Course name:ECE 501- MATLAB Applications in Engineering	Department: Electronics and Communication Engineering							
Semester	**Methods of Education**							**Credit (ECTS)**
	Lecture	Recitation/ (Etud)	Lab	Project/Field Study	Homework	Other	Total	7,5
1	42	22	14		32	7	125	

Language	English
Compulsory/Elective	Compulsory
Prerequisites	None
Course Contents	Introduction to Matlab and matrix operations. Drawing graphs in Matlab. Methods of solving the linear systems (Cramer's rule, Gauss-Jordan, Gauss elimination). User defined functions and function files. Symbolic integration, derivative and limit with MATLAB. Midterm exam. Laplace transform and inverse Laplace transform. Laplace transform and inverse Laplace transform with MATLAB. Solving differential equations of the linear electrical circuits by using Laplace transform. Solving differential equations by using Simulink toolbox. Applications in numerical analysis. Case studies in electronics and communication engineering.
Course Objectives	The aim of this course is to provide the use of matrices, determinants and Laplace transforms for solution of linear systems and to use a computer package program (Matlab) for symbolic and numeric computations.
Learning Outcomes and Competences	Perform simple computations in Matlab on scalars, vectors and arrays. Use matrices and determinants for solving equations. Use the Laplace transform for solution of linear systems. Solve the differential equation by using different technics. Use the numerical analysis methods for engineering problems. Preparing the students to apply the knowledge of electronic science to other courses of the program.
Textbook and /or References	-İlyas Çankaya, Devrim Akgün, "Matlab ile Meslek Matematiği", Seçkin Yayıncılık A.Ş., Ekim 2008 (in Turkish). - Uğur Arifoğlu ve Cemalettin Kubat, "*Matlab ve Mühendislik Uygulamaları*", Alfa Basım Yayım Dağıtım Ltd. Şti., 2003 (in Turkish). - Erwin Kreyszig, "*Advanced Engineering Mathematics*", John Wiley&Sons, 1993, (in English). - Anthony Croft, Robert Davison, Martin Hargreaves, "*Engineering Mathematics – A Modern Foundation for Electronic, Electrical and Control Engineers*", Addison Wesley Publishing Company, 1992 (in English). -Adrian Biran, Moshe Breiner, "*Matlab for Engineers*", Addison Wesley Publishers, 1995 (in English). - A.J. Okyere, "*Matlab Fundamentals: Electronics and Circuit Analysis Using MATLAB*", CC Press, 1999(in English). - J.T. Manassah, "*Elementary Mathematical and Computational Tools for Electrical and Computer Engineers Using MATLAB*", CRC Press, 2001 (in English).

Assessment Criteria		**If any, mark as (X)**	**Percentage (%)**
	Midterm Exams	X	30
	Quizzes		
	Homeworks	X	15
	Projects		
	Term Paper	X	5
	Laboratory work		
	Other		
	Final Exam	X	50

Instructors	Assist. Prof. Dr. İlyas ÇANKAYA
Week	**Subject**
1	Introduction to MATLAB
2	Mathematical operations with arrays and complex numbers

3	Matrix operations and methods of solving the linear systems
4	Using script files and managing data
5	Two and three dimensional plots
6	User defined functions and function files
7	Programming in Matlab
8	Symbolic math
9	Midterm exam
10	Symbolic solution of Laplace transform
11	Solving differential equations by using Simulink Toolbox
12	Applications in numerical analysis
13	Case studies in electronics and communication engineering
14	Case studies in electronics and communication engineering