

DEPARTMENT OF MOLECULAR BIOTECHNOLOGY
COURSE SYLLABUS

Course Details					
Code				Academic Year	Semester
NWI204				2	4
Title	T	A	L	ECTS	
Measurement Techniques	2	0	2	6	
Language					
Level	Undergraduate	X	Graduate		Postgraduate
Department / Program	Molecular Biotechnology				
Forms of Teaching and Learning	Face to Face				
Course Type	Compulsory	X	Elective		
Objectives	Understand the theory of measurement, knowledge of sensors, Knowledge of methods of measuring different sizes, Group work ability for laboratory exercises				
Content	Introduction to metrology Measuring electrical quantities in theory and in practice Measuring non-electrical quantities in theory and in practice Understand the characteristics of transducers Digital metrology, Measurement error analysis and statistical evaluation, Static and dynamic behavior of measuring instruments				
Prerequisites					
Coordinator					
Lecturer(s)	Dr. Sungur Aytaç				
Assistant(s)	Sami Orçun Kortunay, Muhammed Cihat Mercan				
Work Placement					
Recommended or Required Reading					
Books / Lecture Notes	U. Kiencke, R. Eger: "Technique of measurement: Messtechnik", 6. Aufl., Springer, 2005. J. Niebuhr, G. Lindner: „Physikalische Messtechnik mit Sensoren: Physical Measurement with Sensors“, 5. Aufl., Oldenbourg, 2005. E. Schrüfer: „Elektrische Messtechnik: Measurement of electrical and not electrical quantities: Messung elektrischer und nichtelektrischer Größen“, 7. Aufl., Hanser, 2001 J. Hoffmann: „Taschenbuch der Messtechnik: Pocketbook of Measuring“, 4. Aufl., Hanser, 2004				
Other Sources	Heyne, Georg Elektronische Meßtechnik Eine Einführung für angehende Wissenschaftler, OLDENBOURG Wissenschaftsverlag GmbH, 1999 ISBN 3-486-24976-2 ISBN 978-3-486-24976-7 F. Puente León: Messtechnik, Springer-Verlag, Berlin Heidelberg, 2016, ISBN 978-3-662-44820-5				
Additional Course Material					
Documents					

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Assignments			
Exams			
Course Composition			
Mathematics und Basic Sciences		% 30	
Engineering		% 70	
Engineering Design		%	
Social Sciences		%	
Educational Sciences		%	
Natural Sciences		%	
Health Sciences		%	
Expert Knowledge		%	
Assessment			
Activity	Count	Percentage (%)	
Midterm Exam	1	% 25	
Quiz	0	% 0	
Assignments	0	% 0	
Attendance	0	% 0	
Recitations	14	%15	
Projects	0	% 0	
Final Exam	1	% 60	
	Total	100	
ECTS Points and Work Load			
Activity	Count	Duration	Work Load (Hours)
Lectures	14	2	28
Self-Study	10	10	100
Assignments	4	8	32
Presentation / Seminar Preparation			
Midterm Exam	1	2	2
Recitations			
Laboratory	14	1	14
Projects	14	1	14
Final Exam	1	2	2
		Total Work Load	192
		ECTS Points (Total Work Load / Hours)	6
Learning Outcomes			

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1	Understand the theory of methodology
2	Knowledge of sensors
3	Ability of group work in the laboratory environment
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Weekly Content

1	Introduction to measurement technology
2	Introduction to laboratory exercises and safety rules. Measuring devices
3	Metals and semiconductors
4	Measuring electrical quantities
5	Active and passive sensors
6	Measuring non-electrical quantities
7	Characteristics of the transducers
8	Measuring circuits
9	Digital measurement technology
10	Several examples from industry
11	Measurement error and statistical evaluation
12	Static and dynamic behavior of measuring instruments
13	
14	
15	

Contribution of Learning Outcomes to Program Objectives (1-5)

	P1	P2	P3	P4	P5	P6	P7
1	5	5	5	5	5	5	5
2							
3							

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4							
5							
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11							
12							
Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High						
Compiled by:							
Date of Compilation:	08.03.2021						