

Master's degree programme Aerospace Engineering (M.Sc.)



TECHNISCHE
UNIVERSITÄT
DARMSTADT

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The English translation is for information purposes only. The legally binding document is the German version.

Study and examination plan (Appendix I)

Date: 18 November 2020

Key		Examination components							Course		Semester							
		Technical examination	Study examination	Form of examination	Duration (min.)	Weighting for module grade	Weighting for overall grade	Contact hours per week (SWS)	Status	Form of teaching	Total CPs	1	2	3	4			
Assessment system:	St = standard (graded); bnb = passed/not passed																	
Form of examination:	A = submission, B = report, E = essay, H = homework assignment, HÜ = homework, worksheets, K = written exam, Kq = colloquium, M = oral examination as specified in module description, mP = oral examination, M/S = oral/written examination as specified in module description, P = minute, Pt = presentation, R = paper, S = written examination as specified in module description, SF = special form, Th = thesis																	
Status:	o = obligatory; f = facultative																	
Form of teaching:	VL = lecture; S = seminar; Ü = exercise; VÜ = lecture and exercise; PJ = project; PR = practical; PS = proseminar; HÜ = lecture room exercise; GÜ = group exercise, HA = homework, TT = tutorial, iV = integrated course																	
CPs:	Credit points																	
TUCaN number (#) and assignment of CPs to module elements are informative in nature. The CPs are recorded once the module is completed.																		
Compulsory courses											16							
Tutorial											4							
Catalogue	Tutorial	St	SF				1	1	4	o	X		x					
	Tutorial								4	o	TT							
Advanced Design Project (Fn 1)											12		6					
Catalogue	Advanced Design Project (min. 6 CPs)	St	SF				1	1	6	o	X			x	x			
	Advanced Design Project								1	6	f	PJ						
16-cc-e061	External project work (max. 6 CPs)	bnb	SF				1	1	6	f	X			x	x			
	External project work								0	6	f	PJ						
Compulsory Electives Area (Fn 2) (74 CPs)											74							
Electives Area Ia/b, II and III (Fn 2) (min. 62 CPs)											62-68							
Electives Area I and II (Fn 2) (min. 44 CPs)											44-56							
Electives Area I area in accordance with Section 30(5), min. 12 CPs											12-36							
Electives Area Ia Fundamentals (Fn 2) min. 6 CPs											6-18		6					
16-	Maschinendynamik	St	K	150	1	1	4	4	3	f	X							
16-vl	Maschinendynamik								3	o	VL							
16-hü	Maschinendynamik								1	o	HÜ							
16-98-4074	Sustainable Systems Design	St	K	90	1	1	4	4	3	f	X							
16-98-4074-vl	Sustainable Systems Design								3	o	VL							
16-98-4074-ue	Sustainable Systems Design								1	o	Ü							
16-98-4054	Transport Phenomena	St	K	120	1	1	4	4	3	f	X							
16-98-4054-vl	Transport Phenomena								3	o	VL							
16-98-4054-ue	Transport Phenomena								1	o	Ü							
Electives Area Ib Digitalisation (Fn 2) min. 6 CPs											6-18		6					
16-98-4044	Digitalisierung in der Produktion	St	K	120	1	1	4	4	3	f	X							
16-98-4044-vl	Digitalisierung in der Produktion								3	o	VL							
16-98-4044-ue	Digitalisierung in der Produktion								1	o	Ü							
16-98-4174	Machine Learning Applications	St	K	60	0,5	1	4	4	3	f	X							
16-98-4174-vl	Machine Learning Applications								3	o	VL							
16-98-4174-pr	Machine Learning Applications	St	SF		0,5	1	1	1	1	o	Ü							
16-98-4084	Smart Products, Engineering & Services	St	K	60	0,6	1	4,5	4,5	1	f	X							
16-98-4084-vl	Smart Products, Engineering & Services								1	o	VL							
16-98-4084-ue	Smart Products, Engineering & Services								1	o	Ü							
16-98-4084-pj	Smart Products, Engineering & Services	St	Pt		0,4				2,5	o	PJ							
Electives Area II Core Electives from Mechanical Engineering (Fn 2 + 3), area in accordance with Section 30(5), min. 24 CPs											24-44		8	12	12			
Electives Area II Core Electives from Aerospace Engineering (Fn 2) min. 24 CPs											24-44							
16-64-5110	Advanced Fluid Mechanics I	St	mP	30	1	1	4	4	3	f	X							
16-64-5110-vl	Advanced Fluid Mechanics I								3	o	VL							
16-64-5110-ue	Advanced Fluid Mechanics I								1	o	Ü							
16-23-5110	Avionics System Safety	St	mP	20	1	1	2	2	2	f	X							
16-23-5110-vl	Avionics System Safety								2	o	VL							
16-12-3174	Composite Structures I	St	mP	30	1	1	5,5	5,5	2	f	X							
16-12-3174-vl	Composite Structures I								2	o	VL							
16-12-3174-ue	Composite Structures I	bnb	B		0				3,5	o	HA							
16-10-3274	Compressible and Irrotational Flow	St	M/S	30/90	1	1	4	4	2	f	X							
16-10-3274-vl	Compressible and Irrotational Flow								2	o	VL							
16-10-3274-ue	Compressible and Irrotational Flow								2	o	Ü							
16-23-5040	Flight Mechanics II: Dynamics	St	mP+S	60	1	1	3	3	3	f	X							
16-23-5040-vl	Flight Mechanics II: Dynamics								3	o	VL							
16-	Flight Propulsion	St	mP	30	1	1	4	4	4	f	X							
16-vl	Flight Propulsion								4	o	VL							

16-23-3134	Foundations of Space Systems	St	M/S	20/90	1	1	2	f	VL	4													
16-23-3134-vl	Foundations of Space Systems						2	o	VL														
16-08-5120	High Temperature Materials Behaviour	St	M/S	45/60	1	1	3	f	VL	6													
16-08-5120-vl	High Temperature Materials Behaviour						3	o	VL														
16-64-5130	Introduction to Turbulence	St	mP	30	1	1	4	f	VL	6													
16-64-5130-vl	Introduction to Turbulence						3	o	VL														
16-64-5130-ue	Introduction to Turbulence						1	o	Ü														
16-13-5110	Laser Measurement Technology	St	mP	30	1	1	3	f	VL	4													
16-13-5110-vl	Laser Measurement Technology						2	o	VL														
16-13-5110-ue	Laser Measurement Technology						1	o	Ü														
16-12-5040	Lightweight Engineering I	St	mP	20	1	1	3	f	VL	4													
16-12-5040-vl	Lightweight Engineering I						2	o	VL														
16-12-5040-ue	Lightweight Engineering I						1	o	Ü														
16-12-5050	Lightweight Engineering II	St	mP	20	1	1	3	f	VL	4													
16-12-5050-vl	Lightweight Engineering II						2	o	VL														
16-12-5050-1e	Lightweight Engineering II						1	o	Ü														
16-24-5020	Mechatronic Systems I	St	mP	20	1	1	4	f	VL	4													
16-24-5020-vl	Mechatronic Systems I						2	o	VL														
16-24-5020-ue	Mechatronic Systems I						2	o	Ü														
16-24-5030	Mechatronic Systems II	St	mP	20	1	1	4	f	VL	4													
16-24-5030-vl	Mechatronic Systems II						2	o	VL														
16-24-5030-ae	Mechatronic Systems II						2	o	Ü														
16-13-5070	Modelling of Turbulent Flows	St	mP	30	1	1	6	f	VL	8													
16-13-5070-vl	Modelling of Turbulent Flows						4	o	VL														
16-13-5070-ue	Modelling of Turbulent Flows						2	o	Ü														
16-04-3114	Space Propulsion and Space Transportation Systems	St	M/S	30/45	1	1	2	f	VL	4													
16-04-3114-vl	Space Propulsion and Space Transportation Systems						2	o	VL														
16-23-3194	Space Systems and Operations	St	M/S	20/90	1	1	2	f	VL	4													
16-23-3194-vl	Space Systems and Operations						2	o	VL														
and further modules (catalogue)																							
Electives Area II Core Electives without Aerospace Engineering (Fn 2)																							
Catalogue											St		1	1									
Electives Area III Electives from the Natural Sciences and Engineering (Fn 2), area in accordance with Section 30(5), min. 12 CPs																							
Electives Area III Electives from Aerospace Engineering (Fn 2 + 4) min. 12 CPs																							
16-11-5060	Aerodynamics II	St	mP	30	1	1	3	f	VL	6													
16-11-5060-vl	Aerodynamics II						3	o	VL														
16-12-3184	Composite Structures II	St	M/S	20/90	1	1	3	f	VL	4													
16-12-3184-vl	Composite Structures II						2	o	VL														
16-12-3184-1e	Composite Structures II						1	o	Ü														
16-04-5080	Compressor Technology	St	mP	30	1	1	2	f	VL	4													
16-04-5080-vl	Compressor Technology						2	o	VL														
16-19-5030	Finite Element Methods in Structural Mechanics	St	mP	30	1	1	4	f	VL	6													
16-19-5030-vl	Finite Element Methods in Structural Mechanics						3	o	VL														
16-19-5030-ue	Finite Element Methods in Structural Mechanics						1	o	Ü														
16-23-5050	Fundamentals of Navigation I	St	mP	60	1	1	3	f	VL	4													
16-23-5050-vl	Fundamentals of Navigation I						2	o	VL														
16-23-5050-1e	Fundamentals of Navigation I						1	o	Ü														
16-23-5060	Fundamentals of Navigation II	St	mP	60	1	1	3	f	VL	4													
16-23-5060-vl	Fundamentals of Navigation II						2	o	VL														
16-23-5060-ue	Fundamentals of Navigation II						1	o	Ü														
16-23-3184	Future Air Transportation Systems	St	mP	20	1	1	2	f	VL	4													
16-23-3184-vl	Future Air Transportation Systems						2	o	VL														
16-64-3264	High-Accuracy Methods for Computational Fluid Dynamics	St	mP	30	1	1	4	f	VL	6													
16-64-3264-vl	High-Accuracy Methods for Computational Fluid Dynamics						3	o	VL														
16-64-3264-ue	High-Accuracy Methods for Computational Fluid Dynamics						1	o	Ü														
16-08-5131	Lightweight Construction Materials	St	K	60	1	1	2	f	VL	4													
16-08-5130-vl	Lightweight Construction Materials						2	o	VL														
16-12-3154	Nonlinear Finite Element Analysis in Lightweight Design	St	mP	30	1	1	3	f	VL	4													
16-12-3154-vl	Nonlinear Finite Element Analysis in Lightweight Design						2	o	VL														
16-12-3154-ue	Nonlinear Finite Element Analysis in Lightweight Design						1	o	Ü														
16-23-3164	Space Debris – Risks, Surveillance and Mitigation	St	mP	20	1	1	2	f	VL	4													
16-23-3164-vl	Space Debris – Risks, Surveillance and Mitigation						2	o	VL														
16-25-5130	Space Flight Mechanics	St	K	90	1	1	4	f	VL	6													
16-25-5130-vl	Space Flight Mechanics						3	o	VL														
16-25-5130-ue	Space Flight Mechanics						1	o	Ü														
16-61-5050	Structural Integrity and Fracture Mechanics	St	mP	30	1	1	4	f	VL	6													
16-61-5050-vl	Structural Integrity and Fracture Mechanics						3	o	VL														
16-61-5050-ue	Structural Integrity and Fracture Mechanics						1	o	Ü														
16-23-3144	Systemic Evaluation of Air Traffic	St	mP	20	1	1	2	f	VL	4													
16-23-3144-vl	Systemic Evaluation of Air Traffic						2	o	VL														
and further modules (catalogue)																							
Electives Area III Electives without Aerospace Engineering (Fn 2) min. 0 CPs																							
Catalogue																							
Elective Area Studium Generale (general studies) (Fn 5) min. 6 CPs, area in accordance with Section 30(6) APB											St		f										
Catalogue														1	0		f						
Modules not within the natural and engineering sciences area (specific catalogue Dep. 1 – 3, SPZ, INSPIRED).																							
Master's thesis (Fn 6)																	o		30				
Master's thesis											St bnb	Th Kq		1 0	1		o o		30		x		
TOTAL																			120	30	30	30	30

Footnotes

(1) It is possible to enter two ADPs with a total workload of 12 CPs or one ADP (6 CPs) and the External Project Work module (6 CPs). One ADP must be taken from the Aerospace Engineering subject area.

(2) **In the Compulsory Elective Areas/Electives Areas I (Ia + Ib combined), II and III, one change each is possible in accordance with Section 30(5) APB.**

The exemplary study and examination plan recommends attending modules from the following Compulsory Elective Areas: Electives Area Ia Fundamentals (6 CPs), Electives Area Ib Digitalisation (6 CPs), Electives Area II Core Electives from Mechanical Engineering (36 CPs, of which min. 24 CPs in the Core Electives Aerospace Engineering area), Electives Area III Electives from the Natural Sciences and Engineering (18 CPs, of which min. 12 CPs in Electives Area III Electives from Aerospace Engineering) and Studium Generale (general studies) (12 CPs, min. 6 CPs). Overflows from the Electives Areas Ia and Ib and the Aerospace Engineering courses in the core teaching area (Electives Area II Aerospace Engineering) are considered in the area containing unspecified modules of the Compulsory Electives Area II (Electives Area II Core Electives without Aerospace Engineering) and overflows from the Electives Areas Ia, Ib and II (totalling > 44 CPs) are considered in the area containing unspecified modules of the Compulsory Electives Area III (Electives Area III Electives from the Natural Sciences and Engineering without Aerospace Engineering). **In addition, the CP range in the Studium Generale (general studies) (6-12 CPs) section allows for additional 6 CPs to be entered from the Compulsory Elective Areas containing modules of the Department of Mechanical Engineering.**

(3) Maximum 12 CPs from courses offered by a single professor can be considered.

(4) Upon request, overflows from WPB II Aerospace Engineering can be considered to the extend of the overflow from WPB Ia/b and II.

Remark for its course through the administrative bodies: This can only be done manually (therefore "upon request"); academic achievements earned will then be re-hung in this area and no longer appear as core course.

(5) Modules must not include contents from natural or engineering sciences. The university teacher/lecturer has a part-time teaching appointment and is not a member of the Department of Mechanical Engineering.

(6) The Master's thesis has to be written in English and must be within the subject area of Aerospace Engineering.