INFSCI 1090
Serious Game Design With ASP.NET & C#

Time: Mondays, 12:00 - 2:30 PM

Location: IS Building, Room 522

Instructor: Dmitriy Babichenko

Office Hours:

- Mondays, 2:30-3:30 PM
- Thursdays, 2-3 PM
- By appointment

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Overview:

This course is designed to serve as an introduction to design and implementation of serious games -games designed for education and training. Throughout the course of the semester we will explore different techniques for designing serious games across multiple domains – medicine (physician training and critical decision-making), computer science, EMT training. While we will consider different platforms for designing and implementing games, the primary frameworks and libraries for this course will be Microsoft .NET, HTML5, jQuery, and Phaser.js, and the primary programming language will be C#. This course will be a combination of lectures by the instructor, guest speaker presentations, and hands-on workshops.

We will learn how to effectively develop gaming software using Microsoft Visual Studio IDE and Phaser.js gaming engine, as well as how to leverage functionality provided by .NET framework to reduce the amount of code (how to NOT reinvent the wheel).

Students will be working in teams with real stakeholders and will be required to design, implement, and present a fully functional serious game by the end of the semester.

Prerequisites: INFSCI 0017, INFSCI 1022, INFSCI 1024, INFSCI 1052 (recommended)

Textbooks:

- Required:
  - Game Design Workshop: A Playcentric Approach to Creating Innovative Games, Third Edition by Tracy Fullerton. http://www.amazon.com/Game-Design-Workshop-Playcentric-Innovative/dp/1482217163/

Objectives:

Upon successful completion of this course, the student will be able to:

1. Learn to collect requirements from stakeholders
2. Understand concepts of serious game design
3. Design and produce storyboards
4. Playtest and refine games
5. Program in Microsoft C# programming language
6. Build applications on top of Microsoft .NET framework and Phaser.js game engine
7. Build applications using HTML5 canvas and SVG, CSS3, and JavaScript

Course Schedule (tentative, subject to change):

Week	Date	Topic(s)
1	8/31	● Introduction ● Course overview ● Serious games overview ● Games vs. simulations ● Course projects overview ● Introduction to Microsoft Visual Studio environment o Project types o Web application development with C# ● Introduction to Team Foundation Server (TFS)
2	9/14	● First meeting with stakeholders ● Introduction to ASP.NET o Project structure o ASP.NET markup vs. HTML markup
3	9/21	● Game design workshop (guest presenter) ● Introduction to C# o Classes o Properties o Methods o Conditional statements o Loops o Sessions
4	9/28	● **Assignment 1 due** ● The role of game designer ● Game conceptualization ● More on C# o Working with databases ▪ ODBC ▪ OLEDB

		▪ Datasets in ASP.NET
5	10/5	• **Assignment 2 due** • Structure of games • Working with formal game elements • Working with dramatic game elements • More on C# o Error handling o Debugging with Visual Studio o Working with data grids
6	10/12	• **Assignment 3 due** • Working with system dynamics • Game prototyping o Analog o Digital • More on C# o Object-relational mapping with nHibernate • Final project discussion
7	10/19	• In-class code and design reviews • System review with stakeholders
8	10/26	• **Assignment 4: Final code corrections / bug fixes / design modifications due** • Physical components of serious games and simulations ○ WII and Kinect ○ Little Bits ○ Arduino • Arduino workshop I • Design a serious game with physical components
9	11/2	• **Final project proposal due** • Working with sensors • Arduino workshop II
10	11/9	• Web-based games • Second life • In-browser games vs. dedicated gaming platforms / applications • JavaScript review • Manipulating DOM elements • jQuery review
11	11/16	• **Assignment 5 is due: Arduino game** • Basic RESTful web services • JSON

		• jQuery
12	11/23	• **Final project game rules are due** • Introduction to web-based animations • HTML5 Canvas • CSS3 • Phaser.js animation
13	11/30	• **Final project storyboards are due** • Artificial intelligence in gaming engines • Modeling physics • Modeling decisions
14	12/7	• **Assignment 6 is due: JavaScript game** • Graphics with .NET • Microsoft DirectX
15	12/14	• **Final project due** • In-class final project presentations

Assignments:

- Assignments associated with the drug development game (working with external stakeholders) will peer-reviewed and peer-graded for quality of code and design.
- Game proposals (part of your final project) will be peer-reviewed and peer-graded
- All proposals will be submitted via CourseWeb
- All programming assignments related to the drug development game will be submitted via Team Foundation Server (TFS)
- All other programming assignments will be submitted via CourseWeb

Final project reading list - choose one:

1. Ready Player One by Ernest Cline □
2. The Color of Magic by Terry Pratchett□
3. Neuromancer by William Gibson □
4. Snow Crash by Neal Stephenson□
5. Ender's Game by Orson Scott Card□
6. Old Man's War by John Scalzi□
7. Do Androids Dream of Electric Sheep by Philip K. Dick□
8. Forever War by Joe Haldeman□
9. Good Omens by Neil Gaiman□
10. Fluke by Christopher Moore□

11. Robopocalypse by Daniel H. Wilson□

Late Submissions:

Late projects **WILL NOT** be accepted and will receive an automatic grade of **ZERO**.

Required Tools for Collaboration

- Google Drive (drive.google.com) - you will need to create a Gmail account if you don't already have one
- draw.io Pro (a web-based tool for diagrams and workflows, available through Google Drive)
- BaseCamp (www.basecamp.com)

Required Tools for Development

- Microsoft Visual Studio 2013 (available for download from software.pitt.edu → Dreamspark downloads)
- MySQL Workbench (available for download from https://www.mysql.com/products/workbench/)
- Processing (https://processing.org/)
- Arduino (https://www.arduino.cc/)

Collaboration vs. Cheating

Collaboration on homework is permitted to an extent. Specifically, students are allowed to discuss the possible solutions to a problem and help each other with logic errors. However, handing your work to someone so that they may see a copy of your solution, or dictating code to a person on line-by-line basis is not within the spirit of the collaboration policy or the honor code of the university.

Laptop Policy

In order to succeed in this course, you must bring a laptop with you to every class. Most lectures will contain a lab component where you will have to complete (or at least begin) a programming assignment while in class. Furthermore, having a laptop will enable you to better follow code examples and assignments instructions.

Grading Policy:

- Drug Development Game - related assignments: 40%
- Arduino project: 10%
- Browser-based game: 10%
- Final project:
    - Proposal: 10%
    - Game rules: 10%
    - Game storyboards: 10%

- Final presentation: 10%

Project Grading:

- In addition to being reviewed and graded by instructor and stakeholders, the following assignments will be peer-reviewed and peer-graded:
  - Assignments associated with the drug development game (working with external stakeholders) will peer-reviewed and peer-graded for quality of code and design.
  - Game proposals (part of your final project) will be peer-reviewed and peer-graded.

Grading Scale:

- 93 <= A < 100
- 90 <= A- < 93
- 88 <= B+ < 90
- 82 <= B < 88
- 80 <= B- < 82
- 78 <= C+ < 80
- 72 <= C < 78
- 70 <= C- < 72
- 60 <= D < 70
- F < 60

Academic Integrity:

Cheating/plagiarism will not be tolerated. All work must be your own, unless collaboration is specifically and explicitly permitted as in the course group project. Any unauthorized collaboration or copying will at minimum result in no credit for the affected assignment and may be subject to further action under the University Guidelines for Academic Integrity (http://www.provost.pitt.edu/info/ai1.html). You may incorporate excerpts from publications by other authors, but they must be clearly marked as quotations and properly attributed. You may discuss your ideas with others, but all substantive writing and ideas must be your own, or else be explicitly attributed to another, using a citation sufficiently detailed for someone else to easily locate your source.

Disability:

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact the Instructor and Disability Resources and Services, 216 William Pitt Union, (412) 648-7890 / (412) 383-7355 (TTY), as early as possible in the term. Disability Resources and Services reviews documentation related to a student's disability, provides verification of the disability, and recommends reasonable accommodations for specific courses.