

<b>Course name: CENGXXX Introduction to Scientific Computing</b>				<b>Department: Computer Engineering</b>				
<b>Semester</b>	<b>Methods of Education</b>							<b>Credit (ECTS)</b>
	Practice	Recitation/ (Etud)	Lab	Project/ Field Study	Homework	Other	Total	
2021 – 2022 Fall	42	-	-	20	60	28	150	5
<b>Language</b>	English							
<b>Compulsory/Elective</b>	E							
<b>Prerequisites</b>	-							
<b>Face to Face Lecture</b>	2							
<b>Online</b>	1							
<b>Course Contents</b>	<p>Week 1 – Course overview, Input, Output, Decision Structures and Boolean Logic</p> <p>Week 2 – Repetition Structures, Functions and Exceptions</p> <p>Week 3 – Strings, List and Tuples, Dictionaries and Sets</p> <p>Week 4 – Object Oriented Programming</p> <p>Week 5 – NumPy</p> <p>Week 6 – Matplotlib</p> <p>Week 7 – SciPy: linear algebra</p> <p>Week 8 – SciPy: interpolation</p> <p>Week 9 – SciPy: integration</p> <p>Week 10 – SciPy: stats</p> <p>Week 11 – SciPy: Fast Fourier transforms</p> <p>Week 12 – Symbolic mathematics using SymPy</p> <p>Week 13 – Finding minima of functions</p> <p>Week 14 – SciPy: optimization</p> <p>Week 15 – SciPy: optimization</p>							
<b>Course Objectives</b>	<ol style="list-style-type: none"> <li>1. to give students a detailed description of the concepts of symbolic algorithms;</li> <li>2. to provide students with up-to-date knowledge on some methods and techniques</li> <li>3. to make students familiar with Python language to implement the methods mentioned above into practiced in scientific computing.</li> </ol>							
<b>Learning Outcomes and Competences</b>	<ol style="list-style-type: none"> <li>1. master the main methods of non-numerical analysis of functions and processes;</li> <li>2. be able to use the modern algorithms for searching information in targeted areas and the bases of algorithm construction and analysis</li> <li>3. use symbolic software packages to perform engineering and science computations;</li> <li>4. be able to apply these methods to academic and simple practical instances;</li> <li>5. develop the abilities to design and conduct advanced numeric and symbolic experiments appropriate for an applied mathematical model, analyze and interpret their results.</li> </ol>							
<b>Textbook and /or References</b>	Starting out with Python, Tony Gaddis							
<b>Assessment Criteria</b>							<b>%</b>	
	Midterm						30	
	Quiz						30	
	Final						40	

<b>Instructors</b>	Dr. Hilal Arslan		

