



ÇANKAYA UNIVERSITY

Engineering

Course Definition Form

This form should be used for either an elective or a compulsory course being proposed and curricula development processes for an undergraduate curriculum at Çankaya University, Faculty of Engineering. Please fill in the form completely and submit the printed copy containing the approval of the Department Chair to the Dean's Office, and mail its electronic copy. Upon the receipt of *both copies*, the printed copy will be forwarded to the Faculty Academic Board for approval. Incomplete forms will be returned to the Department. The approved form is finally sent to the President's office for approval by the Senate.

Part I. Basic Course Information

Department Name	Mechanical Engineering				Dept. Numeric Code	15	
Course Code	ME 198	Number of Weekly Lecture Hours	2	Number of Weekly Lab/Tutorial Hours	2	Number of Credit Hours	3
Course Web Site	http://me.cankaya.edu.tr/				ECTS Credit	5.00	

Course Name

This information will appear in the printed catalogs and on the web online catalog.

English Name	Computational Tools for Mechanical Engineers
Turkish Name	Makine Mühendisleri için Hesaplama Araçları

Course Description

Provide a brief overview of what is covered during the semester. This information will appear in the printed catalogs and on the web online catalog. Maximum 60 words.

Introduction to Matlab, data representation for computational purposes, plotting data, loop concepts and arrays, implementing basic algorithms to solve characteristic mechanical engineering problems

Prerequisites (if any) <i>Give course codes and check all that are applicable.</i>	1 st	2 nd	3 rd	4 th
	<input type="checkbox"/> Consent of the Instructor	<input type="checkbox"/> Senior Standing	<input type="checkbox"/> Give others, if any.	
Co-requisites (if any)	1 st	2 nd	3 rd	4 th
Course Type <i>Check all that are applicable</i>	<input checked="" type="checkbox"/> Must course for dept. <input type="checkbox"/> Must course for other dept.(s) <input type="checkbox"/> Elective course for dept. <input type="checkbox"/> Elective course for other dept.(s)			

Course Classification

Give the appropriate percentages for each category.

Category	Mathematics & Natural Sciences	Engineering Sciences	Engineering Design		
Percentage	30.00	60.00	10.00		

Part II. Detailed Course Information

Course Objectives

Explain the aims of the course. Maximum 100 words.

1) To teach the difference between analytical and algorithmic solutions 2) To teach data representation for computational purposes 3) To present the use of MATLAB as an interactive computational tool and as a programming tool 4) To teach loop concepts and arrays 5) To teach plotting data 6) To teach how to implement basic algorithms to solve characteristic mechanical engineering problems

Learning Outcomes

Explain the learning outcomes of the course. Maximum 10 items.

1. Develop algorithm to solve engineering problems
2. Use a modern programming language (MATLAB) to develop softwares
3. Develop computer programs for the solution of mechanical engineering problems

Textbook(s)

List the textbook(s), if any, and other related main course materials.

Author(s)	Title	Publisher	Publication Year	ISBN
Amos Gilat, MATLAB An Introduction with Applications, Wiley, 2015				

Reference Books

List the reference books as supplementary materials, if any.

Author(s)	Title	Publisher	Publication Year	ISBN
Musto, Howard, Williams, Engineering Computations An Introduction Using MATLAB and Excel, McGraw Hill, 2006				

Teaching Policy

Explain how you will organize the course (lectures, laboratories, tutorials, studio work, seminars, etc.)

Teaching/ Question and Answer/ Presentation

Laboratory/Studio Work

Give the number of laboratory/studio hours required per week, if any, to do supervised laboratory/studio work, and list the names of the laboratories/studios in which these sessions will be conducted.

For each week lectures are performed in the Laboratory for 4 hours.

Computer Usage

Briefly describe the computer usage and the hardware/software requirements in the course.

Computer is needed for all of the lectures as MATLAB software is used.

Course Outline

List the topics covered within each week.

Wee k	Topic(s)
	1. Starting with Matlab 2. Creating Arrays 3. Mathematical Operations with Arrays 4. Using Script Files and Managing Data 5. Using Script Files and Managing Data 6. Two Dimensional Plots 7. Programming in Matlab 8. Programming in Matlab 9. Programming in Matlab 10. Polynomials, Curve Fitting and Interpolation 11. Polynomials, Curve Fitting and Interpolation 12. Application in Numerical Analysis 13. Application in Numerical Analysis 14. User-Defined Functions and Function Files 15. Three Dimensional Plots

Grading Policy								
<i>List the assessment tools and their percentages that may give an idea about their relative importance to the end-of-semester grade.</i>								
Assessment Tool	Quantity	Percentage	Assessment Tool	Quantity	Percentage	Assessment Tool	Quantity	Percentage
	2	50		1	30		5	10
	1	10						

ECTS Workload			
<i>List all the activities considered under the ECTS.</i>			
Activity	Quantity	Duration (hours)	Total Workload (hours)
Attending Lectures (<i>weekly basis</i>)	14	2.00	28.00
Attending Labs/Recitations (<i>weekly basis</i>)	14	2.00	28.00
Preparation beforehand and finalizing of notes (<i>weekly basis</i>)	14	1.00	14.00
Collection and selection of relevant material (<i>once</i>)			
Self study of relevant material (<i>weekly basis</i>)	14	1.00	14.00
Homework assignments			
Preparation for Quizzes	5	3.00	15.00
Preparation for Midterm Exams (<i>including the duration of the exams</i>)	2	10.00	20.00
Preparation of Term Paper/Case Study Report (<i>including oral presentation</i>)			
Preparation of Term Project/Field Study Report (<i>including oral presentation</i>)			
Preparation for Final Exam (<i>including the duration of the exam</i>)	1	10.00	10.00
TOTAL WORKLOAD / 25			129.00/25
ECTS Credit			5

Total Workloads are calculated automatically by formulas. To update all the formulas in the document first press CTRL+A and then press F9.

Program Qualifications vs. Learning Outcomes						
<i>Consider the below program qualifications determined in terms of learning outcomes of all the courses in the curriculum and capabilities. Look at the learning outcomes of this course given above. Relate these two using the Likert Scale by marking with X in one of the five choices at the right..</i>						
No	Program Qualifications	Contribution				
		0	1	2	3	4
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to engineering; ability to use theoretical and applied information in these areas to model and solve complex engineering problems.			2		
2	Ability to identify and define complex engineering problems; ability to select and apply proper analysis tools and modeling techniques for formulating and solving such problems.					4
3	Ability to design a complex system, a process or product under realistic constraints and conditions in such a way as to meet the desired requirements; ability to apply modern design methods for this purpose.	0				
4	Ability to devise, select and use modern techniques to analyze and solve complex problems for engineering practice; ability to use information technologies effectively.				3	
5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating engineering problems.	0				
6	Ability to work efficiently in intra-disciplinary and multidisciplinary teams by collaborating effectively; ability to work individually.			2		
7	Ability to communicate effectively in Turkish and in English both orally and in writing; knowledge of at least one foreign language; ability to write report, to read report, to prepare design and production reports, to give presentation, to give instruction and receive instruction, effectively.	0				
8	Awareness of life-long learning; ability to access information, to follow developments in science and technology, and to keep continuous self-improvement.	0				
9	Awareness of professional and ethical responsibility; knowledge in standarts used in engineering applications.		1			
10	Knowledge in project management, risk management and change management; awareness of entrepreneurship and innovation; knowledge in sustainable development.	0				
11	Knowledge in global and social effects of engineering practices on health, environment, safety and contemporary issues; awareness of the legal consequences of engineering solutions.	0				

Contribution Scale to a Qualification: **0**-None, **1**-Little, **2**-Medium, **3**-Considerable, **4**-Largest

Part III New Course Proposal Information

State only if it is a new course

Is the new course replacing a former course in the curriculum?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Former Course's Code	Former Course's Name
Is there any similar course which has content overlap with other courses offered by the university?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Most Similar Course's Code	Most Similar Course's Name
Frequency of Offerings <i>Check all semesters that the course is planned to be offered.</i>	<input type="checkbox"/> Fall <input type="checkbox"/> Spring <input type="checkbox"/> Summer			
First Offering	Academic Year	2019	Semester	<input checked="" type="checkbox"/> Fall <input type="checkbox"/> Spring
Maximum Class Size Proposed	30	Student Quota for Other Departments	Approximate Number of Students Expected to Take the Course	60
Justification for the proposal <i>Maximum 80 words</i>				
This course provides a basic background in computing, programming, and the use of computational tools for Engineers. It is intended to familiarize the students with tools that they are likely to encounter in their professional lives, and to equip them with basic problem-solving skills with those tools.				

Part IV Approval

Proposed by	Faculty Member <i>Give the Academic Title first.</i>	Signature	Date
	Dr. Öğr. Üyesi Ülkü Ece AYLI İNCE		5/27/2019

Departmental Board Meeting Date		Meeting Number		Decision Number	
Department Chair	Prof. Dr. Haşmet TÜRKOĞLU	Signature		Date	

Faculty Academic Board Meeting Date		Meeting Number		Decision Number	
Dean	Prof. Dr. Sıtkı Kemal İDER	Signature		Date	

Senate Meeting Date		Meeting Number		Decision Number	
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