## Course information

**Instructor:** P. M. Hoffmann,
**Lecture:** TuTh 2:30 PM → - 3:45 PM
**Location:** Academic Hall 201
**Office Hours:** Fr 9:00 AM
**Location:** Online (Link on Canvas)

**Contact info**
phoffmann@csusm.edu
he/him/his

## Course Description

Introduction to fundamental technologies that enable cloud computing, such as software defined architectures, virtualization, and containers. Includes web middleware technologies and different levels of cloud services. Students will gain hands-on experience through developing new cloud services based on public cloud infrastructures.

### Learning Objectives

This course introduces students to the principles and practices of cloud computing, with a focus on designing, deploying, and managing applications using modern cloud platforms like Google Cloud. By the end of the course, students will be able to:

1. Discuss various types of computing and outline their role in enabling cloud computing.
2. Explain the core concepts, advantages, and disadvantages of the cloud computing paradigm.
3. Identify the need for techniques behind automation and orchestration of resources, as well as key scheduling considerations in the cloud.
4. Illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems.
5. Understand the implications of building a cloud application to achieve resilience and elasticity.
6. Develop and deploy services in the cloud.
7. Enumerate and explain various threats in cloud security.

## Pre/co-requisites

Prerequisite: CS443

## Required Texts

To reduce the cost for students, this course does not require purchase of any textbook. It organizes required reading via Canvas.

## Programming Requirements

You are free to choose your preferred operating system and development environment for this course. You may use **Linux, macOS, or Windows (with Ubuntu WSL)** on your personal machine.

Please ensure that your chosen setup allows you to participate in the required programming activities.

## Grade breakdown (Subject to change with notice)

### Labs (10% of final grade)

There will be weekly activities, each of which will be a hands-on experience with Google Cloud, and these are due on Friday night.

### Assignments (20% of final grade)

There will be weekly assignments. Each assignment will consist of a coding challenge, followed by a brief report. These are due **every Monday at 07:00 am**. Computer Science is not just a collection of syntax and knowledge, but a skill, and like all skills, mastering it requires practice and patience.

### Midterm Project (20% of final grade)

The midterm project will serve as a checkpoint midway through the semester.

### Final Project (50% of final grade)

The final project will be a way to show off your newly acquired skills. View it like a showstopper from the Great British Bake-Off.

### Late Work Policy

**No late work will be accepted.** Exceptions will only be considered under exceptional circumstances. If you encounter an emergency or serious issue, **you must email the professor as soon as possible** with appropriate documentation. Communication is key; do not wait until after the deadline.

## Grading Scale

The letter grades listed below will be further divided into + and -
A > 93% > B > 80% > C > 65% > D > 50% > F

## Academic Honest Policy: Don't cheat (yourselves)!

Students will be expected to adhere to standards of academic honesty and integrity, as outlined in the Student Academic Honesty Policy. All assignments must be original work, clear and error-free. All ideas/material that are borrowed from other sources must have appropriate references to the original sources. Any quoted material should give credit to the source and be punctuated accordingly.

Course materials used in this course are the intellectual property of the professor unless otherwise stated. Posting or sharing these materials outside of the class is not allowed without written permission. Posting to Chegg or other websites is especially not permitted. If I discover that material has been posted I will work to identify the poster and when identified respond accordingly. This will likely result in a severe penalty in the overall course grade as well as reporting to the dean of students office. Be aware that I will check for posts and that websites like Chegg cooperate with faculty to remove posted materials, identify the posters and hold them accountable. The terms of service of those sites you agree to when using them includes conditions relating to posting copyrighted material without permission. Once they are made aware that you violated those terms they are open to legal action and take it very seriously. Use of the instructor's materials as one's own work for course assignments, whether in whole or in part, is strictly prohibited and constitutes academic dishonesty. Violations may result in disciplinary action consistent with university policy.

Academic Honesty and Integrity: Students are responsible for honest completion and representation of their work. Your course catalog details the ethical standards and penalties for infractions. There will be zero tolerance for infractions. If you believe there has been an infraction by someone in the class, please bring it to the instructor's attention. The instructor reserves the right to discipline any student for academic dishonesty, in accordance with the general rules and regulations of the university. Disciplinary action may include the lowering of grades and/or the assignment of a failing grade for an exam, assignment, or the class as a whole.

Incidents of Academic Dishonesty will be reported to the Dean of Students. Sanctions at the University level may include suspension or expulsion from the University. More on the CSUSM's academic honesty policy can be found at
http://www.csusm.edu/policies/active/documents/Academic_Honesty_Policy.html

## CSTEM GenAI Use Guidelines

CSTEM students, faculty, and staff are encouraged to adopt professional versions of GenAI tools responsibly and ethically to support and improve educational activities and workflows. Here is our approach to using GenAI:

- **Adhere to CSU Standards:** GenAI tools should not be used in ways that violate existing university standards, policies, or guidelines. The adoption of GenAI in education should promote fairness, ensure equal access, and maintain academic integrity.
- **Data Privacy and Security:** Never upload confidential, proprietary, or embargoed information or data to public GenAI tools.
- **Intellectual Property Rights:** Do not use copyrighted works with GenAI for editing or modification without the expressed permission of the copyright owner.
- **Transparency and Disclosure:** When utilizing GenAI technologies, users should always disclose the use of AI-generated content.
- **Ethical Implications:** Avoid creating content that perpetuates harmful stereotypes, discriminates against individuals or groups based on background or experience, or promotes unethical or illegal behaviors.
- **Accuracy and Responsibility:** Users should be aware of hallucinations and biases inherent in GenAI systems and must carefully review and fact-check AI-generated output.

- **Critical Thinking:** CSTEM values innovation and continuous improvement. GenAI should assist in gathering information efficiently and fostering innovation, not replace original thinking or critical thinking skills.
- **Customization:** Course-level guidelines in a syllabus should not replace the above institutional guidelines. However, instructors are encouraged to provide specific guidance relevant to their course content and objectives.

By adhering to these guidelines, we can provide transformative educational experiences to our diverse students and prepare them for professional success.

### Credit hour policy

Students are expected to spend a minimum of two hours outside of the classroom each week for each unit of credit engaged in learning. Since the lecture portion of this class is a 4-unit course, you should plan on a minimum of 8 hours per week ouside of class. Given the abstract and complicated nature of the material, 10 to 12 hours might be a more reasonable estimate.

### Student Collaboration Policy

- Students are encouraged to collaborate on all in-lecture activities.
- Students are encouraged to support each other's learning of the interactive materials on Canvas pages.
- Weekly programming assignments and the final project are designed for **individual and original work**. Students are encouraged to seek support from the instructors, peers, or tutors on assignment understanding and problem-solving strategies.
- **Violations of Academic Integrity:**
  - Taking solutions (or nearly completed ones) from others and sharing your solutions (or nearly completed ones) are both considered violations of academic integrity.
  - Accepting directions from others on detailed steps toward a solution is the same as taking a solution from others.
  - Telling others the detailed steps of what to type is the same as giving your solutions to others.
- Any of the above cases will result in disciplinary actions, which include:
  - A report to the Dean of Student's Office
  - A failing grade for the assignment and/or the class

### Student Rights, Responsibilities, and Code of Conduct

Four axiomatic beliefs I hold[1]:

1. Scientific potential is distributed equally among different groups, irrespective of geographic, demographic, and economic boundaries.

[1] Adapted from Frederico Ardila at San Francisco State University

2. Everyone can have joyful, meaningful, and empowering experiences with science.
3. Science is a powerful, malleable tool that can be shaped and used differently by various communities to serve their needs.
4. Every student deserves to be treated with dignity and respect.

**Rights[2].**

- You have a right to a learning environment that supports mental and physical wellness.
- You have a right to respect.
- You have a right to be assessed and graded fairly.
- You have a right to freedom of opinion and expression.
- You have a right to privacy and confidentiality.
- You have a right to meaningful and equal participation.
- You have a right to learn in an environment that is welcoming to all people. No student shall be isolated, excluded or diminished in any way.

**Responsibilities**

- You are responsible for taking care of yourself, managing your time, and communicating with the teaching team and with others if things start to feel out of control or overwhelming.
- You are responsible for acting in a way that is worthy of respect and always respectful of others.
- Your experience with this course is directly related to the quality of the energy that you bring to it, and your energy shapes the quality of your peers' experiences.

## Personal Pronoun Preference

With the goal of creating a learning environment in which people of all identities are encouraged to contribute their perspective I will gladly honor your request to address you by your preferred name or gender pronoun. Class rosters are provided to me with students' legal names, please advise me if you prefer me to use alternate name/pronouns so I may make appropriate changes to my records.

## Disability Support Services

Students with disabilities who require reasonable accommodations must be approved for services by providing appropriate and recent documentation to the Office of Disability Support Services (DSS). This office is located in Craven Hall 4200, and can be contacted by phone at (760) 750-4909. Students authorized by DSS to receive reasonable accommodations should meet with me during my office hours in order to ensure confidentiality.

[2]Adapted from Brian La Cour at University of Texas at Austin