

DS 476: Data Analysis and Presentation

School of Technology & Computing

5 Credits, Undergraduate Course

Summer 2022

Grading Type: Decimal

Access to the Internet is required.

All written assignments must be in Microsoft-Word-compatible formats.

See the library's APA Style Guide tutorial for a list of resources that can help you use APA style.

Faculty Information

Professional experience information for instructors is found under *Faculty Information* in the online course menu.

Contact Information

Contact information for instructors is found under *Faculty Information* in the online course menu.

Email: [first name] [last name]

Phone: [xxx-xxx-xxxx]

Office Hours and Response Time: [I am available through Teams xxday and xxday nights between xx p.m. - xx p.m. I will respond within 24 hours. I will grade within 3 business days after the due date.]

Bio: (keep images under 300px wide)

Course Description

The human-computer interface provides the means whereby users interact with computer systems. The quality of that interface significantly affects usability in all its forms and encompasses a vast range of technologies: animation, visualization, simulation, speech, video, recognition, and graphics. For the data scientist, it is crucial to be aware of the range of options and possibilities and to be able to deploy them appropriately. With graphs and other forms of diagrams, visualization can be used in providing readily understood summaries but can also greatly assist in guiding such activities as clustering and classification. Students completing this course will have an understanding of foundational considerations, visualization, user-centered design, interaction design, and interface design and development.

Course Resources

Required and recommended resources to complete coursework and assignments are found on the course [Reading List](#). Note: resources listed under "Required - Must Purchase" should be purchased from a vendor of the student's own choosing; resources listed under "Available from the Library" are available at no cost to students.

Course Outcomes

As a result of this course, students will know or be able to do the following:

- Understand the various roles visualization plays in Data Science.
- Understand effective approaches to visualization given data sets for a specific purpose.
- Apply visualization tools in support of analysis and presentation.

- Analyze famous examples of visualization in common use.
- Evaluate the adoption of a user-centered approach to analysis and presentation.
- Create data visualization for effective communication.

Grading Scale

The grades earned for the course will be calculated using City University of Seattle’s decimal grading system, found in the current University Catalog (<https://www.cityu.edu/catalog/>).

Grading rubrics with details on how each assignment will be graded are located under *Assignments* and/or in *My Grades* in the online course menu. Students should review the rubric for each assignment prior to completing their work in order to understand how it will be assessed.

| OVERVIEW OF REQUIRED ASSIGNMENTS | % OF FINAL GRADE | POINTS |
|----------------------------------|------------------|---|
| The Muddiest Point (MP) | 5% | 50 = 5 points * 10 modules |
| Concept Test (CT) | 5% | 50 = 5 points * 10 modules |
| Discussion Board (DB) | 10% | 100 = 10 points * 10 modules |
| Hands-On Practice (HOP) | 20% | 200 = 20 points * 10 modules |
| Programming Exercise (PE) | 30% | 300 = 30 points * 10 modules |
| Knowledge Check (KC) | 10% | 100 = 10 points * 10 modules |
| Team Project (TP) | 20% | Proposal: 30 points Progress: 70 points Final Report: 70 points Final PPT: 30 points Subtotal: 200 points |
| TOTAL | 100% | 1,000 points |

Course Assignments and Grading

The instructor will provide grading rubrics that provide more detail as to how this assignment will be graded

The Muddiest Point (MP)

Before class, students are required to submit the Muddiest Point (MP) activity. The purpose of this activity is to stimulate student engagement. The instructor uses the MP to assess how students understood the required readings. The instructor also uses the MP to customize the lecture scope to implement Just-in-Time Teaching (JiTT). The MP consists of writing a brief reflective essay (<= 50 words) identifying the most confusing part (i.e., the MP) of the content covered in the upcoming module. If a student understood all concepts, the student needs to

explain the most exciting aspect. There is one multiple-choice question from the required reading to demonstrate that the student understood the required readings.

| Criteria | % of Grade |
|-----------------|-------------------|
| Participation | 40% |
| Writing | 40% |
| Accuracy | 20% |
| TOTAL | 100% |

Concept Test (CT)

The instructor poses a problem based on key concepts of a lecture. After reflecting on the problem, students submit their response and the instructor review them without providing a correct answer. Students discuss their thought process and solution with a peer. Students then commit to an answer and re-submits their responses. Instructor reviews responses and thought processes with the correct answer.

| Criteria | % of Grade |
|-----------------|-------------------|
| Engagement | 100% |
| TOTAL | 100% |

Discussion Board (DB)

A student posts an answer to a weekly discussion topic in Discussion Board. The student also posts a response to two other students' posts by the end of each module. Comments and questions should be clear and thoughtful, with correct grammar, spelling, and punctuation. The instructor will grade the quality of your discussion postings on both content and response.

| Criteria | % of Grade |
|-----------------|-------------------|
| Participation | 50% |
| Writing | 50% |
| TOTAL | 100% |

Hands-on Practice (HOP)

The instructor will assign Hands-on Practice exercises to a pair of students in class or individually online. Students pair up and practice exercises to learn specific programming languages, application programming interfaces (APIs), or tools related to the programming assignments or virtual labs.

| Criteria | % of Grade |
|-------------------|-------------------|
| Practice Exercise | 80% |
| Engagement | 20% |
| TOTAL | 100% |

Programming Exercise (PE)

The students must individually perform the programming exercise. Programs must be executable and robust. Non-executable programs will not receive any credits. Programs should deliver correct answers on all valid input and produce comprehensible error messages on invalid input. Programs also run correctly on all test data given within a reasonable amount of time. Students should write programs that are easy for other people to read.

| Criteria | % of Grade |
|-----------------------|-------------|
| Program Execution | 40% |
| User Requirement | 40% |
| Program Documentation | 20% |
| TOTAL | 100% |

Knowledge Check (KC)

Weekly quizzes measure knowledge concepts acquired. Focus on the underlying principles and concepts rather than memorization to solve the quizzes.

| Criteria | % of Grade |
|--------------|-------------|
| Correctness | 100% |
| TOTAL | 100% |

Team Project (TP)

Each student can select his or her team that consists of three students. A group of fewer than three students requires the instructor's approval. Each team will use an instructor-approved topic relevant to the course.

The paper must be no less than 6-7 pages. We required you to use the paper template from [EDSIG/CONISAR](#), the international conference standard. *The instructor may recommend the best papers in this course to conferences with the team's approval. If necessary, the instructor may require more revisions after the course is over. However, the paper submission is optional and has nothing to do with your course grade.*

We will provide you three report templates and one presentation template. The file name consists of team project number, team number, and the list of your team members. For example, "TP01 T03 Sam John Mark."

- TP01 for the proposal - "TP01 T0X Author1 Author2 Author3.docx"
- TP02 for the progress report - "TP02 T0X Author1 Author2 Author3.docx"
- TP03 for the final report - "TP03 T0X Author1 Author2 Author3.docx"
- TP04 for the final presentation slide - "TP04 T0X Author1 Author2 Author3.pptx"

As in any scholarly writing, students should not merely copy information from another author. Students should use evidence to support the contentions they have drawn from their findings

and critically analyze related literature. In essence, each paper needs to be an analytical paper, not a summary of readings.

In addition, a team presentation slide is required.

- The presentation consists of 15+4 slides: 15 slides for content and 4 slides for cover, agenda, key reference, and Q&A.
- The PPT template is provided. Your team can change design and color for your team's purpose.
- A presentation video is under 15 minutes.
- A demo video (a maximum of 1-2 minutes) is appropriate. The demo time should be included in the total presentation time (15 minutes).

Four submissions are required according to the following schedule:

- Proposal (1 page; 30 points) - Starting (Module 1) & Ending (Module 3)
- Progress Report (3-4 pages; 70 points; graded after the proposal has been submitted) - Starting (Module 4) & Ending (Module 7)
- Final Report (6-7 pages; 70 points; graded after the progress has been submitted) - Starting (Module 8) & Ending (Module 10)
- Final PPT (15+4slides, 30 points; graded after the final report has been submitted) - Starting (Module 8) & Ending (Module 10)

Students are expected to use the assigned readings, videos, and other materials throughout the quarter. Students can utilize additional sources that were not assigned by the professor. While stylized after an industry report, nonetheless, students are expected to employ APA formatting of citations, footnotes, and bibliography. Students must cite the sources of all ideas, facts, and information used that are not their own, even if they have put the information into their own words. Failure to do so is plagiarism, although the oversight is unintentional. To avoid plagiarism, check <https://library.cityu.edu/howto/apa-writing/avoid-plagiarism/>.

Project Description: Instructor's choice related to program outcomes

Students are required to demonstrate competency analyzing and presenting data visually.

Team Project (TP) Report

The student will provide a report formatted based on a template provided by the instructor. Students are required to improve the writing iteratively and incrementally every week. The revision will always happen during a quarter. Students will add new required sections to the existing paper every week.

The final report is the culmination of applied research and activities conducted throughout the quarter. The final report/paper provides a detailed problem and its solution likely to be encountered by a company or organization described in a case study supplied by the student.

| Criteria | % of Grade |
|-----------------|-------------------|
| Structure | 20% |

| | |
|---------------|-------------|
| Content | 30% |
| Writing | 30% |
| Reference | 10% |
| Collaboration | 10% |
| TOTAL | 100% |

Team Project (TP) Presentation

The student will report on the research outcomes, development, or other project efforts to an academically appropriate committee in a public forum. The nature of the presentation content will determine the specific makeup of the audience. The student will choose the format of the presentation, in consultation with the advisor. The layout and design must be appropriate and adequate to represent the outcomes of the effort. While students must make some form of a visual presentation, the presentation of the results may include publishing in a refereed publication, publication in a trade or popular magazine or journal, broadcast in an appropriate medium, or, in exceptional cases, limited dissemination within a closed community. Each presenter will have 15 minutes for presentation and 5 minutes for questions and answers. Each presenter must keep the total presentation time limit strictly.

| Criteria | % of Grade |
|-----------------------------|-------------------|
| Structure | 20% |
| Visual Presentation | 30% |
| Verbal Quality & Engagement | 30% |
| Team Collaboration | 20% |
| TOTAL | 100% |

Course Policies

Course policies on topics such as *Late Assignments*, *Participation*, and *Professional Writing* are found under *Course Information* in the online course menu. Students are responsible for reviewing and applying these policies while enrolled in this course.

University Policies

Students are responsible for understanding and adhering to all of City University of Seattle's academic policies. The most current versions of these policies can be found in the [University Catalog](#) that is linked from the CityU Web site.

Title IX Statement

City University of Seattle and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. If students have encountered any form of sexual misconduct (e.g. sexual assault, sexual harassment, stalking, domestic or dating violence), we encourage them to report this to the University. If a student

speaks with a faculty member about an incident of misconduct, that faculty member must notify CityU's Title IX coordinator and share the basic fact of the experience. The Title IX coordinator will then be available to assist students in understanding all of the options and in connecting students with all possible resources on and off campus.

To view CityU's sexual misconduct policy and for resources, please visit the [Title IX](#) and [Campus Safety](#) pages in the my.cityu.edu portal.

Religious Accommodations

Washington state law requires that City University of Seattle develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The University's policy, including more information about how to request an accommodation, is available in the University Catalog. Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request Form found on the student dashboard in the my.cityu.edu student portal.

Academic Integrity

Academic integrity in students requires the pursuit of scholarly activity that is free from fraud, deception and unauthorized collaboration with other individuals. Students are responsible for understanding CityU's policy on academic integrity and adhering to its standards in meeting all course requirements. A complete copy of this policy can be found in the [University Catalog](#) under *Student Rights and Responsibilities* on the page titled *Academic Integrity Policy*.

Attendance

Students taking courses in any format at the University are expected to be diligent in their studies and to attend class regularly.

Regular class attendance is important in achieving learning outcomes in the course and may be a valid consideration in determining the final grade. For classes where a physical presence is required, a student has attended if they are present at any time during the class session. For online classes, a student has attended if they have posted or submitted an assignment. A complete copy of this policy can be in the [University Catalog](#) under *Student Rights and Responsibilities* on the page titled *Attendance*.

Support Services

Disability Services Accommodations Statement

Students with a documented disability who wish to request academic accommodations are encouraged to contact Disability Support Services to discuss accommodation requests and eligibility requirements. Please contact Disability Support Services at disability@cityu.edu or 206.239.4752 or visit the [Disability Support Services](#) page in the my.cityu.edu portal. Confidentiality will be observed in all inquiries. Once approved, information about academic accommodations will be shared with course instructors.

Library Services

CityU librarians are available to help students find the resources and information they need to succeed in this course. Contact a CityU librarian through the [Ask a Librarian](#) service, or access [library resources and services online](#), 24 hours a day, seven days a week.

Smarthinking Tutoring

CityU students have access to free online tutoring offered through Smarthinking, including writing support, from certified tutors 24 hours a day, seven days a week. Contact CityU's Student Support Center at help@cityu.edu to request a username and password.