AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Digital Image Processing								
Course Code	ZTM546		Couse Level	Second Cycle (Master's Degree)					
ECTS Credit	8	Workload	200 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	The aim of this course is to teach Image Segmentation, Recognition, Compression, Image Enhancement and Image Understanding techniques.								
Course Content	Fundamentals of Image Processing and MATLAB, Intensity Transformations and Spatial Filtering, Frequency Domain Processing, Image Restoration, Quantization, Color Image Processing, Wavelets and Multi-Resolution Processing, Image Compression, Morphological Image Processing, Image Segmentation, Representation and Description, Object Recognition.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Experiment, Demonstration, Case Study, Individual Study, Problem Solving								
Name of Lecturer(s)	Lec. Yüksel AYDOĞAN								

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	60

Recommended or Required Reading	
1	Image Processing. Analysis and Machine Vision (Fourth Edition), Milan Sonka, Vaclav Hlavac, Roger Boyle, Cengage Learning, 2014.
2	Digital Image Processing Using Matlab, 2nd Edition, by R. Gonzalez, R. Woods and S. Eddins, 2009, Prentice Hall.

Week	Weekly Detailed Course Contents	
1	Theoretical	Introduction to Image Processing: Definition of Image. Definition of Image Processing. Aims, Importance and Limits of Image Processing. Study, Research and Application Areas of Image Processing
2	Theoretical	Matlab and DIP In Matlab
3	Theoretical	Image Sources (Gamma Ray, X-Ray, Ultraviolet, Visible and Infrared, Microwave, Radio, …). Components of an Image Processing System.
4	Theoretical	Digital Image Fundamentals.
5	Theoretical	Intensity Transformations and Spatial Filtering
6	Theoretical	Biometrics Recognition: Face Recognition, Character Recognition, Recognition Using Matlab Filtering in the Frequency Domain and Image Restoration
7	Theoretical	Morphological Image Processing Color Image Processing, Image Compression
8	Intermediate Exam	Midterm Exam
9	Theoretical	Image Segmentation
10	Theoretical	Representation, Description and Recognition
11	Theoretical	Geometric Transformations
12	Theoretical	Blur Algorithms
13	Theoretical	Image Sharpening Algorithms
14	Theoretical	Edge Detection Algorithms, Arithmetic and Logic Operators
15	Final Exam	Final Exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	5	3	112
Assignment	4	5	5	40
Laboratory	4	2	2	16
Midterm Examination	1	14	2	16

Final Examination	1	14	2	16
			Total Workload (Hours)	200
			[Total Workload (Hours) / 25*] = **ECTS**	8
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To develop Image Processing Software; To have ability to apply segmentation, image analysis and recognition techniques on images in real life.
2	To gain the ability to recognize and use image processing environments and tools such as Matlab and C #.
3	To do research in state-of-the-art subjects of digital image processing area; preparing and doing presentation. To gain experience in reading and writing papers in DIP.
4	To learn basic concepts of Digital Image Processing (DIP), mathematical and software background; to have ability to apply DIP to problems. To recognize the role of DIP in computer engineering and computer science.
5	To gain the ability to apply image processing in the agricultural field.

Programme Outcomes *(Agricultural Machinery Master)*	
1	Identification, formulation and solving the problems in the field of Agricultural Machinery
2	The ability to use modern engineering tools and techniques
3	The ability to use the information, which is obtained by following the scientific and technological developments, in the academic life and practice.
4	The ability to evaluate multi-faced relationship between them by understanding interaction among agricultural technology, soil, plants and animals
5	Professionalism and ethical responsibility
6	The ability to work in disciplinary and multi-disciplinary teams
7	The ability to communicate effectively
8	The ability to do research for accessing information and to use data base and other resources
9	The ability to do analyze and interpret the experimental results and the design of experiment
10	The ability to identify and interpret knowledge of current professional issues and events
11	The ability to get aware the universal and social effects of engineering solutions and applications
12	Accordance with the requirements of science and technology, ability to use scientific knowledge creative

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5
P1	5	3	4		5
P2	5	4	5	4	5
P3	5	4	5		5
P4	5	4	5	4	5
P6	4		4		
P8	4	3	4	3	
P9	4	4			5
P10	5		4		
P11				3	5
P12	5		4	4	5