

## § 30 Master Study Program Mechatronics

### (1) Non-consecutive studies

The non-consecutive Mechatronics program consists of three semesters and is designed for graduates of technical or scientific programs with at least a bachelor's or diploma degree.

#### Individual study plan

Prior to commencement of studies, an individual study plan from Tables 1 to 3 is compiled for each student by the examination board of the program. The courses are selected in such a way that they complement the different previous education and that a number of at least 30 ECTS is achieved in each case.

The individual study plan is designed in such a way that the courses from Table 1 are included unless they have already been completed in the previous study program. For specialization, courses from Table 2 (Special Modules) amounting to at least six ECTS are selected in the semester MM2. If, due to the crediting of already completed examination achievements from Tables 1 and 2, not enough courses remain to achieve the necessary number of ECTS, courses are preferably added from Table 3 (Optional Modules). Furthermore, with the approval of the chairperson of the examination board (Master Mechatronics), courses from Ravensburg-Weingarten University can be selected from other Master's programs.

By the end of semester MM2, a scientific project (Scientific Project) must be completed in one of the university's laboratories during the lecture-free period or parallel to the lectures. This project includes an engineering part in which an interdisciplinary problem is to be addressed. In an introductory part, aspects of project management and intercultural cooperation are to be presented and tested. The Scientific Project is to be graded by two professors and concludes with a report summarizing the results achieved. The results are to be presented in a university public lecture. The report is to be submitted to the chairperson of the relevant examination committee for approval before the beginning of the semester MM3.

The third semester of study is preferably reserved for the preparation of the Master's thesis. Parallel to the master's thesis, elective or compulsory modules may be scheduled.

For the successful completion of the non-consecutive study program, courses as well as the corresponding course and examination achievements amounting to at least 90 ECTS are required. These are shown in tables 1 to 3.

Graduates of bachelor's degree programs whose studies only comprise 180 ECTS must provide evidence of additional study achievements from the fields of mechatronics to the extent of 30 ECTS or complete them during the master's degree program, which must be approved by the examination board. These 30 ECTS are shown in the Diploma Supplement, but are not included in the overall grade of the Master's degree.

## (2) Teaching language

The courses are to be offered in English.

## (3) Examination achievements

The examination achievements scheduled for the semesters MM1, MM2 and MM3 are listed in Tables 1 to 3. The type of study and examination performance for the study-accompanying courses as well as their scope is determined as follows:

Type of course	Type of exam	Scope of exam
<b>V</b> Lecture	<b>B</b> Bachelor thesis	<b>SWS</b> Semester hours
<b>PR</b> Project	<b>R</b> Seminar Paper and presentation	<b>ECTS</b> ECTS points in compliance with the European Credit Transfer System
<b>S</b> Seminar	<b>PF</b> Portfolio	<b>E</b> Medium of instruction is English
<b>P</b> Practical, exercises	<b>K(xx)</b> Written examination duration of xx minutes	<b>D</b> Medium of instruction is German
	<b>M</b> Oral examination	
	<b>PA</b> Practical work (lab, term or seminar paper or project work)	
	<b>RPA</b> Practical work documented by a seminar paper and presentation (PF: 50% PA graded and 50% R graded)	

If tutoring activities are carried out, their total volume may not exceed five ECTS. In cases of doubt, the chairperson of the responsible examination board decides on the ECTS to be credited.

## (4) Master's thesis

In order to be admitted to work on the master's thesis, the course work from the semesters MM1 and MM2 amounting to at least 55 ECTS must have been completed.

The Master's thesis should not be carried out in the student's home country. This means for German students that they usually do their Master's thesis at selected partner universities. Exceptions require the approval of the chairperson of the examination board. Holders of a foreign university degree usually do their Master's thesis at Ravensburg-Weingarten University of Applied Sciences. In both cases, the Master's thesis may possibly be carried out in cooperation with a company.

The Master's thesis must be written in English. If the Master's thesis is carried out at a partner university, it will be jointly supervised and graded by a professor of Ravensburg-Weingarten University and a professor of the partner university. If the Master's thesis is not carried out at a partner university or Ravensburg-Weingarten University, it will be graded by two professors from Ravensburg-Weingarten University. After completion, the results of the Master's thesis are presented in a public event at Ravensburg-Weingarten University.

**(5) Master's certificate**

The Master's certificate is issued in English. All completed module examinations from Tables 1 to 3 and the Master's thesis are included in the certificate. Upon application, additional modules can be listed in the Master's certificate; these are not taken into account in the formation of the overall grade.

**(6) Overall score**

The completed module examinations and the Master's thesis are included in the calculation of the average grade with the weight according to the ECTS.

**Table 1: Modules for MM1 to MM3**

Modules	Courses	Assigned semester				Graded Examination achievement
			MM1	MM2	MM3	
		Type	ECTS/SWS	ECTS/SWS	ECTS/SWS	
Mathematics	Advanced Mathematics for Engineers	V	10/8			PF
	Advanced Mathematics for Engineers - Lab	L				
Electrical Drives	Electrical Drives	V	5/4			K90
Power Electronics	Power Electronics	V	5/4			K90
Engineering Design and Materials	Engineering Design and Materials	V+Ü	6/6			K90
Engineering Mechanics	Engineering Mechanics	V	6/6			K90
Integration of Mechatronic Systems	Integration of Mechatronic Systems	V		5/4		K90
Process Interface Equipment	Process Interface Equipment	V/4		8/6		K90
	Laboratory on Process Interface Equipment	L/2				
Simulation of Mechatronic Systems	Simulation of Mechatronic Systems	V	5/4			K90
Scientific Project	Working in International Scientific Project Teams	S/1		6/5		PR
	Scientific Project	P/4				
Advanced Control Systems	Digital Control	V		5/4		K60
	Digital Control Lab	L				
Automation	Automation	V		5/4		K90
Embedded Computing	Embedded Computing	V/4	0/4			PF
	Embedded Computing Lab	L/2		10/5		
	Embedded Project	P/3				
Special Module	Tab. 2			8/6		
Optional Module	Tab. 3				5/4	
Master's thesis	Master's thesis incl. Colloquium				25/0	
<b>Summe ECTS/SWS</b>			<b>37/36<sup>1</sup></b>	<b>47/34<sup>1</sup></b>	<b>30/4</b>	

1) According to the individual study plan, only some of the modules are to be taken (cf. § 29 paragraph 1)

**Table 2: Special Modules**

The courses are offered in the MM2 semester.

Modul	Courses	Assigned semester				Graded Examination achievement
			MM1	MM2	MM3	
		Type	ECTS/ SWS	ECTS/ SWS	ECTS/ SWS	
Robotics	Robotics	V/4		8/6		K90
	Lab on Robotics	L/2				

**Table 3: Optional Modules**

Courses are not offered every semester. Other courses may be offered in addition if necessary.

Modules	Type of course	Type of exam	ECTS	SWS
Industrial Project	P	PR	5	4
Research Project	P	PR	5	4
PLC Programming	P	PR	5	4
Systems Analysis and Simulation with LabView	V	PF	5	4