

## 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

In this course, students will work in teams to develop a distributed application in the cloud using AWS as their cloud service provider and MySQL/Aurora as the DBMS. They will learn to manage their projects using Scrum and set up CI/CD pipelines with a focus on Continuous Integration. Git will be used as the version control system, and students will integrate GitLab for automated security testing, including SAST (Static Application Security Testing) and DAST (Dynamic Application Security Testing). Through these hands-on experiences, the course will prepare students to work in modern cloud-based information systems environments, emphasizing industry-relevant tools and practices.

**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

## 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

## GitLab, a web-based DevOps platform that provides version control using Git and includes features for CI/CD, issue tracking, and project management. It also supports automated security testing tools like SAST and DAST to help identify vulnerabilities early in the development process.

## MySQL, an open-source database management system

## AWS, a cloud services provider

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

## 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:
  + Scrum, CI (continuous integration) and CD (continuous deployment) quizzes: Student will demonstrate their mastery of scrum and DevSecOps practices through online exams.
  + Programming assignments: Students will familiarize themselves with Git and GitLab by using those tools when solving a programming problem.
  + 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,
* Scrum Project: Scrum is a popular agile software engineering methodology. Students will work in teams to deliver an online course registration system. The system will enable students to review and enroll in courses being offered in the following semester. The specific project deliverables are:
  + Architecture document: Teams will submit a technical design document for the system that includes the following:
    1. The cloud service provider (which will be AWS)
    2. The application’s programming language, run-time environment, port, and APIs. Students are not limited in their choices, for example, AWS’s serverless computing environment (Lambda).
    3. The operating system used by the application’s virtual servers.
    4. Database design (must be in third-normal form)
    5. Network architecture and design, including subnets and firewalls.
    6. Testing and quality assurance process
    7. 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. The build must include test data in the database tables.
  + 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 series of three sprints. Each sprint will have three deliverables:
    1. A sprint plan, which describes what functionality (and how) will be built during the course of the sprint
    2. A product review, which demonstrates the completed functionality **contained in the working production system** to the instructor.
    3. A sprint retrospective where the team reflects on what it can do to improve performance.

**Grade weighting**

* Individual: 35% of total grade
  + Scrum exam: 10%
  + CI and CD quizzes: 5%, or 2.5% each
  + RFP assignment: 5%
  + Programming assignments: 10% or 5% each
  + LLM build: 5%
* Team: 55% of total grade
  + Architecture document: 15%
  + Infrastructure build: 10%
  + UI/UX build: 5%
  + Product backlog: 5%
  + Sprints: 30%, or 10% 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: SDLC  Introduction: What is CI? | Form teams  SDLC quiz  Continuous integration quiz  Create Git account |
| 2 | Jan 21  Jan 23 | Source code repository: Git  Git, continued | CI quiz  Programming assignment #1 |
| 3 | Jan 28  Jan 30 | Introduction: What is CD  Software testing | GitLab set up  CD exam |
| 4 | Feb 4  Feb 6 | Agile & scrum overview  Sprint planning | Programming assignment #2 |
| 5 | Feb 11  Feb 13 | Sprint ceremonies  Requirements analysis | Product backlog assignment |
| 6 | Feb 18  Feb 20 | Estimating and velocity  MVC pattern, distributed computing | Architecture document |
| 7 | Feb 25  Feb 27 | Infrastructure Database  Infrastructure: Configuration | Infrastructure build project |
| 8 | Mar 4  Mar 6 | Sprint planning: Review  Sprint planning | Sprint plant 1 due |
| 9 | Mar 11  Mar 13 | Spring break  Spring break |  |
| 10 | Mar 18  Mar 20 | Daily scrum  Daily scrum | LLM project is due |
| 11 | Mar 25  Mar 27 | Product reviews  RFP overview | Sprint plan 2 due |
| 12 | Apr 1  Apr 3 | Daily scrum  Daily scrum | RFP project is due |
| 13 | Apr 8  Apr 10 | Daily scrum  Product reviews |  |
| 14 | Apr 15  Apr 17 | Sprint plan 3  Daily scrum | Sprint plan 3 is due |
| 15 | Apr 22  Apr 24 | Daily scrum  Daily scrum | AI research project is due |
| 16 | Apr 29  May 1 | Sprint 3: Product reviews  Sprint 3: Product reviews |  |