DEPARTMENT OF MECHATRONICS ENGINEERING
COURSE SYLLABUS

Course Details				
Code		**Academic Year**		**Semester**
MEC321		3		Fall
Title	**T**	**A**	**L**	**ECTS**
Image Based Automation I	2	1	1	6

Language	German					
Level	**Undergraduate**	x	**Graduate**		**Postgraduate**	
Department / Program	Mechatronics Engineering					
Forms of Teaching and Learning	Classroom teaching					
Course Type	**Compulsory**	x	**Elective**			
Objectives	Recognition of image processing systems requirements To provide knowledge on software, camera, lighting and lens equipment To teach the basic image processing methods and the related applications Gaining the skill of preparing protocols for the experiments					
Content	Introduction to image-based automation Image processing basics Image acquisation Operator types Edge detection, Morphology Hough transform Fourier transform Image noise, Noise suppression Texture analysis					
Prerequisites	-					
Coordinator	-					
Lecturer(s)	Asst. Prof. Dr. N. Özben Önhon					
Assistant(s)	Onur Akgün					
Work Placement						

Recommended or Required Reading	
Books / Lecture Notes	• Demant, C.: „Industrielle Bildverarbeitung: Wie optische Qualitätskontrolle wirklich funktioniert“ • Jähne, B.: „Digitale Bildverarbeitung“ • Bässmann, H.; Kreyss, J.: „Bildverarbeitung Ad Oculos“ • Burger, W.; Burge, M.J.: „Digitale Bildverarbeitung: Eine Einführung mit Java und ImageJ“
Other Sources	

Additional Course Material	
Documents	

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Assignments		
Exams	1 Midterm, 1 Final	
Course Composition		
Mathematics und Basic Sciences		30%
Engineering		30%
Engineering Design		%
Social Sciences		%
Educational Sciences		%
Natural Sciences		%
Health Sciences		%
Expert Knowledge		40%
Assessment		
Activity	**Count**	**Percentage (%)**
Midterm Exam	1	30
Quiz		
Assignments		
Attendance		
Recitations	6	30
Projects		
Final Exam	1	40
	Total	**100**

ECTS Points and Work Load			
Activity	**Count**	**Duration**	**Work Load (Hours)**
Lectures	14	2	28
Self-Study	14	8	112
Assignments			
Presentation / Seminar Preparation			
Midterm Exam	1	2	2
Recitations	14	1	14
Laboratory	14	1	14
Projects			
Final Exam	1	2	2
		Total Work Load	**172**
		ECTS Points (Total Work Load / Hour)	**6**

Learning Outcomes

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1	Recognition of the requirements for image processing systems
2	Learn how to choose suitable software, cameras, lighting and lenses
3	Learning the basic image processing methods
4	Preparation of protocols for experiments
5	
6	
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10	
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12	
Weekly Content	
1	Introduction to image-based automation
2	Image processing basics
3	Image capture
4	Image capture
5	Operator types
6	Operator types
7	Edges, morphology
8	Edges, morphology
9	Midterm
10	Hough transform
11	Fourier transform
12	Fourier transform
13	Image noise, noise reduction
14	Image noise, noise reduction
15	Texture analysis

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

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
1	5	5	5	5	5	5	4	4	5	4	5	
2	5	5	5	5	5	5	4	4	5	4	5	
3	5	5	5	5	5	5	4	4	5	4	5	

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4	5	5	5	5	5	5	4	4	5	4	5	
5												
6												
7												
8												
9												
10												
11												
12												

Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High

https://obs.tau.edu.tr/oibs/bologna/progLearnOutcomes.aspx?lang=en&curSunit=196

Compiled by:	Asst. Prof. Dr. N. Özben Önhon
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