of thermodynamics
5	Thermal and caloric equations of state of ideal gases
6	Thermodynamic properties
7	Calculation of cycles and their diagrams
8	Determination of the efficiency
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Contribution of Learning Outcomes to Program Objectives (1-5)

	P1	P2	P3	P4	P5	P6	P7
1	5	5	5	5	5	5	5
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3							
4							
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Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High
Compiled by:	
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