Course Syllabus

Course Number: CS 401

Course Title: Software Engineering and Design

Department Name: Computer Science

College/School/Division Name: Natural Sciences and Mathematics

Term: Spring 2025

Course Credits: 3

Class Meeting Days: Monday, Wednesday, and Friday

Class Meeting Hours: 10:30am-11:20am HST

Class Location: Data Science Center

Instructor Name:

Andrew Solis, MS

Email: andrew.solis@chaminade.edu

Phone: (210) 452-1600

Office Location: Data Science Center or Zoom

Office Hours:

MTWThF: 12:00 PM – 1:00 PM

1. University Course Catalog Description

This course will introduce the concepts, principles, techniques, standards and best practices, and methods of software engineering to design and develop high-quality and cost-effective software products and systems. This course will utilize computer architecture, data structures, and object-oriented approaches. Students in this course will learn an overview to design and develop software products and systems; software life cycle; specifications; cost and effort estimation; and tools to effectively analyze, design, test, and maintain software.

2. Course Overview

This course is an introduction to software engineering concepts and the design of software systems. Through a semester long process, students will learn how to build a software system like products created in the real world. Students will explore different software ideas including version control, containers, APIs, web development, and database management.

3. Program Learning Outcomes

Upon completion of the undergraduate B.S. program in Data Science, Analytics & Visualization, students will be able to:

1. Describe foundational computer organization, architecture, computing resources, and systems;
2. Describe foundational mathematical concepts and operations towards design, development, and analysis of applications;
3. Apply programming language towards application development;
4. Integrate an awareness of ethical issues and collective standards to positively influence the application of data science to service, justice and peace in working towards solutions for societal problems.

4. Course Learning Outcomes and Linkage to Program Learning Outcomes

Students who successfully complete this course will be able to:

Course Learning Outcomes	PLO 1	PLO 2	PLO 3	PLO 4
1. Identify and describe various software design concepts.	X	X		
2. Apply version control to manage projects.	X	X		
3. Understand and how to use containers.	X	X	X	
4. Design and build RESTful APIs.	X	X	X	X
5. Design and create a website.			X	X
6. Communicate and manage data through a RDBMS.	X	X	X	X
7. Manage a software project through project management resources.	X			
8. Create and publish documentation for a software application.	X	X		X
9. Design and create a full-stack web application.	X	X	X	X

5. Course Prerequisites

EN 102, COM 101, and CS 202 OR CS 205

6. Required Learning Materials

Learning materials will be provided through canvas and the class website. This includes tutorials, documentation, website, homework, and class source code, Google Drive, Github. Students will need to install the following applications throughout the semester: python3, flask, postman, docker, MySQL.

7. Course Website:

All assignments and materials will be submitted via **Canvas Course Management System** unless stated otherwise. The assignments are to be clear, professional quality, and must be submitted in the requested format or the work will receive zero points. Please familiarize yourself with Canvas and visit the site regularly as materials, grades, announcements, and submission of assignments will be on Canvas.

8. Technical Assistance for Canvas Users:

Search for help on specific topics at help.instructure.com. Chat live with Canvas Support 24/7/365. Watch this video to get you started with online guides and tutorials. Contact the Chaminade IT Helpdesk for technical issues: helpdesk@chaminade.edu, or call (808) 735-4855

9. Assessment.

Assessments	Points
Participation and Communication	5
Assignments (4x)	35
Project proposal	10
Final project	50
Total	**100**

10. Grading Scale

Letter grades are given in all courses except those conducted on a credit/no credit basis. They are interpreted as follows:

A 90-100%   90 points or more: Outstanding scholarship and an unusual degree of intellectual initiative

B 80-90%   80-89 points: Superior work done in a consistent and intellectual manner

C 70-80%   70-79 points: Average grade indicating a competent grasp of subject matter

D 60-70%   60-69 points: Inferior work of the lowest passing grade, not satisfactory for fulfillment of prerequisite course work.

F <60%   59 points or less: Failed to grasp the minimum subject matter; no credit given

Feedback and grades on course deliverables (e.g., assignments, projects, quizzes, etc.) will be provided in the "Grades" of Canvas. Response time will take place up to 3 days.

11. Course Schedule

Date	Lesson	Assignment
01/06 – 01/10	• Orientation of the class and introduce syllabus. • Everyone introduces themselves. • Essentials and things to know. • Version Control with Git: Part 1 • Version Control with Git: Part 2	
01/13 – 01/17	• Introduction to Containers • Advanced Containers	Homework 1 Due
01/20 – 01/24	• Advanced Containers • Docker Compose	
01/27 – 01/31	• Intro to Software Design • Diagrams of Software Design	
02/03 – 02/07	• Code Organization	Homework 2 Due
02/10 – 02/14	• Documentation • Unit Testing • Error Handling	
02/17 – 02/21	• Intro to APIs • Intro to Flask	
02/24 – 02/28	• Intro to Flask • Advanced Flask • **Introduce Project Proposal**	Homework 3 Due
03/03 – 03/07	• Advanced Flask • Containerizing Flask • Flask Special Topics	
03/10 – 03/14	• Intro to HTML • Intro to CSS	**Project Proposal Due**
03/17 – 03/21	• Spring Recess (No class)	
03/24 – 03/28	• Intro to CSS • Intro to Javascript	
03/31 – 04/04	• Introduction to Web Framework • Work on project	Homework 4 Due
04/07 – 04/11	• Intro to Databases • Work on Project	
04/14 – 04/18	• Intro to Flask-SQLAlchemy • Work on project	
04/21 – 04/25	• Last week of class	**Project Due** **Project Presentation**
04/28 – 05/02	Finals week	Finals week

Credit Hour Policy:
This is a three-credit course requiring a minimum of 135 clock hours of student engagement, per the official CUH Credit Hour Policy. Students enrolled in this course are anticipated to spend 37.5 hours in class and 52.5 hours research and completing a project. There will be an additional 45 hours of work required beyond what is listed here (course readings, assignments, etc.), averaging 3.3 hours each week.

Course Changes: The instructor reserves the right to change the course instruction, schedule, deadlines, course requirements, and grading throughout the semester. Changes will be announced through email or Canvas Course Management System.

12. Alignment of Natural Sciences Courses with Marianist and Hawaiian values of the University.

The Natural Sciences Division provides an *integral, quality education:* sophisticated integrative course content taught by experienced, dedicated, and well-educated instructors.

- We *educate in family spirit* – every classroom is an *Ohana* and you can expect to be respected yet challenged in an environment that is supportive, inclusively by instructors who take the time to personally get to know and care for you.

- We *educate for service, justice and peace*, since many of the most pressing global issues (climate change, health inequity, poverty, justice) are those which science and technology investigate, establish ethical parameters for, and offer solutions to.

- We *educate for adaptation and change*. In science and technology, the only constant is change. Data, techniques, technologies, questions, interpretations and ethical landscapes are constantly evolving, and we teach students to thrive on this dynamic uncertainty.

The study of science and technology can be formative, exploring human creativity and potential in the development of technologies and scientific solutions, the opportunity to engage in the stewardship of the natural world, and the opportunity to promote social justice. We provide opportunities to engage with the problems that face Hawai'i and the Pacific region through the Natural Sciences curriculum, in particular, those centered around severe challenges in health, poverty, environmental resilience, and erosion of traditional culture. The Marianist Educational Values relate to Native Hawaiian ideas of *mana, na'auao, ohana*, *aloha* and *aina*. We intend for our Natural Sciences programs to be culturally-sustaining, rooted in our Hawaiian place, and centered on core values of *Maiau,* be neat, prepared, careful in all we do; *Makawalu*, demonstrate foresight and planning; *`Ai,* sustain mind and body; *Pa`a Na`au*, learn deeply.

13. Additional departmental and university policies

13.1. Late Work Policy

Requests for extensions due to extenuating circumstances (medical problems, for example) will be considered, but work received after the deadline will not be graded. Computer problems are not an excuse for late work.

13.2. Grades of "Incomplete"

Students and instructors may negotiate an incomplete grade when there are specific justifying circumstances. An Incomplete Contract (available form the Divisional Secretary and the Portal) must be completed. When submitting a grade the "I" will be accompanied by the alternative grade that will automatically be assigned after 90 days. These include IB, IC, ID, and IF. If only an "I" is submitted the default grade is F. The completion of the work, evaluation, and reporting of the final grade is due within 90 days after the end of the semester or term. This limit may not be extended.

13.3. Writing Policy

Paper requirements and formatting will be discussed during the course when the assignment is given.

13.4. Instructor and Student Communication

Questions for this course can be emailed to the instructor at [andrew.solis@chaminade.edu]. Online, in-person and phone conferences can be arranged. Response time will take place up to 3 days.

The University provides a Chaminade email address for all students. Official Chaminade communications will be sent to the students' Chaminade email address and instructors will use only this email to communicate with students. It is the responsibility of the student to check their email frequently. Report email-related problems to the Helpdesk at 808-735-4855 or helpdesk@chaminade.edu

13.5. Cell phones, tablets, and laptops

Music Devices and Cellular Phones: Unless specifically permitted by your instructor, use of music devices and cell phones is prohibited during all Natural Science and Mathematics classes, as it is discourteous and may lead to suspicion of academic misconduct. Students unable to comply will be asked to leave class. Out of consideration for your classmates, please set your cell phone to silent mode during class. Students are encouraged to bring laptops or tablets to class as the instructor will assign online activities and readings that will require the use of a laptop or tablet. Laptops and tablets should not be misused, such as checking distracting websites. Use your best judgment and respect your classmates and instructor.

13.6. Disability Access

Chaminade University of Honolulu offers accommodations for all actively enrolled students with disabilities in compliance with Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act (ADA) of 1990, and the ADA Amendments Act (2008).

Students are responsible for contacting Kokua Ike: Center for Student Learning to schedule an appointment. Verification of their disability will be requested through appropriate documentation and once received it will take up to approximately 2–3 weeks to review them. Appropriate paperwork will be completed by the student before notification will be sent out to their instructors. Accommodation paperwork will not be automatically sent out to instructors each semester, as the student is responsible to notify Kokua Ike via email at ada@chaminade.edu each semester if changes or notifications are needed.

13.7. Title IX Compliance

Chaminade University of Honolulu is committed to providing a learning, working and living environment that promotes the dignity of all people, inclusivity and mutual respect and is free of all forms of sex discrimination and gender-based violence, including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence, and stalking. As a member of the University faculty, I am required to immediately report any incident of sex discrimination or gender-based violence to the campus Title IX Coordinator.

13.8. Nondiscrimination Policy & Notice Nondiscrimination

Chaminade University of Honolulu does not discriminate on the basis of sex and prohibits sex discrimination in any education program or activity that it operates, as required by Title IX and its regulations, including in admission and employment. Inquiries about Title IX may be referred to the University's Title IX Coordinator, the U.S. Department of Education's Office for Civil Rights, or both and contact information may be found at the Chaminade University Title IX Office Contact Information and Confidential Resources website. On-campus Confidential Resources may also be found here at CAMPUS CONFIDENTIAL RESOURCES.

The University's Nondiscrimination Policy and Grievance Procedures can be located on the University webpage at: https://chaminade.edu/compliance/title-ix-nondiscrimination-policies-procedures/.

To report information about conduct that may constitute sex discrimination or make a complaint of sex discrimination under Title IX, please refer to the Campus Incident Report form. Chaminade University of Honolulu prohibits sex discrimination in any education program or activity that it operates. The NOTICE of NONDISCRIMINATION can be found here: Notice of Nondiscrimination.

13.9. CUH Alert Emergency Notification

To get the latest emergency communication from Chaminade University, students' cell numbers will be connected to Chaminade's emergency notification text system. When you log in to the Chaminade portal, you will be asked to provide some emergency contact information. If you provide a cellphone number, you will receive a text from our emergency notification system asking you to confirm your number. You must respond to that message to complete your registration and get emergency notifications on your phone.

13.10. Assessment for Student Work

With the goal of continuing to improve the quality of educational services offered to students, Chaminade University conducts assessments of student achievement of course, program, and institutional learning outcomes. Student work is used anonymously as the basis of these assessments, and the work you do in this course may be used in these assessment efforts.

13.10. Kōkua ʻIke: Tutoring & Learning Services

Chaminade is proud to offer free, one-on-one tutoring and writing assistance to all students. Tutoring and writing help is available on campus at Kōkua ʻIke: Center for Student Learning in a variety of subjects (including, but are not limited to biology, chemistry, math, nursing, English, etc.) from trained Peer and Professional Tutors. Please check Kōkua ʻIke's website for the latest times, list of drop-in hours, and information on scheduling an appointment. Free online tutoring is also available via TutorMe. Tutor Me can be accessed 24/7 from your Canvas account. Simply click on Account > TutorMe. For more information, please contact Kōkua ʻIke at tutoring@chaminade.edu or 808-739-8305.

13.11. Attendance Policy

The following attendance policy is from the 2024-2025 Academic Catalog: Students are expected to attend regularly all courses for which they are registered. Student should notify their instructors when illness or other extenuating circumstances prevents them from attending class and make arrangements to complete missed assignments. Notification may be done by emailing the instructor's Chaminade email address, calling the instructor's campus extension, or by leaving a message with the instructor's school office (Natural Science and Math 1 (808) 440-4204). It is the instructor's prerogative to modify deadlines of course requirements accordingly. Any student who stops attending a course without officially **withdrawing** may receive a failing grade.

Unexcused absences equivalent to more than a week of classes may lead to a grade reduction for the course. Any unexcused absence of two consecutive weeks or more may result in being **withdrawn** from the course by the instructor, although the instructor is not required to **withdraw** students in that scenario. Repeated absences put students at risk of failing grades.

Students with disabilities who have obtained accommodations from the Chaminade University of Honolulu ADA Coordinator may be considered for an exception when the accommodation does not materially alter the attainment of the learning outcomes. Federal regulations require continued attendance for continuing payment of financial aid. When illness or personal reasons necessitate continued absence, the student should communicate first with the instructor to review the options. Anyone who stops attending a course without official withdrawal may receive a failing grade or be withdrawn by the instructor at the instructor's discretion.

13.12. Academic Conduct Policy

See the current Undergraduate Academic Catalog and the Student Handbook available from Student Affairs.