

<b>Department</b> Department of Mathematics			<b>Academic Year</b> 2022-2023	<b>Date</b> 01/12/2022	
<b>Course Unit Code</b> MATH3107	<b>Course Unit Title</b> Numerical Analysis and its Computer Applications I		<b>Semester/Year</b> Fall / 3	<b>Number of ECTS Credits</b> 6	
<b>Language of Instruction</b>	Turkish				
<b>Type of Course Unit</b>	Compulsory				
<b>Prerequisites and co-requisites</b>	-				
<b>Address of course</b>	-				
<b>Local Credit</b>	<b>Theoretical</b>	<b>Practical</b>	<b>Laboratory</b>	<b>Presentation</b>	<b>Project</b>
3	2	2	-	-	-
<b>Name of Lecturers</b>	Professor Hasan BULUT				
<b>Assistants</b>	-				

<b>Course content</b>	Number representation and programming techniques on the computer, Mathematica and basic instructions, Numerical account of the roots of nonlinear equations, fixed point iteration, bisection, Newton Raphson, tangent methods and Mathematica codes and computer applications, Finite difference, interpolation and numerical derivative, polynomial interpolation and error, numerical derivative estimation, numerical integral, trapezoidal method, Romberg algorithm, Simpson and Gauss numerical approximation formulas and Mathematica codes and computer applications
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<b>Weekly Detailed Course Contents</b>	
<b>Week</b>	<b>Topic</b>
1	Number representation and programming techniques on the computer
2	Mathematica and basic instructions
3	Applications of Mathematica and basic instructions
4	Numerical account of the roots of nonlinear equations, fixed point iteration, bisection
5	Newton Raphson, tangent methods and Mathematica codes and computer applications
6	Mathematica codes and computer applications of the methods
	Finite difference
8	Interpolation
9	General application
10	Numerical derivative, polynomial interpolation and error
11	Numerical integral, trapezoidal method, Romberg algorithm, Simpson's method
12	Gauss numerical approximation formulas
13	Mathematica codes and computer applications
14	A brief evaluation of the course content and topics

<b>Course Resources</b>	1. Sayısal Analiz Yöntemleri(Eyüp Sabri TÜRKER) 2. Sayısal Analiz ve Mühendislik Uygulamaları(İrfan Karagöz) 3. Nümerik Analiz (Nuri Özalp)
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<b>Assessment Methods and Criteria</b>	<b>In-Term studies</b>	<b>Quantity</b>	<b>Percentage (%)</b>
	<b>Mid-Term Exams</b>	1	40
	<b>Quizzes</b>	-	-
	<b>Assignments</b>	-	-
	<b>Projects</b>	-	-
	<b>Term assignment</b>	-	-
	<b>Laboratory</b>	-	-
	<b>Other</b>	-	-

	<b>Final exam</b>	1	60
<b>On Assessment Methods and Criteria</b>	A grade of success; the relative evaluation system or the discretion of the instructor. In order to be taken into consideration in the courses in which the relative evaluation system and teaching staff's discretion are applied, the final exam score of the student must be at least YSAS. Students who fall below this score are considered to fail directly. For the courses that can not be evaluated with the relative evaluation system, the letter grades of the success grades are determined by the consent of the instructor teaching the table by 100 points by the Senate using the distribution of the final grade of success. A student who has received a grade AA, BA, BB, CB or CC grade is deemed to have completed that course. A student who has received one of the grade DC or DD grades is deemed to have fulfilled that course condition. In order for a student who takes DD and DC letters to be counted as successful, the GNO must be at least 2.00. A student who receives a graded FF grade is considered to have failed that course		

<b>Percentage of Course Category (%)</b>	<b>Mathematics and Basic Sciences</b>	80
	<b>Computer Sciences</b>	20
	<b>Programming Design</b>	0
	<b>Social sciences</b>	0

<b>Course Outcome</b>	Students have basic knowledge about “number representation and programming techniques on the computer, mathematica and basic instructions, Numerical account of the roots of nonlinear equations, fixed point iteration, bisection, Newton raphson, tangent methods and Mathematica codes and computer applications, Finite difference, interpolation and numerical derivative, polynomial interpolation and error, numerical derivative estimation, numerical integral, trapezoidal method, Romberg algorithm, Simpson and Gauss numerical approximation formulas and Mathematica codes and computer applications”.
<b>Aims of the course</b>	1. Create the infrastructure of necessary information relation to Numerical Analysis and Computer Applications I. 2. Acquire the technical knowledge to be able to produce the most appropriate solution in Numerical Analysis and Computer Applications I and write and operate codes with computer program
<b>The way of processing course</b>	Face to face

<b>Relation of the course with program outcomes</b>				
<b>Learning outcomes</b>		<b>1</b>	<b>2</b>	<b>3</b>
<b>1</b>	To have advanced theoretical and applied knowledge in a way to prioritize the scientific approach supported by textbooks containing up-to-date information in the field, application tools and other resources			
<b>2</b>	Adapting and transferring the knowledge gained in the field to secondary education			
<b>3</b>	Ability to independently carry out an advanced study in the field			
<b>4</b>	Be aware of the necessity of lifelong learning and continuously improve their professional knowledge and skills.			X
<b>5</b>	Using a foreign language at least at the European Language Portfolio B1 General Level, following the information in the field and being able to communicate with colleagues			
<b>6</b>	To be able to use information and communication technologies together with computer software at minimum advanced level of European computer license required by the field.			
<b>7</b>	Have the ability to make oral and written presentation in native language			
<b>8</b>	Having the ability to understand spoken English and use English at reading level			
<b>9</b>	To have the ability to assimilate mathematical concepts and understand the relationships between them, to recognize different aspects of the same concepts and relationships		X	
<b>10</b>	To have the ability to define and formulate the relationships between items in non-mathematical disciplines in the language of mathematics.			X
<b>11</b>	To have the ability to use mathematical knowledge in different problems			
<b>12</b>	Having the ability to develop computer programs using mathematical knowledge			
<b>Contribution of the course: 1:No 2:Partially 3:Completely</b>				

**Preparer:** Professor Hasan BULUT  
**Preparation date:** 01/12/2022