ESOGU CIVIL ENGINEERING DEPARTMENT

COURSE INFORMATION FORM

Course Name	Course Code
BASIC COMPUTER SCIENCES	151412212

Semester	Number of Course Hours per Week		ECTS
	Theory	Practice	
2	3	0	4

Course Category (Credit)				
Basic Sciences	Engineering Sciences	Design	General Education	Social
2	2			

Course Language	Course Level	Course Type
Turkish	Undergraduate	Elective

Prerequisite(s) if any	
Objectives of the Course	To help solve engineering problems, use the basic functions of Mathematica, and gain entry to programming and algorithm development skills owing to Mathematica's coding structure.
Short Course Content	Matematica interface, menus and toolbars, basic functions of Mathematica, Logical operators, Control structures, Loop structures, and Graph drawing.

	Learning Outcomes of the Course	Contributed PO(s)	Teaching Methods *	Measuring Methods **
1	Can use Mathematica standard functions.	1, 2, 4	1, 5, 6, 10, 11	A, B
2	Can create own procedures in Mathematica.	1, 2, 4	1, 5, 6, 10, 11	A, B
3	Can create algorithms for solving simple problems.	1, 2, 4	1, 5, 6, 10, 11	A, B
4	Can write scripts to solve simple problems.	1, 2, 4	1, 5, 6, 10, 11	A, B
5	Can show the obtained results in tables.	1, 2, 4	1, 5, 6, 10, 11	A, B
6	Can transfer data to graph.	1, 2, 4	1, 5, 6, 10, 11	A, B
7				
8				

***Teaching Methods** **1:**Expression, 2**:**Discussion, **3:**Experiment, **4:**Simulation, **5:**Question-Answer, **6:**Tutorial, **7**:Observation, **8**:Case Study, **9:**Technical Visit, **10:**Trouble/Problem Solving, **11:**Induvidual Work, **12**:Team/Group Work, **13**:Brain Storm, **14:**Project Design / Management, **15:**Report Preparation and/or Presentation

****Measuring Methods** **A:**Exam, **B:**Quiz, **C:**Oral Exam, **D:**Homework, **E:**Report, **F:**Article Examination, **G:**Presentation, **I:**Experimental Skill, **J:**Project Observation, **K**:Class Attendance; **L**:Jury Exam

Main Textbook	Fizik Ve Mühendislikte Wolfram Mathematica, R. Gökhan Türeci, Gazi Kitapevi 2020.
Supporting References	Mathematica İle Diferensiyel Denklemler Bilgisayar Uygulamaları, Aytekin Bayram Çıbık, Hilal Karadavut, Seçkin Yayıncılık, 2023. http://www.wolfram.com
Necessary Course Material	

Course Schedule	
1	Mathematica general introduction, program window, menus
2	Arithmetic operations, spelling rules, notations, parentheses, Constants
3	Standard functions Sin, Cos, Tan, Cot, Sec, Csc, Exp, Log, Log10
4	Standard functions Simplify, FullSimplify, Expand, Minimize, Maximize
5	Standard functions Coefficient, Numerator, Denominator
6	Function definition, integral, derivative, limit sum, multiplication
7	Matrix operations, Determinant, matrix multiplication
8	Mid-Term Exam
9	Standard functions, Solve, NSolve, FindRoot, Array operations
10	Standard functions, Reduce, Replace, ReplaceAll, Collect, Together
11	Logical operators
12	Control structures If, Select Case
13	Loop structures, For, Do, While
14	graphic drawing
15	graphic drawing
16,17	Final Exam

Calculation of Course Workload			
Activities	**Number**	**Time (Hour)**	**Total Workload (Hour)**
Course Time (number of course hours per week)	14	3	42
Classroom Studying Time (review, reinforcing, prestudy,….)	14	3	42
Homework			
Quiz Exam	5	1,5	7,5
Studying for Quiz Exam			
Oral exam			
Studying for Oral Exam			
Report (Preparation and presentation time included)			
Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
Mid-Term Exam	1	1	1
Studying for Mid-Term Exam	1	10	10
Final Exam	1	1	1
Studying for Final Exam	1	12	12
		Total workload	**115,5**
		Total workload / 30	**3,85**
		Course ECTS Credit	**4**

Evaluation	
Activity Type	**%**
Mid-term	30
Quiz	30
Homework	
Bir öğe seçin.	
Bir öğe seçin.	
Final Exam	40
Total	100

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO) (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	**PROGRAM OUTCOME**	**Contribution**
1	Sufficient knowledge of engineering subjects related with mathematics, science and civil engineering; an ability to apply theoretical and practical knowledge on solving and modeling	5
2	Ability to determine, define, formulate and solve complex civil engineering problems; for that purpose an ability to select and use convenient analytical and experimental methods.	4
3	Ability to design a complex system, a component and/or an engineering process under real life constrains or conditions, defined by environmental, economical and political problems; for	1
4	Ability to develop, select and use modern methods and tools required for civil engineering applications; ability to effective use of information technologies.	5
5	In order to investigate civil engineering problems; ability to set up and conduct experiments and ability to analyze and interpretation of experimental results.	1
6	Ability to work effectively in inner or multi-disciplinary teams; proficiency of interdependence.	1
7	Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language.	1
8	Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement.	3
9	Understanding of professional and ethical issues and taking responsibility	1
10	Awareness of project, risk and change management; awareness of entrepreneurship, innovativeness and sustainable development.	1
11	Knowledge of actual problems and effects of engineering applications on health, environment and security in global and social scale; an awareness of juridical results of engineering	1
12	Sufficient knowledge of engineering subjects related with mathematics, science and civil engineering; an ability to apply theoretical and practical knowledge on solving and modeling	

LECTUTER(S)				
Prepared by	Assist.Prof. Dr. Hakan EROL			
Signature(s)				

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