Course Description Form	
Course Code and Name	MATH 201 DIFFERENTIAL EQUATIONS
Course Semester	3
Catalog Content	Mathematical models. linear and nonlinear differential equations Laplace Transfom solution of Systems, Differential equations with polynomial coefficients, Power series solutions of initial value problems
Textbook	P.V. O'Neil ,Advance Engineering Mathematics,Fifth Ed.,2003.
Supplementary Textbooks	Erwin Kreyszig, Advanced Engineering Mathematics, 10th Ed.,Wiley, USA, 2011
Credit	5
Prerequisites of the Course (Attendance Requirements)	-
Type of the Course	Compulsory
Instruction Language	English
Course Objectives	To learn the fundamental differential equations used for the solution of engineering problems.
Course Learning Outcomes	1. Understand the differential equation concept. 2. Learning the types of differential equation. 3. Be able to formulate mathematical models for engineering problems 4. Be able to determine the particular and general solutions of the first and second-order differential equations. 5. Be able to solve the differential equations with Laplace transform.
Instruction Methods	Lecture, Question & Answer, Drill – Practise
Weekly Schedule	1. Week :Mathematical models. Definition of linear and nonlinear differential equations . Separable equations. 2. Week :Solution of for various linear and nonlinear forms in y of f(x,y). 3. Week :Exact differential equations. Integrating factors. Linear first-order equation. Existence and uniqueness of solutions. Picard's iteration. 4. Week :Second-order constant-coefficient linear differential equations. Higher-order differential equations. 5. Week :Characteristic equation and case of real repeated and complex roots.Euler's formula for complex exponential function. Cauchy-Euler. 6. Week :The nonhomogeneous equation and applications of second order differential equations 7. Week :Laplace transform method. First and second shifting theorems 8. Week :1. Midterm Laplace transform method. First and second shifting theorems 9. Week :Transformation of initial-value problems with various discontinuous loading functions 10. Week :Convolution. Unit impulses and the dirac delta function. 11. Week :Laplace Transfom solution of Systems. 12. Week :Differential equations with polynomial coefficients 13. Week :2. Midterm Power series solutions of initial value problems . 14. Week :Singular points and the method of Frobenius. 15. Week: Final Exam

Teaching and Learning Methods *(These are examples. Please fill which activities you use in the course)*	Weekly theoretical course hours:4 Weekly applied course hours:0 Practising course hours Reading Internet browsing, library work Preparation of Midterm and Midterm Exam Final Exam and Preparation for Final Exam

Assessment Criteria

	Numbers	Total Weighting (%)
Midterm Exams	2	50
Assignment	0	0
Application	0	0
Projects	0	0
Practice	0	0
Quiz	4	10
Percent of In-term Studies (%)	-	60
Percentage of Final Exam to Total Score (%)	-	40
Attendance	-	0

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Theoretical Study Hours of Course Per Week	14	4	56
Practising Hours of Course Per Week			0
Reading	10	2	20
Searching in Internet and Library	11	1	11
Designing and Applying Materials			0
Preparing Reports			0
Preparing Presentation			0
Presentation			0
Mid-Term and Studying for Mid-Term	4	7	28
Final and Studying for Final	1	10	10
Other			
Total Workload			125
Total Workload / 25			5.0
Course Credit (ECTS)			5

Contribution Level Between Course Learning Outcomes and Program Outcomes

NO	PROGRAM LEARNING OUTCOMES	1	2	3	4	5
1	Engineering graduates with sufficient theoretical and practical background for a successful profession and with application skills of fundamental scientific knowledge in the engineering practice.			X		
2	Engineering graduates with skills and professional background in describing, formulating, modeling and analyzing the engineering problem, with a consideration for appropriate analytical solutions in all necessary situations				X	

	3	Engineering graduates with the necessary technical, academic and practical knowledge and application confidence in the design and assessment of machines or mechanical systems or industrial processes with considerations of productivity, feasibility and environmental and social aspects.		X		
	4	Engineering graduates with the practice of selecting and using appropriate technical and engineering tools in engineering problems, and ability of effective usage of information science technologies				
	5	Ability of designing and conducting experiments, conduction data acquisition and analysis and making conclusions				
	6	Ability of identifying the potential resources for information or knowledge regarding a given engineering issue			X	
	7	The abilities and performance to participate multi-disciplinary groups together with the effective oral and official communication skills and personal confidence				
	8	Ability for effective oral and official communication skills in Turkish Language and, at minimum, one foreign language			X	
	9	Engineering graduates with motivation to life-long learning and having known significance of continuous education beyond undergraduate studies for science and technology				
	10	Engineering graduates with well-structured responsibilities in profession and ethics				
	11	Engineering graduates who are aware of the importance of safety and healthiness in the project management, workshop environment as well as related legal issues				
	12	Consciousness for the results and effects of engineering solutions on the society and universe, awareness for the developmental considerations with contemporary problems of humanity				

The Course's Lecturer(s) and Contact Informations	1. bilgili@gazi.edu.tr, Asst.Prof.Dr. Muhittin BİLGİLİ, 2. tapatay@gazi.edu.t, Dr.Tunç APATAY