

Module description: Thermodynamics						
Module Code	t.BA.XX.FTH2.19HS					
ECTS Credits	4					
Language of Instruction/Examination	German					
Organizational Unit	IEFE					
Module Coordinator	Marius Banica					
Legal Framework	The module description is part of the legal basis in addition to the general academic regulations. It is binding. During the first week of the semester a written and communicated supplement can specify the module description in more detail.					
Module Characteristic	Type 3b 2 lecture lessons per semester week and class+ 4 lab bi-weekly lessons per semester and half-class					
Module Description	In the Thermodynamics module of the Fluid- and Thermodynamics (FTH) series, students learn the basics of thermodynamics at UAS Bachelor level. The overall goal is to understand the changes of state of gases in technical processes.					
Module Content	<ul style="list-style-type: none"> • Contents of the lectures and exercises: Ideal gas equation, First Law of Thermodynamics for open and closed systems, Second Law of Thermodynamics, Thermodynamic processes in open and closed systems, Thermodynamic cycles, Thermodynamic processes in simple heat engines with ideal gases, Thermodynamic processes with changes of state • Lab exercises: Centrifugal pump, Pipe flows with friction, High pressure fan, Piston compressor 					
Prerequisite Knowledge	https://gpmpublic.zhaw.ch/GPMDocProdDPublic/2_Studium/2_02_Grundlagen_Studium/T_C_L_Modulauspraegungen_SM2025.pdf					
Learning Objectives (Competences)	Students...		Competencies	Taxonomies		
	The students know the Ideal Gas Law, the First and Second Law of Thermodynamics, important changes of state and circular processes		F	K1		
	The students can represent and explain the important changes of state and circular processes in the state diagrams.		M, F	K2		
	They analyse simple plants and plant components and can perform calculations such as the determination of status points and efficiencies.		M, F	K3		
Performance Assessment	End-of-module exam	Assessment	Length (min.)	Weighting	Form	
	written exam	Grade	90	80	acc. to module agreement	
	Performance assessment during the semester		Assessment	Length (min.)	Weighting	Form
	written exam		Grade	60	20	acc. to module agreement
Classroom Attendance Requirement	None					

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Learning material	<ul style="list-style-type: none">• Baehr, H. & Kabelac, S. (2016). Thermodynamik. 16 Edition. Berlin: Springer. ISBN 978-3-662-49567-4.• Cerbe, G. & Wilhelms, G. (2013). Technische Thermodynamik. 17 Edition. München: Hanser. ISBN 978-3-446-43750-0.• Labuhn, D. & Romberg, O. (2013). Keine Panik vor Thermodynamik!. 6 Edition. Berlin: Springer. ISBN 978-3-8348-1936-9.
Comments	The lessons are accompanied by a group practicum with 4 experiments (compulsory). Details are regulated in the module agreement.