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. year* 1 *semester*

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 mark (Written)

Online consultation *(in case it's required):* *... (BBB link)*

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*: Exception handling in practice
10.	*Lab*: Assignment of projects. **Labor make-up midterm**
11.	*Lecture*: Interface *Lab*: Interface in practice
12.	*Lab*: Holiday
13.	*Lecture*: **Theoretical midterm** *Lab*: Complex task
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
Theoretical, lab midterm: 35 Project midterm: 15 points	Theoretical, lab midterm 14 Project midterm: 8 points	15 points	8 points	8 points	-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

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.