



School of Natural Sciences and Mathematics
Computer Science

CS-204 Data Visualization

Tredtin Hall DSC TTh 8:00AM – 9:20 AM
Credits: #3 Section: #1 Term: Fall 2025

Instructor Information



Instructor: Kelly Gaither

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Virtual Office:

<https://utexas.zoom.us/j/5041849659?pwd=ZGNKcDBjZVBVYlhpcUJmN1IDOXJnZz09>

Virtual Office Hours: M-F 11-12 HST or by appointment

Communication: Email, slack or text. I will respond within 24/48 business hours.

School & Department Information

School of Natural Sciences and Mathematics

Office Location: Data Science Center

Phone: (808) 739-8340

If you have questions regarding the Computer Science Department, reach out to your Instructor or the School of Natural Sciences and Mathematics.

Course Description & Materials

Catalog Course Description

This course is an applied visualization and analytics course that includes lectures, discussions, assignments, hands-on experiences, and a semester project. The course will primarily focus on visualization and analytics of data by providing and preparing students with the necessary knowledge, techniques, skills from a data science mindset. Students in this course will use Python, Jupyter notebooks, and a visualization library to create web-based interactive visualizations and will learn the design, development, evaluation, and interpretation of visualization methods with different levels of development difficulty.

Prerequisites: CS 201 or CS 202.

Time Allocation

This is a three-credit hour course requiring 135 clock hours of student engagement, per the official CUH Credit Hour Policy. Over the 15 weeks of this course, students will spend 37.5 hours in class, 60 hours programming the final project over the course of the semester, and 20 hours designing and prototyping visualizations. There will be an additional 17.5 hours of work required beyond what is listed here (course readings, homework assignments, etc.), averaging 1.2 hours each week.

Required Materials

No textbook is required. Relevant reading materials will be provided prior to each class meeting

Canvas (<https://chaminade.instructure.com>)

Canvas is Chaminade University of Honolulu's official learning management system, designed to enhance teaching and learning. It's a versatile platform suitable for various instructional formats, including online (asynchronous/synchronous), hybrid, and traditional face-to-face classes. Canvas empowers educators to create engaging learning experiences with its rich set of tools for content creation, assignments, assessments, and communication. Its user-friendly interface and mobile compatibility ensure accessibility and convenience, elevating the overall educational quality at Chaminade University. For easy access, you can bookmark the bitly link at [https://bit.ly/CUHCanvasLinks to an external site.](https://bit.ly/CUHCanvasLinks%20to%20an%20external%20site) or type "bit.ly/CUHCanvas" in your browser's address bar to log in directly to CUH Canvas, streamlining your online learning experience.

Learning Outcomes

Program Learning Outcomes (PLOs)

Upon completion of Computer Science Degree, the student will be able to:

1. Describe foundational computer organization, architecture, computing resources, and system.
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 computer science to service, justice, and peace in working towards solutions for societal problems and opportunities.

Course Learning Outcomes (CLOs)

Upon completion of CS 204, the student will be able to:

1. Apply a structured design process to create effective visualizations
2. Critique visualizations and identify suggestions for refinement and improvement
3. Construct visualization designs using sketching and prototyping
4. Apply principles of human perception, cognition and storytelling to visualization design
5. Create web-based interactive visualizations on TACC's supercomputers using Jupyter notebooks, Python and visualization api's (python-nvd3)
6. Create dashboards for interactive visualizations using UI/UX principles, visualization design and storytelling using

Marianist Values

This class represents one component of your education at Chaminade University of Honolulu. An education in the Marianist Tradition is marked by five principles and you should take every opportunity possible to reflect upon the role of these characteristics in your education and development:

1. Education for formation in faith.
2. Provide an integral, quality education.
3. Educate in family spirit.
4. Educate for service, justice and peace, and integrity of creation.
5. Educate for adaptation and change.

This course will provide a collaborative environment for instruction that fosters and teaches concepts from the standpoint of service, justice and peace, and integrity of creation. Additionally, this course will provide instruction that integrates concepts of adaptation and change.

Native Hawaiian Values

Education is an integral value in both Marianist and Native Hawaiian culture. Both recognize the transformative effect of a well-rounded, value-centered education on society, particularly in seeking justice for the marginalized, the forgotten, and the oppressed, always with an eye toward God (Ke Akua). This is reflected in the 'Ōlelo No'eau (Hawaiian proverbs) and Marianist core beliefs:

1. Educate for Formation in Faith (Mana) E ola au i ke akua ('Ōlelo No'eau 364) May I live by God.

2. Provide an Integral, Quality Education (Na'auao) Lawe i ka ma'alea a kū'ono'ono ('Ōlelo No'eau 1957) Acquire skill and make it deep.
3. Educate in Family Spirit ('Ohana) 'Ike aku, 'ike mai, kōkua aku kōkua mai; pela iho la ka nohana 'ohana ('Ōlelo No'eau 1200) Recognize others, be recognized, help others, be helped; such is a family relationship.
4. Educate for Service, Justice and Peace (Aloha) Ka lama kū o ka no'eau ('Ōlelo No'eau 1430) Education is the standing torch of wisdom.
5. Educate for Adaptation and Change (Aina) 'A'ohe pau ka 'ike i ka hālau ho'okahi ('Ōlelo No'eau 203) All knowledge is not taught in the same school

Alignment of Course Learning Outcomes

	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5	CLO 6
Marianist Values	2,4	5	2,5	2,4,5	2,4,5	2,4,5
PLOs	2	2	2,3	2,4	1,3	1,3,4
Native Hawaiian Values	2,5	3,5	2,5	2,4,5	2,4,5	2,4,5
Gen Ed Learning Outcomes (if applicable)						

Course Activities

Discussions

Discussions will be conducted on topics over the course of the semester. Participation in these discussions will be graded.

Homework

Readings will be given prior to class with the expectation that students will read the material and come prepared to participate in in-class discussion.

Quizzes and Exams

This course is primarily project based. Quizzes and exams will not be given.

Team Projects

There will be no team project assignments. Teams may only work on the final project with prior approval of the instructor.

Individual Projects

Individual projects will be given to design and prototype visualizations and interactive web-based components of the final project.

Final Project

Students will create a dashboard using a combination of Jupyter notebooks, Python, python-nvd3, matplotlib and Solara for their final project. All individual projects act as preparatory components for the final project.

Course Policies

Attendance

Attendance will be taken for this class and will factor into the class participation grade. We will be discussing new concepts and conducting activities during class and attendance is an important part of mastering the subject matter. Lectures will be recorded and saved on instructor's google drive for access outside of class for the duration of the course.

Late Work

Late work will be accepted up to one week after the deadline. A penalty for late work will be assessed. This does not apply to work that is late due to circumstances with appropriate documentation. If work is late due to excused circumstances, student will work with faculty to determine appropriate and fair timeline for completion.

Extra Credit

Extra credit work may be given during the course semester. This work is intended to enhance learning of topic areas and students will be asked to adhere to documented instructions. Late extra credit work will not be accepted without appropriate documentation.

Changes to the Syllabus

While the provisions of this syllabus are as accurate and complete as possible, your instructor reserves the right to change any provision herein at any time. Every effort will be made to keep you advised of such changes, and information about such changes will be available from your instructor.

Grades of Incomplete

While the provisions of this syllabus are as accurate and complete as possible, your instructor reserves the right to change any provision herein at any time. Every effort will be made to keep you advised of such changes, and information about such changes will be available from your instructor.

Final Grades

Final grades are submitted to [Self-Service](#):

A = 90% and above

B = 80-89%

C = 70-79%

D = 60-69%

F = 59% and below

Grading and Assessment	
Assessments	Points
Communication and Class Participation	5
Dear Data	10
Programming Assignments (3)	35
Final Project Proposal	5
Final Project Progress Check	5
Final Project Submission	25
Final Project Presentation	15

Important Information

Academic Honesty

Academic honesty is an essential aspect of all learning, scholarship, and research. It is one of the values regarded most highly by academic communities throughout the world. Violations of the principle of academic honesty are extremely serious and will not be tolerated.

Students are responsible for promoting academic honesty at Chaminade by not participating in any act of dishonesty and by reporting any incidence of academic dishonesty to an instructor or to a University official. Academic dishonesty may include theft of records or examinations, alteration of grades, and plagiarism, in addition to more obvious dishonesty.

Questions of academic dishonesty in a particular class are first reviewed by the instructor, who must make a report with recommendations to the Dean of the Academic Division. Punishment for academic dishonesty will be determined by the instructor and the Dean of Academic Division and may include an “F” grade for the work in question, an “F” grade for the course, suspension, or dismissal from the University.

For the most up to date information, please refer to the [Academic Honesty Policy](#) on the Chaminade University Catalog website.

Title IX and Nondiscrimination Statement

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. For pregnant and parenting students, I am also obligated to provide you with similar resources for support and protections available to you. My goal is to make sure that you are aware of the range of options available to you and have access to the resources and support you need.

Nondiscrimination Policy & Notice of Nondiscrimination

The university is committed to comply with all State and Federal statutes, rules, and regulations which prohibit discrimination. The university is committed to a policy of nondiscrimination on the basis of race, sex, gender identity and expression, age, religion, color, national origin (including shared ancestry and ethnic characteristics), ancestry, citizenship, disability, genetic information, marital status, breastfeeding, arrest and court record (except as permissible under State law), sexual orientation, or status as a covered veteran. Inquiries about Title IX or general Civil Rights concerns 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 [HERE](#). *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](#).

Hazing Prevention Resources and Athlete Helpline:

Assists athletes, parents, coaches, and any allies interested in ensuring physical and mental safety for sports communities by offering confidential emotional support, crisis intervention, informational athlete-focused resources, and guidance related to concerns about any type of abuse—including hazing.

Chaminade University's Hazing Policy:

<https://catalog.chaminade.edu/studenthandbook/codeofconduct>

<https://hazingpreventionnetwork.org/athlete-helpline/>

<https://hazingpreventionnetwork.org/how-to-report-hazing/>

Basic Needs Resources: <https://chaminade.edu/basic-needs/>

Campus Safety/ SafeSwords

A program for students, faculty and staff, who may feel uncomfortable or unsafe walking alone on campus, at any time of the day. Call security, and a security professional will meet you at your location on campus. The security professional will escort you to your residence hall, car, etc. Students may utilize this when walking to and from night classes around campus or after late night events. [SafeSwords Webpage](#)

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.

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.

Student with Disabilities Statement

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.

Kōkua 'Ike: 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 'Ike: 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 'Ike'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 'Ike at tutoring@chaminade.edu or 808-739-8305.

Topics & Due Dates

Week	Date	Lesson	Due Dates
1	8/26-8/28	<ul style="list-style-type: none"> • Student Introductions • Syllabus Review • TACC Accounts and Jupyter Notebooks • Using Generative AI • Dear Data 	
2	9/2-9/4	<ul style="list-style-type: none"> • Using Jupyter Notebooks • Python Programming • The Art of Debugging 	Dear Data
3	9/9-9/11	<ul style="list-style-type: none"> • Why We Visualize • Making Our First Visualization 	Dear Data
4	9/16-9/18	<ul style="list-style-type: none"> • Matplotlib • Assignment 1 	Dear Data
5	9/23-9/25	<ul style="list-style-type: none"> • Python-nvd3 • Assignment 2 	Dear Data
6	9/30-10/2	<ul style="list-style-type: none"> • Principles and Encoding Techniques • Design Thinking 	Dear Data, Assignment 1 Due
7	10/7-10/9	<ul style="list-style-type: none"> • Visual Hierarchy • Gestalt Principles • Color and Inspiration 	Dear Data, Assignment 2 Due
8	10/14-10/16	<ul style="list-style-type: none"> • Data Stories and Narratives • Storyboarding and Inspiration • Creating a Storyline • Assignment 3 	Dear Data
9	10/21-10/23	<ul style="list-style-type: none"> • Building our First Dashboard in Solara • Final Project Proposal 	Dear Data
10	10/28-10/30	<ul style="list-style-type: none"> • Adding visualizations to our Dashboard 	Dear Data, Final Project Proposal Due
11	11/4-11/6	<ul style="list-style-type: none"> • Creating Advanced Visualizations 	Dear Data, Assignment 3 Due
12	11/11-11/13	<p>No Class 11/11 (Veteran's Day)</p> <ul style="list-style-type: none"> • Encoding Effectiveness • Adding Animation 	Dear Data
13	11/18-11/20	<ul style="list-style-type: none"> • Introduction to UI/UX • Scientific Visualizations • Information Visualization 	Dear Data, Final Project Checkpoint
14	11/25-11/27	<ul style="list-style-type: none"> • Visual Analytics <p>No Class 11/27 (Thanksgiving holiday)</p>	
15	12/2-12/4	<ul style="list-style-type: none"> • Final Project Working Session • Final Project Presentations 	Final Project Due

