Course Syllabus

Chaminade University OF HONOLULU

Course Number: DS 101
Course Title: Data Lifecycle
Department Name: Data Science
School: School of Natural Sciences and Mathematics
Term: Spring 2024
Course Credits: 3
Class Meeting Days: Tuesdays and Thursdays
Class Meeting Hours: 10:00am – 11:20am
Class Location: Henry 225

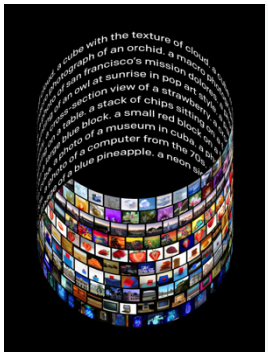
Instructor Name: Helen Turner, PhD (she/her)
Email: hturner@chaminade.edu
Phone: Text me at 808 778 8920 – make sure you give your name
Office Location: CTCC255
Office Hours: By appointment email tiffany.rivera@chaminade.edu
Instructor Website: turnerlabhawaii.org

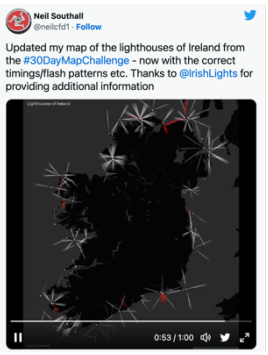
1. University Course Catalog Description

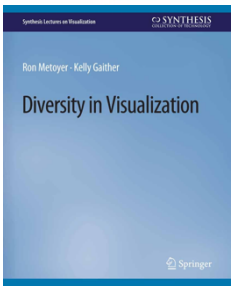
This course is an introduction to data lifecycle, data structures, and data analytics that will cover data topics. This course will include lectures, discussions, assignments, and a project that could be used for future classes and investigation. The goals of the course, it will provide an overview of the depth and breadth of the data flow stages, and prepare students for the next data science courses and data science practice. Students in this course will learn the data lifecycle; data planning process; data security, ethics, and policies; generation and collecting data; cleaning, formatting, and preparing data; data storage and structures; data management; data analysis, visualization, interpretation; communicating and storytelling data results; and sharing, publishing, and preserving data.

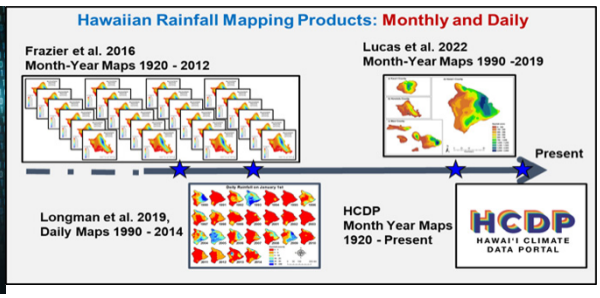
2. Course Overview

This course has a number of themes: It will explore the practice of data science as decision science, examining how the field can assist individuals, organizations and societies to make evidence-based decisions. It will use case studies presented by Chaminade and external experts to illustrate the application of the data lifecycle to major global challenges, framed around the United Nations Sustainable Development Goals (SDG, e.g., Climate Action, Health Equity, Gender Equity, Justice). The course will examine a broad range of types, forms and structures of data that humans use to transmit information and that can be analyzed and visualized to gain knowledge. We will address the role of AI and Machine Learning in decision support. Finally, we will engage with our data scientist identities as storytellers, exploring best practices and case studies in visualization.









3. Program Learning Outcomes

B.S. Data Science Analytics and Visualization Program Learning Outcomes

1. Source, describe and curate large data sets ('Big Data') that may not be amenable to traditional hardware and software, and conventional statistical analysis including domain and file specific metadata and the tools built around alternatives to tabular relations that allow the use of multimodal data;	2. Identify, describe and apply foundational mathematical and statistical concepts and operations, including the application of tools such as R, SQL and Python languages, that underlie data sourcing, management, analysis and interpretation;
3. Develop and implement approaches for effective data translation, dissemination and communication between domains, stakeholders and the public;	4. Identify and apply basic data modeling, predictive models and visualizations to support decision-making;
5. 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;	6. Explain, plan and execute data science tasks within multidisciplinary teams;
7. Execute a domain-specific capstone project addressing a stakeholder-generated use case.	8. Personal and professional awesomeness

4. Course Learning Outcomes and Linkage to Program Learning Outcomes

CLO	PLO							
	1	2	3	4	5	6	7	8
1. Identify and describe the stages of the data lifecycle.	X	X	X	X	X	X		X
2. Connect the stages of data lifecycle to real-world use cases	X	X		X				X
3. Conceptualize data science theory and practice as decision science, using the UN SDG to illustrate use cases for data-driven decision support			X		X			X
4. Analyze decision support use cases as example of data science processes and methods that are stages of the Data Lifecycle	X	X	X	X	X	X		X
5. Identify data forms and structures across domains of human knowledge including quantitative and social sciences, and the arts.	X	X						X
6.Explain opportunities and concerns surrounding the application of AI and ML to decision support			X		X			X
7. describe and implement best practices in data visualization and storytelling for diverse audiences			X					X

5. Course Prerequisites

None. Come as you are. You do you.

6. Required Learning Materials

The course outline will be provided on Canvas

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

The course's day to day management will be via a Google Drive where student has a folder to submit assignments. There will be some required readings which will be provided in Google drive. You will all be shared on the Google Drive in Week 1.

7. Assessment

Attendance/Participation	250 points	25%
Homeworks A-E	50 points each/250 points total	25%
Major Assignment 1	250 points	25%
Major Assignment 2	250 points	25%
Total	**1000 points**	**100%**

8. 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% 900 points or more

Outstanding scholarship and an unusual degree of intellectual initiative

B 80-89% 800-890 points

Superior work done in a consistent and intellectual manner

C 70-79% 700-790 points

Average grade indicating a competent grasp of subject matter

D 60-69% 600-690 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

9. Course Schedule

This schedule is meant as a guideline and is subject to change at the instructors' discretion. The student will be notified of any significant deviations from this schedule.

major theme	week	session	date	Theme/TITLE	What	Notes
	1	1	01/07	Data Science Is Decision Science	Dr Turner Week 1 lecture	
		2	01/09	Personal decision making activity	Dr Turner Week 1 lecture	
	2	1	01/14	Data to Knowledge to Insights Framework	Dr Turner Week 2 lecture	
		2	01/16	Dataset sourcing activity	Dr Turner Week 2 lecture	
	3	1	01/21	Data for Decision Support: the data lifecycle	Dr Turner Week 3 lecture	
		2	01/23	Data for Decision Support: the data lifecycle and data equity	Dr Turner Week 3 lecture	
Decision science, data lifecycle elements and rationale,	4	1	01/28	Data for Decision Support: the data lifecycle and data security/privacy/longevity	Dr Turner Week 4 lecture	
		2	01/30	Data for decision support: Systems change theory and the Data Lifecycle	Guest: Dr. Catherine Brockway	
	5	1	02/04	Decision Support Case study: Developing the Pacific Drought Knowledge Exchange	Guest: Dr. Ryan Longman	**Homework A** is to make a PPT showing exploration of PDKE
		2	02/06	Decision Support Case study: health and health equity, health data	Dr Turner Week 5 Lecture	**Homework B** is to complete the health equity scenario table
	6	1	02/11	Decision Support Case study: Hawai'i Climate Data Portal	Guest: Dr. Sean Cleveland	**Homework C** is to make a PPT showing exploration of HCDP
		2	02/13	Data & the SDG: Global SDG data international surveys and,indicators	Guest: Connor Flynn	**Homework D** is to make a PPT exploring use of the SIDS Platform
	7	1	02/18	Securing the data lifecycle: Blockchain InfoSec	Guest: Ken Spedden	
		2	02/20	Data for decision support: role of AI and ML	Dr Turner Week 7 Lecture	
	8	1	02/25	Data Forms: Social science data	Guest: Dr JD Baker	**Post Major Assignment 1:** Annotated data lifecycle for an SDG-related case study
		2	02/27	Office Hours: Homeworks and Overview of Major Assignments	Dr Turner Week 11 Lecture	**Post Major Assignment 2:** GPT generated LLM SDG essay
	9	1	03/04	Data Forms: Indigenous data, contemporary and historical	Guest: Kumu Kahoaali'i Keahi	
		2	03/06	Indigenous data activity	Guest: Kumu Kahoaali'i Keahi	
Data Forms and human knowledge transmisison across history and culture	10	1	03/11	Data Forms: Language and Linguistics	Guest: Dr. Catherine Brockway	
		2	03/13	Language and Linguistics activity	Guest: Dr. Catherine Brockway	
			3/18/24 3/20/24	SPRING BREAK		
	11	1	03/25	Data Forms: Electronic Health Records and Vital Statitics	Guest: TBD	
		2	03/27	Data Forms: Art, Textiles and Music	Dr Turner Week 11 Lecture	**Homework E:** annotate Dall-E or music AI project centered on an SDG issue
Storytelling with data 	12	1	04/01	Data Viz for Decision Support	Guest: Dr. Kelly Gaither	
		2	04/03	Data Viz for Decision Support	Guest: Dr. Kelly Gaither	
	13	1	04/08	Blockchain Datapreneurship	Guest: Benjamin Diggles	
		2	04/10	Class party and AI showcase	All	
Assignments 	14	1	04/15	Office Hours	Dr. Turner	
		2	04/17	Office Hours	Dr. Turner	
	15	1	04/22	Office Hours	Dr. Turner	
		2	04/24	Office Hours	Dr. Turner	All Assignments and Homeworks Final Due Date 04/25

10. Policies, Guidance and Assistance

Technical Assistance for Canvas Users:

- Search for help on specific topics or get tips in Canvas Students
- Live chat with Canvas Support for students
- Canvas Support Hotline for students: +1-833-209-6111
- Watch this video to get you started
- Online tutorials: click on "Students" role to access tutorials
- Contact the Chaminade IT Helpdesk for technical issues: helpdesk@chaminade.edu or call (808) 735-4855

Tutoring and Writing 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 (https://chaminade.edu/advising/kokua-ike/) 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 Account – Notifications – TutorMe. For more information, please contact Kōkua 'Ike at tutoring@chaminade.edu or 808-739-8305.

Late Work Policy

Requests for extensions due to extenuating circumstances (documented computer or medical problems, for example) will be considered but in general work received after the deadline will not be graded (i.e., will receive a score of zero).

Grades of "Incomplete"

Should you encounter a significant medical or personal event that prohibits you from completing the course requirements within the time that is allocated for this course, an incomplete grade can be given. Issuance is not automatic, and is at the discretion of the faculty member. An incomplete grade may be assigned to a student who has successfully completed with at least a passing grade the majority of the work of the course, and who has an unavoidable and compelling reason why the remainder of the work cannot be completed on schedule.

Writing Policy

Guidance on written assignment formatting and citation style will be provided in class.

Instructor and Student Communication

Questions for this course can be emailed to the instructors. Online, in-person and phone conferences can be arranged. Response time will take place up to 24 hours..

Disability Access

If you need individual accommodations to meet course outcomes because of a documented disability, please speak with me to discuss your needs as soon as possible so that we can ensure your full participation in class and fair assessment of your work. Students with special needs who meet criteria for the Americans with Disabilities Act (ADA) provisions must provide written documentation of the need for accommodations from Kōkua 'Ike: Center for Student Learning by the end of week three of the class, in order for instructors to plan accordingly. If a student would like to determine if they meet the criteria for accommodations, they should contact the Kōkua 'Ike Coordinator at (808) 739-8305 for further information (ada@chaminade.edu).

Title IX Compliance

Chaminade University of Honolulu recognizes the inherent dignity of all individuals and promotes respect for all people. Sexual misconduct, physical and/or psychological abuse will NOT be tolerated at CUH. If you have been the victim of sexual misconduct, physical and/or psychological abuse, we encourage you to report this matter promptly. As a faculty member, I am interested in promoting a safe and healthy environment, and should I learn of any sexual misconduct, physical and/or psychological abuse, I must report the matter to the Title IX Coordinator. If you or someone you know has been harassed or assaulted, you can find the appropriate resources by visiting Campus Ministry, the Dean of Students Office, the Counseling Center, or the Office for Compliance and Personnel Services.

Attendance Policy

The following attendance policy is from the Academic Catalog: Faculty members should also check with their divisions for division-specific guidelines. "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 division office. 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 Tutor 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.

Academic Conduct Policy

From the 2019-2020 Undergraduate Academic Catalog (p. 39):

Any community must have a set of rules and standards of conduct by which it operates. At Chaminade, these standards are outlined so as to reflect both the Catholic, Marianist values of the institution and to honor and respect students as responsible adults. All alleged violations of the community standards are handled through an established student conduct process, outlined in the Student Handbook, and operated within the guidelines set to honor both students' rights and campus values. Students should conduct themselves in a manner that reflects the ideals of the University. This includes knowing and respecting the intent of rules, regulations, and/or policies presented in the Student Handbook, and realizing that students are subject to the University's jurisdiction from the time of their admission until their enrollment has been formally terminated. Please refer to the Student Handbook for more details. A copy of the Student Handbook is available on the Chaminade website. For further information, please refer to the Student Handbook: https://chaminade.edu/wp-content/uploads/2019/08/NEW-STUDENT-HANDBOOK-19-20-Final-8.20.19.pdf

Credit Hour Policy

The unit of semester credit is defined as university-level credit that is awarded for the completion of coursework. One credit hour reflects the amount of work represented in the intended learning outcomes and verified by evidence of student achievement for those learning outcomes. Each credit hour earned at Chaminade University should result in 45 hours of engagement. This equates to one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester, 10 week term, or equivalent amount of work over a different amount of time. Direct instructor engagement and out-of-class work result in total student engagement time of 45 hours for one credit. The minimum 45 hours of engagement per credit hour can be satisfied in fully online, internship, or other specialized courses through several means, including (a) regular online instruction or interaction with the faculty member and fellow students and (b) academic engagement through extensive reading, research, online discussion, online quizzes or exams; instruction, collaborative group work, internships, laboratory work, practica, studio work, and preparation of papers, presentations, or other forms of assessment. This policy is in accordance with federal regulations and regional accrediting agencies. The minimum 45 hours of engagement per credit hour can be satisfied in fully online, internship, or other specialized courses through several means, including (a) regular online instruction or interaction with the faculty member and fellow students and (b) academic engagement through extensive reading, research, online discussion, online quizzes or exams; instruction, collaborative group work, internships, laboratory work, practica, studio work, and preparation of papers, presentations, or other forms of assessment. This policy is in accordance with federal regulations and regional accrediting agencies.

This is a three-credit hour course requiring 135 clock hours of student engagement, per the official CUH Credit Hour Policy. Students enrolled in this course are anticipated to spend 135 hours working on the class:

- 35 hours across 26 x 80 minute class sessions/lectures
- 35 hours in total homework assignments (5 homeworks)
- 5 hours attending Office Hours
- 60 hours researching and completing two Major Assignments

11.11. Syllabus Easter Egg

If you read this far then text Dr Turner (808 778 8920) the following

[Your last name] DS101 excited to start the course!

And you can pick up a special prize from my office in CTCC255!