

Master-Program Systems Design (full time)

Special Topics in: **Mechatronic Systems**
Control Systems
Embedded Systems
Remote Systems
Sensor Systems

1. Semester					22	30	2. Semester					21	30						
Mathematics and IT (VSD-MAIT)			SWS	ECTS				Modelling and Simulation (VSD-MSIM)			SWS	ECTS							
			4,5	6,5				System Theory 2 (VSD-SYS2)			4,5	7,0	Business & Management (VSD-BUMA)		4,5	7,0			
Mathematic Models			2,0	3,0	Non-linear Systems			2,0	2,5	Statistics and Stochastic Systems			2,5	4,0	Organization Theory	1,0	2,0		
OO Programming 1			1,0	1,5	Simulation Technologies			1,5	2,0	Digital Signal Processing			2,0	3,0	Risk Management	2,0	2,0		
OO Analysis and Design			1,5	2,0	OO Programming 2			1,0	2,0	Special Topics 1			SWS	ECTS	Special Topics 2			SWS	ECTS
System Theory 1 (VSD-SYS1)			SWS	ECTS				Control Systems Design 1 (VSD-CSD1)			SWS	ECTS			SWS	ECTS			
			4,5	6,5				Foreign Languages 1 (VSD-FOL1)			SWS	ECTS			SWS	ECTS			
System Theory Basics			2,5	3,5	Control Systems 1			2,5	3,5	Foreign Language 1**			4,0	4,0	Foreign Languages 2 (VSD-FOL2)			SWS	ECTS
Signal Transformations			2,0	3,0	Control Systems Lab 1			2,0	3,0	Foreign Language 2**			2,0	2,0			SWS	ECTS	
3. Semester					20	30	4. Semester					2	30						
Special Topics 3			SWS	ECTS				Special Topics 4			SWS	ECTS							
			5,0	7,0				Special Topics 5			SWS	ECTS							
			5,0	8,0				Master Thesis (VSD-MATH)			SWS	ECTS							
			5,0	8,0				Master Thesis			2,0	30,0							
			5,0	8,0				Master Thesis - Seminar			2,0	2,0							

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Master-Program Systems Design (full time)

Special Topic: **Embedded Systems (EMS)**

1. Semester					22	30
Mathematics and IT (VSD-MAIT)	SWS	ECTS	Modelling and Simulation (VSD-MSIM)	SWS	ECTS	
	4,5	6,5		4,5	6,5	
Mathematic Models	2,0	3,0	Non-linear Systems	2,0	2,5	
OO Programming 1	1,0	1,5	Simulation Technologies	1,5	2,0	
OO Analysis and Design	1,5	2,0	OO Programming 2	1,0	2,0	
System Theory 1 (VSD-SYS1)	SWS	ECTS	Control Systems Design 1 (VSD-CSD1)	SWS	ECTS	
	4,5	6,5		4,5	6,5	
System Theory Basics	2,5	3,5	Control Systems 1	2,5	3,5	
Signal Transformations	2,0	3,0	Control Systems Lab 1	2,0	3,0	
Foreign Languages 1 (VSD-FOL1)				SWS	ECTS	
Foreign Language 1**				4,0	4,0	

2. Semester					21	30
System Theory 2 (VSD-SYS2)	SWS	ECTS	Business & Management (VSD-BUMA)	SWS	ECTS	
	4,5	7,0		4,5	7,0	
Statistics and Stochastic Systems	2,5	4,0	Organization Theory	1,0	2,0	
Digital Signal Processing	2,0	3,0	Risk Management	2,0	2,0	
			Controlling	1,5	3,0	
Field Theory (VSD-FITH)	SWS	ECTS	Embedded Systems I (VSD-EMBSI)	SWS	ECTS	
	5,0	7,0		5,0	7,0	
Partial Differential Equations	2,0	2,5	Real-Time Systems ST	3,0	4,0	
Field Numerics	2,0	3,0	Microcontroller ST	2,0	3,0	
Electromagnetic Fields	1,0	1,5				
Foreign Languages 2 (VSD-FOL2)				SWS	ECTS	
Foreign Language 2**				2,0	2,0	

3. Semester					20	30
Embedded Systems II (VSD-EMBSII)	SWS	ECTS	Automotive Systems (VSD-AUTO)	SWS	ECTS	
	5,0	8,0		5,0	8,0	
Digital Design (FPGA)	2,0	3,0	Discrete & Integr. Power El.	2,0	3,0	
DSP Applications	2,0	3,0	Sensors and Microsystems	3,0	5,0	
Embedded Software Systems	1,0	2,0				
System Integration (VSD-SYSI)	SWS	ECTS	Communication Systems (VSD-COM)	SWS	ECTS	
	5,0	7,0		5,0	7,0	
High-Speed Board Design	2,0	2,5	Wireless Communication	3,0	4,0	
PCB Simulation	2,0	2,5	Adv. Communication Systems	2,0	3,0	
RF Measurements	1,0	2,0				

4. Semester			2	30
Master Thesis (VSD-MATH)			SWS	ECTS
			2,0	30,0
Master Thesis				28,0
Master Thesis - Seminar			2,0	2,0

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Master-Program
Systems Design (full time)

Special Topic: **Mechatronic Systems (MES)**

1. Semester			22	30
Mathematics and IT (VSD-MAIT)	SWS	ECTS		
	4,5	6,5		
Mathematic Models	2,0	3,0		
OO Programming 1	1,0	1,5		
OO Analysis and Design	1,5	2,0		
System Theory 1 (VSD-SYS1)	SWS	ECTS		
	4,5	6,5		
System Theory Basics	2,5	3,5		
Signal Transformations	2,0	3,0		
Foreign Languages 1 (VSD-FOL1)			SWS	ECTS
Foreign Language 1**			4,0	4,0

2. Semester			21	30
System Theory 2 (VSD-SYS2)	SWS	ECTS		
	4,5	7,0		
Statistics and Stochastic Systems	2,5	4,0		
Digital Signal Processing	2,0	3,0		
Engineering Mechanics (VSD-EMEC)	SWS	ECTS		
	5,0	7,0		
Mechanical Principles	3,0	4,0		
Physics (Selected Topics)	2,0	3,0		
Business & Management (VSD-BUMA)	SWS	ECTS		
	4,5	7,0		
Organization Theory	1,0	2,0		
Risk Management	2,0	2,0		
Controlling	1,5	3,0		
Control Systems Design 1 (VSD-CSD1)	SWS	ECTS		
	4,5	6,5		
Control Systems 1	2,5	3,5		
Control Systems Lab 1	2,0	3,0		
Computational Physics (VSD-CPH)	SWS	ECTS		
	5,0	7,0		
Numerical Methods Basics	1,0	2,0		
Computational Physics	2,0	2,5		
Finite Elements	2,0	2,5		
Foreign Languages 2 (VSD-FOL2)			SWS	ECTS
Foreign Language 2**			2,0	2,0

3. Semester			20	30
Automotive Control (VSD-AUTC)	SWS	ECTS		
	5,0	7,0		
Embedded Control Syst. ST	2,0	3,0		
Motion Control	1,0	2,0		
Drive Control	2,0	2,0		
Robotics (VSD-ROBO)	SWS	ECTS		
	5,0	7,0		
Robot Dynamics	2,0	3,0		
Robot Control	2,0	2,0		
Robotics Lab	1,0	2,0		
FEM Applications (VSD-FEMA)	SWS	ECTS		
	5,0	8,0		
FEM Structural Analysis	2,0	3,0		
Heat Flow Analysis	1,0	2,0		
Computer Fluid Dynamics	2,0	3,0		
Mechatronic Systems (VSD-MECS)	SWS	ECTS		
	5,0	8,0		
Mechatronic Systems Design (CAD)	3,0	4,0		
Mechatronics and Manufacturing (CAD-CAM)	2,0	4,0		

4. Semester			2	30
Master Thesis (VSD-MATH)			SWS	ECTS
			2,0	30,0
Master Thesis				28,0
Master Thesis - Seminar			2,0	2,0

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Master-Program Systems Design (full time)

Special Topic: **Control Systems (COS)**

1. Semester					22	30
Mathematics and IT (VSD-MAIT)		SWS	ECTS			
		4,5	6,5			
Mathematic Models		2,0	3,0			
OO Programming 1		1,0	1,5			
OO Analysis and Design		1,5	2,0			
System Theory 1 (VSD-SYS1)		SWS	ECTS			
		4,5	6,5			
System Theory Basics		2,5	3,5			
Signal Transformations		2,0	3,0			
Foreign Languages 1 (VSD-FOL1)		SWS	ECTS			
Foreign Language 1**		4,0	4,0			

2. Semester					21	30
System Theory 2 (VSD-SYS2)		SWS	ECTS			
		4,5	7,0			
Statistics and Stochastic Systems		2,5	4,0			
Digital Signal Processing		2,0	3,0			
System Modelling (VSD-SYSM)		SWS	ECTS			
		5,0	7,0			
Control Systems 2		2,0	3,0			
Mechanical Principles		3,0	4,0			
Business & Management (VSD-BUMA)		SWS	ECTS			
		4,5	7,0			
Organization Theory		1,0	2,0			
Risk Management		2,0	2,0			
Controlling		1,5	3,0			
Control Systems Design 2 (VSD-CSD2)		SWS	ECTS			
		5,0	7,0			
Process Identification		2,0	3,0			
Human Machine Interfaces		2,0	2,5			
Control Systems Lab 2		1,0	1,5			
Foreign Languages 2 (VSD-FOL2)		SWS	ECTS			
Foreign Language 2**		2,0	2,0			

3. Semester					20	30
Automotive Control (VSD-AUTC)		SWS	ECTS			
		5,0	7,0			
Embedded Control Syst. ST		2,0	3,0			
Motion Control		1,0	2,0			
Drive Control		2,0	2,0			
Control Systems Design 3 (VSD-CSD3)		SWS	ECTS			
		5,0	8,0			
Non-linear Control Systems		2,0	3,0			
CS Special Topics 1		1,5	3,0			
Computational Aspects of CSI		1,0	2,0			
Robotics (VSD-ROBO)		SWS	ECTS			
		5,0	7,0			
Robot Dynamics		2,0	3,0			
Robot Control		2,0	2,0			
Robotics Lab		1,0	2,0			
Intelligent Control Systems (VSD-INCS)		SWS	ECTS			
		5,0	8,0			
Computer Process Control		1,0	2,0			
Sensors***		2,0	3,0			
CS Special Topics 2		2,0	3,0			

4. Semester			2	30
Master Thesis (VSD-MATH)		SWS	ECTS	
		2,0	30,0	
Master Thesis				28,0
Master Thesis - Seminar		2,0	2,0	

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*** part of "Sensors and Microsystems" in Embedded Systems

Master-Program Systems Design (full time)

Special Topic: Remote Systems (RES)

1. Semester			22	30
Mathematics and IT (VSD-MAIT)	SWS	ECTS		
	4,5	6,5		
Mathematic Models	2,0	3,0		
OO Programming 1	1,0	1,5		
OO Analysis and Design	1,5	2,0		
System Theory 1 (VSD-SYS1)	SWS	ECTS		
	4,5	6,5		
System Theory Basics	2,5	3,5		
Signal Transformations	2,0	3,0		
Modelling and Simulation (VSD-MSIM)	SWS	ECTS		
	4,5	6,5		
Non-linear Systems	2,0	2,5		
Simulation Technologies	1,5	2,0		
OO Programming 2	1,0	2,0		
Control Systems Design 1 (VSD-CSD1)	SWS	ECTS		
	4,5	6,5		
Control Systems 1	2,5	3,5		
Control Systems Lab 1	2,0	3,0		
Foreign Languages 1 (VSD-FOL1)	SWS	ECTS		
Foreign Language 1**	4,0	4,0		

2. Semester			21	30
System Theory 2 (VSD-SYS2)	SWS	ECTS		
	4,5	7,0		
Statistics and Stochastic Systems	2,5	4,0		
Digital Signal Processing	2,0	3,0		
Remote Systems Basics (VSD-REMB)	SWS	ECTS		
	5,0	7,0		
Internet Technologies	2,0	3,0		
Digital Image Processing	2,0	3,0		
Rem. Applications & Trends	1,0	1,0		
Business & Management (VSD-BUMA)	SWS	ECTS		
	4,5	7,0		
Organization Theory	1,0	2,0		
Risk Management	2,0	2,0		
Controlling	1,5	3,0		
Special IT Basics (VSD-SITB)	SWS	ECTS		
	5,0	7,0		
Data Bases and Networks	2,0	2,5		
Design of Electr. Documents	1,0	2,0		
Human Machine Interfaces	2,0	2,5		
Foreign Languages 2 (VSD-FOL2)	SWS	ECTS		
Foreign Language 2**	2,0	2,0		

3. Semester			20	30
Virtual and Remote Applications (VSD-VRAP)	SWS	ECTS		
	5,0	7,0		
Graphical Programming	1,0	2,0		
Virtual and Remote Labs	2,0	2,5		
Remote Technologies Lab	2,0	2,5		
Mobile and Wireless Communication (VSD-MWTE)	SWS	ECTS		
	5,0	7,0		
Mobile Computing	2,0	4,0		
Wireless Internet	3,0	3,0		
Telerobotics (VSD-TELR)	SWS	ECTS		
	5,0	8,0		
Teleop. of Mechatr. Systems	2,0	3,0		
Soft Comp. Control Techn.	2,0	3,0		
Teleoperations Lab	1,0	2,0		
Virtual and Remote Appl. II Project (VSD-PRO)	SWS	ECTS		
	5,0	8,0		
Research Seminar	1,0	3,0		
Project Work	4,0	5,0		

4. Semester			2	30
Master Thesis (VSD-MATH)	SWS	ECTS		
	2,0	30,0		
Master Thesis				28,0
Master Thesis - Seminar	2,0	2,0		

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Master-Studium Systems Design (Full time)

Vertiefung: **Sensor Systems**

1. Semester					22	30
Mathematics and IT (VSD-MAIT)	SWS	ECTS	Modelling and Simulation (VSD-MSIM)	SWS	ECTS	
	4,5	6,5		4,5	6,5	
Mathematic Models	2,0	2,5	Non-linear Systems	2,0	2,5	
OO Programming 1	1,0	1,5	Simulation Technologies	1,5	2,5	
OO Analysis and Design	1,5	2,5	OO Programming 2	1,0	1,5	
System Theory 1 (VSD-SYS1)	SWS	ECTS	Control Systems Design 1 (VSD-CSD1)	SWS	ECTS	
	4,5	6,5		4,5	6,5	
System Theory Basics	2,5	3,5	Control Systems 1	2,5	3,5	
Signal Transformations	2,0	3,0	Control Systems Lab 1	2,0	3,0	
Foreign Languages 1 (VSD-FOL1)				SWS	ECTS	
Foreign Language 1**				4,0	4,0	

2. Semester					21	30
System Theory 2 (VSD-SYS2)	SWS	ECTS	Data Acquisition (VSB-DA)	SWS	ECTS	
	4,5	7,0		4,5	7,0	
Statistics	2,5	4,0	DAQ and Transmission	1,5	2,0	
Digital Signal Processing	2,0	3,0	Data Evaluation	1,5	3,0	
			Sensor Networks	1,5	2,0	
Sensor Basics	SWS	ECTS	Sensoric Principles	SWS	ECTS	
	5,0	7,0		5,0	7,0	
Physics (Selected Topics)	2,5	4,0	Sensor Principles	1,5	4,0	
Process Analytical Technology	2,5	3,0	Filter Design	1,5	4,0	
			Sensor Models and Simulation	2,0	3,0	
Foreign Languages 2 (VSD-FOL2)				SWS	ECTS	
Foreign Language 2**				2,0	2,0	

3. Semester					20	30
Reliability and Optimization (VSD-RO)	SWS	ECTS	Process Implementation (VSD-PI)	SWS	ECTS	
	5,0	7,0		5,0	7,0	
Reliability and Security of Sensor Systems	2	3	Advanced Process Control	2,0	3,0	
System Optimization	1,5	2	Sensor Implementation	1,5	2,0	
Packaging of Sensors	1,5	2	Sensor Data Fusion	1,5	2,0	
Sensor Applications (VSD-SEA)	SWS	ECTS	Optical Sensorics (VSB_OS)	SWS	ECTS	
	5,0	8,0		5,0	8,0	
Chemical Sensors	1,5	2,5	Applied Image Processing	2,0	3,0	
Mechanical and Thermal Sensors	2,0	3,0	Optical Sensor Systems Design	3,0	5,0	
Optical Sensors	1,5	2,5				

4. Semester			2	30
Master Thesis (VSD-MATH)			SWS	ECTS
			2,0	30,0
Master Thesis				28,0
Master Thesis - Seminar			2,0	2,0

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