

## INFO 465 Projects in Information Systems

## Section 901

## Instructor

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Office hours: Through zoom sessions via appointment.

## VCU School of Business

The VCU School of Business has the mission to be a dynamic hub of business education and research, fueled by creativity and a commitment to preparing students to lead in a complex world. The vision is to drive the future of business through the power of creativity. The strategic pillars through which the school will achieve this vision are EPIC - **E**xperiential Learning, **P**roblem-Solving Curricula, **I**mpactful Research, and **C**reative Culture.

**VCU Policies**

Students should visit <http://go.vcu.edu/syllabus> and review **all** syllabus statement information. The full university syllabus statement includes information on safety, registration, the VCU Honor Code, student conduct, withdrawal and more.

**Department news and library resources:**

The Information Systems Department website is:

[**https://business.vcu.edu/academics/information-systems/**](https://business.vcu.edu/academics/information-systems/)

Use VCU libraries to find and access library resources, spaces, technology, and services that provide support and enhance all learning opportunities at the university (<https://www.library.vcu.edu/>).

## Note: The recommended texts for this course (Essential Scrum and Automating DevOps with GitLab) are available for free from the VCU library.

## Course Description – 3 credit hours

## Students will work in teams, using the Scrum methodology, to execute a semester-long application development project. Students will use the skills acquired from the prerequisites to take a project from a formal business proposal to a finished product. The finished product is delivered through multiple sprints.

## Course overview

This course provides students with hands-on experience in modern application development using the Scrum methodology. Working in teams, students will execute a semester-long project to develop an online course registration system, progressing from business requirements to deployment. The course emphasizes collaboration, agile project management, and technical skills, including source control with Git/GitHub, database design with MySQL, and cloud deployment using AWS. Individual assignments include programming tasks, quizzes on Scrum and CI/CD, and research-focused projects on AI and RFP development. Through iterative sprints, students will gain practical experience in user story development, architecture design, infrastructure setup, and product delivery, culminating in a functional distributed application.

**Class meetings: Format, dates, times**

Tuesday and Thursday 8am-9:15AM, January 14-May 1

Class will be conducted exclusively online. The link to join the class is [Zoom link](https://vcu.zoom.us/j/84100866380)

**Course Learning Outcomes:**

After successful completion of the course, students will be:

* An ability to analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
* An ability to design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program’s discipline.
* An ability to communicate effectively in a variety of professional contexts.
* An ability to function effectively as a member or leader of a team engaged in activities appropriate to the program’s discipline.
* An ability to support the delivery, use, and management of information systems within an information systems environment

## Course materials

## Recommend two books available from the VCU library:

## Automating DevOps with GitLab CI/CD platforms by Christopher Cowell and Nicholas Lotz

## Essential Scrum: A practical guide to the most popular agile process by Kenneth Rubin

## In addition, I have posted a Git and GitHub reference book on Canvas: [Pro Git 2nd Edition.pdf](https://virginiacommonwealth.instructure.com/courses/113521/files/13412408?wrap=1)

## Prerequisites

## Prerequisites: [INFO350](https://bulletin.vcu.edu/search/?search=INFO+350),  [INFO 364](https://bulletin.vcu.edu/search/?search=INFO+364) and [INFO 370](https://bulletin.vcu.edu/search/?search=INFO+370) all with a minimum grade of C.

## Tools used during the course

## Laptop with Internet Connection

## Git, an open-source code repository

## GitHub, a web-based platform for version control and collaboration tool using Git, enables developers to manage code repositories and track changes.

## GitLab, a web-based DevOps platform. It enables teams to plan, build, test and deploy code.

## MySQL, an open-source database management system

## AWS, a cloud services provider

## An IDE (integrated development environment) such as Visual Studio Code.

## A data visualization tool such as Tableau (depending on the case selected).

## Assignment due dates

## Assignments must be submitted on or before the deadline. Late assignments will not be accepted, unless the student has received prior approval from the instructor. There are no exceptions to this policy.

**Assignment descriptions**

* Individual assignments:
  + Business proposal: Students will submit an executive-level to address a business problem.
  + Scrum, CI/CD quizzes: Student will demonstrate their mastery of scrum and DevSecOps practices through online exams.
  + Programming assignments (2): Students will enhance their programming skills and gain hands-on experience with collaborative development using Git and GitHub for version control.
  + LLM assignment: Students will implement a Hugging Face LLM (large language model) within Google Colab. Students will then write a paper discussing how the model can be used within organizations.
  + RFP development project: An RFP (Request for Proposal) is a document issued by an organization, documenting the organization’s service requirements, to potential providers. Writing and/or responding to an RFP (Request for Proposal) is a common task in project management, procurement and consulting. Students will practice writing a RFP for a case study.
  + AI research project: Students will analyze an AI company of their choosing and make a recommendation to senior management on whether the company should use and/or invest in the company,
* Project: Students working in teams using Scrum, a popular agile software engineering methodology, to deliver a production system. Teams can choose one of the following types of projects:
  + Online registration system: Systems will build an online course registration system. This will be a full stack development project deployed in the cloud.
  + A data analysis system, using a data visualization tool such as Tableau. Teams will pick one of 3 case studies posted on Canvas.

Regardless of the case study chosen, students must prepare the infrastructure and application architecture for the course registration system. The specific assignments, which are cumulative and designed to facilitate a full stack development project, are:

* UI/UX design: Teams will design and demonstrate functional, browser-based screens for an Online Course Registration System, including Home, Course Search, Student Registration, Instructor Schedule, and Session Enrollment. Screens must meet usability standards, align with project requirements, and be stored in the team's GitHub repository, with all members as collaborators.
* Architecture document: Teams will submit a technical design document for the system that includes the following:
  + The cloud service provider
  + The application’s programming language, run-time environment, port, and APIs.
  + The operating system used by the application’s virtual servers.
  + Database design (must be in third-normal form)
  + Network architecture and design, including subnets and firewalls.
  + Data visualization tool
  + Testing and quality assurance process
  + Authentication process
* Infrastructure build project: Teams will prove that their infrastructure is ready for use by building the AWS environment as specified in the architecture document.
  + - Database build project: Teams will implement their database design from the Architecture document by creating a MySQL database in AWS RDS, populating it with realistic test data, and validating its functionality through SQL queries.
  + Product backlog: The team will demonstrate their mastery of user stories and the business case by submitting an initial list of user requirements (the product backlog) for the registration system
  + Sprints – The team will create and deploy the registration application through a two three-week sprints. Each sprint will have three deliverables:
    - A sprint plan, which describes what functionality (and how) will be built during the course of the sprint
    - A product review, which demonstrates the completed functionality **contained in the working production system** to the instructor.
    - A sprint retrospective where the team reflects on what it can do to improve performance.

**Grade weighting**

* Individual: 40% of total grade
  + Business proposal assignment: 5%
  + Scrum exam: 10%
  + CI/CD quiz: 5%
  + RFP assignment: 5%
  + Programming assignments: 5% or 2.5% each
  + LLM build: 5%
  + AI Research project 5%
* Team: 60% of total grade
  + UI/UX build: 5%
  + Architecture document: 10%
  + Infrastructure build: 5%
  + Database project: 5%
  + Product backlog: 5%
  + Sprints: 30%, or 15% for each sprint.

**Final course grades**

Final course grades will be determined as follows:

A >= 90%

B >= 80%

C >= 70%

D >= 60%

F = below 60%

**There are no makeup assignments.**

**A missed or late assignment will be scored as a zero, unless you have received prior permission or have a mutually-agreed-upon emergency.**

**There are no extra credit assignments.**

**Your grade is final – not the start of a negotiation.**

**Tentative schedule – subject to change at the instructor’s discretion.**

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| **Week** | **Day** | **Topic** | **Assignments** |
| 1 | Jan 14  Jan 16 | Introduction  Version control software | Business proposal  Create Git, GitLab accounts |
| 2 | Jan 21  Jan 23 | Run time environment - JS  AWS refresher; Build VPC | Programming assignment #1  Form teams  Build a VPC, EC2 instance |
| 3 | Jan 28  Jan 30 | AWS refresher: Security  AWS refresher: Build template | Programming assignment #2 |
| 4 | Feb 4  Feb 6 | Database design: Review  Intro to Agile | UI/UX project |
| 5 | Feb 11  Feb 13 | Intro to Scrum  Requirements analysis | Architecture project  Project backlog |
| 6 | Feb 18  Feb 20 | Sprint planning  Sprint ceremonies | Infrastructure build project |
| 7 | Feb 25  Feb 27 | Estimating and velocity  Sprint planning: Review | Database build  Sprint plan 1 |
| 8 | Mar 4  Mar 6 | Daily scrum  Daily scrum | AI research project |
| 9 | Mar 11  Mar 13 | Spring break  Spring break |  |
| 10 | Mar 18  Mar 20 | Daily scrum  CI/CD overview | CI/CD quiz |
| 11 | Mar 25  Mar 27 | Daily scrum  Daily scrum | Sprint plan 1 review and retrospective |
| 12 | Apr 1  Apr 3 | Product reviews  Daily scrum | Scrum exam  Sprint plan 2 |
| 13 | Apr 8  Apr 10 | RFP overview  Daily scrum | RFP project |
| 14 | Apr 15  Apr 17 | Daily scrum  Daily scrum | LLM project |
| 15 | Apr 22  Apr 24 | Daily scrum  Daily scrum | Sprint 2 Retrospective and Review |
| 16 | Apr 29  May 1 | Sprint 2 product reviews  Reserved |  |