**Hilltop Online**

**Software Design Document**

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# Introduction

## Project Overview

The Hilltop Online system seeks to streamline and unify the enrollment and grading processes for undergraduate universities, specifically at St. Edward’s University. This system will give registrars, instructors, and students the ability to access needed information regarding grades, courses, and registration sections. Registrars are the administrators of the system and are responsible for managing users, updating course information, and creating sections. Instructors are capable of viewing information regarding their own sections, assigning grades, and managing students within their sections. Lastly, students are allowed viewable access to current and past grades and are capable of performing enrollment actions such as adding or dropping sections. Hilltop online will provide university staff and students with a user-friendly and simple interface allowing for straightforward interactions with important enrollment and grading information all in one place.

Use Case Diagram

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# System Architecture

## System Architecture Diagram

System Modules.png

## System-level ER diagram

## System ER Diagram.png

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# System Design

## Enrollment Subsystem

### Architecture Diagram

Enrollment.png

### User Interface Designs

* + 1. View All Sections by StudentView All Sections by Student.png

View All Sections by Registrar

View Section History by Instruc tor

View Students in Section by InstructorView Students by Instructor.png

* + 1. View Current Sections by Student

### Class Diagrams

### ../../../../Downloads/Classes%20for%20Enrollment%20Subsystem.p

### Data Layer Tables for Enrollment Subsystem.png

## 

## 

## User Management Subsystem

### Architecture Diagram

User Management.png

### User Interface Designs

* + 1. Instructor DashboardInstructor Dashboard.png
    2. LoginLogin.png

Registrar Dashboard - includes View User's functionalityRegistrar Dashboard.png

* + 1. Student DashboardStudent Dashboard.png

### Class DiagramsClasses for User Management Subsystem.png

### Data Layer Tables for User Management Subsystem.png

## 

## 

## Grading Subsystem

### Architecture Diagram

Grading.png

### User Interface Designs

* + 1. Submit Final GradeSubmit Final Grade.png
    2. Assignment Grading TableView Assignment Grading Table by Instructor.png
    3. View Assignments by InstructorView Assignments by Instructor.png
    4. View Assignments/Grades by StudentView Grades by Student (Assignments).png
    5. View TranscriptView Transcript.png

### ../../../../Downloads/Classes%20for%20Grading%20Subsystem.pClass Diagrams

### 

### Data Layer Tables for Grading Subsystem.png

## 

## 

## Course Catalog Subsystem

### Architecture Diagram

### Course Catalog.png

### User Interface Designs

* + 1. View DepartmentsView Departments.png
    2. View Course Catalog
    3. View Course Catalog by Registrar
    4. Add Course to Course Catalog
    5. Edit Course in Course Catalog
    6. View Terms



### era Class DiagramsClasses for Course Catalog Subsystem.png

### Data LayerTables for Course Catalog Subsystem.png

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# System Implementation

The Hilltop Online system is implemented using a combination of popular enterprise grade technologies. The main goal is to create a product satisfying the above subsystems by reusing as much code as possible and developing when necessary.

The main language for system development will be Java - one of the most popular programming languages in the world, and one in which the developer’s are well versed. More importantly, bodes well for our system architecture. MVC patterns are common enough today that Java developers have created multiple frameworks for incorporating the pattern into their products. The framework of choice for Hilltop Online is Spring and Spring Boot. These two technologies, along with all their sub projects - Spring MVC, Spring Security, and Spring Data - will allow for rapid development of the system using tried and tested software. Spring Boot plays an important role in product release as well. Using Spring Boot’s packaging functionality, our software can be delivered in a single Jar file to the customer and to our production servers.

Database design is equally as proven as Java and Spring. The data layer will be implemented in MySql, our developer’s RDBMS of choice. This will run our production database, where an integrated Java H2 database is to be used for developer’s testing and pre-release verification. H2 is also integrated with Spring Data, making Java development of database wrappers and objects simpler for the developers.

After our implementation phase is complete, our product will be delivered using Amazon’s AWS EC2 platform and Bitbucket’s delivery tool Pipelines. These two products together allow for continuous deployment of our application as maintenance releases are made. AWS is built on a strong suite of tools for configuration management of infrastructure that will ease the process of deploying the hilltop online system for both production and tests.

Using these modern tools, code reuse, and configuration management, we expect development time to to be around three weeks, starting March 22, 2017 and ending April 15th 2017, allowing for a five day validation period before system release on April 20th.

# Conclusion

# Hilltop Online is a web application providing undergraduate institutions a complete Grading and Registration system for use by their faculty, staff, and students. Our aim is to maintain a cohesive and intuitive interface for all actors in the system.

# The chosen development tools provide Hilltop Online with the security and reliability that universities expect from administrative systems.

Please see the following websites for more information regarding the tools used for the development of Hilltop Online:

* Spring Framework - <https://spring.io/>
  + Spring Boot - http://projects.spring.io/spring-boot/
* Gradle - https://gradle.org/
* Bitbucket Pipelines - https://bitbucket.org/product/features/pipelines