



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Analytical Methods in Engineering							
Course Code		MCE501		Course Level		Second Cycle (Master's Degree)			
ECTS Credit	7	Workload	175 (<i>Hours</i>)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The objectives of this course are to enable the students to understand analytical solution methods for linear ordinary and partial differential equations. This course will enable graduate students to solve Bessel, Gamma,Laguerre functions and Legendre polynomials.							
Course Content		Ordinary differential equations. Series solutions of ordinary differential equations. Method of Frobenius. Fourier series. Boundary conditions. Partial differential equations. Seperation of variables. Bessel, Gamma,Laguerre functions. Legendre polynomials.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Case Study, Individual Study, Problem Solving					
Name of Lecturer(s)		Prof. Selman SAĞLAM							

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	2	40
Final Examination	1	40
Assignment	4	20

Recommended or Required Reading

1	P.V. O'Neil, Advanced Engineering Mathematics, 7. Ed., Cengage Learning, 2010.
2	F.B. Hildebrand, Advanced Calculus for Applications, 2. Ed., Prentice-Hall, 1976
3	C.R. Wylie, Differential Equations, McGraw-Hill, 1979

Week	Weekly Detailed Course Contents	
1	Theoretical	Elementary Methods for solution of ordinary differential equations
2	Theoretical	Elementary Methods for solution of ordinary differential equations
3	Theoretical	Series solutions of ordinary differential equations
4	Theoretical	Series solutions of ordinary differential equations
5	Theoretical	Method of Frobenius
6	Theoretical	Fourier Series
7	Theoretical	Boundary Conditions
8	Intermediate Exam	Midterm Exam
9	Theoretical	Partial Differential Equations
10	Theoretical	Partial Differential Equations
11	Theoretical	Separation of variables
12	Theoretical	Separation of variables
13	Theoretical	Separation of variables
14	Theoretical	Special functions
15	Theoretical	Special functions
16	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	2	3	70
Assignment	4	0	4	16
Midterm Examination	2	25	3	56



Final Examination	1	30	3	33
Total Workload (Hours)				175
[Total Workload (Hours) / 25*] = ECTS				7
*25 hour workload is accepted as 1 ECTS				

Learning Outcomes

1	be able to find analytical solutions of linear ordinary differential equations
2	be able to find analytical solutions of partial differential equations
3	be familiar with Fourier series
4	be able to solve Bessel, Gamma, Laguerre functions
5	be familiar with Legendre polynomials

Programme Outcomes (Food Engineering Master)

1	To provide further training and research opportunities to food engineers to meet the needs of the food industry
2	To develop and deepen the current and advanced knowledge in the field of food engineering with original thought and / or research at the level of expertise, based on the qualifications of the master
3	To identify, define, formulate and solve problems in applications related to Food Engineering and gain the ability to select and apply appropriate analytical methods and modeling techniques
4	To gain the ability to evaluate the accuracy of the data obtained from food analysis
5	To educate students having research, entrepreneur qualifications

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	5	5	5	5	5
P4	5	5	5	5	5
P5	3	3	3	3	3

