**CST-247 Milestone Project** **Overview & Requirements**

# Scope

## Overview

Over the course, with the included topics, students will learn a great deal about databases and how they are used in building dynamic web applications in ASP.Net and C#. In this course, students will build a web application based off of the desktop version of the Minesweeper application built as part of the CST-227 Enterprise Applications Programming II. Database, reporting, and Web Service integration will be incorporated into the Minesweeper application. The project will be managed and delivered using the Agile Scrum methodology.

### Learning Objectives

1. Learn how to port a C# based Desktop App to a modern, scalable .NET based web Application.
2. Learn how to design and build a .NET N-Layer Web Application in .NET using C#.
3. Learn how to design and build a .NET N-Layer Web Application leveraging .NET MVC 5.
4. Learn how to design and build a Relational Database model in SQL Server leveraging ADO.NET.
5. Learn how to design and build a Web service leveraging Windows Communication Foundation.
6. Manage a complex team-based project leveraging Agile Scrum practices.

### Core Competencies

1. Develop solutions to computational problems using a given programming language and performance and resource constraints.
2. Solve business problems using enterprise-programming tools.
3. Demonstrate technological literacy skills necessary to design components of information systems solutions.
4. Analyze the social and professional context of information technology and computing, and adhere to ethical codes of conduct.
5. Research the historical, social, professional, ethical and legal aspects of computing.
6. Recognize and demonstrate the importance of professional oral and written communication skills.

## Collaboration, Planning, and Design

Students will breakdown the project into smaller tasks, assign dates and times to these tasks, assign man hour work efforts based estimations to these tasks, and deliver a Sprint Back Log and Sprint Burn Down Chart, along with a Technical Design Report, on a weekly basis during this course. Refer to the “CST-247 Milestone Project Resources,” located in the course materials for resource templates.

The following outlines the Agiler Scrum practices that will be applied during this course:

* Collaboration: Daily Stand Ups, Retrospectives
* Planning: Sprint Planning, Sprint Back Log, and Sprint Product Log
* Reporting: Sprint Burn Down Chart and .NET Application Programming Project Status and Design Report

The Technical Design Report will capture all technical elements as a formal Design Specification, and be kept up-to-date during the project iterations.

High Level Functional Requirements

1. All Minesweeper Game Logic and Rules, as defined in CST-227 Enterprise Applications Programming II class, will be supported.
2. Ability to Register new users on the Game site.
3. Ability to Login into the Game site.
4. Ability to secure the Game Site.
5. Ability to save current Game State and Game Stats in a database.
6. Ability to display Game Stats and Results HTML based Reports.
7. Ability to retrieve Game Stats and Results via a Web Service Interface.

### High Level Nonfunctional and Technical Requirements

1. Use Visual Studio 2015 Community Edition or Professional Edition for all development.
2. Reuse and/or refactor Game Logic and Rules written in C# from the CST-227 Enterprise Applications Programming II class.
3. Design and develop an N-Layer Web Application Architecture leveraging .NET MVC 5.
4. Design and develop a responsive and AJAX web-based User Interface. The User Interface design itself will be left to the creative freedom of the team.
5. Design and develop a Relational Database model using SQL Server (Express).
6. Design and build a secure Game site.
7. Design and build a modern scalable Game site using industry-standard best practices and design patterns.
8. All design artifacts and code artifacts will be maintained in a version control system.
9. Any graphical assets shall be made or attained as necessary with appropriate permissions.

Delivery Schedule

This is a Collaborative Learning Community (CLC) assignment. The following is the Milestone and Weekly Iterative delivery schedule for the course:

|  |  |  |
| --- | --- | --- |
| **Assignment** | **ONLINE**  **Week Due** | **ONGROUND**  **Week Due** |
| CLC – Milestone 1: Initial Scrum Planning | 1 | 2 |
| CLC – Milestone 2: Login and Registration Modules | 2 | 3 |
| CLC – Milestone 3: Initial Game Board Module | 3 | 5 |
| CLC – Milestone 4: Final Game Board Module | 5 | 9 |
| CLC – Milestone 5: Save/Restore Game Progress and REST API Features | 6 | 12 |
| CLC – Milestone 6: Final Project and Presentation: Completed Minesweeper Game | 7 | 15 |

## Major Milestone Assignments

**Topic 1 thru Topic 3: Analysis and Initial Iteration of Game Implementation**

* **Milestone 1 -** Initial Analysis, Sprint Planning, UI Mockups/Concepts
* **Milestones 2 and 3 -** Game Functionality:
  + Registration and Login Pages
  + Relational Data Model (initial)
  + Front End Game Board
* Provide up to date and accurate Design Reports.
* Clearly demonstrate Agile Scrum practices.

**Topic 4 thru Topic 7 – Final Iteration of Game Implementation, Final Project Presentation, with Demo**

* **Milestones 4 and 5** - Game Functionality:
  + Responsive and AJAX based Front End Game Board
  + Save game progress and resume game
  + Save game results
  + Game Results Web Service Interface
  + Relational Data Model (final)
* Provide up to date and accurate Design Reports.
* Clearly demonstrate Agile Scrum practices.
* **Milestone 6** - Your team will create a PowerPoint presentation of approximately 20 slides showing the progression of your project that took place over the duration of the course. Your team will also create a demo of your working application. For the demo, the ground modality will present the application to the class, and for the online modality, you will create a screencast video. The PowerPoint presentation should include the following:
  + 10-15 minute presentation (2-3 minutes a slide, excluding opening and agenda slides)
  + 2-3 slides on functionality
  + 2-3 slides on technical design
  + 1-2 slides on known issues and challenges
  + 5-minute demo
  + 5 minutes for Q&A

## Opportunities (Wish List)

Students should first forecast the required elements of the web application (see High Level Functional Requirements list above), and then decide if they want to add extra features, and add those into their Sprint Product Log as future opportunities.