

AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Dynamic System Modelling and Simulation							
Course Code		MME634		Couse Level		Third Cycle (Doctorate Degree)			
ECTS Credit	8	Workload	200 (Hours)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		To introduce fundamentals on modelling and simulation of dynamical systems, and to provide simulation tools to obtain response of dynamical systems							
Course Content		Modeling dynamical systems, numerical tools to simulate behavior of dynamical systems							
Work Placement		N/A							
Planned Learning Activities		and Teaching Methods Explanation (Presentation), Case Study, Individual Study							
Name of Lecturer(s)									

Prerequisites & Co-requisities

Language Requisite

Assessment Methods and Criteria

Method	Quantity	Percentage (%)	
Midterm Examination	1	20	
Final Examination	1	60	
Assignment	1	20	

Yes

Recommended or Required Reading

1	Modelling, Analysis & Control of Dynamic Systems. William J. Palm, III, 2000.
2	Modelling and Simulation, J.R. Leigh, Peter Peregrinus Ltd. London, UK, 1983.
3	Modelling and Identification of Dynamic Systems, N. K. Sinha, B. Kuszta, Van Nostrand Reinhold Company, 1981.
4	Modelling & Analysis of Dynamic Systems. C. M. Close, D. K. Frederick, J. C. Newell, 2002.

Week	Weekly Detailed Cours	ed Course Contents				
1	Theoretical	Introduction to Modeling and Simulation				
2	Theoretical	Formulation of Engineering Systems: Differential Equations				
3	Theoretical	Mechanical Systems: Translational and Rotational				
4	Theoretical	D'Alembert's Principle and Lagrange Equations				
5	Theoretical	Electrical Systems				
6	Theoretical	Mixed Discipline Systems: Electromechanical system				
7	Theoretical	Modeling examples: Problem solutions				
8	Intermediate Exam	Midterm				
9	Theoretical	Nonlinear systems: Linearization				
10	Theoretical	Frequency response analysis				
11	Theoretical	Time response analysis of linear systems: Analytical solutions				
12	Theoretical	Time response analysis of linear systems: Numerical solutions				
13	Theoretical	Applications with MATLAB				
14	Theoretical	Applications with MATLAB				
15	Theoretical	Applications with MATLAB				
16	Final Exam	Final Exam				

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	6	3	126
Assignment	7	3	1	28
Midterm Examination	1	20	3	23



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Final Examination	1	20	3	23			
	200						
[Total Workload (Hours) / 25*] = ECTS							
*25 hour workload is accepted as 1 ECTS							

Learn	earning Outcomes	
1	1 To derive mathematical modeling of dynamical systems	
2	2 To obtain fundamental knowledge on simulation tools	
3	3 To be able to solve differential equations by using numerical tools	
4	4 To obtain MATLAB Software skills for industrial applications	
5	5 To enrich programming and simulation skills for real-life problems	

Programme Outcomes (Mechanical Engineering (English) Doctorate)

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1	1. In Mathematics, natural sciences and mechanical engineering, department has the sufficient infrastructure; the ability to use the theoretical and practical information for engineering solutions
2	2. The ability to identify, define, and solve the formula for complex engineering problems; the ability to select and apply for the appropriate analytical methods and modelling techniques
3	3. To meet desired needs of a system, system component, or process, analysing and designing skill under realistic constraints; in this respect, the ability to apply the methods of modern design
4	4. The ability to use and choose modern techniques and tools for required engineering applications and; the ability to use information technology effectively
5	5. The ability to design the experiment, collect the data for the experiment and interpret to analysing results
6	6. The ability to use computer software and hardware information, access to information and other information sources
7	7. The ability to work individually and with multidisciplinary teams effectively, taking responsibility self-confidence for complex situations
8	8. The ability to communicate with foreign colleagues by having high level of foreign language knowledge in the field of engineering
9	9. Monitoring the science and technology developments and the ability to renew itself with innovative ideas constantly
10	10. Professional and ethical responsibility awareness
11	11. Having an adequate information and awareness in the subjects of occupational safety, occupational health, social security rights, quality control and management issues of environmental protection
12	12. The ability to appreciate the effects of engineering solutions and applications in universal and social dimensions
13	13. The ability to be enlightened to the experts or non-expert audience groups on the issues related with engineering problems and solutions written and oral
14	14. The ability to have adequate knowledge and skills in the project development and application, manage the activities planning, including the projects to the employees having the responsibility of the project by increasing vocational awareness

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	3	5	5	5	4
P2	4	5	4	4	3
P3	5	5	4	4	3
P4	5	4	5	4	5
P5	5	3	4	5	5
P6	4	5	5	5	4
P7	3	5	5	5	4
P8	3	5	5	5	5
P9	4	5	4	4	5
P10	3	4	4	4	5
P11	5	4	4	5	4
P12	5	4	5	5	4
P13	5	5	5	5	5
P14	4	5	5	5	5

