

MATH 395—Spring 2023 Syllabus

BIG (Business, Industry and Government) Experiences in Mathematics

Instructor:	Dr. Jessica Stewart Kelly
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Office Hours:	MTWR: 10:30-11:30
Course Times:	TR: 3:00-4:15, Luter 352

Prerequisite: MATH 240–Intermediate Calculus or permission of instructor

Course Description: The purpose of this course is to prepare students for a career in industry. Students will actively engage in real-life problems that are of interest to organizations and businesses. As students seek to solve challenging, open-ended problems proposed by our community partners, they will develop problem solving, team work, and communication skills.

Course Goals:

The purpose of this course is to prepare you, a mathematics student, for a career in industry. You will be actively engaged in real-life problems that are of interest to businesses and government agencies. As you seek to solve challenging, open-ended problems proposed by our community partners, you will be developing your problem solving, team work, and communication skills. The types of problems you and your teammates will be working to solve are examples of projects that you might be asked to solve as a new hiree in industry.

At the end of this course, successful students will:

1. improve written and oral communication skills with respect to mathematics
2. improve ability to reason rigorously in mathematical arguments
3. develop ability to undertake independent work
4. advance their level of critical thinking
5. gain perspective on interplay of applications, problem-solving, and theory
6. conduct research and make written and video presentations on various topics
7. understand the role mathematics plays in the setting of industry

Course Organization:

We will meet together as an entire class for two, hour and fifteen minute class periods each week; however, *your 3-4 person project group is expected to meet for at least two hours outside of class each week.*

This is not a lecture-based class! You will be driving the content of the course as you work to solve your problem. Although Dr. Kelly is available to answer questions, you should be prepared to seek out information. You will need to decide what type of math should be used to approach your problem—should it be statistics or differential equations, operations research or numerical analysis? You will need to support your findings with data—how can you check that you have an accurate solution? You possibly want to approach the problem from a second viewpoint—is there a different methodology you could employ?

The class will be structured as such: During every Tuesday and alternating Thursday class meetings, you will have the opportunity to work in your project groups. Dr. Kelly will be available to assist you with any questions that you have. On the other Thursdays, you will be sharing your progress with the class. You will give a presentation sharing details relating to your problem, your proposed technique, and progress that has been made. There will also be class discussions related to related to readings on mathematics and industry.

Assignments

Journals: Each person will be required to keep two “Progress Report Journals.” One journal will be compiled by and shared with your team; the other journal will be your individual journal. Both journals should be kept for the entirety of the semester. Dr. Kelly will provide you with a Google Doc template for both journals.

In the team journal, you will log the hours you as work together as a group. This includes both in and out of class meeting times. *You are expected to spend three hours each week (beyond our meeting time) working on research with your team.* In the group journal, you will answer the following questions:

1. When and where did you meet?
2. Who were the group members present?
3. What were your goals for the meeting?
4. What did you accomplish? (Did you work on writing a computer program; researching articles; exchanging information about certain calculations; practice your presentation?)
5. Did you run into any roadblocks?
6. What tasks (to be done before the next group meeting) are assigned to each of the members?
7. When and where is the next group meeting?

Additionally, each week you will reflect upon your individual experience by answering the following questions:

1. What were three tasks you personally accomplished this week?
2. What were three roadblocks or hurdles you or your team encountered? Explain how you overcame these challenges or how you plan to confront the roadblocks next week.
3. Review your goal from last week and assess your progress. Did you spend your time on the right things? If not, how will you improve next week?
4. What was the biggest lesson you learned this week?
5. What frustrations do you have?
6. What is your goal for next week? This goal could relate to working on the problem or some aspect of teamwork.

Progress Reports: Every other Thursday, as a team, you will submit a progress report. This progress report should be no longer than one page; and it should summarize the efforts you have made to solve the proposed problem. The progress reports should be well-organized and professional as they will be shared with the community partners. You should also take care to explain any technical mathematics in a manner that the community partner can understand and find useful.

On the alternate Thursday (when you are not turning in a written report), you will give a 5 minute group presentation to the other members of the class, sharing information similar to that which you are including in the written progress reports. Community partners are invited to attend these presentations or receive a video recording, so the presentations should be professional and include one to three slides with important information. Following each group’s presentation, there will be an opportunity for discussion and collaboration between groups. (Even though each group will have a different project, other students may be able to provide insight!)

Final Project: Your group will turn in both a written report and give a final presentation at the end of the semester. For both the written report and final presentation, a detailed rubric will be provided. A copy of the written report and a video recording of the final presentation will be given to your community partner.

Semester Grade:

Your semester grade will be comprised of the following:

Team Progress Journal	10%
Individual Progress Journal	10%
Written Progress Reports, Presentations, Discussions	30%
Final Presentation	20%
Final Paper	30%
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Total	100%

Your semester grades will be calculated on the following scale:

A	93-100	B-	80-82.99	D+	67-69.99
A-	90-92.99	C+	77-79.99	D	63-66.99
B+	87-89.99	C	73-76.99	D-	60-62.99
B	83-86.99	C-	70-72.99	F	0-59.99

University Statement on Diversity and Inclusion: The Christopher Newport University community engages and respects different viewpoints, understands the cultural and structural context in which those viewpoints emerge, and questions the development of our own perspectives and values, as these are among the fundamental tenets of a liberal arts education.

Accordingly, we affirm our commitment to a campus culture that embraces the full spectrum of human attributes, perspectives, and disciplines, and offers every member of the University the opportunity to become their best self.

Understanding and respecting differences can best develop in a community where members learn, live, work, and serve among individuals with diverse worldviews, identities, and values. We are dedicated to upholding the dignity and worth of all members of this academic community such that all may engage effectively and compassionately in a pluralistic society.

If you have specific questions, suggestions or concerns regarding diversity on campus please contact **Diversity.Inclusion@cnu.edu**

Disabilities/Accessibility: In order for a student to receive an accommodation due to a disability, that disability must be on record in the Office of Student Affairs, 3rd Floor, David Student Union (DSU). If you have a diagnosed disability, please contact Jacquelyn Barnes, Student Disability Support Specialist in Student Affairs ((757) 594-7160) to discuss your needs.

Students with documented disabilities are to notify the instructor at least seven days prior to the point at which they require an accommodation (the first day of class is recommended), in private, if accommodation is needed. The instructor will provide students with disabilities with the reasonable accommodations approved and directed by the Office of Student Affairs. Work completed before the student notifies the instructor of his/her disability may be counted toward the final grade at the sole discretion of the instructor.

Academic Support: The Center for Academic Success offers free tutoring assistance for Christopher Newport students in several academic areas. Center staff offer individual assistance and/or workshops on various study strategies to help you perform your best in your courses. The center also houses the Alice F. Randall Writing Center. Writing consultants can help you at any stage of the writing process, from invention, to development of ideas, to polishing a final draft. The Center is not a proofreading service, but consultants can help you to recognize and find grammar and punctuation errors in your work as well as provide assistance with global tasks. Contact them as early in the writing process as you can!

You may contact the Center for Academic Success to request a tutor, confer with a writing consultant, obtain a schedule of workshops, or make an appointment to talk with a staff member about study skills and strategies. The Center is located in Christopher Newport Hall, first floor, room 123. You may email

academicsuccess@cnu.edu or call (757) 594-7684.

Course Materials: All content created and assembled by the faculty member and used in this course is to be considered intellectual property owned by the faculty member and Christopher Newport University. It is provided solely for the private use of the students currently enrolled in this course. To ensure the free and open discussion of ideas, students may not make available any of the original course content, including but not limited to lectures, discussions, videos, handouts, and/or activities, to anyone not currently enrolled in the course without the advance written permission of the instructor. This means that students may not record, download, screenshot, or in any way copy original course material for the purpose of distribution beyond this course. A violation may be considered theft. It is the student's responsibility to protect course material when accessing it outside of the physical classroom space.