
 <b>OSTİM TEKNİK ÜNİVERSİTESİ</b> A N K A R A	<b>FACULTY OF ENGINEERING COURSE SYLLABUS FORM</b>	Doküman Kodu	MF.FR.003
		Yayın Tarihi	06.09.2024
		Revizyon No	0
		Revizyon Tarihi	0
		Gizlilik Sınıfı	Hizmet içi

SENG 116 – OBJECT ORIENTED PROGRAMMING					
Course Code	Course Name			Semester	
SENG 116	Object Oriented Programming			Fall <input type="checkbox"/> Spring <input checked="" type="checkbox"/> Summer <input type="checkbox"/>	
Hours				Credit	ECTS
Theory	Practice	Lab	3	4	
3	0	0			


Course Details	
Department	Computer Engineering
Course Language	English
Course Level	Undergraduate <input checked="" type="checkbox"/> Graduate <input type="checkbox"/>
Mode of Delivery	Face to Face <input checked="" type="checkbox"/> Online <input type="checkbox"/> Hybrid <input type="checkbox"/>
Course Type	Compulsory <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
Course Objectives	<p>The course aims to provide students with a comprehensive understanding of the fundamental concepts of object-oriented programming, including encapsulation, inheritance, polymorphism, and abstraction. Students will learn to design and implement classes and objects that effectively model real-world entities and relationships. The course emphasizes the importance of code reusability through inheritance and composition, promoting efficient software development practices. Students will apply object-oriented techniques to solve complex programming problems, focusing on algorithm design and data structures. Debugging and testing skills will be developed to ensure the reliability and correctness of object-oriented programs. Students will also analyze and implement OOP concepts in real-world applications using C# programming language.</p>
Course Content	<p>Introduction to Visual Studio and Visual Programming, Introduction to C# App Programming, Introduction to Classes, Objects, Methods and strings, Methods, A Deeper Look, Introduction to LINQ and the List Collection, Classes and Objects: A Deeper Look, Object-Oriented Programming: Inheritance, OOP, Polymorphism and Interfaces</p>
Course Method/ Techniques	Lecture <input checked="" type="checkbox"/> Question & Answer <input checked="" type="checkbox"/> Presentation <input type="checkbox"/> Discussion <input checked="" type="checkbox"/>
Prerequisites/ Corequisites	
Work Placement(s)	
Textbook/References/Materials	

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- Visual C# How to Program, P. Deitel, H. Deitel, Global Ed. (6<sup>th</sup> Ed.), Pearson Education Ltd.


Course Category				
Mathematics and Basic Sciences	<input type="checkbox"/>		Education	<input type="checkbox"/>
Engineering	<input checked="" type="checkbox"/>		Science	<input type="checkbox"/>
Engineering Design	<input type="checkbox"/>		Health	<input type="checkbox"/>
Social Sciences	<input type="checkbox"/>		Profession	<input type="checkbox"/>

Weekly Schedule		
No	Topics	Materials/Notes
1	<b>Introduction to Visual Studio and Visual Programming:</b> Overview of the Visual Studio IDE, Menu Bar and Toolbar, Navigating the Visual Studio IDE, Help Menu and Context-Sensitive Help, Visual Programming: Creating a Simple App that Displays Text and an Image (Deitel, Ch-2)	Creating simple GUI's
2	<b>Introduction to C# App Programming:</b> Simple App: Displaying a Line of Text, Creating a Simple App in Visual Studio, Modifying Your Simple C# App, String Interpolation, Another C# App: Adding Integers, Memory Concepts, Arithmetic, Decision Making: Equality and Relational Operators (Deitel, Ch-3)	Creating C# Apps
3	<b>Introduction to Classes, Objects, Methods and strings:</b> Test-Driving an <code>Account</code> Class, <code>Account</code> Class with an Instance Variable and Set and Get Methods, Creating, Compiling and Running a Visual C# Project with Two Classes, Software Engineering with Set and Get Method (Deitel, Ch-4)	
4	Account Class with a Property Rather Than Set and Get Methods, Auto-Implemented Properties, Account Class: Initializing Objects with Constructors, Account Class with a Balance; Processing Monetary Amounts (Deitel, Ch-4)	Computerization of Health Records
5	<b>Methods: A Deeper Look:</b> Packaging Code in C#, <code>static</code> Methods, <code>static</code> Variables and Class <code>Math</code> , Methods with Multiple Parameters, Notes on Using Methods, Argument Promotion and Casting, The .NET Framework Class Library, Case Study: Random-Number Generation, (Deitel, Ch-7)	
6	Case Study: A Game of Chance; Introducing Enumerations, Scope of Declarations, Method-Call Stack and Activation Records, Method Overloading, Optional Parameters, Named Parameters, C# 6 Expression-Bodied Methods and Properties, Recursion, Value Types vs. Reference Types, Passing Arguments By Value and By Reference (Deitel, Ch-7)	Computer-Assisted Instruction: Reducing Student Fatigue
7	<b>Midterm Exam</b>	
8	<b>Introduction to LINQ and the List Collection:</b> Querying an Array of <code>int</code> Values Using LINQ, Querying an Array of <code>Employee</code> Objects Using LINQ (Deitel, Ch-9)	Sorting Pets Names by Length

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9	Introduction to Collections, Querying the Generic <code>List</code> Collection Using LINQ (Deitel, Ch-9)	
10	<b>Classes and Objects: A Deeper Look:</b> <code>Time</code> Class Case Study; Throwing Exceptions, Controlling Access to Members, Referring to the Current Object's Members with the <code>this</code> Reference, <code>Time</code> Class Case Study: Overloaded Constructors, Default and Parameterless Constructors (Deitel, Ch-10)	Rational Numbers
11	Composition, Garbage Collection and Destructors, <code>static</code> Class Members, <code>readonly</code> Instance Variables, <code>Class View</code> and <code>Object Browser</code> , Object Initializers, Operator Overloading; Introducing <code>struct</code> , <code>Time</code> Class Case Study: Extension Methods (Deitel, Ch-10)	
12	<b>Object-Oriented Programming: Inheritance:</b> Base Classes and Derived Classes, <code>protected</code> Members, Relationship between Base Classes and Derived Classes, Constructors in Derived Classes, Software Engineering with Inheritance, <code>Class object</code> (Deitel, Ch-11)	Account Inheritance Hierarchy
13	<b>OOP: Polymorphism and Interfaces:</b> Polymorphism Examples, Demonstrating Polymorphic Behavior, Abstract Classes and Methods (Deitel, Ch-12)	
14	Case Study: Payroll System Using Polymorphism, <code>sealed</code> Methods and Classes, Case Study: Creating and Using Interfaces (Deitel, Ch-12)	CarbonFootprint Interface: Polymorphism
15	<b>Final Exam</b>	


Assessment Methods and Criteria		
In-term studies	Quantity	Percentage
Attendance	12	6
Lab		
Practice		
Fieldwork		
Course-specific internship		
Quiz/Studio/Criticize		
Homework	2	14
Presentation / Seminar		
Project		
Report		
Seminar		
Midterm Exam	1	30
Final Exam	1	50
<b>Total</b>		<b>100%</b>
<b>Contribution of Midterm Studies to Success Grade</b>		<b>50%</b>
<b>Contribution of End of Semester Studies to Success Grade</b>		<b>50%</b>
<b>Total</b>		<b>100%</b>

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<b>ECTS Allocated Based on Student Workload</b>			
<b>Activities</b>	<b>Quantity</b>	<b>Duration (Hrs)</b>	<b>Total Workload</b>
Course Hours	14	3	42
Lab			
Practice			
Fieldwork			
Course-specific Work Placement			
Out-of-class study time	14	2	28
Quiz/Studio/Criticize			
Homework	2	5	10
Presentation / Seminar			
Project			
Report			
Midterm Exam and Preparation for Midterm	1	10	10
Final Exam and Preparation for Final Exam	1	10	10
<b>Total Workload</b>			100
<b>Total Workload / 25</b>			4
<b>ECTS Credit</b>			4

<b>Course Learning Outcomes</b>	
<b>No</b>	<b>Outcome</b>
<b>L1</b>	Understanding OOP principles
<b>L2</b>	Designing classes and objects
<b>L3</b>	Ability to create reusable code through inheritance and composition
<b>L4</b>	Ability to apply object-oriented techniques to solve complex programming problems
<b>L5</b>	Developing skills in debugging and testing object-oriented programs

<b>Program Competencies</b>	
<b>No</b>	<b>Outcome</b>
<b>P1</b>	<b>Engineering Knowledge:</b> Knowledge in mathematics, natural sciences, fundamental engineering, computational methods, and discipline-specific engineering topics; the ability to apply this knowledge in solving complex engineering problems.
<b>P2</b>	<b>Problem Analysis:</b> The ability to identify, formulate, and analyze complex engineering problems using fundamental sciences, mathematics, and engineering knowledge while considering the relevant UN Sustainable Development Goals (SDGs).
<b>P3</b>	<b>Engineering Design:</b> The ability to design creative solutions for complex engineering problems; the capability to design complex systems, processes, devices, or products in a way that meets current and future needs while considering realistic constraints and conditions.
<b>P4</b>	<b>Use of Techniques and Tools:</b> The ability to select and use appropriate techniques, resources, and modern engineering and computing tools—including simulation and modeling—for analyzing and solving complex engineering problems while being aware of their limitations.
<b>P5</b>	<b>Research and Investigation:</b> The ability to conduct research by performing literature reviews, designing experiments, conducting experiments, collecting data, analyzing results, and interpreting findings to examine complex engineering problems.
<b>P6</b>	<b>Global Impact of Engineering Applications:</b> Knowledge of the impact of engineering applications on society, health and safety, the economy, sustainability, and the environment

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	within the framework of the UN Sustainable Development Goals (SDGs); awareness of the legal implications of engineering solutions.
<b>P7</b>	<b>Ethical Behavior:</b> Adhering to professional engineering ethics; knowledge of ethical responsibilities; awareness of acting impartially, ensuring inclusivity, and avoiding discrimination in all matters.
<b>P8</b>	<b>Individual and Teamwork:</b> The ability to work effectively both individually and as a member or leader of disciplinary and interdisciplinary teams (face-to-face, remote, or hybrid).
<b>P9</b>	<b>Verbal and Written Communication:</b> The ability to communicate technical topics effectively in oral and written form while considering the diverse backgrounds of the target audience (such as education, language, and profession).
<b>P10</b>	<b>Project Management:</b> Knowledge of professional practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.
<b>P11</b>	<b>Lifelong Learning:</b> The ability to engage in independent and continuous learning, adapt to new and emerging technologies, and think critically about technological advancements.

Contribution of Course Learning Outcomes to Program Competencies/Outcomes											
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
<b>L1</b>	✓										
<b>L2</b>		✓									
<b>L3</b>			✓								
<b>L4</b>				✓							
<b>L5</b>				✓							