Obuda University John von Neumann Faculty of Informatics	Software Engineering Institute

Name and code: Software Technology and Graphical User Interface Design (NSXSG1EBNE) **Credits:** 5
Computer Science BSc
Daytime 2022/23 year II. semester

Subject lecturers: Sipos Miklós László, Mikhel Roland

Prerequisites (with code):	Software Design and Development I., Software Design and Development II., Advanced Development Techniques			
Weekly hours:	Lecture: 2	Seminar.: 0	Lab. hours: 3	Consultation: 0
Way of assessment:	Exam-season grade			

Course Description

Goal:
During the practices, the students familiarize with the MVVM/MVC patterns using the C# language. During the lectures, the students familiarize with the GoF Basic Design Patterns.

Course description:
MVVM design pattern in the WPF framework (controls, events, data binding). Using the MVC design pattern in the ASP.NET framework (razor, controllers, API endpoints, API access). Simple game development in WPF framework. GoF Basic Design Patterns. JavaScript fundamentals, DOM manipulation, events, Web API usage.

Weekly Schedule

Education week	*Lab topic*	*Lecture topic*
1.	WPF intro, event handling, controllers and content managers, OpenFileDialog, SaveFileDialog, MessageBox, application development using only access by name (x:Name)	Requirements, UI history, MVVM, WPF intro
2.	Using multiple windows in WPF, using of collection controllers (ListBox, ComboBox)	Software management I.
3.	Databinding basics, development of a CRUD application with code-behind logic	Software management II.
4.	MVVM basics, layering, MVVMLightLibs usage	Git advanced
5.	Mediator pattern, IoC container, web API client development	UML I.
6.	Game development with Visuals I.	UML II.
7.	Game development with Visuals II.	GoF I. (SOLID, Factories)
8.	**Lab exam (WPF)**	GoF II. (Creational, Behavioral)
9.	JS intro, JS in separate file, simple (pure) JS application	MVC, ASP intro
10.	DOM manipulation, event handling	GoF III. (Behavioral)
11.	JS collections, JSON serialization, localstorage	GoF IV. (Structural)
12.	JS Fetch API	Other patterns (DDD, CQRS)
13.	**Lab exam retake (WPF)**	Microservices
14.	WPF project work presentation	

Midterm Requirements

Lab exam

Students write one exam from the lab materials, on the 8th week during lab occasion. Writing the exam is obligatory. In order to pass the lab exam, at least 50% must be reached. If the student does not write the exam or does not reach 50% then it can be re-written during the 13th week during lab occasion.

The student can re-write the lab exam even if on the first try 50% (or more) was reached. In this case the final result will be the re-written exam's result.

Small homework projects

Students have to create two smaller homework projects, one from the WPF part and one from the JS part. These has to be finished and submitted until the 13th week. The lab teacher will check these and decide if each homework project has failed or passed. If any of the homeworks is not accepted or has not been finished by the student then it can be fixed and re-submitted until the 14th week for extra fee. Details will be described during the semester. Students have to pass both small homework projects.

Group project work

Students have to create a project work on their own forming a group of 3-4 people, that shows how they mastered the semester's knowledge materials and key topics. The groups will be assembled by the teacher. During the creation of the project work students have to meet specific requirements and pass milestones. Project works will be evaluated on a passed or failed binary scale by the lab teacher. Additional details will be described during the semester around the 4th week.

Project work has to be submitted until the given deadline which is on the 13th week. If the project work has not been submitted, or the teacher does not accept the quality of the work, or it simply does not fulfil the minimum requirements, then it means that the project work failed. If failed, students can fix and re-submit their project work for the 14th week for extra fee. The deadlines' exact date and time will be determined by the teacher.

By the end of the 14th week, in order to receive signature students must have

- a successful lab exam (50% or more), and
- a passed / accepted WPF small homework project, and
- a passed / accepted JS small homework project, and
- a passed / accepted group project work.

If any of these components is missing, then the student can correct the missing component only in the exam season (even all three of them can be corrected) for extra fee.

Depending on the pandemic situation's momentary state, the lecture and lab occasions may be held online. Even in this case, the lab exams are tried to be held in person, depending on the situation. Details will be specified accordingly to the pandemic situation.

Midterm Test Scheduling

Education week	*Topic*
8.	Written examination (lab)
13.	Written examination retake (lab)

Final Grade Calculation Methods

Students will receive signature granted status if all of the obligatory components are successfully finished, as stated in the Midterm Requirements section. If signature is granted, students can take the final exam in the exam season. The final exam will be from the lecture materials.

The final grade will be calculated as follows:

- mid-term lab exam will count as 25% weight
- final exam's first part will count as 25% weight
- the final exam's second part will count as 50% weight

Students will receive "Letiltva" (banned) status in the system, if they miss 30% (or more) of the lecture occasions. Students will receive "Letiltva" (banned) status in the system, if they miss 30% (or more) of the lab occasions. In this case according to the Study And Examination Regulations Of Óbuda University there is no possibility to complete the subject in the current semester.

Method of Replacement

At the 13th week of the semester, the lab exam can be re-taken.
At the 14th week of the semester, the project work can be re-submitted to be accepted.
At the 14th week of the semester, the WPF small homework project can be re-submitted to be accepted.
At the 14th week of the semester, the JS small homework project can be re-submitted to be accepted.

During the exam season, students can correct the missing component (lab exam and/or WPF homework project and/or JS homework project and/or group project work) if there is any. All of the replacement options are require extra fee.

References

Mandatory:
The lecture and lab materials (codes, slides etc.) provided by the teacher to the students during the semester. https://nik.siposm.hu/sgui

Recommended:
Horváth Rudolf: Common Design Patterns
Aniruddha Chakrabarti: Design Patterns (GoF) in .NET
Michael Feathers: Working Effectively with Legacy Code
Joshua Kerievsky: Refactoring to Patterns
Martin Fowler: Refactoring (a.k.a. The Refactoring Bible)
Design Patterns: Elements of Reusable Object-Oriented Software, 1994, ISBN-13: 978-0201633610
Microsoft official C# documentation: https://docs.microsoft.com/en-us/dotnet/csharp/
Design Patterns: http://dofactory.net/net/design-patterns