AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title		Optimization Theory						
Course Code		EEE533		Couse Level		Second Cycle (Master's Degree)		
ECTS Credit	8	Workload	200 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The objective of this course is to understand the essential optimization techniques and apply them to some communication problems.						
Course Content		Unconstrained optimization techniques: Gradient Methods, Newton Methods, Quasi-Newton Methods, Least Squares Analysis, Genetic Algorithms; Linear Programming; Constrained optimization techniques: Convex optimization Problems, Algorithms for constrained optimization.						
Work Placement		N/A						
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion, Case Study, Project Based Study, Individual Study, Problem Solving				
Name of Lecturer(s)								

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	20
Final Examination	1	40
Assignment	5	20
Project	1	20

Recommended or Required Reading

1	An Introduction to Optimization (4th Edition), by Edwin K. P. Chong , Stanislaw H. Zak.
2	S. Boyd and L. Vandenberghe, Convex Optimization ,Cambridge University Press, 2004.

Week	Weekly Detailed Course Contents	
1	Theoretical	Mathematical Review
2	Theoretical	Mathematical Review
3	Theoretical	Basics of Unconstrained Optimization; One Dimensional Search Methods
4	Theoretical	Gradients Method
5	Theoretical	Newton's Methods; Quasi Newton's Methods
6	Theoretical	Least Squares Analysis
7	Theoretical	Genetic Algorithm
8	Intermediate Exam	Midterm Exam
9	Theoretical	Linear Programming
10	Theoretical	Linear Programming
11	Theoretical	Basics of Constrained Optimization; Problems with equality constraints
12	Theoretical	Problems with inequality constraints
13	Theoretical	Convex Optimization Problems
14	Theoretical	Algorithms for Constrained Optimization
15	Theoretical	Algorithms for Constrained Optimization
16	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	3	3	84
Assignment	5	4	0	20
Project	1	36	0	36
Individual Work	14	3	0	42
Midterm Examination	1	6	3	9

Final Examination	1	6	3	9
		Total Workload (Hours)		200
		[Total Workload (Hours) / 25*] = **ECTS**		8

*25 hour workload is accepted as 1 ECTS

Learning Outcomes

1	To understand the fundamentals of the optimization problems and solution techniques.
2	To be able to solve unconstrained optimization problems by using different optimization methods.
3	To learn linear programming.
4	To gain experience on the convex optimization problems.
5	To gain ability to do original research in academia or industry through final projects that are closely related to students' own research interests.

Programme Outcomes *(Electrical and Electronics Engineering Master)*

1	Developing and intensifying knowledge that requires expertise in the area of Electrical-Electronics Engineering, and gaining the skills necessary to analyze and solve problems using this knowledge
2	Grasping the inter-disciplinary interaction related to Electrical-Electronics Engineering, interpreting and forming new types of knowledge by combining the knowledge from Electrical-Electronics Engineering and the knowledge from various other disciplines
3	Developing new approaches to solve the complex problems arising in Electrical-Electronics Engineering, coming up with solutions while taking responsibility and carrying out a specific study independently
4	Assessing the knowledge and skill gained in the area of Electrical-Electronics Engineering with a critical view
5	Transferring the current developments and one's own work in Electrical-Electronics Engineering, to other groups in written, oral and visual forms
6	The ability to control the collecting, interpreting, practicing and announcing processes of the Electrical-Electronics Engineering related to data taking into consideration scientific, cultural and ethical values and the ability to teach these values to others
7	Developing application plans concerning the subjects related to Electrical-Electronics Engineering and the ability to evaluate the end results of these plans within the frame of quality processes

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	4	4	4	4	4
P2	4	4	4	4	4
P3	4	4	4	4	4
P4	4	4	4	4	4
P5	4	4	4	4	4
P6	4	4	4	4	4
P7	4	4	4	4	4