

Óbuda University Bánki Donát Faculty of Mechanical and Safety Engineering			Institute of Mechatronics and Vehicle Engineering		
Subject title and code: Object Oriented Programming BMXOPE3BNF Credits: Full-time study 2026/2027 ac. 1 semester year					
The course is available at: mechatronical engineering					
Supervised by: Prof. Dr. Edit Ludányi-Laufer			Instructors: Prof. Dr. Edit Ludányi-Laufer, Kornél Földes		
Prerequisite (neptun code): Algorithms and Data Structures, BMXAAE2BNF					
Weekly number of lessons					
Lecture: 1	Group seminar:	Lab: 2	Consultation:		
Way of assessment: Midterm (Written) mark					
Online consultation (<i>in case it's required</i>): ... (<i>BBB link</i>)					
Edu. goal: The goal of the lecture is to develop further the algorithmic way of thinking through object oriented programming. It builds on the knowledge base that was introduced in the course Algorithms and Data Structures but develops it into another direction. The Lab sessions aim to help the students deepen their knowledge of algorithms through practical problems by implementing them using a concrete OOP language. By the end of the semester the students should be able to develop projects on their own.					
Schedule					
Education week	Topics				
1.	Lecture: Basics of object oriented programming, Classes, objects, Constructor, Destructor Lab: Creation of simple classes, Instantiation				
2.	Lab: Object arrays				
3.	Lecture: Properties, dealing with value and reference types, objects in the memory, object arrays Lab: Using Properties in practice				
4.	Lab: Working with files, handling dates and time				
5.	Lecture: Elements of the object oriented paradigm, class level members, static classes Lab: Using class level members in practice				
6.	Lab: Complex problem solving				
7.	Lecture: Inheritance, polymorphism Lab: Lab midterm				
8.	Lab: Inheritance, polymorphism				
9.	Lecture: Exception handling Lab: Polymorphism. Abstract classes.				
10.	Lab: Exception handling in practice				
11.	Lecture: Interface Lab: Lab make-up midterm				
12.	Lab: Holiday				
13.	Lecture: Theoretical midterm Lab: Project consultation				
14.	Lab: Project midterm				
Mid-semester requirements					
Test		Assignment to be submitted		Blitz quizzes	
amount	dates	amount	deadlines	amount	dates
3	weeks 7,13,14	1	week 13	8	weeks 1,2,3,4,5,8,9,11
According to the HKR attendance of group seminars and lab exercises are mandatory.					

Other requirements for participation in sessions not covered by the regulations and restrictions on substitutions:
 During the semester, in accordance with the schedule above, a student can make up one of the midterms if they have a valid official absence note (from a doctor or from a coach). The make up test for theory will happen during the semester at a separately assigned time. The blitz quizzes cannot be made up.

Test		Assignment to be submitted		Blitz quizzes	
maximum points available	minimum score required to pass /test	maximum points available	minimum score required to pass / assignment	maximum points available	minimum score required to pass /lab -points
Theoretical, lab midterm: 35 Project midterm: 15 points	Theoretical, lab midterm 14 Project midterm: 8 points	15 points	8 points	8 points	

Total number of points achievable in semester: 100points

Grading thresholds	satisfactory 40 % and above	average 55 % and above	good 70 % and above	excellent 85 % and above
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Other evaluation criteria:

For the midterms only those solution elements (data or control structures and algorithms) are acceptable that were covered either in the lectures or at the lab sessions. Those problems that can be solved by using programming theorems are expected to be solved that way. Similarly, problems requiring object oriented approach are expected to be solved through that approach.

A prerequisite for passing the course is that the student achieves at least the minimum required score in each assessment component individually.

Assessment weighting:

- Practical midterm: 35%
- Theoretical midterm: 35%
- Project assignment and project midterm together: 30%

The Project Assessment consists of two components:

- Project Assignment (15%)
- Project Midterm (15%)

As part of the Project Assessment, students are required to complete a Project Midterm during the final class session of the semester. During this assessment, students must implement a modification specified by the instructor in their previously submitted project. The Project Midterm can only be taken if the submitted project assignment meets the project requirements. The purpose of the Project Midterm is to verify that the student understands the structure and operation of the submitted project and is capable of extending and modifying it independently. The project is considered successfully completed if the student submits the project assignment by the specified deadline and implements the modification assigned during the Project Midterm in a manner that can be evaluated.

Bonus points can be earned through the blitz quizzes. A maximum of 4 bonus points may be added to the score of the theoretical midterm and a maximum of 4 bonus points may be added to the score of the practical midterm. Bonus points cannot be applied to the Project Midterm.

Receive a signature denied entry:

- fail to attend any required assessment without providing a valid justification,
- fail to submit the project assignment,
- fail to achieve the minimum required score in any assessment component (theoretical midterm, practical midterm, project assignment, or Project Midterm), or
- exceed the maximum number of absences permitted by the Study and Examination Regulations.

Required references:	
Recommended references:	Computer Programming: The Bible: Learn From The Basics to Advanced of Python, C, C++, C#, HTML Coding, and Black Hat Hacking Step-by-Step, Createspace Independent Publishing Platform, 2018. Robert Ciesla, Programming basics, Getting Started with Java, C#, Python, Apress, 2021
Quality assurance methods of the subject:	

Things, that are not included, can be found within the regulations of Óbuda University.