

## § 30 Master's Program Mechatronics

### (1) Non-Consecutive Master's Program

This non-consecutive Mechatronics Master's Program consists of three semesters and is designed for those who have already successfully completed an undergraduate program in a technical or scientific field.

Coursework and exams equivalent to at least 90 European Credit Transfer and Accumulation System (ECTS) credits must be earned in order to complete the master's degree program. These courses are listed in Tables 1 to 4 along with electives.

Graduates of bachelor's degree programs which comprised only 180 ECTS must either demonstrate the successful completion of an additional 30 ECTS of coursework directly related to the field of mechatronics or must complete such coursework during the course of their master's degree program. This additional coursework must be approved by the examination board. The extra 30 ECTS are documented in the diploma supplement, but are not included in the master's degree final grade.

### (2) Prior Education Taken into Consideration eaching language

The modules and structure of the master's degree plan are adapted according to each student's prior education. Depending on the type of undergraduate program previously completed, the following module plans apply for the MM1 to MM3 semesters:

Table 1: Module plan for students who have completed a bachelor's degree in the field of mechanical engineering.

Table 2: Module plan for students who have completed a bachelor's degree in the field of electrical engineering.

Table 3: Module plan for students who have completed a bachelor's degree in the field of computer science.

Table 4: Module plan for students who have not completed a bachelor's degree in any field corresponding to Tables 1, 2, or 3.

Each student is assigned to one of the four module plans by the chairperson of the program's examination board.

Tables 1 to 3 include elective modules. The list of pre-approved electives is announced at the beginning of each semester. Furthermore, additional courses from other Ravensburg-Weingarten University master's programs can also be taken with the approval of the Mechatronics Master's Program examination board chairperson.

### (3) Language of Instruction eaching language

The courses are offered in the English language

#### (4) Assessment

The assessments scheduled for the MM1, MM2, and MM3 semesters are listed in Tables 1 to 4. The type and scope of the coursework, as well as corresponding assessments are indicated as follows:

Type of Course		Assessment		Other Abbreviations	
<b>L</b>	Lecture	<b>W(xx)</b>	Written Exam; duration in (xx) minutes	<b>SH</b>	Number of Semester Hours
<b>LH</b>	Lab/Hands-on	<b>SWP</b>	Seminar Work and Presentation	<b>ECTS</b>	Number of Credits Earned (§3)
<b>T</b>	Tutorial	<b>PR</b>	Project Result		
<b>S</b>	Seminar/Presentation	<b>PF</b>	Portfolio		
<b>P</b>	Project				

Tutoring can satisfy elective module requirements but may not exceed 5 ECTS in total. When in doubt, the chairperson of the respective examination board shall decide on the number of ECTS to be awarded.

#### (5) Master's Thesis

At least 45 ECTS must be earned in the MM1 and MM2 semesters before a student may apply to begin work on their master's thesis. Students have 6 months to complete the thesis and it must be written in English.

After submission, the master's theses are presented in a public event at Ravensburg-Weingarten University.

#### (6) Master's Degree Certificate & Transcript

The master's degree certificate and transcript are issued in English. All of the completed modules from table 1, 2, 3, or 4 are included in the transcript. Any additional modules which were taken but not included in the overall grade may be included in the transcript upon request.

#### (7) Final Grade

Both completed examinations as well as the master's thesis are included in the calculation of the final GPA (grade point average). The contribution of each assessment to the final grade is weighted according to its respective number of ECTS credits

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Table 1: MM1 to MM3 module plan for students who have completed a bachelor's degree in the field of mechanical engineering

Module	Course	Program Semester			Graded Assessment	
		Type	ECTS/ SH	ECTS/ SH		ECTS/ SH
Mathematics	Advanced Mathematics for Engineers	L/4	10/8		PF	
	Advanced Mathematics for Engineers - Lab	LH/4				
Elective Module				5/0		
Power Electronics	Power Electronics	L/4	5/4		W90	
Elective Module				5/0		
Elective Module			5/0			
Automation	Automation	L/4		5/4	W90	
Process Interface Equipment	Process Interface Equipment	L/4	5/4		PF	
	Laboratory on Process Interface Equipment	LH/2		2/2		
Simulation of Mechatronic Systems	Simulation of Mechatronic Systems	L/4	5/4		W90	
Scientific Project	Working in International Scientific Project Teams	S/1		5/5	PF	
	Scientific Project	P/4				
Advanced Control Systems	Digital Control	L/3		5/5	W60	
	Digital Control Lab	LH/2				
Robotics	Robotics	L/4		8/6	W90	
	Lab on Robotics	LH/2				
Master's Thesis	Master's Thesis incl. Colloquium			25/0		
Total ECTS / SH			30/20	30/22	30/0	

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Table 2: MM1 to MM3 module plan for students who have completed a bachelor's degree in the field of electrical engineering

Module	Course	Program Semester				Graded Assessment
			MM1	MM2	MM3	
		Type	ECTS/SH	ECTS/SH	ECTS/SH	
Mathematics	Advanced Mathematics for Engineers	L/4	10/8			PF
	Advanced Mathematics for Engineers - Lab	LH/4				
Electrical Drives	Electrical Drives	L/4		5/4		W90
Elective Module				5/0		
Engineering Design and Materials	Engineering Design and Materials	L+T/4	5/4			W90
Advanced Engineering Mechanics	Advanced Engineering Mechanics	L/4	5/4			W90
Elective Module				5/0		
Elective Module					5/0	
Simulation of Mechatronic Systems	Simulation of Mechatronic Systems	L/4	5/4			W90
Scientific Project	Working in International Scientific Project Teams	S/1		5/5		PF
	Scientific Project	P/4				
Advanced Control Systems	Digital Control	L/3		5/5		W60
	Digital Control Lab	LH/2				
Embedded Computing	Embedded Computing	L/4	5/4			PF
	Embedded Computing Lab	LH/2		5/2		
	Embedded Project	P/3				
Master's Thesis	Master's Thesis with Colloquium				25/0	
Total ECTS / SH			30/24	30/16	30/0	

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Table 3: MM1 to MM3 module plan for students who have completed a bachelor's degree in the field of computer science

Module	Course	Program Semester			Graded Assessment
		Type	MM1 ECTS/ SH	MM2 ECTS/ SH	
Mathematics	Advanced Mathematics for Engineers	L/4	10/8		PF
	Advanced Mathematics for Engineers - Lab	LH/4			
Electrical Drives	Electrical Drives	L/4		5/4	W90
Power Electronics	Power Electronics	L/4	5/4		W90
Engineering Design and Materials	Engineering Design and Materials	L+T/4			5/4 W90
Advanced Engineering Mechanics	Advanced Engineering Mechanics	L/4	5/4		W90
Elective Module				5/0	
Process Interface Equipment	Process Interface Equipment	L/4	5/4		
	Laboratory on Process Inter- face Equipment	LH/2		2/2	PF
Elective Module			5/0		
Scientific Project	Working in International Scientific Project Teams	S/1		5/5	PF
	Scientific Project	P/4			
Advanced Control Systems	Digital Control	L/3		5/5	W60
	Digital Control Lab	LH/2			
Robotics	Robotics	L/4		8/6	W90
	Lab on Robotics	LH/2			
Master's Thesis	Master's Thesis with Colloquium				25/0
Total ECTS / SH			30/20	30/22	30/4

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Table 4: MM1 to MM3 module plan for students who have not completed a bachelor's degree in any field corresponding to Tables 1, 2, or 3

Module	Course	Program Semester			Graded Assessment
		Type	MM1 ECTS/ SH	MM2 ECTS/ SH	
Mathematics	Advanced Mathematics for Engineers	L/4	10/8		PF
	Advanced Mathematics for Engineers - Lab	LH/4			
Electrical Drives	Electrical Drives	L/4		5/4	W90
Power Electronics	Power Electronics	L/4	5/4		W90
Engineering Design and Materials	Engineering Design and Materials	L+T/4			5/4 W90
Advanced Engineering Mechanics	Advanced Engineering Mechanics	L/4	5/4		W90
Automation	Automation	L/4		5/4	W90
Process Interface Equipment	Process Interface Equipment	L/4	5/4		
	Laboratory on Process Interface Equipment	LH/2		2/2	PF
Simulation of Mechatronic Systems	Simulations of Mechatronic Systems	L/4	5/4		W90
Scientific Project	Working in International Scientific Project Teams	S/1		5/5	PF
	Scientific Project	P/4			
Advanced Control Systems	Digital Control	L/3		5/5	W60
	Digital Control Lab	LH/2			
Robotics	Robotics	L/4		8/6	W90
	Lab on Robotics	LH/2			
Master's Thesis	Master's Thesis with Colloquium				25/0
Total ECTS / SH			30/24	30/26	30/4