



## Correspondence Tables – Double Degree Automation Engineering M.Sc., Bologna and Technische Kybernetik M.Sc., U Stuttgart

The following four tables (pages 2-5) show the correspondence of the two study programmes. They are meant to provide details and explanations in addition to the Macroplan. More specifically, the following four tables indicate how

1. Bologna students taking part in the DD satisfy the exam regulations (Prüfungsordnung)/study plan in Bologna,
2. Bologna students taking part in the DD satisfy the exam regulations (Prüfungsordnung)/study plan in Stuttgart,
3. Stuttgart students taking part in the DD satisfy the exam regulations (Prüfungsordnung)/study plan in Stuttgart,
4. Stuttgart students taking part in the DD satisfy the exam regulations (Prüfungsordnung)/study plan in Bologna.

On the left, we list the courses of the respective study programme (Stuttgart/Bologna) and on the right we list the corresponding courses of the DD, color-coded by the location where the courses are taken.

The course structure diagram in Automation Engineering can be found [here](#) and the study plan for Engineering Cybernetics can be found [here](#). For more details also see the [list of Stuttgart courses](#) in Technische Kybernetik and the Stuttgart exam regulations ([Prüfungsordnung](#)).

## Bologna students – Bologna exam regulations

The following table shows how Bologna students satisfy the exam regulations in Bologna.

Exam regulations Bologna <sup>1</sup>		ECTS	Sem.	Courses taken (Stuttgart / Bologna)	Type	ECTS	Sem.	
Mandatory	Mathematical Methods for Automation Engineering	C	6	I	Mathematical Methods for Automation Engineering	C	6	I
	System Theory and Advanced Control	B	9	I	System Theory and Advanced Control	B	9	I
	Industrial Robotics	B	6	II	Industrial Robotics	B	6	II
	Learning and Estimation of Dynamical Systems	B	6	II	Learning and Estimation of Dynamical Systems	B	6	II
	Mechanics of Machines for Automation	B	9	II	Mechanics of Machines for Automation	B	9	II
	Real Time Systems for Automation	C	12	I-II	Real Time Systems for Automation	C	12	I-II
	Optimal Control	B	6	III	Advanced Control: Optimal Control		6	III
	Modelling and simulation of mechatronic systems	B	9	III-IV	Data-Driven Control or Adaptive Control		3	III
					Area of Specialisation with control focus	B	3	IV
					Industry Internship (3 of 15)		3	III
			63			63		
Elective	Elective Courses	B	12		B Elective	B	6	II
					Area of Specialisation with control focus	B	6	III
		C	6		C Elective	C	6	I-II
	Courses Freely Chosen by the Student	D	12		Industry Internship (12 of 15)		12	III
	Thesis Project and Final Examination	E	21	IV	Master thesis		30	IV
External Internship	F	6	IV					
			120			123		

<sup>1</sup> Bologna requires their students to study the first year almost exactly as shown in the [course structure diagram](#) for Automation Engineering. One exception is 6 ECTS of a B elective that Bologna students already take in the first year in Bologna.

## Bologna students – Stuttgart exam regulations

The following table shows how Bologna students satisfy the exam regulations in Stuttgart.

Exam regulations Stuttgart		Type	ECTS	Sem.	Courses taken (Stuttgart / Bologna)	Type	ECTS	Sem.
Mandatory	Dynamics of Distributed Parameter Systems		6	II	Mathematical Methods for Automation Engineering	C	6	II
	Project Engineering Cybernetics		3	I-II	Mechanics of Machines for Automation (3 of 9)	B	3	I-II
	Concepts of Automatic Control		6	I	System Theory and Advanced Control (6 of 9)	B	9	I
	Advanced Control		12	II-III	System Theory and Advanced Control (3 of 9)		3	
					Data-Driven Control or Adaptive Control		3	III
					Optimal Control		6	III
	System Analysis II and Modeling II		6	I-III	Learning and Estimation of Dynamical Systems	B	6	II
Elective	Area of Specialisation 1: C courses bucket		18	I-III	Real Time Systems for Automation	C	12	I-II
					C Elective	C	6	I-II
	Area of Specialisation 2		12	I-III	B Elective	B	6	I-II
					Area of Specialisation with control focus	B	9	III-IV
	Elective		12	I-III	Industrial Robotics	B	6	II
					Mechanics of Machines for Automation (6 of 9)	B	6	II
	Industry Internship		15	III	Industry Internship	D	15	III
	Master Thesis		30	IV	Master thesis		30	IV
			120				123	

## Stuttgart students – Stuttgart exam regulations

The following table shows how Stuttgart students satisfy the exam regulations in Stuttgart.

Exam regulations Stuttgart		Type	ECTS	Sem.	Courses taken (Stuttgart / Bologna)		Type	ECTS	Sem.
Mandatory	Concepts of Automatic Control		6	I	Concepts of Automatic Control			6	I
	Dynamics of Distributed Parameter Systems		6	II	Dynamics of Distributed Parameter Systems			6	II
	Project Engineering Cybernetics		3	I-II	Project Engineering Cybernetics			3	I-II
	Advanced Control		12	I-III	Advanced Control: Nonlinear Control			6	II
	System Analysis II and Modeling II		6	I-II	Advanced Control: Optimal Control	B		6	III
Elective	Area of Specialisation 1 <sup>2</sup>		12	I-III	Modelling and Identification of dynamical systems			6	II
					Area of Specialisation with Comp. Science/Engineering focus	C		6	I-III
	Area of Specialisation 2		18	I-III	C Elective	C		6	I - III
					B Elective	B		6	I-IV
					B Elective	B		6	I - IV
					Area of Specialization ( <i>Maschinendynamik if not taken in BSc</i> )	B		6	I-IV
	Elective		12	I-III	Modelling and simulation of mechatronic systems	B		9	III-IV
				Control Tech. of Machines and Industrial Robots			6	I-III	
	Industry Internship		15	I-II	Industry Internship			15	I-II
	Master Thesis		30	IV	Master Thesis <sup>3</sup>			30	IV
				120					123

<sup>2</sup> 6 ECTS must be chosen from the following list of courses (= Area of Specialisation 1: C course bucket) at the University of Stuttgart:

- Software Engineering for Real Time Systems
- Control Architectures and Communication Technology
- Operation Systems
- Real-time Concepts for Embedded Systems.

<sup>3</sup> The 3 ECTS excess credit points are due to the 27 ECTS for the master thesis in Bologna and 30 ECTS for the master thesis in Stuttgart.

## Stuttgart students – Bologna exam regulations

The following table shows how Stuttgart students satisfy the exam regulations in Bologna

Exam regulations Bologna					Courses taken (Stuttgart / Bologna)				
		Type	ECTS	Sem.		Type	ECTS	Sem.	
Mandatory	Mathematical Methods for Automation Engineering	C	6	I	Dynamics of Distributed Parameter Systems		6	II	
	System Theory and Advanced Control	B	9	I	Concepts of Automatic Control (3 of 6)		3	I	
					Nonlinear Control		6	II	
	Industrial Robotics	B	6	II	Control Tech. of Machines and Industrial Robots	B	6	II	
	Learning and Estimation of Dynamical Systems	B	6	II	Modelling and Identification of dynamical systems		6	II	
	Mechanics of Machines for Automation	B	9	II	Area of Specialization with control focus or <i>Maschinendynamik</i> <sup>4</sup>		6	I-IV	
					Concepts of Automatic Control (3 of 6)		3	I	
	Real Time Systems for Automation	C	12	I-II	Area of Specialisation with Comp. Science/Engineering focus		6	I-II	
					Industry Internship (3 of 15)		3		
					Project Engineering Cybernetics		3	I-II	
	Optimal Control	B	6	III	<b>Optimal Control</b>	B	6	III	
	Modelling and simulation of mechatronic systems	B	9	III-IV	<b>Modelling and simulation of mechatronic systems</b>	B	9	III-IV	
			63				63		
Elective	Elective Courses	B	12	I-IV	<b>B Elective</b>	B	12	III-IV	
	Elective Courses	C	6	I-II	<b>C Elective</b>		6	I-II	
	Courses Freely Chosen by the Student	D	12	III-IV	Industry Internship (12 of 15)		12	I-II	
	Thesis Project and Final Examination	E	21	IV	<b>Master Thesis</b> <sup>5</sup>		30	IV	
	External Internship	F	6	IV					
			120				123		

<sup>4</sup> Stuttgart students that have not taken "Maschinendynamik" in the B.Sc. must take it instead of a B Elective.

<sup>5</sup> The 3ECTS excess credit points are due to the 27 ECTS for the master thesis in Bologna and 30 ECTS for the master thesis in Stuttgart.