AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Numerical Method Of Heat Conduction								
Course Code	ZTM622		Couse Level	Third Cycle (Doctorate Degree)					
ECTS Credit	8	Workload	200 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	Solutions of algebraic equation systems, gaus elimination method, gaus seidel repetition method, solution of linear equation systems by matrix method, finite difference method, solution of one dimensional heat conduction in continuous regime with finite difference method, solution of two dimensional heat conduction in continuous regime with finite difference method, discontinuous method solution of one dimensional heat conduction by finite difference method in open regime, open method, closed method, solution of two dimensional heat conduction in discontinuous regime by means of artificial difference method, thermal resistance and capacity, finite difference method for moving boundary problems, boundary conditions, Crank-Nicholson method, finite differences errors in network solutions.								
Course Content	Solutions of algebraic equation systems, gaus elimination method, gaus seidel repetition method, solution of linear equation systems by matrix method, finite difference method, solution of one dimensional heat conduction in continuous regime with finite difference method, solution of two dimensional heat conduction in continuous regime with finite difference method, discontinuous method solution of one dimensional heat conduction by finite difference method in open regime, open method, closed method, solution of two dimensional heat conduction in discontinuous regime by means of artificial difference method, thermal resistance and capacity, finite difference method for moving boundary problems, boundary conditions, Crank-Nicholson method, finite differences errors in network solutions.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Problem Solving								
Name of Lecturer(s)									

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

Recommended or Required Reading	
1	Çengel, Y. (2011). Isı ve kütle transferi . İstanbul: Güven Yayın.

Week	Weekly Detailed Course Contents	
1	Theoretical	Entrance
2	Theoretical	Solutions of algebraic equations
3	Theoretical	Gaus destruction method
4	Theoretical	Gaus destruction method
5	Theoretical	Solution of linear equation systems by matrix method,
6	Theoretical	Finite difference method
7	Intermediate Exam	midterm exam
8	Theoretical	Solution of one dimensional heat conduction in continuous regime by finite difference method
9	Theoretical	Solution of one dimensional heat conduction in continuous regime by finite difference method
10	Theoretical	Solution of one dimensional heat conduction in discontinuous regime by finite difference method,
11	Theoretical	Thermal resistance and capacity
12	Theoretical	Finite difference method for moving boundary problems
13	Theoretical	Boundary conditions, Crank-Nicholson method
14	Final Exam	final exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	4	3	98
Assignment	6	5	10	90
Midterm Examination	1	3	3	6

Final Examination	1	3	3	6
			Total Workload (Hours)	200
			[Total Workload (Hours) / 25*] = **ECTS**	8
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	Mastery of numerical methods
2	To be able to use numerical methods in heat conduction
3	Solutions of algebraic equations
4	Solution of linear equation systems by matrix method,
5	Finite difference method for moving boundary problems

Programme Outcomes *(Agricultural Machinery Doctorate)*	
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	L3	L5
P1	4		4
P2		5	
P3	4		
P4			4
P5		5	
P6	5		
P8		5	
P9			4