

TU Braunschweig Subject-Specific Qualifications

Application for MSc. Data Science

| Category | Course Equivalent | CP (ECTS) |
|--|---|----------------------------|
| Computer Science (92 ECTS) | | |
| Programming | CSCE 155E - Computer Science I CSCE 235 - Introduction to Discrete Structures CSCE 251 - UNIX Programming CSCE 301 - Data Structures & Algorithms CSCE 474 - Introduction to Data Mining CSCE 478 - Introduction to Machine Learning | 6 6 2 6 6 6 |
| Software Engineering and Database¹ | CSCE 361 - Software Engineering CSCE 156 - Computer Science II CSCE 401H - Design Studio I CSCE 402H - Design Studio II | 6 8 6 6 |
| Distributed Systems and IT Security | CSCE 231 - Computer Systems Engineering CSCE 451 - Operating Systems | 8 6 |
| Theoretical Computer Science | CSCE 322 - Programming Language Concepts CSCE 423 - Design & Analysis of Algorithms COMPSCI 136 - Economics & Computation (Algorithmic Game Theory) ² | 6 6 8 |
| Mathematics (60 ECTS) | | |
| Analysis | MAT 133 - Calculus & Analytical Geometry I ³ MAT 134 - Calculus & Analytical Geometry II ⁴ MATH 208 - Calculus III MATH 325 - Elementary Analysis | 8 8 8 6 |
| Linear Algebra Modern Algebra | MATH 314 - Linear Algebra MATH 310 - Introduction to Modern Algebra MATH 417 - Group Theory | 6 6 6 |
| Applied Mathematics | MATH 428 - Introduction to Operations Research MATH 435 - Math in the City (Mathematical Epidemiology) | 6 6 |
| Statistics and Data Science | ECON 215 - Statistics STAT 380 - Statistics and Application ECON 417 - Introduction to Econometrics ECON 409 - Economic Data Visualization SCMA 350 - Business Data Analytics | 6 6 6 6 6 |

Professional Equivalency for Required Areas

Refer to the CV for detailed information.

Databases & Data Engineering

Researcher (Lead Author), Berkman Klein Center (Harvard)
Database Developer Intern, Farm Credit Services of America

Oct 2024 – Jun 2025
Aug 2021 – Aug 2022

IT Security & Computer Networks

Intelligent Solutions Engineer, Unified Communications

Sep 2025 – Present

¹CSCE 156 covers topics on relational databases and their design. CSCE 401H and CSCE 402H capstone sequence involves the application of a Graph Database Neo4j. Excerpt from the project can be found [here](#).

²Credits earned at the Harvard Kenneth C. Griffin Graduate School of Arts and Sciences. See [notes on the document](#) for more details.

³Credits transferred from INTI International College Penang, which is deemed equivalent to MATH106 at the University of Nebraska-Lincoln. See [notes on the document](#) for more details.

⁴Credits transferred from INTI International College Penang, which is deemed equivalent to MATH107 at the University of Nebraska-Lincoln. See [notes on the document](#) for more details.

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Notes on the Document

This is a compilation of the syllabi that are relevant to the requirements of the program for the admissions committee. A document outline is provided for ease of access; the courses are grouped by major and sorted by course number.

At the University of Nebraska-Lincoln, a comprehensive list of all courses offered in my majors, including brief descriptions, can be found in the course catalog at the following links:

1. [Computer Science](#)
2. [Mathematics](#)
3. [Economics](#)

Additionally, I transferred credits from INTI International College Penang, where I obtained credits for MATH 133 and MATH 134. These were recognized as equivalent credits at the University of Nebraska-Lincoln for MATH 106 (Calculus I) and MATH 107 (Calculus II).

However, since INTI International College Penang does not retain its previous syllabi, I have used the syllabi from the University of Nebraska-Lincoln instead.

CS 136 was taken for graduate credit at Harvard University during my time as a Research Associate.

All other credits listed here were obtained at the University of Nebraska-Lincoln.

Computer Science I

CSCE 155E - Syllabus

School of Computing
College of Engineering
University of Nebraska Lincoln

“If you really want to understand something, the best way is to try and explain it to someone else. That forces you to sort it out in your own mind... that’s really the essence of programming. By the time you’ve sorted out a complicated idea into little steps that even a stupid machine can deal with, you’ve certainly learned something about it yourself.”

—Douglas Adams, *Dirk Gently’s Holistic Detective Agency*

In my experience, you assert control over a computer—show it who’s the boss—by making it do something unique. That means programming it... If you devote a couple of hours to programming a new machine, you’ll feel better about it ever afterwards”

—Michael Crichton, *Electronic Life*

The readings were the most underrated things ever (I’ve never actually read them but I wish I did) thanks for providing them and leaving the whole course available to us.

—Former student a year after taking this course

Enjoyed the videos. Did not really watch them videos until [later], realized that it was a mistake now.

—Former student a year after taking this course

Course Info

Prerequisites: MATH 103 or equivalent.

Description: Introduction to problem solving with computers. Topics include problem solving methods, software development principles, computer programming, and computing in society.

Credit Hours: 3

Postrequisites: The course after this course, CSCE 156 – Computer Science II requires that you receive a grade of C or better in this course to move on. If you are a Computer Science or Computer Engineering major you will need to receive a C or better in this course to continue in the major.

For all other information, see the course website.

University Policies, Resources & Services

Students are responsible for knowing the university policies and be aware of resources found on this page: <https://go.unl.edu/coursepolicies>

Continuation of Instruction

If in-person classes are canceled by the University during a lecture day, lecture may still be livestreamed. If in-person classes are canceled by the University during a lab/hack day, in-person attendance will not be required, help *may* be made available via zoom and you will still be expected to complete the work remotely.

Skills Objectives

This course has several learning objectives and “skills objectives.” These are the skills that, upon successful completion of this course, you should be able to exhibit.

- You should have a mastery of the fundamentals of programming in a high-level language, including data types and rudimentary data structures, control flow, repetition, selection, input/output, and procedures and functions.
- You should be able to approach a reasonably complex problem, design a top-down solution, and code a program in a high-level programming language that automates solutions.
- You should have a familiarity with problem solving methods, including problem analysis, requirements and specifications, design, decomposition and step-wise refinement, and algorithm development (including recursion).
- You should have a familiarity with software development principles and practices, including data and operation abstraction, encapsulation, modularity, code and artifact reuse, prototyping, iterative development, best practices in coding design, style, and documentation, a good understanding of proper testing and debugging techniques and a familiarity with development tools.
- You should have exposure to algorithms for searching, sorting and other problems, graphical user interfaces, event-driven programming, and database access.
- You should have a foundation for further software development and exploration. You should have a deep enough understanding of at least one high-level programming language that you should be able to learn another programming language with relative ease in a relatively short amount of time.

Schedule

See the course website (canvas).

Grading

Assessment (grading) will be based on weekly readings, labs, “hacks”, attendance as well as exams and a comprehensive final with the following point distributions.

| Category | Number | Points Each | Total |
|--------------------|--------|-------------|-------|
| Starter Points | | | 30 |
| PDC Module/Surveys | | | 70 |
| Readings (zyBooks) | 13 | 15 | 195 |
| Labs | 13 | 15 | 195 |
| Hacks | 14 | 25 | 350 |
| Attendance | 14 | 10 | 140 |
| Exams | 2 | 75 | 150 |
| Final | 1 | 150 | 150 |
| Total | | | 1,280 |

Starter Points

It is important to start out positively. Put yourself in the mindset that you *will* succeed in this course and commit yourself to putting in a full effort in every aspect of it. To get you started, we’re giving you **free starter points**. You have a perfect score in this course already! Keep it up!

PDC Modules/Surveys

This course is experimenting with introducing **Parallel and Distributed Computing** (PDC) concepts early in the computing curriculum. These topics are usually covered in depth in advanced elective courses. However, we have developed a series of “codeless” modules that do not require any coding knowledge and cover PDC concepts in an accessible manner.

As part of this study, you will complete pre-module survey(s) which will be graded based on completion. You will then go through several modules on PDC which includes running and observing some simulations, visualizations, etc. You may complete these modules at your own pace. Once completed, you will then take post-module survey(s) again graded based on completion only. Full details and due dates are posted in canvas.

Readings

This course is organized into modules (roughly 1 module per week) and each module has reading associated with it. Some reading is required and other

readings are suggested/recommended and provide a deeper understanding of the topics. Some of the required reading will be assessed and will count toward your grade.

The assessed reading for this course is delivered through an online textbook provided by zyBooks, a web-based interactive text book that has you do some reading and then assesses your understanding through short quiz questions. You may retry these quizzes until you get them correct. These readings are assessed based on completion and are generally due *before* the lectures on the modules in order to better prepare you for the presented material. If you do not complete the readings for each module, you will not receive any credit.

Not every set of required reading represents an equal amount of work. Some modules have more reading than others. However, all assessment is equally weighted since it is based on completion.

Labs

There will be weekly labs that give you hands-on exercises for topics recently covered in lecture. The purpose of lab is not only to give you further working experience with lecture topics, but also to provide you with additional information and details not necessarily covered in lecture. Each lab will have some programming requirements and a supplemental worksheet.

Depending on logistics, those in the on-campus section may be randomly paired with a partner. One of you will be the *driver* and the other will be the *navigator*. The navigator will be responsible for reading the instructions and guiding the driver. The driver will be in charge of the keyboard and will type the code. Both driver and navigator are responsible for developing and working through solutions together. Neither the navigator nor the driver is “in charge,” it is an equal partnership. Beyond your immediate pairing, you are encouraged to help and interact and with other pairs in the lab.

Each lab is assessed based on completion. In general you will need to submit code and (possibly) an electronic writeup of your worksheet through an online grading system. You will have until midnight on the day of the lab (Tuesdays) to submit your solutions. Points will be awarded based on the results of the online grader.

Hacks

There will be weekly Thursday *hack sessions* that will provide an opportunity to start working on exercises in an open, collaborative environment. Each hack session is a simple program or exercise. You may not necessarily complete the entire exercise during the hack session.

Further details are provided in the handouts, but you are highly encouraged to collaborate with any individual and to receive as much help as you desire on the exercises.

You may complete hacks on your own, but you are encouraged to pair up and collaborate with (**at most**) one other student. If you choose to pair up with another student, you must form a pair using canvas (People -> Hack Pairs).

Attendance

To ensure participation your attendance **and** engagement in your weekly lab/hack sessions will be graded. Each session will be worth 10 points. To earn the full 10 points you must:

- Attend **both** the lab and hack session for the entire time. Do not be more than 5 minutes late.
- Put forth a full effort. You must work on the lab/hack for that week or for other material in the course; you may not work on other material or remain idle.
- You may only leave the lab/hack session early if you have already completed both the lab and hack for that module.

Alternative

It is understandable that you may not be able to attend every lab/hack session or that your background or approach to this material means you don't need the structured environment that the lab/hack session provides. As an alternative, *if you can prove yourself capable* of completing labs and hacks on your own you may choose not to attend the lab/hack session.

If you attend as outlined above, you get the full 10 points. If you choose not to attend, you may still earn the 10 points **provided** that you earn at least 75% of the remaining points for each module (Reading/Lab/Hack). If you do not attend and you earn less than 75% of the points for the module, you will get a zero for the attendance portion of the module.

Exams

There will be several exams as well as a comprehensive final exam. These will be open-book, open-note, *required computer* exams. The exams consist of live coding exercises for which you will need your own machine as you will be coding and submitting programs online for grading. More details will be announced closer to the exam dates. No collaboration is allowed on exams.

15th Week Policy Notification

A per UNL's 15th Week Policy (also known as "dead week") available here:

<https://registrar.unl.edu/academic-standards/policies/fifteenth-week-policy/>

we are required to serve written notice that the final assignment as well as the final lab, hack, and assignment will be due during the 15th week.

Scale

Final letter grades will be awarded based on the following standard scale. This scale may be adjusted upwards if the instructor deems it necessary based on the final grades only. No scale may be made for individual assignments or exams.

| Letter Grade | Percent |
|--------------|-------------|
| A+ | $\geq 97\%$ |
| A | $\geq 93\%$ |
| A- | $\geq 90\%$ |
| B+ | $\geq 87\%$ |
| B | $\geq 83\%$ |
| B- | $\geq 80\%$ |
| C+ | $\geq 77\%$ |
| C | $\geq 73\%$ |
| C- | $\geq 70\%$ |
| D+ | $\geq 67\%$ |
| D | $\geq 63\%$ |
| D- | $\geq 60\%$ |
| F | $< 60\%$ |

Grading Policy

If you have questions about grading or believe that points were deducted unfairly, you must first address the issue with the individual who graded it to see if it can be resolved. Such questions should be made within a reasonable amount of time after the graded assignment has been returned. No further consideration will be given to any assignment a week after its grades have been posted. It is important to emphasize that the goal of grading is consistency. A grade on any given assignment, even if it is low for the entire class, should not matter that much. Rather, students who do comparable work should receive comparable grades (see the subsection on the scale used for this course).

Late Work Policy

In general, there will be no make-up exams or late work accepted. Exceptions may be made in certain circumstances such as health or emergency, but you must make every effort to get prior permission. Documentation may also be required.

Assignments have a strict due date/time as defined in canvas and the online handin system. All program files must be handed in as specified in individual assignment instructions. Programs that are even a few seconds past the due date/time will be considered late and you will be locked out of handing anything in after that time.

Grader Policy

Failure to adhere to the requirements of an assignment in such a manner that makes it impossible to grade your program means that a disproportionate amount of time would be spent evaluating your assignment. For this reason, we will not grade any assignment that does not compile and run through the online grading system.

Academic Integrity

All homework assignments, programs, and exams must represent your own work unless otherwise stated. No collaboration with fellow students, past or current, is allowed unless otherwise permitted on specific assignments or problems. The Department of Computer Science & Engineering has an Academic Integrity Policy. All students enrolled in any computer science course are bound by this policy. You are expected to read, understand, and follow this policy. Violations will be dealt with on a case by case basis and may result in a failing assignment or a failing grade for the course itself. The most recent version of the Academic Integrity Policy can be found at <https://computing.unl.edu/academic-integrity-policy>

Artificial Intelligence Tool Usage

Various Artificial Intelligence (AI) applications have been developed in recent years (technically called Large Language Models) that can generate code based on user interactions. The use of these tools (including but not limited to ChatGPT, GitHub's co-pilot, etc.) in *any* capacity for this course is ***strictly prohibited*** and any such use will be considered a violation of academic integrity. Violations may include zeros on assignments or failure of the course.

These tools have legitimate uses, but not for students in this course. You are here to learn the basics of problem solving, programming and computing. These tools simply give you answers without you having to think, learn or understand the solution(s) that they give you. Often these tools will give you answers that violate academic integrity even if you do not explicitly ask them to do so. It would *clearly* be a violation of academic integrity if you asked another *human* to write a program for you and they did so. Asking an AI to do so is no different. You will not build muscle by having someone else lift weights for you. You will not learn anything by having someone else, human or AI, do the learning for you.

That said, these tools *can* provide a meaningful learning experience if they are properly filtered. For that reason, we will be allowing the use of the built-in "Rubber Duck" debugger chat bot in the CS50 IDE. It has been configured so that it won't provide code directly but you can ask it questions to understand your code and/or resolve problems.

Communication & Getting Help

The primary means of communication for this course is an online message forum system designed for college courses. You should have received an invitation to join. If you have not, contact the instructor immediately. On this forum, you can ask questions anonymously, remain anonymous to your classmates, or choose to be identified. Using this open forum system the entire class benefits from the instructor and TA responses. In addition, you and other students can also answer each other's questions (again you may choose to remain anonymous or identify yourself to the instructors or everyone). You may still email the instructor or TAs, but more than likely you will be redirected to this message board for help.

Learning Assistant Program (LAP)

This course is supported by the CSE Learning Assistant Program (LAP). The mission of the LAP is to improve student comprehension and retention in computing fields by focusing on the learner's experience. This course will be supplemented by Learning Assistants (LAs) and Course Leaders (CLs) to help improve your learning. LAs and CLs are other undergraduate students who have taken the same or similar courses and have been trained to help you succeed in this course. Your LAs and CLs will hold regular office hours, help with grading, and assist you with labs/assignments.

I strongly encourage you to utilize the LAs and CLs when you are completing coursework. More information can be found in the Learning Assistant Program Module on Canvas.

Getting Help

Your success in this course is ultimately your responsibility. Your success in this course depends on how well you utilize the opportunities and resources that we provide. There are numerous outlets for learning the material and getting help in this course:

- Lectures: attend lectures regularly and when you do use the time appropriately. Do not distract yourself with social media or other time wasters. Actively take notes (electronic or hand written). It is well-documented that good note taking directly leads to understanding and retention of concepts.
- Lecture Videos: Lecture videos are intended as a supplement that mirrors lecture material but that may not cover everything. Watch them at your own pace on a regular basis for reiteration or in case you missed something in lecture.
- Required Reading: do the required reading on a regular basis. The readings provide additional details and depth that you may not necessarily get directly in lecture.

- Labs & Hack Sessions: use your time during lab and hack sessions wisely. Engage with your lab instructors, teaching assistants, your partner(s) and other students. Be sure to adequately prepare for labs by reading the handouts before coming to lab. Get started and don't get distracted.
- Online message board: if you have questions post to our online message board. It is the best and likely fastest way to get help with your questions. Also, be sure to read other student's posts and questions and feel free to answer yourself!
- Office Hours & Student Resource Center: the instructor and teaching assistants hold regular office hours throughout the week as posted on the course website. Attend office hours if you have questions or want to review material. The Student Resource Center (SRC, <https://computing.unl.edu/current-undergraduate#SRC>) Monday through Friday. Even if your TAs are not scheduled during that time, there are plenty of other TAs and students present that may be able to help. And, you may be able to help others!
- Don't procrastinate. The biggest reason students fail this course is because they do not give themselves enough opportunities to learn the material. Don't wait to the last minute to start your assignments. Many people wait to the last minute and flood the TAs and SRC, making it difficult to get help as the due date approaches. Don't underestimate how much time your assignment(s) will take and don't wait to the week before hand to get started. Ideally, you should be working on the problems as we are covering them.
- Get help in the *right way*: when you go to the instructor or TA for help, you must demonstrate that you have put forth a good faith effort toward understanding the material. Asking questions that clearly indicate you have failed to read the required material, have not been attending lecture, etc. is *not acceptable*. Don't ask generic questions like "I'm lost, I don't know what I'm doing". Instead, explain what you have tried so far. Explain why you think what you have tried doesn't seem to be working. Then the TA will have an easier time to help you identify misconceptions or problems. This is known as "Rubber Duck Debugging" where if you try to explain a problem to someone (or, lacking a live person, a rubber duck), then you can usually identify the problem yourself. Or, at the very least, get some insight as to what might be wrong.

Computer Science II

CSCE 156 - Syllabus - Spring 2025

School of Computing
College of Engineering
University of Nebraska-Lincoln
University of Nebraska-Omaha

“Smart data structures and dumb code works a lot better than the other way around.”

—Eric S. Raymond, *The Cathedral and the Bazaar*

Course Info

Prerequisites: MATH 106 or equivalent and a grade of C or better in CSCE 155

Description: Data structures, including linked lists, stacks, queues, and trees; algorithms, including searching, sorting, and recursion; programming language topics, including object-oriented programming; pointers, references, and memory management; design and implementation of a multilayer application with SQL database.

Credit Hours: 4

Postrequisites: This course is a prerequisite for CSCE 310 - Data Structures & Algorithms. A grade of C or better is required to move on to CSCE 310.

University Policies, Resources & Services

Students are responsible for knowing the university policies and resources found on this page: <https://go.unl.edu/coursepolicies>

Learning & Skills Objectives

Throughout the duration of this course, you will be presented with a lot of information, some of which will have immediate application and some whose importance is not immediately apparent. As a different measure of your success in this course, by the end, you should have the following skills.

- Be able to more easily pick up and learn a new programming language on your own
- Be able to recognize, use, design and appreciate programs with an object-oriented flavor

- Be able to design a database-backed application from scratch given a general problem statement
- Be able to understand and implement basic data structures as well as recognize how and when to leverage appropriate simple data structures
- Be able to identify and analyze basic algorithms

Overall, CS2 is a continuation of CS1. At the end of a typical CS1 course, you should be able to approach a reasonably complex problem, design a top-down solution, and code a program in a high-level programming language. By the end of this course your approach to problem solving should be modified to ask and answer design questions first:

- What entities/objects would be appropriate to model this problem?
- How would these objects interact to solve the problem?
- What data structures would be the most appropriate or efficient to use?

Tentative Topics

- Introduction to Java / Python (Honors section)
- Object-Oriented Programming, OOP in Java
- Database Design, SQL, Database Connectivity, multi-tier design
- Lists (array-based, linked; circular doubly-linked), Stacks & Queues
- Algorithm Analysis, Recursion, Searching & Sorting
- Trees; Binary Search Trees

Continuation of Instruction

If in-person classes are canceled by the University during a lecture day, lecture may still be livestreamed.

Assessment

Assessment (grading) will be based on labs and assignments. To start you out on the right foot, you have been awarded 20 free starter points. You are currently earning an A in this course; keep it up!

| Category | Number | Points |
|-------------|--------|--------|
| Starter Pts | | 20 |
| Surveys | | 30 |
| Labs | 14 | 350 |
| Assignments | 8 | 950 |
| Total | | 1350 |

The honor section point distribution is similar but there are more total points due to additional required points on the assignments.

Scale

Final letter grades will be awarded based on the following standard scale. This scale may be adjusted upwards if the instructor deems it necessary based on the final grades only. No scale will be made for individual assignments.

| Letter Grade | Percent |
|--------------|---------|
| A+ | >= 97% |
| A | >= 93% |
| A- | >= 90% |
| B+ | >= 87% |
| B | >= 83% |
| B- | >= 80% |
| C+ | >= 77% |
| C | >= 73% |
| C- | >= 70% |
| D+ | >= 67% |
| D | >= 63% |
| D- | >= 60% |
| F | < 60% |

Labs & Attendance

There are 14 labs. They are graded based on completion which means *all* of the test cases must compile, run, **and pass**. If any test(s) fail no points will be awarded. Each lab is worth 25 points: 20 for the actual lab and 5 points for attendance at lab. However, if you cannot attend or choose not to attend you can still earn the 5 points back by earning full credit on the lab itself.

Labs give you hands-on exercises for topics recently covered in lecture. The purpose of lab is not only to give you further working experience with lecture topics, but also to provide you with additional information and details not necessarily covered in lecture. Each lab will come with some starter code and exercises that you have to complete. You will submit your code as specified through the handin and we will grade your lab using the webgrader.

Labs are setup as a *peer programming* experience. If you are attending lab *in person*, you may be randomly paired with a partner. One of you will be the *driver* and the other will be the *navigator*. The navigator will be responsible for reading the instructions and guiding the driver. The driver will be in charge of the keyboard and will type the code. Both driver and navigator are responsible for developing and working through solutions *together*. Neither the navigator nor the driver is “in charge.” This is an equal collaboration and all efforts should

be equally shared. Beyond your immediate pairing, you are encouraged to help and interact with other pairs in the lab. If you are attending lab remotely or online, you may be paired up with another person virtually if you choose or you may complete the lab on your own.

Assignments

The majority of your assessment will be based on assignments whose point values may vary. There are 8 assignments as well as a design document. Assignments will be due 1 second before midnight Friday evening the week that they are due. Code and other relevant *artifacts* must be submitted using handin unless otherwise stated.

In this course, most of the assignments build on prior assignments. Therefore, it is **extremely important** for you to stay on task and not fall behind with assignments. You should start on assignments early and resolve any and all issues (bugs, design flaws) as soon as possible so they do not carry over to the next assignment. To facilitate good time management, we have provided a **Gantt Chart** with a recommended schedule of work.

15th Week Policy Notification

A per UNL's 15th Week Policy (available here: <https://registrar.unl.edu/academic-standards/policies/fifteenth-week-policy/>) we are required to serve written notice that the final assignment as well as the final lab will be due during the 15th week or "dead week."

Grading Policy

If you have questions about grading or believe that points were deducted unfairly, you must first address the issue with the individual who graded it to see if it can be resolved. Such questions should be made within a reasonable amount of time after the graded assignment has been returned. No further consideration will be given to any assignment a week after its grades have been posted. It is important to emphasize that the goal of grading is consistency. A grade on any given assignment, even if it is low for the entire class, should not matter that much. Rather, students who do comparable work should receive comparable grades (see the subsection on the scale used for this course).

Late Work Policy

In general, there will be no make-up or late work accepted. Exceptions may be made in certain circumstances such as health or emergency, but you must make every effort to get prior permission. Documentation may also be required.

Homework assignments have a strict due date/time as defined by the server's system clock. All program files must be handed in using handin as specified in individual assignment handouts. Programs that are even a few seconds past

the due date/time will be considered late and you will be locked out of handing anything in after that time.

Webgrader Policy

Failure to adhere to the requirements of an assignment in such a manner that makes it impossible to grade your program via the webgrader means that a disproportionate amount of time would be spent evaluating your assignment. For this reason, we will not grade any assignment that does not compile and run through the webgrader.

Academic Integrity

All homework assignments, programs, and exams must represent your own work unless otherwise stated. No collaboration with fellow students, past or current, is allowed unless otherwise permitted on specific assignments or problems. The School of Computing has an Academic Integrity Policy. All students enrolled in any School of Computing course are bound by this policy. You are expected to read, understand, and follow this policy. Violations will be dealt with on a case by case basis and may result in a failing assignment or a failing grade for the course itself.

Use of AI The use of any AI tools for the design or implementation of programs is strictly prohibited for this course.

Honors Section

For those in the Honors section of this course topics will be covered at a faster pace so that additional “advanced” topics can also be covered.

In addition, each assignment may contain additional requirements or problems that must be completed. There may also be additional assignments. Bottom line, there will be higher expectations with regard to the quality and quantity of work in this course compared to the regular section. As a student in this course, you will be expected to meet or exceed those expectations which may require more of your time and a more proactive approach to studying and greater diligence in completing assignments.

Communication & Getting Help

The primary means of communication for this course is Piazza, an online forum system designed for college courses. We have established a Piazza group for this course and you should have received an invitation to join. If you have not, contact the instructor immediately. With Piazza you can ask questions anonymously, remain anonymous to your classmates, or choose to be identified. Using this open forum system the entire class benefits from the instructor and TA responses. In addition, you and other students can also answer each other’s

questions (again you may choose to remain anonymous or identify yourself to the instructors or everyone). You may still email the instructor or TAs, but more than likely you will be redirected to Piazza for help.

In addition, there is an anonymous suggestion box that you may use to voice your concerns about any problems in the course if you do not wish to be identified.

Learning Assistant Program (LAP)

This course is supported by the CSE Learning Assistant Program (LAP). The mission of the LAP is to improve student comprehension and retention in computing fields by focusing on the learner's experience. This course will be supplemented by Learning Assistants (LAs) and Course Leaders (CLs) to help improve your learning. LAs and CLs are other undergraduate students who have taken the same or similar courses and have been trained to help you succeed in this course. Your LAs and CLs will hold regular office hours, help with grading, and assist you with labs/assignments.

I strongly encourage you to utilize the LAs and CLs when you are completing coursework. More information can be found in the Learning Assistant Program Module on Canvas.

UNL Writing Center

The Writing Center can provide you with meaningful support as you write for this class as well as other courses. Trained undergraduate and graduate peer consultants are available to talk with you about all forms of communication. You are welcome to bring in everything from lab reports, presentations, and research papers to cover letters, application essays, and graduate theses and dissertations. Writing Center Consultants can work with you at any stage of the writing process, from brainstorming and organizing your ideas through polishing a final draft.

There are three ways you can connect with a Consultant:

- Online (a real-time, video conversation)
- eTutoring (email feedback)
- In person in Andrews 102 To learn more about online options and view video tutorials, visit <https://www.unl.edu/writing/online-writing-center-services>.

Sign up for an appointment any time by visiting <https://unl.mywconline.com>. For other information about the Writing Center, please visit <https://unl.edu/writing>.

Getting Help

Your success in this course is ultimately your responsibility. Your success in this course depends on how well you utilize the opportunities and resources that we

provide. There are numerous outlets for learning the material and getting help in this course:

- Lectures: attend lectures regularly and when you do use the time appropriately. Do not distract yourself with social media or other time wasters. Actively take notes (electronic or hand written). It is well-documented that good note taking directly leads to understanding and retention of concepts.
- Lecture Videos: Lecture videos are intended as a supplement that mirrors lecture material but that may not cover everything. Watch them at your own pace on a regular basis for reiteration or in case you missed something in lecture.
- Required Reading: do the required reading on a regular basis. The readings provide additional details and depth that you may not necessarily get directly in lecture.
- Labs: use your time during labs wisely. Engage with your lab instructors, teaching assistants, your partner(s) and other students. Be sure to adequately prepare for labs by reading the handouts before coming to lab. Get started and don't get distracted.
- Piazza: if you have questions ask them on Piazza. It is the best and likely fastest way to get help with your questions. Also, be sure to read other student's posts and questions and feel free to answer yourself!
- Office Hours & Student Resource Center: the instructor and teaching assistants hold regular office hours throughout the week as posted on the course website. Attend office hours if you have questions or want to review material. The Student Resource Center is open Monday through Friday. Even if your TAs are not scheduled during that time, there are plenty of other TAs and students present that may be able to help. And, you may be able to help others!
- Don't procrastinate. The biggest reason students fail this course is because they do not give themselves enough opportunities to learn the material. Don't wait to the last minute to start your assignments. Many people wait to the last minute and flood the TAs and SRC, making it difficult to get help as the due date approaches. Don't underestimate how much time your assignment(s) will take and don't wait to the week before hand to get started. Ideally, you should be working on the problems as we are covering them.
- Get help in the *right way*: when you go to the instructor or TA for help, you must demonstrate that you have put forth a good faith effort toward understanding the material. Asking questions that clearly indicate you have failed to read the required material, have not been attending lecture, etc. is *not acceptable*. Don't ask generic questions like "I'm lost, I don't know what I'm doing". Instead, explain what you have tried so far. Explain

why you think what you have tried doesn't seem to be working. Then the TA will have an easier time to help you identify misconceptions or problems. This is known as "Rubber Duck Debugging" where if you try to explain a problem to someone (or, lacking a live person, a rubber duck), then you can usually identify the problem yourself. Or, at the very least, get some insight as to what might be wrong.

CSCE 231: Computer Systems Engineering

Fall 2020

Schedule

All times are U.S. Central Time (UTC-5 until November 1; UTC-6 after November 1)

Lecture

- Section 150: Monday, Wednesday, Friday via prerecorded videos

Recitation

- Section 153: Monday 3:30pm-4:20pm in Zoom
- Section 151: Tuesday 3:30pm-4:20pm in Zoom
- Section 152: Wednesday 8:30am-9:20am in Zoom

Laboratory

- Section 165: Monday 4:30pm-6:20pm in Avery 021 & Zoom
- Section 161: Tuesday 4:30pm-6:20pm in Avery 021 & Zoom
- Section 162: Tuesday 6:30pm-8:20pm in Avery 021 & Zoom
- Section 163: Wednesday 9:30am-11:20am in Avery 021 & Zoom
- Section 164: Wednesday 1:30pm-3:20pm in Avery 021 & Zoom

The Zoom link for recitation & laboratory will be available on Canvas.

Instructor

Dr. Christopher Bohn bohn@unl.edu
Office Hours: TR 9:30-11:00am Avery 262
Zoom office hours link: https://go.unl.edu/bohn_office_hours

TAs

| Name | Office Hours | email |
|--------------------|--------------------------------------|------------------------------------|
| Aaron Johnson | M,W 11:30am-12:30pm | aaronjohnson14325@gmail.com |
| Brennan Rhoadarmer | M,F 9:30-11:00am | rhoodarmerb@gmail.com |
| Katie Gerot | M,T 9:00-10:00am | katie.gerot@huskers.unl.edu |
| Christine Discenza | R 12:30-2:30pm | cdisenza3@gmail.com |
| Thomas Hillebrandt | M,F 1:30-2:30pm T,R 10:00-11:00am | thomas.hillebrandt@huskers.unl.edu |
| Adrian Pilkington | M 7:00-9:00pm | apilkington@huskers.unl.edu |

TA office hours are in the CSE Virtual Student Resource Center (vSRC).

Catalog Description

Computer Systems Engineering (4 cr) Lec 3, rct 1, lab 2. Introduction to organization, structure, and applications of computer systems. Boolean Logic, Digital Arithmetic, Processor Organization, C Programming, Machine Language Programming, Input/Output, Memory Organization and Management, Building Embedded System Application.

Prerequisites

Grade of “P” or “C” or better in CSCE 235, CSCE 235H, or RAIK 184H.

Prerequisites by Topic

- *Mastery of* mathematical problem solving skills, mathematical maturity and competence to the level of introductory calculus
- *Familiarity with* programming, logarithms, integer and floating point numbers
- *Exposure to* recursion, operating systems services

Course Objectives

- *Mastery of* Boolean algebra, logic equations, binary numbers (including negatives), fixed-point binary arithmetic, hexadecimal notation, exponential numbers
- *Mastery of* C programming, accessing I/O devices, processor organization, stacks, subroutines, instruction set architecture (with hands-on experience in embedded system design and implementation)
- *Familiarity with* logic gates and diagrams, floating point arithmetic, memory devices and hierarchies, micro-operations & micro- architectures
- *Familiarity with* assembler language principles, flow of control, assemblers, linkers, loaders, the syntax & semantics of short assembler programs
- *Familiarity with* memory errors such as buffer overflows and segmentation faults, security vulnerabilities

Course Goals

How does a modern digital computer interpret programs written in a high-level programming language into the streams of electronic signals that actually do the thinking, the arithmetic, the keeping track of data, the sequencing of actions, and the input/output? What is the hardware-software interface and how can we use it to build modern computer systems and develop software? What system design considerations go into defining and designing it? In this course you will gain an understanding of the interface by first writing programs in a low-level assembly language that is close to the machine language,

developing the logic design of basic processor components, and then designing and implementing an embedded system. In the process you will gain practical experience with computer-aided design tools and C programming environments. The course comprises of lectures, recitation, and labs. The recitation sessions are used to prepare students to tackle the implementation and experimentation aspects of concepts discussed during lectures. The labs provide time for students to implement and experiment with these topics.

Topics Covered

1. *System Level Organization*: CPU, memory systems (main memory, cache, virtual memory), storage technologies, I/O devices & processes
2. *Arithmetic and Logic Level*
 - (a) Boolean algebra, truth tables, logic equations, logic gates, combinatorial logic, sequential logic & memory devices, clocks, waveform diagrams
 - (b) Signed & unsigned binary numbers, floating-point numbers, BCD, hexadecimal, ASCII
 - (c) Signed & unsigned fixed-point arithmetic, floating-point arithmetic, ALU structures
3. *Micro-Architecture Level*: data paths & components, micro- operations, memory interfacing, the fetch/execute cycle
4. *Instruction Set Architecture Level*: instruction types & formats, opcodes, operands, immediate values, addressing modes, flow of control, branching & procedure calls
5. *Assembler Language level*: syntax, directives vs. instructions, assemblers, linkers, loaders, semantics of simple programs, stack management, procedure calls
6. *High-Level Programming Level*: C programming syntax, pointer arithmetic, I/O access, polling & interrupt handling, dynamic memory management, memory errors, security vulnerabilities

Lecture, Recitation, and Laboratory

While the lecture will occasionally address practical matters, the principal purpose of the lectures is to provide you with a theoretical understanding of computer systems engineering. Through the individual labs, the group lab, and the group project, you will learn to apply this theory to practice. The recitation will help you transition from the theory of the lectures to the practice of the labs.

It is a common misunderstanding that the purpose of this course is to program in C. That is not the case. A course such as this requires working with computer systems much closer to the hardware level than most software developers typically do. Few high-level languages afford access to the underlying computer system, and of those that do, C is by far the most commonly- used.

Grading

Your grade will be calculated based on your performance in the following areas:

- *Homework* (20%) Homework will help cement the concepts from the lecture and the textbook. Doing so will pay off in the other components of the course grade. Because group study is an effective learning technique, I encourage you to work with your peers to discuss the homework, but **be sure to write your own solutions and indicate whom you worked with.**
- *Labs* (30%) The labs will provide hands-on practice to provide better understanding of what you've learned in the lectures. Some labs will be programmed in C; others entail assembly programming.
- *Midterm Exams* (30%) We will have two midterm exams, that you will take during lab time. They are scheduled for **September 21-23** and **October 26-28**; if there are changes, I'll announce them at least a week in advance. *Unless I explicitly specify otherwise, the exams will be closed book/closed note/closed neighbor/closed internet; and programmable calculators, laptops, tablets, and smartphones will be disallowed.* You may have one $8\frac{1}{2}'' \times 11''$ sheet of notes, double-sided, printed or hand-written. Alternate exams will be available for students who cannot attend lab in-person.
- *Final Exam* (20%) This will be a comprehensive exam, scheduled for **Sunday, November 25 at 3:30-5:30pm**. As with the midterm exams, unless I explicitly specify otherwise, the exams will be closed book/closed note/ closed neighbor/ closed internet.
- Final grades will be assigned based on the traditional cutoff percentages.

| Grade | A+ | A | A- | B+ | B | B- | C+ | C | C- | D | F |
|-------|----|----|----|----|----|----|----|----|----|----|-----|
| Score | 97 | 93 | 90 | 87 | 83 | 80 | 77 | 73 | 67 | 60 | <60 |

- *Rounding of final grades* I am not in the habit of *giving* grades, but I am sympathetic to students who put in effort. In lieu of rounding, after calculating each student's score and adding extra credit points, I will make one final adjustment to scores near a letter-grade cutoff:

$$adjustment = \begin{cases} 0.50 & \text{if all assignments completed} \\ 0.015 \times \text{number_of_assignments_completed} & \text{otherwise} \end{cases}$$

Textbooks

- *Programming at the Hardware-Software Interface*, 1st ed., Christopher A. Bohn
- Other useful references available in the “Pages” section of the course’s Canvas site, including *The C Programming Language*, 2nd ed., Brian W. Kernigan & Dennis M. Ritchie (“K&R”)

Notional Sequence

| Topics | | Chapter |
|--|---|-----------------------------|
| Week 1: August 17-21 | | |
| lecture | Intro, Prerequisite review, Digital data | 1, 2 |
| lab | Lab 0 (Simple C refresher, environment setup) | |
| Week 2: August 24-28 | | |
| lecture | Digital data, Integer Arithmetic | 2, 3 |
| lab | Lab 1 (Advanced C refresher) | |
| Week 3: August 31 - September 4 | | |
| lecture | Integer, Floating Point Arithmetic | 3, 4 |
| lab | Lab 2 (Integer Lab) | |
| Week 4: September 7-11 | | |
| lecture | Floating Point Arithmetic | 4 |
| lab | Lab 3 (Float Lab) | |
| Week 5: September 14-18 | | |
| lecture | Simple Assembly Language | 5 |
| lab | Lab 3, continued | |
| Week 6: September 21-15 | | |
| lecture | Simple & Structured Assembly Language | 5, 6 |
| lab | Exam 1 (weeks 1-5) | |
| Week 7: September 28 - October 2 | | |
| lecture | Structured Assembly Language | 6 |
| lab | Lab 4 ("Bomb" Lab) | |
| Week 8: October 5-9 | | |
| lecture | Assembly Language, Buffer Overflow | 6, first half of ch11 |
| lab | Lab 4, continued | |
| Week 9: October 12-16 | | |
| lecture | Concurrency, Processor Design | 7, first half of ch8 |
| lab | Lab 5 ("Attack" Lab) | |
| Week 10: October 19-23 | | |
| lecture | Simple Processor Design | first half of ch8 |
| lab | Lab 5, continued | |
| Week 11: October 26-30 | | |
| lecture | Exceptional Control Flow, System I/O | 9 |
| lab | Exam 2 (weeks 6-10) | |
| Week 12: November 2-6 | | |
| lecture | Advanced Processor Design | second half of ch8 |
| lab | Lab 6 (TBD) | |
| Week 13: November 9-13 | | |
| lecture | Advanced Processor Design, Memory | 10, second half of ch8 |
| lab | Lab 6, continued | |
| Weeks 14-15: November 16-20 | | |
| lecture | Memory, Tying it all together | 10, 12, second half of ch11 |
| lab | no lab currently scheduled | |
| Final Exam: Sunday, November 25, 3:30-5:30pm | | |

Policies and Resources

- *Attendance:* Lecture this semester will be prerecorded and will be available through VidGrid; you may view them at any time. I plan to release a week's worth of lectures prior to the start of that week. We will cover some material in class that is not covered in the text; your assignments and test questions may be based on that material. In particular, many of the details necessary to complete assignments will be presented in class. In the interest of maximizing knowledge retention, do not binge-watch the recordings. It is to your benefit to watch the recordings during their nominal week.
- *Class Preparation and Participation:* I expect you to be prepared for class, participate in discussions, and ask and answer questions.
- *Assignments:* All work must be completed when due, and all quizzes and exams must be taken when given. **No make-up quizzes or exams will be given, and with rare exception no late homework or labs will be accepted.** If you have a valid excuse (e.g., illness or injury of yourself or your dependent, an academic conference, a job interview, military obligation, jury duty, bereavement, religious observances, participation in university-sponsored intercollegiate athletic events, etc.), the score for a missed quiz or exam score will be replaced by the average of the remaining quizzes/exams. Similarly, if you have a valid excuse then at my option you will either be given an extension on a homework or lab assignment or will have the missed score replaced by the average of the remaining assignments in the same category.
 - If you wish to challenge the grade you received on an assignment, you must demonstrate that the answer you provided is correct; *i.e.*, that your grade is erroneous. We will not adjust your grade if your answer is too illegible for us to read. You will have two class-days in which to do so. We will not adjust grades for an assignment after two days past the day on which it was returned to you.
 - I will, at a minimum, honor the guidance for excused absences in the UNL Faculty Senate's Class Attendance Policy. See <https://www.unl.edu/facultysenate/classattendancepolicy%20%20April%203%202018.pdf>
 - * Notify me of planned absences in advance, and preferably early. I will not excuse missed assignments due to planned absences if you notify me after-the-fact.
 - * Notify me of unplanned absences when you are able. In general, I will not require proof of the excuse; however, I will require proof of the excuse for missed exams, and I may require proof of the excuse if absences are extended or common.
 - * If missed assignments due to excused absences become frequent enough that I cannot gauge how well a student has met the course objectives, then at my discretion I may award an "Incomplete" for the course and require the student to complete the assignments before receiving a letter grade.
 - We will provide information regarding the exams at a future date.
- *Services for Students with Disabilities:* The University strives to make all learning experiences as accessible as possible. If you anticipate or experience barriers based on

your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can discuss options privately. To establish reasonable accommodations, I may request that you register with Services for Students with Disabilities (SSD). If you are eligible for services and register with their office, make arrangements with me as soon as possible to discuss your accommodations so they can be implemented in a timely manner. SSD contact information: 232 Canfield Admin. Bldg.; 402- 472-3787.

- *Counseling and Psychological Services* UNL offers a variety of options to students to aid them in dealing with stress and adversity. Counseling and Psychological Services (CAPS, <https://caps.unl.edu/>) is a multidisciplinary team of psychologists and counselors that works collaboratively with Nebraska students to help them explore their feelings and thoughts and learn helpful ways to improve their mental, psychological and emotional well-being when issues arise. CAPS can be reached by calling 402-472-7450. Big Red Resilience & Well- Being (<https://resilience.unl.edu/big-red-resilience-well-being>) provides fun events, innovative education, and dynamic services to help students understand emotions, manage stress, build strength, connect with others, develop grit and navigate transitions.
- *Diversity and Inclusion* The University of Nebraska-Lincoln does not discriminate on the basis of race, ethnicity, color, national origin, sex (including pregnancy), religion, age, disability, sexual orientation, gender identity, genetic information, veteran status, marital status, and/ or political affiliation.
- *Student Resource Center:* The CSE Department has established a Virtual Student Resource Center which you can access through Canvas. See <https://canvas.unl.edu/courses/95368>.
- *Check Your Email* The CSE Department's policy is that all students in CSE courses should regularly check their email so they don't miss important announcements.
 - We will make announcements through Piazza; make sure that Piazza is configured to forward these announcements to your preferred the email address.
 - When email is appropriate, we will contact you through the email in Canvas; make sure that Canvas is has your preferred the email address.
 - If you aren't already doing so, I strongly encourage you to check your huskers.unl.edu email daily. The university has indicated that any announcements it makes will be to your huskers.unl.edu email.
- *Departmental Contact Form:* The CSE Department has an Anonymous Online Contact Form that you may use to voice your concerns about any problems in the course or department if you do not wish to be identified. See <http://cse.unl.edu/contact-form>.
- *Academic Integrity Policy:* Academic honesty is essential to the existence and integrity of an academic institution. The responsibility for maintaining that integrity is shared by all members of the academic community. The University's Student Code of Conduct addresses academic dishonesty. Students who commit acts of academic dishonesty are subject to disciplinary action and are granted due process and the

right to appeal any decision. See <https://stuafs.unl.edu/DeanofStudents/Student%20Code%20of%20Conduct%20May%20Rev%202014%20a.pdf>.

All homework assignments, exams, etc. must be your own work. The Computer Science and Engineering department has an Academic Integrity Policy. All students enrolled in any CSE course are bound by this policy. You are expected to read, understand, and follow this policy. Violations will be dealt with on a case by case basis and may result in a failing assignment or a failing grade for the course itself. See http://cse.unl.edu/ugrad/resources/academic_integrity.php.

The Department requires me to report every offense to the Chair for further consideration. The key to avoiding cheating is to be totally open and transparent about any and all collaborations, noting that appropriate teamwork and collaboration will be highly encouraged. Here is some elaboration on the examples listed on the department's academic integrity webpage:

- I encourage discussions of *what* and *why*, but discussions of specific solutions or implementations are prohibited.
- Being in possession of a worked or partially-worked solution to an assignment (whether from a fellow student, from the internet, or from another source) before you have completed the assignment is unauthorized collaboration on the assignment.
- If another student has a copy of your worked solution to an assignment before s/he has completed the assignment, I will assume that you facilitated their cheating unless it can be demonstrated that they obtained the copy despite your reasonable precautions to prevent them from doing so. Students who share a computer should protect their files either by using separate accounts or by placing their coursework in password-protected folders.
- If we detect academic misconduct on group assignments, I will hold the full group responsible unless there is compelling evidence that only a proper subset of the group committed the misconduct and that the remainder of the group was unaware of the misconduct.

We will use software, including but not limited to MOSS, to help us detect academic integrity violations; however, we will also apply human judgement. We will retain your assignment submissions to be compared with future students' submissions.

- *Student Concerns and Feedback:* Your experience with remote learning in this course is important to me. If you have questions, concerns, or positive feedback, please contact me at bohn@unl.edu or 472-1803. If I am unable to respond, or you feel I've not adequately addressed your concerns, you can contact Dr. Marilyn Wolfe at mwolf@unl.edu or 472-2401. If your concern is still not resolved, please contact Dean Lance Pérez at lcperez@unl.edu or 472-5259.
- *Required Use of Face Coverings for On-Campus Shared Learning Environments:* As of July 17, 2020 and until further notice, all University of Nebraska–Lincoln (UNL) faculty, staff, students, and visitors (including contractors, service providers, and others) are required to use a facial covering at all times when indoors except under specific conditions outlined in the COVID 19 face covering policy found at:

<https://covid19.unl.edu/face-covering-policy>. This statement is meant to clarify classroom policies for face coverings:

To protect the health and well-being of the University and wider community, UNL has implemented a policy requiring all people, including students, faculty, and staff, to wear a face covering that covers the mouth and nose while on campus. The classroom is a community, and as a community, we seek to maintain the health and safety of all members by wearing face coverings when in the classroom. Failure to comply with this policy is interpreted as a disruption of the classroom and may be a violation of UNL's Student Code of Conduct.

Individuals who have health or medical reasons for not wearing face coverings should work with the Office of Services for Students with Disabilities (for students) or the Office of Faculty/Staff Disability Services (for faculty and staff) to establish accommodations to address the health concern. Students who prefer not to wear a face covering should work with their advisor to arrange a fully online course schedule that does not require their presence on campus.

Students in the classroom:

1. If a student is not properly wearing a face covering, the instructor will remind the student of the policy and ask them to comply with it.
2. If the student will not comply with the face covering policy, the instructor will ask the student to leave the classroom, and the student may only return when they are properly wearing a face covering.
3. If the student refuses to properly wear a face covering or leave the classroom, the instructor will dismiss the class and will report the student to Student Conduct & Community Standards for misconduct, where the student will be subject to disciplinary action.

Instructors in the classroom:

1. If an instructor is not properly wearing a face covering, students will remind the instructor of the policy and ask them to comply with it.
2. If an instructor will not properly wear a face covering, students may leave the classroom and should report the misconduct to the department chair or via the TIPS system for disciplinary action through faculty governance processes.

Last updated: 09:14-2020/08/27

Introduction to Discrete Structures

“Computer Science is no more about computers than astronomy is about telescopes.”

– Edsger Dijkstra

Course Information

| | |
|-----------------------------|--|
| Prerequisites | A grade of 'P' or 'C' or better in CSCE 155 (A, E, H, N, T) / SOFT 160 (H) / RAIK 183H and MATH 106. |
| Lectures | Tuesday and Thursday (12:30:PM to 1:45:PM) Brace Lab-206 |
| Instructor | Dr. Shruti Bolman <i>née</i> Daggumati sdaggumati@unl.edu Avery Hall 369 |
| Office Hours | Please check “Syllabus” on Canvas for updates and details |
| Textbook (suggested) | <i>Discrete Mathematics and Its Applications</i> Kenneth H. Rosen, McGraw Hill (7 th Edition) |
| TAs | Please check “Syllabus” on Canvas for updates and details |
| Homepage | We will use Canvas (http://canvas.unl.edu) to: <ul style="list-style-type: none">• send out announcements• post lecture notes• assign homework |

Course Details

Computer Science is **not programming**. Rather, Computer Science is the mathematical modeling and study of what computation is – that is, what problems have a computational solution and how efficient that solution can be. Thus, a strong foundation in mathematics is essential to your success as a computer scientist. At the heart of computer science are fundamental discrete structures that we will study in this course. Specifically, you will learn many of the mathematical definitions, techniques, and ways of thinking that will be useful in Computer Science.

Catalog Description

Survey of elementary discrete mathematics. Elementary graph and tree theories, set theory, relations and functions, propositional and predicate logic, methods of proof, induction, recurrence relations, principles of counting, elementary combinatorics, and asymptotic notations.

Tentative Schedule of Topics

Below is a list of topics I intend to cover along with the relevant sections of the text. This schedule is tentative and may be changed or topics added/removed as time dictates. Furthermore, though we will follow the book, additional material may be introduced (with sufficient resources) while the depth of each topic may vary. A complete schedule of topics as well as the associated required reading is available on the course webpage. The topic outline is roughly as follows.

- Propositional Logic, Predicate Logic
- Proofs
- Sets
- Functions
- Relations
- Algorithms & Algorithm Analysis
- Induction
- Recurrence Relations
- Combinatorics
- Graphs & Trees

Teaching Style

I teach using power point slides, white board and class discussions. Handouts of the slides are available, but you are ultimately responsible for the material, thus regular attendance is strongly encouraged. Furthermore, you will be expected to read the relevant sections of the textbook before coming to class. Several pop quizzes (though not necessarily announced) will also be given in the lecture and recitation class. Since make-up quizzes will not be given, attendance is highly recommended.

The text offers good examples of the materials and numerous opportunities to work out examples. The answers to all odd numbered questions are in the back of the book and provide a good opportunity to work problems on your own. Homework and exams are used to assess your progress in this course and should be considered the *minimal* amount of work required to learn the material. You should work additional examples and exercises from the book in order to master the material.

Discussion Through Piazza

We will be using Piazza for class discussion. The system is highly catered to provide you help fast and efficiently from classmates, TAs, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. Please note that posted questions or discussion will be moderated if appeared to be inappropriate or irrelevant. Also, if you have a **question for a specific instructor (me or a TA)**, you must send an email to that person, otherwise don't expect to receive a quick response. Sign up for the class page at: <https://piazza.com/unl/spring2020/csce235>

Grading

Grading will be based on homework, quizzes, and exams with the following contributions.

| Category | Weight |
|--------------|--------|
| Homework | 45% |
| Quizzes | 20% |
| Midterm Exam | 15% |
| Final Exam | 20% |

Scale

Letter grades will be awarded based on the following scale. I will use an **absolute grading policy**. For example, scores within the range between 89.00 and 89.49 will be rounded to 89.00 while scores within the range between 89.50 and 89.99 will be rounded to 90.00. Therefore, a score of 89.49 will earn you a B+ grade but 89.50 will earn an A-(minus) grade.

| | | | | | | | | | |
|----|-------|----|-------|----|-------|----|-------|---|-----|
| A+ | >= 97 | B+ | >= 87 | C+ | >= 77 | D+ | >= 67 | F | <60 |
| A | >= 93 | B | >= 83 | C | >= 73 | D | >= 63 | | |
| A- | >= 90 | B- | >= 80 | C- | >= 70 | D- | >= 60 | | |

Homework

There will be 6 homework assignments, about one every other week. Homework will consist of selected exercises from the text as well as original problems. You will be expected to follow all instructions on the homework assignments. Clarity and legibility are of great importance. If homework is sloppy or unclear, points may be deducted. Each assignment will have a fixed deadline (beginning of class). Homework can be completed in pairs, if students choose to do so. The responsibility to learn and understand the material falls on the student.

Quizzes

There will be several pop quizzes (i.e., they may or may not be announced in advance) given during the lecture/recitation. They will generally be short and will cover recent topics.

Exams

There will be one midterm exam (in class) and one final exam. These will be **closed notes/book** exams and comprehensive.

Grading Policy

If you have questions about grading or believe that points were deducted unfairly, you must first address the one who graded it to see if it can be resolved. Such questions should be made within a reasonable amount of time after the graded assignment has been returned. **No further consideration will be given to any assignment a week after it has been graded and returned (regardless of whether you fail to pick it up when handed back).** It is your responsibility to **check Canvas regularly** and report missing/incorrect entry **within one week of submission** of your assignment or exam. You need to report questions related to grading **before I post your final grade** in Canvas.

Late Work Policy

Homework assignments have a strict *in-class* (at the beginning) due date.

It is understandable that unforeseen events may interfere with your ability to hand in all homework assignments on time. As such, I've adopted a policy of allowing **one late homework**. You may turn in a single assignment **up to** a week late. Any submissions after a week will not be considered. Any late submissions after using your one "free pass" will not be considered.

Exceptions: You are **NOT ALLOWED** to use a late pass on either the first or the last homework assignments.

In general, there will be no make-up exams or quizzes. Exceptions may be made in certain circumstances such as health or emergency, but you must make every effort to get prior permission. Documentation may also be required.

University and Departmental Policies

Dead Week Policy

In conformance with UNL's 15th Week Policy (see Registration and Records main webpage, <http://www.unl.edu/regrec/>), be aware that the final homework may be due during the final week of classes. Finally, all assignments, homework, labs or otherwise, will have a strict final due date during the final week of classes. This supersedes any unused late or screw-up passes that you may have (that is, such passes cannot be used to extend the due date of any assignment past the last week of classes). Also, please be aware that there may be quizzes during the final week of semester.

Academic Integrity

All homework assignments, quizzes, exams, etc. must be your own work. No direct collaboration with fellow students, past or current, is allowed unless otherwise stated. The Computer Science & Engineering department has an [Academic Integrity Policy](#). All students enrolled in any computer science course are bound by this policy. You are expected to read, understand, and follow this policy. Violations will be dealt with on a case by case basis and may result in a failing assignment or a failing grade for the course itself. **If any student performs academic dishonesty (complete or partial)**, as defined by the UNL academic integrity policy, following actions will be taken.

- 1) For a first offense where the student actions were isolated and/or they are remorseful, they will receive no credit for the assignment in question.
- 2) For a first offense that is considered egregious, e.g., their actions impacted many others, they persist in making untruthful statements in light of overwhelming evidence, etc., they will receive a failing grade for the class and will not be permitted to drop the class or change to pass/no-pass grading.
- 3) For a second offense, they will receive a failing grade for the class and will not be permitted to drop the class.

- 4) For a third offense, they will be expelled from their CSCE major or minor and will not be permitted to subsequently enroll in any CSCE course.

It is acceptable to discuss the meaning of assignments with fellow students. Discussing general approaches and strategies for solutions may be permissible, but unless specifically allowed, such communications should not include written material or code and should not transmit substantive or specific elements of a solution. Any cooperation beyond discussing general approaches and general strategies is not allowed unless specifically permitted by the instructor. You may not develop joint solutions, share work, or copy anything. You are also responsible for safeguarding your own work. All external contributions must be acknowledged, including help from others or from non-course materials such as websites. If in doubt, ask.

Accommodations for Students with Disabilities

Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodations to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 232 Canfield Administration, 472-3787 voice or TTY.

Sources for Help and Assistance

UNL offers a variety of options to students to aid them in dealing with stress and adversity. Counseling and Psychological Services (CAPS) (<https://caps.unl.edu>) is a multidisciplinary team of psychologists and counselors that works collaboratively with Nebraska students to help them explore their feelings and thoughts and learn helpful ways to improve their mental, psychological, and emotional well-being when issues arise. CAPS can be reached by calling 402-472-7450.

Big Red Resilience & Well-Being (<https://resilience.unl.edu/big-red-resilience-well-being>) provides fun events, innovative education, and dynamic services to help students understand emotions, manage stress, build strength, connect with others, develop grit, and navigate transitions

CSE Department

The CSE Department has an anonymous contact form (<http://cse.unl.edu/contact-form>) that you may use to voice your concerns about any problems in the course or department if you do not wish to be identified.

It is CSE Department policy that all students in CSE courses are expected to regularly check their email so they do not miss important announcements. You are ultimately responsible for your success in this course.

If you have questions on material covered or assigned in class, it is up to you to seek out assistance from the course instructors or TAs. Staff in the CSE Student Resource Center may also be able to assist you with general questions. The CSE Student Resource Center (<http://cse.unl.edu/src>) is located at Avery 12. The CSE Department also maintains a Frequently Asked Questions page (<https://cse.unl.edu/faq>).

Finally, I will hold regular office hours and will make myself available by appointment; please email me to set one up. **However, note that you may not receive any response during weekends/holidays and after office hours.**

Help

Your success in this course is ultimately your responsibility. That said, there are several outlets for you to seek help and assistance.

1. Your Instructor – Attend lecture regularly and engage in class discussions, ask questions in class, visit me during my office hours or setup a meeting time to see me
2. Your TAs – TAs hold regular weekly office hours, visit with them and ask questions, ask for examples, etc.
3. Student Resource Center – Though they may not be your direct TA, all Graduate Teaching Assistants (and some advanced undergraduates) hold regular office hours in the Student Resource Center (<http://cse.unl.edu/src/index.shtml>) open Monday thru Friday 9AM to 7PM and should be staffed most hours. Ask for help from anyone in the SRC.
4. Course materials – start on assignments early, attend lectures and labs, work extra problems from the book, read all required (and optional!) materials.
5. Your colleagues – Chances are, if you are having problems, your classmates are having them too. Discussion and dialog among students is encouraged (within the parameters set by CSE's academic integrity policy, this course's policy, and policies set for individual assignments).

CSCE 251, Sec 700: UNIX Programming

University of Nebraska – Lincoln

Spring 2020

Instructor: Garrett Wirka

E-mail: Through Canvas

Course Location: Online

Website: <https://canvas.unl.edu/>

Course Description

This online course introduces the basics of the Unix operating system, including commands and script programming. The goal of this course is for you to become familiar with Unix, to learn the art of scripting, and to support other courses in programming languages, data structures, and operating systems.

The topics covered in this course include: Unix history, accessing Unix systems, different programs/utilities found in Unix, the Unix file system, file processing, ownership and permissions, editing files with vi and emacs, filters and pipes, wildcards and regular expressions, command shells, AWK programming, Unix processes, and shell scripting.

Required Materials

There are no required materials for this course.

Online Course

This course is an online-only course. There will not be any regular meeting times. All materials will be posted to Canvas. You are responsible for checking Canvas regularly to keep up with any information and content that is posted. If you have any problems or questions, please feel free to contact the instructor via Canvas.

Course Objectives

After you complete this course, you will have:

1. Developed a good understanding of the Unix operating system

2. Gained an understanding of and experience with basic Unix commands and the bash programming environment
3. Used regular expressions and gained an understanding of AWK programming
4. Obtained a basic understanding of Unix processes
5. Perhaps most importantly, taken your first steps towards learning effective shell scripting

Course Structure

Homework Assignments

There will be three required assignments to complete during this course. These will be used to help you gain hands-on experience with Unix, Unix programming, and shell scripting. In total, assignments are worth 55% of your final grade, though they may not necessarily be weighted equally.

Assignments may be composed of written questions, scripting exercises, or some combination of the two. The solutions to written work must be submitted as a text file, and scripting exercise solutions as shell scripts. More detailed instructions will be given with the individual assignments. Both text files and scripts must be submitted via handin (cse.unl.edu/handin). Scripts will be graded using a webgrader (cse.unl.edu/~cse251/grade), which you will have access to in order to verify your solutions. It is strongly recommended that you take advantage of this.

Lastly, constructive collaboration on homework assignments is encouraged. All students are expected to do and submit their own work on homework assignments, though you are allowed to ask each other questions and bounce ideas off of one another, especially for the purpose of debugging. **If you collaborate with another student, prominently indicate their name(s) in your solution (commented out, in the case of scripts).** Failure to do so will leave you vulnerable to accusations of violating the department's academic integrity policy, discussed below.

Quizzes

There will be 3 quizzes for this course. Each quiz is worth 10% of your final grade. These quizzes will all be multiple choice and taken via Canvas. Each quiz will have questions randomly selected (and in random order) from a large question bank, so that no two quizzes will be the same. The quizzes will be open everything (books, notes, etc.). During the quizzes, any communication regarding the quiz contents with other students is strictly prohibited. You must complete the quizzes by yourself. The three quizzes cover material from lectures 1–9, 10–14, and 15–22 respectively.

Final Exam

The final exam for this course will be open all semester as a quiz on Canvas, but must be completed by 11:59:00 pm on **Wednesday, May 6th**. The final exam will essentially be a big quiz (worth 15% of your final grade) with the questions randomly drawn from the question banks of

the previous 3 quizzes. Some of the questions may be ones you've had before, while others may be new. There will be 60 questions total, and you will have 2 hours to complete it.

Grading Policy

Your final grade for this course will be determined according to your grades on quizzes, homework assignments, and the final. Each quiz will be worth 10% of your grade, and the final will be worth 15%. The homework assignments will make up the remaining 55% of the points, but they may be weighted differently.

Computing letter grades starts with this base scale, where s is the final score:

$$\begin{aligned}s \geq 90\% &\Rightarrow A \\ 80\% \leq s < 90\% &\Rightarrow B \\ 70\% \leq s < 80\% &\Rightarrow C \\ 60\% \leq s < 70\% &\Rightarrow D \\ s < 60\% &\Rightarrow F\end{aligned}$$

You will receive a "+" with your grade if the last digit of your score is ≥ 7 , and a "-" if the last digit is < 3 . I will scale up from this base scale if warranted. So if you get an 87% in this course you are guaranteed at least a B+ (similarly, an 82% guarantees at least a B-).

Course Policies

Late Assignments / Quizzes

All due dates in this course are at exactly 11:59:00 pm on the specified date. CSE's system clock, which timestamps your submissions, is the official clock for this course. Late submissions for quizzes and the final will not be accepted. Late submissions for assignments are allowed within **one week** of the deadline, for at most half credit.

Late Pass

Life happens, and sometimes deadlines can't be met. To accommodate life, each student may use a late pass for one **homework** during this course, which will allow for one assignment to be submitted up to one week late with no penalty. This pass will be automatically applied if you submit an assignment within a week after the deadline has passed, provided you have not yet used your late pass. This late pass **may not** be used on any of the quizzes or the final.

Academic Integrity

All homework assignments, scripts, and quizzes must be your own work. No collaboration with fellow students, past or current, is allowed unless otherwise permitted. The Computer Science & Engineering department has an Academic Integrity Policy. All students enrolled in any computer science course are bound by this policy. You are expected to read, understand, and follow this policy. Violations will be dealt with on a case by case basis and may result in a failing assignment or a failing grade for the course itself. The most recent version of the Academic Integrity Policy can be found at <http://cse.unl.edu/academic-integrity-policy>.

It is worth noting that all scripts submitted in this course will be compared with those of other students.

Accommodations for Disabilities

Students with disabilities are encouraged to contact us for a confidential discussion of their individual needs for academic accommodation. This includes students with mental health disabilities like depression and anxiety. It is the policy of the University of Nebraska-Lincoln to provide individualized accommodations to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 117 Louise Pound Hall, (402) 472-3787.

CSE Anonymous Contact Form

The CSE Department has an anonymous contact form that you may use to voice your concerns about any problems in the course or department if you do not wish to be identified. The form can be found at <http://cse.unl.edu/contact-form>.

Additional Information

It is CSE Department policy that all students in CSE courses are expected to regularly check their email so they do not miss important announcements.

Computer Science III

Data Structures & Algorithms Syllabus

Department of Computer Science & Engineering
University of Nebraska–Lincoln

CSCE 310 – Summer 2021

“Computer Science is no more about computers than astronomy is about telescopes.”
—Edsger Dijkstra

“If you want to be a good programmer you just program every day for two years. If you want to be a world class programmer you can program every day for ten years, or you could program every day for two years and take an algorithms class.”
—Charles E. Leiserson

1 Course Info

Prerequisites: CSCE 156 (Computer Science II) and CSCE 235 (Discrete Math)

Description: A review of algorithm analysis, asymptotic notation, and solving recurrence relations. Advanced data structures and their associated algorithms, heaps, priority queues, hash tables, trees, binary search trees, and graphs. Algorithmic techniques, divide and conquer, transform and conquer space-time trade-offs, greedy algorithms, dynamic programming, randomization, and distributed algorithms. Introduction to computability and NP-completeness.

Credit Hours: 3

Textbook: The *recommended* text book for this course is *Introduction to the Design and Analysis of Algorithms* (any edition) by Anany Levitin. However, no text book is required as there are plenty of free online Data Structures and Algorithms resources:

- My lecture notes: cse.unl.edu/~cbourke/ComputerScienceThree.pdf
- Open DSA: <https://opendatastructures.org/>
- *Algorithms* by Jeff Erickson <http://jeffe.cs.illinois.edu/teaching/algorithms/>

Postrequisites: If you are a Computer Science or Computer Engineering major you will need to receive a C or better in this course to continue in the major.

2 Course Overview

Computer Science is not programming. Rather, Computer Science is the mathematical modeling and study of what computation is—what problems have a computational solution and how efficient that solution can be. Thus, a strong foundation in mathematics is essential to your success as a computer scientist. At the heart of computer science are fundamental, discrete structures which we will study in this course. Specifically, you will learn many of the mathematical definitions, techniques, and ways of thinking that will be useful in Computer Science.

2.1 Topics

- A review of algorithms, algorithm analysis and asymptotics
- Brute Force algorithms, backtracking, generating combinatorial objects
- Divide & conquer techniques, repeated squaring, Karatsuba multiplication, Strassen's matrix multiplication, etc.
- Algorithms for linear systems
- Greedy Algorithms: Huffman coding
- Balanced Trees: Heaps, AVL Trees, 2-3 Trees
- Hash-based data structures
- Graph algorithms: DFS, BFS, MSTs, path finding, shortest path
- Dynamic Programming
- Computation and computability

3 Schedule

See Canvas

4 Course Delivery

For summer sessions this course is delivered online only in a (more-or-less) asynchronously manner.

- Daily lectures will be live streamed via YouTube (<https://www.youtube.com/c/ChrisBourkeUNL/live>), however the time is yet to be determined.
 - Recordings of the lectures will be available immediately following so you can watch/rewatch at your convenience
 - During the live broadcast, Piazza will be used for questions/answers
- For assignments that allow collaboration, you may use any medium you choose.
 - You can establish your own Zoom rooms to talk back and forth and share a screen
 - You may use discord or slack instead
 - You can (in fact should) be using git to share code (but only use private repos)
 - There are (free) online IDEs that allow you both to type in the same editor at the same time: <https://repl.it>, <https://ide.cs50.io/>; a more extensive list: <https://gist.github.com/rouzbeh84/4bafc9fe4fe02edf506d11997c4674b0>
- Written solutions must be submitted through canvas as PDFs
- Live office hours will be held online via zoom
- Exams will still be run, but asynchronously as “take home” exams that will be released the day-of. You will have a limited but *flexible* time period to complete them and submit it electronically. No collaboration will be allowed on the exams.

5 Accommodations for Students with Disabilities

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can discuss options privately. To establish reasonable accommodations, I may request that you register with Services for Students with Disabilities (SSD). If you are eligible for services and register with their office, make arrangements with me as soon as possible to discuss your accommodations so they can be implemented in a timely manner. SSD contact information: 117 Louise Pound Hall.; 402-472-3787

6 Grading

Grading will be based on assignments (both written and programming portions) as well as two exams.

| Category | Number | Points Each | Total |
|-------------|--------|-------------|-------|
| Assignments | 4 | 200 | 800 |
| Midterm | 100 | 1 | 100 |
| Final | 100 | 1 | 100 |
| Total | | | 1,000 |

6.1 Scale

Final letter grades will be awarded based on the following standard scale. This scale may be adjusted upwards if the instructor deems it necessary based on the final grades only. No scale will be made for individual assignments or exams.

| Letter Grade | Percent |
|--------------|-----------|
| A+ | ≥ 97 |
| A | ≥ 93 |
| A- | ≥ 90 |
| B+ | ≥ 87 |
| B | ≥ 83 |
| B- | ≥ 80 |
| C+ | ≥ 77 |
| C | ≥ 73 |
| C- | ≥ 70 |
| D+ | ≥ 67 |
| D | ≥ 63 |
| D- | ≥ 60 |
| F | < 60 |

6.2 Assignments

There will be 4 assignments that will consist of both written exercises as well as *substantial* programming problems. You will be expected to follow all instructions on the assignments. Clarity and legibility are of great importance. If homework is sloppy or unclear, points may be deducted. You are not required to typeset your written solutions; however, it is strongly recommended that you do so using L^AT_EX, markdown or similar typesetting system. Resources for L^AT_EX are available on the course web page. Source code and all relevant files for programming portions must be handed in using the CSE web handin program. Each assignment will have a fixed deadline based on CSE's server time. No late assignments will be accepted.

Further, programming solutions will be graded using our online webgrader system. Failure to submit compilable or runnable code may result in a zero. You are expected to do your

own substantial testing (and to submit valid, working test cases as well), but it is essential that your submissions work on the webgrader.

6.3 Exams

There will be two exams, both of which will be open-book, open-note, open-computer but you may *not* collaborate with anyone in or outside the class on the solutions.

6.4 Grading Policy

If you have questions about grading or believe that points were deducted unfairly, you must first address the issue with the individual who graded it to see if it can be resolved. Such questions should be made within a reasonable amount of time after the graded assignment has been returned. No further consideration will be given to any assignment a week after its grades have been posted. It is important to emphasize that the goal of grading is consistency. A grade on any given assignment, even if it is low for the entire class, should not matter that much. Rather, students who do comparable work should receive comparable grades (see the subsection on the scale used for this course).

6.5 Late Work Policy

In general, there will be no make-up exams or late work accepted. Exceptions may be made in certain circumstances such as health or emergency, but you must make every effort to get prior permission. Documentation may also be required.

Homework assignments have a strict due date/time as defined by the CSE server's system clock. All program files must be handed in using CSE's webhandin as specified in individual assignment handouts. Programs that are even a few seconds past the due date/time will be considered late and you will be locked out of handing anything in after that time.

6.6 Webgrader Policy

Failure to adhere to the requirements of an assignment in such a manner that makes it impossible to grade your program via the webgrader means that a disproportionate amount of time would be spent evaluating your assignment. For this reason, we will not grade any assignment that does not compile and run through the webgrader.

6.7 Academic Integrity

All homework assignments, programs, and exams must represent your own work unless otherwise stated. No collaboration with fellow students, past or current, is allowed unless otherwise permitted on specific assignments or problems. The Department of Computer Science & Engineering has an Academic Integrity Policy. All students enrolled in any computer science course are bound by this policy. You are expected to read, understand, and follow this policy. Violations will be dealt with on a case by case basis and may result in a failing assignment or a failing grade for the course itself. The most recent version of the Academic Integrity Policy can be found at <http://cse.unl.edu/academic-integrity>

7 Summer Session Policy

As a summer session, the course pace and presentation is accelerated. What would normally be covered over 15 weeks is compressed into less than five. Your success in this course depends on your acceptance of this fact and a commitment to putting in the extra work necessary to understand this material in the time that we do have. This means extensive daily review of materials outside of lecture and a diligent attitude toward completing assignments. As such, no late work will be accepted and no makeup quizzes or exams will be given. The compressed time period and logistics of offering summer courses make it extraordinarily difficult to make such considerations.

In addition, the summer version of this course lacks the same resources that would be available during the regular academic year. In particular, the Student Resource Center is closed and there is no recitation section. This may make getting additional help more difficult and you should make the appropriate adjustments or reconsider taking this course during the regular academic year.

8 Communication & Getting Help

The primary means of communication for this course is Piazza, an online forum system designed for college courses. We have established a Piazza group for this course and you should have received an invitation to join. If you have not, contact the instructor immediately. With Piazza you can ask questions anonymously, remain anonymous to your classmates, or choose to be identified. Using this open forum system the entire class benefits from the instructor and TA responses. In addition, you and other students can also answer each other's questions (again you may choose to remain anonymous or identify yourself to the instructors or everyone). You may still email the instructor or TAs, but more than likely you will be redirected to Piazza for help.

In addition, there are two anonymous suggestion boxes that you may use to voice your concerns about any problems in the course if you do not wish to be identified. My personal

box is available at <https://cse.unl.edu/~cbourke/email/>. The department also maintains an anonymous suggestion box available at <https://cse.unl.edu/contact-form>.

8.1 Getting Help

Your success in this course is ultimately your responsibility. Your success in this course depends on how well you utilize the opportunities and resources that we provide. There are numerous outlets for learning the material and getting help in this course:

- Lectures: attend lectures regularly and when you do use the time appropriately. Do not distract yourself with social media or other time wasters. Actively take notes (electronic or hand written). It is well-documented that good note taking directly leads to understanding and retention of concepts.
- Required Reading: do the required reading on a regular basis. The readings provide additional details and depth that you may not necessarily get directly in lecture.
- Piazza: if you have questions ask them on Piazza. It is the best and likely fastest way to get help with your questions. Also, be sure to read other student's posts and questions and feel free to answer yourself!
- Office Hours: the instructor and GTA(s) hold regular office hours throughout the week as posted on the course website. Attend office hours if you have questions or want to review material.
- Don't procrastinate. The biggest reason students fail this course is because they do not give themselves enough opportunities to learn the material. Don't wait to the last minute to start your assignments. Many people wait to the last minute and flood the TAs and SRC, making it difficult to get help as the due date approaches. Don't underestimate how much time your assignment(s) will take and don't wait to the week before hand to get started. Ideally, you should be working on the problems as we are covering them.
- Get help in the *right way*: when you go to the instructor or TA for help, you must demonstrate that you have put forth a good faith effort toward understanding the material. Asking questions that clearly indicate you have failed to read the required material, have not been attending lecture, etc. is *not acceptable*. Don't ask generic questions like "I'm lost, I don't know what I'm doing". Instead, explain what you have tried so far. Explain why you think what you have tried doesn't seem to be working. Then the TA will have an easier time to help you identify misconceptions or problems. This is known as "Rubber Duck Debugging" where in if you try to explain a problem to someone (or, lacking a live person, a rubber duck), then you can usually identify the problem yourself. Or, at the very least, get some insight as to what might be wrong.



CSCE 322: Programming Language Concepts (3 credits)

Fall 2022 – Section 001

Lecture: 10:30am – 11:20am MWF in Avery 106

Contact Information:

Instructor

Marcus Gubanyi
“Office:” Avery 352
Email: marcus.gubanyi@cune.edu

Teaching Assistants

Jared Soundy and Mrinal Rawool
Office Hours in the Student Resource Center
Email: jared.soundy@huskers.unl.edu and mrawool2@huskers.unl.edu

Office hours for the instructor and TA's are up-to-date on Canvas.

Prerequisite: CSCE 156/H or RAIK 184H or CSCE 311 or SOFT 161/H

Course Materials: Students are expected to obtain a copy of *Concepts of Programming Languages* by Robert W. Sebesta, 11th edition (2016). ISBN-13: 978-0133943023. Other materials will be available on Canvas.

Course Description: List-processing, string-processing, and other types of high-level programming languages. Fundamental concepts of data types, control structures, operations, and programming environments of various programming languages. Analysis, formal specification, and comparison of language features.

Objectives: Students successfully completing this course will be able to:

1. Understand different programming language paradigms,
2. Understand formal language theory as it relates to programming languages,
3. Evaluate programming language design choices,
4. Appreciate the complexity of the implementation of programming language features,
5. Implement solutions with functional programming.

Grading: Grading will be based on a weighted system outlined below. Late submissions will be accepted up to one week after the deadline, penalized 30%.

| Item | Weight |
|-------------------------|-----------------|
| 3 Midterm Exams | $3 \times 10\%$ |
| Final Exam (Cumulative) | 20% |
| Homework | 20% |
| Programming Assignments | 30% |

Letter grades will be awarded based on the following percentages:

$$\begin{array}{lllll} A+ \geq 97 & B+ \geq 87 & C+ \geq 77 & D+ \geq 67 & F < 60 \\ A \geq 93 & B \geq 83 & C \geq 73 & D \geq 63 & \\ A- \geq 90 & B- \geq 80 & C- \geq 70 & D- \geq 60 & \end{array}$$

Course Schedule: The course is split into 4 modules, each spanning three to four weeks. Each module has a homework assignment, programming assignment, and an exam. Homework will be due a week prior to the exam and is directly related to exam content. Programming assignments will be due after the exam, except for the final. ***All dates are tentative and subject to change.***

1. Programming Language Concepts

- Lecture Topics: Programming Paradigms, Language Evaluation, Design and Implementation, Evolution of Programming Languages, Functional Programming
- Homework 1: Due September 9
- Midterm 1: September 16
- Program 1: Due September 23

2. Formal Language Theory and Syntax

- Lecture Topics: Formal Language Theory, Chomsky's Hierarchy, Grammars, Automata, Parsing
- Homework 2: Due September 5
- Midterm 2: October 12
- Program 2: October 19

3. Variables

- Lecture Topics: Variables, Binding, Scope, Data Types, Memory Management
- Homework 3: Due November 2
- Midterm 3: November 9
- Program 3: Due November 16

4. "Control Structures"

- Lecture Topics: Expressions, Statements, Selection, Iteration, Subprograms, Abstract Data Types, Object-Oriented Programming
- Homework 4: Due December 2
- Program 4: Due December 2
- Final Exam: Finals Week

UNL Course Policies and Resources: Students are responsible for knowing the university policies and resources found on this page: <https://go.unl.edu/coursepolicies>.

- University-wide Attendance Policy
- Academic Honesty Policy
- Services for Students with Disabilities
- Mental Health and Well-Being Resources
- Final Exam Schedule
- Fifteenth Week Policy
- Emergency Procedures
- Diversity & Inclusiveness
- Title IX Policy
- Other Relevant University-Wide Policies

SoC Academic Integrity: The Computer Science & Engineering department has an [Academic Integrity Policy](#). Please note that by staying on the course you are abiding by the rules and regulations as described on the page. This is non-negotiable.

Miscellaneous

- The SoC has an [anonymous suggestion box](#) that you may use to voice your concerns about any problems in the course or school if you do not wish to be identified.
- The SoC has a [Student Resource Center](#) in Avery 12. This is where you can get additional help from the TA during his/her office hours and additional help with coursework and assignments. This is also the place where you can get technical support with SoC Computer Systems.
- All students enrolled in CSCE/SOFT courses will be enrolled in the [Virtual SRC](#). You can access the virtual SRC via canvas. All SRC tutors will have experience up through CSCE 310 and/or SOFT 262. The SRC tutors will serve as hosts to move students into break-out rooms while the specific course TAs are holding office hours and be available to answer general questions. For our TA hours, please check our office hours page on canvas.

CSCE 361: Software Engineering

Course Description

Catalog Description

Computer Systems Engineering (3 cr). Techniques used in the disciplined development of large software projects. Software requirements analysis and specifications, program design, coding and integration testing, and software maintenance. Software estimation techniques, design tools, and complexity metrics. *Requires participation in a group design and implementation of a software project.*

Prerequisites

Grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H, or RAIK 283H.

Prerequisites by Topic

- *Mastery of* A high-level programming language
- *Mastery of* Basic data structures and algorithm design
- *Familiarity with* Two or more programming languages

Course Objectives

- *Mastery of* Concepts and techniques for large-scale software development.
- *Familiarity with* Design techniques, such as structured and object-oriented analysis
- *Familiarity with* The software life cycle and the software development process
- *Familiarity with* Pragmatic aspects of developing software systems
- *Exposure to* Software testing techniques
- *Exposure to* Developing and maintaining large-scale software systems
- *Exposure to* Using existing software systems or legacy code when developing a software system
- *Exposure to* Working in a team of software developers
- *Exposure to* Communication of technical results (done in context of projects)
- *Exposure to* Ethical issues in computing

Topics Covered

- Programming vs. large-scale software development
- Software process and life cycle models
- Requirements engineering
- Specification techniques
- Structured analysis and design
- Object-oriented design techniques

- Software testing (black box and white box; unit and system)
- System maintenance issues and techniques
- Software architecture

Back to Syllabus Outline

Design Studio

Design Studio is a two semester (yearlong) sequence of courses:

First (fall) semester (Design Studio I & III) consists of the following course numbers:

RAIK 401H, RAIK 403H, CSCE 401H, CSCE 403H

Second (spring) semester (Design Studio II & IV) consists of the following course numbers:

RAIK 402H, RAIK 404H, CSCE 402H, CSCE 404H

Staff and Faculty:

| | | | |
|-------------------------------|----------------|--------------------------|--|
| Cheryl Nelson | Kauffman #108B | Interim Director | cheryl.nelson@unl.edu |
| Professor Justin Firestone | Kauffman #140 | Tribe Lead | justin.firestone@unl.edu |
| Professor David Keck | Kauffman #145 | Tribe Lead | dkeck@unl.edu |
| Professor Robert Mackalski | Kauffman #139 | Tribe Lead | robert.mackalski@unl.edu |
| Professor Stephanie Valentine | Kauffman #144 | Tribe Lead | valentine@unl.edu |
| Rachel Bradley | Kauffman #108C | Grad TA Tech Resource | rbradley4@huskers.unl.edu |

Faculty and staff are available to meet by request through an appointment.

Prerequisites to start sequence: Good standing in the University Honors Program and admission to the Jeffrey S. Raikes School of Computer Science and Management or by invitation; RAIK 383H or equivalent. See below for class sequencing.

Meeting: TR 2:00pm – 3:15pm, KAUF Great Hall (122)

Finals Time:

- First semester = Tuesday, December 14th: 1:00pm – 3:00pm, KAUF Great Hall (122)
- Second semester = Wednesday, May 11th: 1:00pm – 3:00pm, KAUF Great Hall (122)

Showcase: Friday, April 29th: 2:00pm – 4:30pm, Nebraska Innovation Campus

Course Objectives

At the end of this course, students will have gathered practical real-world product development experience with interdisciplinary team-based roles, environments, best practices, and processes by working with industry, government, and non-profit partners.

There are five main learning objectives where the students shall be able to:

- A. Apply, demonstrate, and integrate learned professional skills including:
 - Communications
 - Leadership
 - Ethics
 - Teamwork
 - Critical Thinking
 - Problem Solving
- B. Discover and manage diverse expectations including:
 - Client Relationships
 - Accountability
 - Conflict Resolution
 - Self-management
 - Self-motivation
 - Time Management

- C. Apply, demonstrate, and integrate learned business skills including:
 - Product Management (requirements analysis; marketing; story mapping, intellectual property)
 - Project Management and Planning
 - Risk Management
 - Visioning
 - Design Thinking
- D. Apply, demonstrate, and integrate learned software engineering skills including:
 - Testing/Quality Assurance
 - DevOps (working build processes; static code analysis; continuous integration)
 - Tech Proficiencies/Dependability Engineering
 - Architecture and Design
 - Release-driven Iterative Methodologies
- E. Learn beyond project/practice with:
 - Continual Learning
 - Shared Learning
 - Self-improvement
 - Intellectual Curiosity (creativity; innovation)

Course Sequencing

Students in the Raikes School traditionally take Design Studio for two years (four consecutive semesters). We offer the opportunity for students outside of the Raikes School, called Associates, to also take Design Studio by invitation for either one or two years. Here are the course progressions for the different type of students/options:

- Raikes School Student: RAIK 401H → RAIK 402H → RAIK 403H → RAIK 404H
- Raikes School Student with Research Studio Options:
 - RAIK 401H → RAIK 402H → RAIK 405H → RAIK 406H
 - RAIK 405H → RAIK 406H → RAIK 401H → RAIK 402H
- Associate: CSCE 401H → CSCE 402H [→ CSCE 403H → CSCE 404H] (*Optional for second year)
- Software Engineering Associate Options:
 - CSCE 401H → CSCE 402H → CSCE 403H → CSCE 404H
 - CSCE 486 → CSCE 488 → CSCE 403H → CSCE 404H
 - CSCE 401H → CSCE 402H → SOFT 403 → SOFT 404

The reason for this sequencing relates to ACE requirements. The RAIK 401H-402H (and CSCE 486-488) sequence offers both ACE 8 and ACE 10. The course progressions above preserve the student's ability to earn both of those graduation requirements with their initial year of Design Studio (or Senior Design).

Class Time

Design Studio is made up of both hands-on product development and review sessions with faculty and staff. Class time is allocated each week for lectures and workshops designed to support the work that you are doing in teams. We will continue to have guest lectures from the community on various topics. In addition to lectures and workshops, class-time occasionally will be used for teams to present work for review and feedback.

Class topics and content will be organized by weeks and made available in Canvas modules throughout both semesters. The fall and spring schedules will be provided in a separate Design Studio Course Schedule document.

Snow Days

If in-person classes are canceled, you will be notified through a Canvas announcement on alternative measures taken by DS to hold the class session via Zoom or if the class session will be canceled or rescheduled. Students will be expected to check these notifications for continuity of instruction.

Team Time

The focus of each student team is to achieve a successful project by delivering a working solution that delights the customer. Each team is responsible for organizing itself effectively to complete the project. Team time ideally will be scheduled in 3-4 hour blocks but may not be less than 2 hours without the permission of the program lead and tribe lead. For team time, the longer the block the more productive the team. Depending on the skill and efficiency of the student team, it may take more or less time. At least one block of team time must be scheduled on a weekday between 9am and 5pm (beginning at 4:30pm does not fulfill this requirement). Due to the nature of software development, some weeks may require more work than others. Students are encouraged to use all available resources to work “smarter” and not necessarily just “harder.” Team time cannot be scheduled during class time when a class session is scheduled to be held.

Students are expected to spend at least 12 hours in team time each week and are encouraged to spend around 15 hours doing project work during any given week. Most of these hours should have the entire team present and no hours with only first-year or only second-year students. Schedules must be approved by the project’s leadership team, sponsor and tribe lead. The team needs to send a finalized schedule (including weekly meetings) to all stakeholders and post and pin the schedule in their Slack project channel.

Your team will be supervised by a tribe lead (faculty instructor) who will meet with teams throughout the semester to review work and provide feedback. The program lead role which advises teams on DS policies and procedures will be handled by Cheryl Nelson on an as-needed basis.

Grading

Grades will be based on both exhibited practices and delivered work product. Points can be earned in the course as assigned by the tribe lead in the following areas and scaled based on the percentages below.

- Product release evaluations from sponsors (graded 3 times per semester) – 45%
- Best Practices and Process – 30%
- Special Topics Presentation – 10%
- Executive Summary and Project Retrospective – 5%
- Course Participation and Engagement – 5%
- Individual Student Assessment – 5%

Students are expected to participate and be engaged with the class content and activities. This includes with in-class discussions, review of posted videos, completion of assigned activities, etc. While attendance may not be taken on every occasion, instructors will continually make note of who is and is not attending class. It is not acceptable to miss class without a University approved excused absence. Exceeding two unexcused absences will result in reduction of course participation and engagement grade.

Project Releases

A major component of Design Studio is delivery of a software product that delights the customer. Students will be regularly evaluated by their sponsor and points will be based on performance in their development teams. At the end of each release, sponsors will evaluate teams based on four criteria: 1) vision, 2) planning, 3) execution, and 4) communication.

The following points will be awarded for each criterion as follows:

| Release | Communication | Execution | Planning | Vision |
|------------------------|---------------|-----------|----------|--------|
| 1 - October 8 | 3 | 2 | 5 | 5 |
| 2 - November 5 | 3 | 6 | 3 | 3 |
| 3 – December 10 | 3 | 8 | 2 | 2 |

| | | | | |
|------------------------|---|---|---|---|
| 4 - February 11 | 3 | 6 | 3 | 3 |
| 5 - March 11 | 3 | 8 | 2 | 2 |
| 6 - April 15 | 3 | 8 | 3 | 1 |

Sponsors will evaluate the entire team and assign ratings based on their interactions with the team during the release development cycle. Tribe leads will assign the team points based on sponsor feedback and their own view of the project. Points from releases will be distributed in conjunction with a peer review process with each member of the team assigning some number of points to all team members. The total points earned by a student for each release will be assigned by the tribe lead in consideration of the average of all points distributed to that student by the members of the team. Points will be deducted from a student for non-completion of the peer review process within 5 days of notification by DS system.

Team Best Practices

New in Semester Two is the process of Best Practices. One of the goals of Design Studio is to prepare students to be successful members of development project teams by exposing them to best practices that are associated with managing, building, and releasing high-quality products. Students will set goals in the following categories which will be reviewed with Tribe Leads in their weekly interactions.

SEMESTER 1 - Completed

1. Product Management – Customer Discovery, Understanding Requirements, Ideation
2. Story Mapping – Vision, Release Planning
3. Project Management – Initiation, Planning, Estimating, Logistics
4. Teamwork – Leadership, Inclusion, Accountability
5. DevOps – such as, but not limited to:
 - Working Build
 - Static Code Analysis
 - Continuous Integration
 - Continuous Deployment
6. Releases – Process, Commitments
7. Risk Management

SEMESTER 2

8. Communications – Presentations, Technical Writing
9. Testing – Quality Assurance, Test Strategy, User Testing
10. Security
11. Technical Proficiencies – such as, but not limited to:

| | |
|---|---|
| <ul style="list-style-type: none"> ○ Accessibility ○ Efficiency/Performance ○ Interoperability/Compatibility ○ Privacy ○ Reliability/Dependability | <ul style="list-style-type: none"> ○ Scalability ○ Telemetry ○ Testability ○ Usability ○ Others not listed |
|---|---|
12. Expectation Management – Improving Estimation, Velocity, Re-setting Expectations
13. Transition

For each team, the points associated with the goals in the above areas will be determined by the team. The degree to which each of these items are performed will be evaluated by the tribe lead assigned to your team. Be advised that you should ensure that you always conform to these practices. If you are unsure of how to put practices in place on your team, communicate with your tribe lead who is here to help you.

Policies

You **will never** be downgraded or negatively impacted for asking for help in Design Studio. Late work will receive an automatic 50% deduction and will not be accepted more than one week past the due date. Grades will be assigned based on the following scale:

| | | | | | |
|----|------------|---|------------|----|------------|
| A+ | * | A | >= 93.0000 | A- | >= 90.0000 |
| B+ | >= 87.0000 | B | >= 83.0000 | B- | >= 80.0000 |
| C+ | >= 77.0000 | C | >= 73.0000 | C- | >= 70.0000 |
| D+ | >= 67.0000 | D | >= 63.0000 | D- | >= 60.0000 |
| F | < 60.0000 | | | | |

* Grades of A+, at the discretion of the faculty and staff, will be reserved for students who demonstrate an exemplary performance on all practice and academic tasks.

Student Expectations

Students are expected to follow all sponsor, coach, and faculty and staff instructions during the completion of their assigned projects. When expectations are unclear or unknown, it is the responsibility of the student to seek clarification by consulting the appropriate parties. As students will be collaborating closely with industry professionals, all students are expected to be respectful and interact with the highest levels of professionalism in all aspects of this experience. Students are required to attend (either virtually or in-person) all scheduled class events and participate in activities.

First year students are generally expected to be team members, contributing fully to the team while gaining experience in the Design Studio expectations and process. First year students have the opportunity to provide leadership in a specific subject area or skill within a team once those areas are identified. Second year students are generally expected to be team leaders, fulfilling one of the two manager roles on the team and using their experience to lead and direct the team through Design Studio.

Team Expectations

Projects are completed over the course of the academic year. Projects will be completed using an iterative development methodology based on Scrum as outlined in course materials. Each project team, in conjunction with the sponsor, coach, and faculty and staff, is expected to operate using the processes prescribed by Design Studio. Deviation from the processes should be discussed with the Design Studio director and tribe lead and agreed to by all parties; deviations from the Design Studio process rarely will be approved. Teams also are responsible for reporting their status to all stakeholders on at least a weekly basis. Expectations of the team will come primarily from the sponsor and be supported by class content.

Conflicts

Design Studio includes a significant amount of software development work for sponsors who pay a fee for development. The primary purpose of the course is to provide an educational opportunity for the students and an opportunity for sponsors to recruit interns and new post-graduate hires. At the same time, teams are developing intellectual property that will be owned by the sponsor at the end of the Design Studio year. As a result, Design Studio requires some conflict management policies similar to those that you would find in an internship or after you accept a job.

Your Time

What you do in your free time is up to you; however, when you are working on your project during scheduled team time, that is the sponsor's time. When in team time you should not be working on tasks that are unrelated to your Design Studio project. There is always plenty to do and team time is not homework time. If you have your own business, you should **never under any circumstances use team time or Design Studio equipment or resources for any work related to your business.**

Design Studio Resources

We will provide you with all the tools and resources necessary to successfully complete your project. This includes a space to work, a machine to develop on, and devices needed to adequately test your product. You should not use any of these resources for tasks that are not related to your Design Studio project. While team rooms are primarily for Design Studio work, other quiet uses of the space that don't impact the other Design Studio teams are acceptable (such as using it as a quiet place to do homework outside of team time). You should not use personal computers for Design Studio related development and vice versa. If you choose to do Design Studio work on a personally owned computer, be aware that your computer and all its content may be subject to review by the sponsor. Also, be aware that anything you put on a University-owned computer is not private and may be reviewed by UNL faculty and staff, or a member of the sponsor organization.

Employment

To balance time spent on Design Studio with all the other activities in which students are involved, and to prevent undue influence that may disrupt that balance, working for a Design Studio sponsor during the academic year is prohibited. Working for means being paid in any way for work that is being done during either the fall or spring semester. In a limited number of cases, exceptions to this policy can be made with the understanding that **no student may work for the sponsor of the project to which they are assigned under any circumstances.** This policy does not prevent you from seeking post-graduate employment or internships or accepting any offer of employment outside of the Design Studio year; you are encouraged to take advantage of the opportunities that are created by working with sponsors in Design Studio. Requests for an exemption to this policy must be made to the Director of Design Studio in writing (email is fine).

Sponsor Meetings

Weekly team meetings with sponsors are required. They may occur during regularly scheduled team times but may not be scheduled during class time when a class session is scheduled to be held. All team members must be present either in-person or virtually.

Release Meetings

Release meetings allow teams to hand off, demonstrate, and defend the current results while providing direction and planning for project completion. The goal of each release meeting is to provide the sponsor with releasable work product. Releasable work product is some iteration of the project that the sponsor can interact with outside of the meeting, share with others, and use to provide feedback independent of interaction with the team. Teams are encouraged to plan features around making each release as functional as possible and push aggressively towards production-ready releases. All Design Studio teams will release work product in a coordinated effort across all teams and tribes. See the Canvas course calendar or Slack for release dates.

Each release will involve the Design Studio project team, the sponsor team (including the product owner), and the assigned Design Studio tribe lead working together to demonstrate and discuss their progress on the project to the project executive sponsors. Release meetings must be scheduled within one week (before or after) of the scheduled release date and must take place between the hours of 9am and 5pm; without permission from Design Studio, a release meeting may not be scheduled to run later than 5pm. If a sponsor requires a release meeting that will run late, it should be scheduled with your team's tribe lead. Unless otherwise requested by and prearranged with the sponsor, in-person release meetings need to take place in Kauffman.

Teams are **strongly encouraged** to schedule release meetings as early as possible after the backlog for the release has been set. Tribe leads attend multiple meetings, and it may be difficult to coordinate schedules with them. There are a limited number of conference rooms available for in-person meetings or video conference rooms for online meetings with the team members taking place in Kauffman. A calendar meeting invitation should be sent to all required meeting participants.

Online Tools

Online management and collaboration tools will be detailed during the first several weeks of class. Teams are expected to utilize Design Studio supplied project resources for collaboration, issue tracking, and source code management. We use Slack, Canvas, SharePoint, GitHub, and ZenHub for these purposes. In cases where sponsors wish to provide their own tools, teams are expected to use those and ensure that the tribe lead and Design Studio staff have access during the project.

Meeting and Team Rooms

Each team will be assigned a team room and will have access to space for the various meetings that take place in Design Studio. Please be sure to choose meeting spaces most appropriate for the size and technology needs (i.e. video conferencing) of your planned meeting. The following spaces are available to Design Studio teams this year for meetings:

- Kauffman 127A – Small Video Conference Room
- Kauffman 127B – Small Video Conference Room
- Kauffman 127C – Small Video Conference Room
- Kauffman 127D – Large Video Conference Room
- Kauffman 127E – Large Video Conference Room
- Kauffman 102 – Large Conference Room

The following spaces are available to Design Studio teams this year for working team times:

- Kauffman 103 – 3 spaces
- Kauffman 104 – 3 spaces
- Kauffman 114 – 2 spaces
- Kauffman 115 – 2 spaces
- Kauffman 116 – 2 spaces
- Kauffman 125 – 3 spaces
- Kauffman 137/A – 5 spaces

Conference rooms in Kauffman can be scheduled for sponsor meetings throughout the semester using the UNL scheduling tool – instructions will be provided.

[SoC Student Resource Center \(SRC\)](#)

The Computer Science Resource Center (SRC) is committed to continuing to provide support for students enrolled in Computer Science and Software engineering courses. The Student Resource Center is staffed by student tutors and teaching assistants who are available to help you with course work. Teaching assistants for all courses hold office hours in the Student Resource Center.

A virtual Student Resource Center has been set up via Canvas (<https://canvas.unl.edu/courses/120620>) to accommodate students during the COVID-19 pandemic.

HOURS: Monday – Friday, 10 a.m. – 5 p.m.

LOCATION: Avery Hall Room #12

The SoC Student Resource Center is staffed by student tutors and teaching assistants who are available to help you with course work. The SRC is a community hub for SoC students. Even if you don't need help, the Student Resource Center is a great place to study with your peers.

[Writing Center](#)

At the Writing Center, our undergraduate and graduate Writing Consultants work with writers at all levels, from all disciplines, at all stages of the writing process. All members of the UNL community (students, faculty, and staff) are welcome. Whether you are brainstorming or organizing ideas or polishing a final draft, we look forward to discussing your writing with you.

All forms of communication are welcome, from essays, lab reports, research papers, and journal articles to presentations, cover letters, personal statements, and theses/dissertations. Writing Center Consultants can work with you at any stage of the writing process, from brainstorming and organizing your ideas through polishing a final draft.

The Writing Center's main location is 102 Andrews Hall. During the 2021-22 academic year, offering online and in-person appointments. Please schedule your appointments as usual through WConline. Visit Online Writing Center Services page to learn more about our online formats. Sign up for an appointment any time by visiting unl.mywconline.com. For other information about the Writing Center, please visit unl.edu/writing.

[Course Policies](#)

[Huskers Email Required](#)

@huskers.unl.edu accounts became the primary email for all university communications to students beginning May 20, 2019. This email will ensure that students never miss important university communications and it will be connected to MyRED and Canvas accounts. Additionally, students will use it to access university library services and software — like Adobe Creative Cloud, Matlab, VidGrid, Zoom, Office 365 and more.

A @huskers.unl.edu address has been assigned to you. This will be the primary email for all Design Studio communications emailed to students this year. To access your @huskers.unl.edu email, simply log in to mymail.unl.edu to an external site. with your My.UNL username and password. If you aren't sure what your @huskers.unl.edu email address is, you'll find it listed under the Profile tab in MyRED or MyNCTA.

It's important to check your @huskers.unl.edu email frequently — we recommend daily — so you don't miss any time-critical messages from the university, especially from the offices of Scholarships and Financial Aid, University Registrar, Admissions, and Student Accounts. Instructors will communicate with you primarily through Canvas and Slack, but may use this email, as well.

Recording of Class-Related Activity

We invite all of you to join us in actively creating and contributing to a positive, productive, and respectful classroom culture. Each student contributes to an environment that shapes the learning process. Any work and/or communication that you are privy to as a member of this course should be treated as the intellectual property of the speaker/creator and is not to be shared outside the context of this course.

Students may not make or distribute screen captures, audio/video recordings of, or livestream, any class-related activity, including lectures and presentations, without express prior written consent from the DS Director or an approved accommodation from Services for Students with Disabilities. If you have (or think you may have) a disability such that you need to record or tape class-related activities, you should contact Services for Students with Disabilities. If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Failure to follow this policy on recording or distributing class-related activities may subject you to discipline under the Student Code of Conduct.

ACE Requirements

The CSCE 401H course will satisfy ACE Learning Outcome #8: Explain ethical principles, civics, and stewardship, and their importance in society. Learning opportunities for ACE8 will include:

- reading, viewing, and discussing the required materials,
- an investigative case study,
- hands-on design of your capstone project.

In this course, you will be given opportunities to learn, be assessed on what you have learned, and have specific critical skills reinforced. Specifically, through the required materials, you will learn about events due to poor ethics, lack of civic judgments, and inadequate stewardship exercised by the environment, and how these events impacted the society. The readings and other materials have been specifically chosen for that purpose. After going through these materials, quizzes will be given. First, you will be required to learn about general ethical principles expanded into applying those principles via several real-world case studies. Second, you will be quizzed regarding the application of the ethical principles. Quizzes related to these activities will count towards 10% of your semester grade. As part of the overall course grade, you will be assessed via the quizzes, your project reports, and how you practice ethical principles in the way you document your work and acknowledge others'.

The RAIK 402H and CSCE 402H courses will satisfy ACE Learning Outcome #10: Generate a creative or scholarly product that requires broad knowledge, appropriate technical proficiency, information collection, synthesis, interpretation, presentation, and reflection.

Design Studio is the capstone learning experience of the Jeffrey S. Raikes School in Computer Science and Management. In Design Studio, student teams partner with sponsoring businesses and government agencies to develop real-world, software-based solutions meeting their sponsor's needs. Design Studio gives students and sponsors the ability to interact, while benefiting from the support of Raikes School faculty and facilities. Students have opportunities to demonstrate their abilities, knowledge, and capacities by completing consulting based technology projects. Throughout these consulting based projects, student teams will be required to determine and meet the expectations set forth by the project sponsors. Each project goes through all phases of the development process including initiation, execution, and closing.

Students are evaluated based on 1) individual and team improvement, 2) achievement of learning objectives, and 3) project success. Graded assignments used to assess achievement of this outcome include:

- Presentation to the sponsor at completion of several checkpoints throughout the project to assess appropriate technical proficiency, information collection, synthesis, interpretation, presentation, and reflection.

- Iteration commitment/satisfaction forms to assess appropriate technical proficiency, synthesis, interpretation, and reflection.
- Sponsor documents to assess appropriate technical proficiency, information collection, synthesis, and interpretation.
- Project sponsor surveys and sign-off documents to assess broad knowledge, appropriate technical proficiency, information collection, synthesis, interpretation, presentation, and reflection.
- Project retrospective to assess information collection, synthesis, interpretation, presentation, and reflection.

SoC Policies

Design Studio follows all of the School of Computing course policies:

- The SoC has an anonymous contact form (<http://cse.unl.edu/contact-form>) that you may use to voice your concerns about any problems in the course or department if you do not wish to be identified.
- All homework assignments, quizzes, exams, etc. must be your own work. No direct collaboration with fellow students, past or current, is allowed unless otherwise stated. The SoC has an Academic Integrity Policy (<http://cse.unl.edu/academic-integrity-policy>). All students enrolled in any computer science course are bound by this policy. You are expected to read, understand, and follow this policy. Violations will be dealt with on a case-by-case basis and may result in a failing assignment or a failing grade for the course itself.

Additional UNL Course Policies and Resources

Students are responsible for knowing the university policies and resources found on this page.
(<https://go.unl.edu/coursepolicies>)

Satisfying Senior Project (Thesis) Requirements

UNL Honors Senior Project

Participation in Design Studio will satisfy the requirement for an undergraduate thesis in the UNL Honors program. The use of the Design Studio experience in satisfying these requirements is subject to all policies, deadlines, and requirements of the respective program. Teams will complete two documents in the spring (Project Retrospective and Executive Summary) that will be approved by Design Studio faculty and staff and can then be submitted to the Honors program to complete the thesis requirement. Additional instructions will be provided in the spring semester with the two documents on exactly how to submit your work for Honors thesis credit.

UNL Honors Senior Project:

<https://honors.unl.edu/academics/senior-project>

College of Arts & Sciences Undergraduate Thesis for Degrees with Distinction

Participation in Design Studio may be used to partially satisfy requirements for an undergraduate thesis for graduation with some level of distinction in the College of Arts & Sciences. The use of the Design Studio experience in partially satisfying these requirements is subject to all policies, deadlines, and requirements of the college. Students intending to complete a thesis are advised to familiarize themselves with the program requirements.

UNL College of Arts and Sciences:

<http://cas.unl.edu/degrees-distinction>

The work of writing a thesis must be supervised by a faculty member from the college (faculty advisor). If you do not have a preferred faculty advisor for your thesis, Dr. Steve Cooper, Executive Director of the Raikes School, will serve as your faculty advisor.

Requirements for an Undergraduate Thesis for Degrees with Distinction

The thesis must be the result of independent, sustained thought and intellectual curiosity. A survey of the literature about a particular topic is not sufficient however novel it may be. Ideally, there should be a clear formulation of a problem or question, scholarly study which illuminates or addresses it supported by the work done in Design Studio, and a conclusion supported by evidence. A bibliography and reference to existing literature in the field should be included where appropriate. The thesis should be a minimum of 20 pages. Students, working closely with their two thesis advisors, may develop a project that takes a form other than a traditional thesis (e.g. they may develop video, audio, or web-based project), but the research, knowledge, effort, and quality of work should be comparable to that of a thesis in the discipline.

Students should work closely with their faculty advisor as they complete their thesis. A final copy of the thesis must be submitted to their faculty advisor no later than one month prior to the program deadline for final thesis submission.

Design Studio

Design Studio is a two semester (yearlong) sequence of courses:

First (fall) semester (Design Studio I & III) consists of the following course numbers:

RAIK 401H, RAIK 403H, CSCE 401H, CSCE 403H

Second (spring) semester (Design Studio II & IV) consists of the following course numbers:

RAIK 402H, RAIK 404H, CSCE 402H, CSCE 404H

Faculty and Staff:

| | | | |
|---|----------------|--------------|--|
| Mark Antonson | Kauffman #108A | 402-472-7465 | mark.antonson@unl.edu |
| Professor Justin Firestone | Kauffman #140 | 402-472-6000 | justin.firestone@unl.edu |
| Professor David Keck | Kauffman #145 | 402-472-6000 | dkeck@unl.edu |
| Professor Robert Mackalski | Kauffman #139 | 402-472-6000 | robert.mackalski@unl.edu |
| Cheryl Nelson | Kauffman #108B | 402-472-6003 | cheryl.nelson@unl.edu |
| Jeremy Suing | Kauffman #108D | 402-472-1658 | jsuing@unl.edu |
| Professor Stephanie Valentine | Kauffman #144 | 402-472-6000 | valentine@unl.edu |
| Architecture and Engineering Lead – TBD | Kauffman #108C | 402-472-5052 | |

Faculty and staff are available to meet by request through an appointment.

Prerequisites to start sequence: Good standing in the University Honors Program and admission to the Jeffrey S. Raikes School of Computer Science and Management or by invitation; RAIK 383H or equivalent. See below for class sequencing.

Meeting: TR 2:00pm – 3:15pm, KAUF Great Hall (122)

Finals Time:

- First semester = Tuesday, December 14th: 1:00pm – 3:00pm, KAUF Great Hall (122)
- Second semester = TBD

Showcase: Friday, April 29th: 1:30pm – 4:30pm, Nebraska Innovation Campus

Course Objectives

At the end of this course, students will have gathered practical real-world product development experience with interdisciplinary team-based roles, environments, best practices, and processes by working with industry, government, and non-profit partners.

There are five main learning objectives where the students shall be able to:

- A. Apply, demonstrate, and integrate learned professional skills including:
 - Communications
 - Leadership
 - Ethics
 - Teamwork
 - Critical Thinking
 - Problem Solving
- B. Discover and manage diverse expectations including:
 - Client Relationships
 - Accountability
 - Conflict Resolution
 - Self-management
 - Self-motivation
 - Time Management

- C. Apply, demonstrate, and integrate learned business skills including:
 - Product Management (requirements analysis; marketing; story mapping)
 - Project Management and Planning
 - Risk Management
 - Visioning
 - Design Thinking
- D. Apply, demonstrate, and integrate learned software engineering skills including:
 - Testing/Quality Assurance
 - DevOps (working build processes; static code analysis; continuous integration)
 - Tech Proficiencies/Dependability Engineering
 - Architecture and Design
 - Release-driven Iterative Methodologies
- E. Learn beyond project/practice with:
 - Continual Learning
 - Shared Learning
 - Self-improvement
 - Intellectual Curiosity (creativity; innovation)

Course Sequencing

Students in the Raikes School traditionally take Design Studio for two years (four consecutive semesters). We offer the opportunity for students outside of the Raikes School, called Associates, to also take Design Studio by invitation for either one or two years. Here are the course progressions for the different type of students/options:

- Raikes School Student: RAIK 401H → RAIK 402H → RAIK 403H → RAIK 404H
- Raikes School Student with Research Studio Options:
 - RAIK 401H → RAIK 402H → RAIK 405H → RAIK 406H
 - RAIK 405H → RAIK 406H → RAIK 401H → RAIK 402H
- Associate: CSCE 401H → CSCE 402H [→ CSCE 403H → CSCE 404H] (*Optional for second year)
- Software Engineering Associate Options:
 - CSCE 401H → CSCE 402H → CSCE 403H → CSCE 404H
 - CSCE 486 → CSCE 488 → CSCE 403H → CSCE 404H
 - CSCE 401H → CSCE 402H → SOFT 403 → SOFT 404

The reason for this sequencing relates to ACE requirements. The RAIK 401H-402H (and CSCE 486-488) sequence offers both ACE 8 and ACE 10. The course progressions above preserve the student's ability to earn both of those graduation requirements with their initial year of Design Studio (or Senior Design).

Class Time

Design Studio is made up of both hands-on product development and review sessions with faculty and staff. Class time is allocated each week for lectures and workshops designed to support the work that you are doing in teams. We will continue to have guest lectures from the community on various topics. In addition to lectures and workshops, class-time occasionally will be used for teams to present work for review and feedback. Students in this course must work in close physical proximity to one another for extended periods of time in order to achieve the academic goals of the course. For this reason, the Raikes School has determined that face coverings will be required in this course. If you are unwilling to comply with this requirement, please visit with your advisor about possible alternative courses that you might take in lieu of this one.

Class topics and content will be organized by weeks and made available in Canvas modules throughout both semesters. The fall and spring schedules will be provided in a separate Design Studio Course Schedule document.

Team Time

The focus of each student team is to achieve a successful project by delivering a working solution that delights the customer. Each team is responsible for organizing itself effectively to complete the project. Team time ideally will be scheduled in 3-4 hour blocks but may not be less than 2 hours without the permission of the program lead and tribe lead. For team time, the longer the block the more productive the team. Depending on the skill and efficiency of the student team, it may take more or less time. At least one block of team time must be scheduled on a weekday between 9am and 5pm (beginning at 4:30pm does not fulfill this requirement). Due to the nature of software development, some weeks may require more work than others. Students are encouraged to use all available resources to work “smarter” and not necessarily just “harder.” Team time cannot be scheduled during class time when a class session is scheduled to be held.

Students are expected to spend at least 12 hours in team time each week and are encouraged to spend around 15 hours doing project work during any given week. Most of these hours should have the entire team present and no hours with only first-year or only second-year students. Schedules must be approved by the project’s leadership team, sponsor, program lead, and tribe lead. The team needs to send a finalized schedule (including weekly meetings) to all stakeholders and post and pin the schedule in their Slack project channel.

Each team will be assigned a program lead. The program lead is the primary connection with the Design Studio organization. Program leads will spend time each week in team time with you, so you must schedule at least some team time that can accommodate the program lead’s schedule. In addition to the program lead, your team will be supervised by a tribe lead (faculty instructor) who will meet with teams throughout the semester to review work and provide feedback.

Grading

Grades will be based on both exhibited practices and delivered work product. Points can be earned in the course as assigned by the tribe lead in the following areas and scaled based on the percentages below.

- Product release evaluations from sponsors (graded 3 times per semester)
 - 45% for RAIK403H/CSCE403H and RAIK404H/CSCE404H
 - 30% for RAIK401H/CSCE401H and RAIK402H/CSCE402H
- Best practices and process (graded 3 times per semester)
 - 30% for RAIK403H/CSCE403H and RAIK404H/CSCE404H
 - 45% for RAIK401H/CSCE401H and RAIK402H/CSCE402H
- 10% – ethics (CSCE401H)/core values (RAIK401H/RAIK403H) assignments (fall semester)
- 10% – special topics presentations (spring semester)
- 8% – course participation and engagement
- 7% – individual student assessment (17% for CSCE403H in fall semester)

Students are expected to participate and be engaged with the class content and activities. This includes with in-class discussions, review of posted videos, completion of assigned activities, etc.

Project Releases

A major component of Design Studio is delivery of a software product that delights the customer. Students will be regularly evaluated by their sponsor and points will be based on performance in their development teams. At the end of each release, sponsors will evaluate teams based on four criteria: 1) vision, 2) planning, 3) execution, and 4) communication. The following points will be awarded for each criterion as follows:

| Release | Communication | Execution | Planning | Vision |
|------------------------|---------------|-----------|----------|--------|
| 1 - October 8 | 3 | 2 | 5 | 5 |
| 2 - November 5 | 3 | 6 | 3 | 3 |
| 3 – December 10 | 3 | 8 | 2 | 2 |

| | | | | |
|------------------------|---|---|---|---|
| 4 - February 11 | 3 | 6 | 3 | 3 |
| 5 - March 11 | 3 | 8 | 2 | 2 |
| 6 - April 15 | 3 | 8 | 3 | 1 |

Sponsors will evaluate the entire team and assign ratings based on their interactions with the team during the release development cycle. Tribe leads will assign the team points based on sponsor feedback and their own view of the project. Points from releases will be distributed in conjunction with a peer review process with each member of the team assigning some number of points to all team members. The total points earned by a student for each release will be assigned by the tribe lead in consideration of the average of all points distributed to that student by the members of the team. Points will be deducted from a student for non-completion of the peer review process within a given timeframe.

Team Best Practices

One of the goals of Design Studio is to prepare students to be successful members of development project teams by exposing them to best practices that are associated with managing, building, and releasing high-quality products. Students will be evaluated throughout the semester on how they exhibit these practices and processes. Tools and techniques for implementing these will be discussed in presentations and workshops by faculty and staff and industry partners within class sessions and the Canvas modules. Assessment will be based on several activities related to the practices and processes. The following areas will be evaluated for each team over the course of the academic year:

1. Product Management – Customer Discovery, Understanding Requirements, Ideation
2. Story Mapping – Vision, Release Planning
3. Project Management – Initiation, Planning, Estimating, Logistics
4. Teamwork – Leadership, Inclusion, Accountability
5. DevOps – such as, but not limited to:
 - Working Build
 - Static Code Analysis
 - Continuous Integration
 - Continuous Deployment
6. Releases – Process, Commitments
7. Risk Management
8. Communications – Presentations, Technical Writing
9. Testing – Quality Assurance, Test Strategy, User Testing
10. Security
11. Technical Proficiencies – such as, but not limited to:

| | |
|----------------------------------|---------------------|
| ○ Accessibility | ○ Scalability |
| ○ Efficiency/Performance | ○ Telemetry |
| ○ Interoperability/Compatibility | ○ Testability |
| ○ Privacy | ○ Usability |
| ○ Reliability/Dependability | ○ Others not listed |
12. Expectation Management – Improving Estimation, Velocity, Re-setting Expectations
13. Transition

For each team, the following points will be assessed at the given releases for each of the evaluated best practices during the course of the two semesters:

| # | Best Practice | R1 | R2 | R3 | R4 | R5 | R6 |
|----------|--------------------|----|----|----|----|----|----|
| 1 | Product Management | 3 | 7 | | | | |
| 2 | Story Mapping | 3 | 7 | | | | |
| 3 | Project Management | 3 | 7 | | | | |
| 4 | Teamwork | | | 3 | 7 | | |

| | | | | | | |
|-------------|-------------------------|---|---|--|--|--|
| 5 | DevOps | 3 | 7 | | | |
| 6 | Releases | 3 | 7 | | | |
| 7 | Risk Management | 3 | 7 | | | |
| 8 | Communications | 3 | 7 | | | |
| 9 | Testing | 3 | 7 | | | |
| 10 | Security | 3 | 7 | | | |
| 11-1 | Technical Proficiencies | 3 | 7 | | | |
| 11-2 | Technical Proficiencies | 3 | 7 | | | |
| 12 | Expectation Management | 3 | 7 | | | |
| 13 | Transition | 3 | 7 | | | |

The degree to which each of these items is performed will be evaluated by the tribe lead assigned to your team twice during the year. Be advised that you should ensure that you **always** conform to these practices. If you are unsure of how to put practices in place on your team, **communicate with your tribe lead** who is here to help you.

Policies

You **will never** be downgraded or negatively impacted for asking for help in Design Studio. Late work will receive an automatic 50% deduction and will not be accepted more than one week past the due date. Grades will be assigned based on the following scale:

| | | | | | |
|----|------------|---|------------|----|------------|
| A+ | * | A | >= 93.0000 | A- | >= 90.0000 |
| B+ | >= 87.0000 | B | >= 83.0000 | B- | >= 80.0000 |
| C+ | >= 77.0000 | C | >= 73.0000 | C- | >= 70.0000 |
| D+ | >= 67.0000 | D | >= 63.0000 | D- | >= 60.0000 |
| F | < 60.0000 | | | | |

* Grades of A+, at the discretion of the faculty and staff, will be reserved for students who demonstrate an exemplary performance on all practice and academic tasks.

Student Expectations

Students are expected to follow all sponsor, coach, and faculty and staff instructions during the completion of their assigned projects. When expectations are unclear or unknown, it is the responsibility of the student to seek clarification by consulting the appropriate parties. As students will be collaborating closely with industry professionals, all students are expected to be respectful and interact with the highest levels of professionalism in all aspects of this experience. Students are required to attend (either virtually or in-person) all scheduled class events and participate in activities.

First year students are generally expected to be team members, contributing fully to the team while gaining experience in the Design Studio expectations and process. First year students have the opportunity to provide leadership in a specific subject area or skill within a team once those areas are identified. Second year students are generally expected to be team leaders, fulfilling one of the two manager roles on the team and using their experience to lead and direct the team through Design Studio.

Team Expectations

Projects are completed over the course of the academic year. Projects will be completed using an iterative development methodology based on Scrum as outlined in course materials. Each project team, in conjunction with the sponsor, coach, and faculty and staff, is expected to operate using the processes prescribed by Design Studio. Deviation from the processes should be discussed with the program lead and tribe lead and agreed to by all parties; deviations from the Design Studio process rarely will be approved. Teams also are responsible for reporting their status to all stakeholders on at least a weekly basis. Expectations of the team will come primarily from the sponsor and be supported by class content.

Conflicts

Design Studio includes a significant amount of software development work for sponsors who pay a fee for development. The primary purpose of the course is to provide an educational opportunity for the students and an opportunity for sponsors to recruit interns and new post-graduate hires. At the same time, teams are developing intellectual property that will be owned by the sponsor at the end of the Design Studio year. As a result, Design Studio requires some conflict management policies similar to those that you would find in an internship or after you accept a job.

Your Time

What you do in your free time is up to you; however, when you are working on your project during scheduled team time, that is the sponsor's time. When in team time you should not be working on tasks that are unrelated to your Design Studio project. There is always plenty to do and team time is not homework time. If you have your own business, you should **never under any circumstances use team time or Design Studio equipment or resources for any work related to your business.**

Design Studio Resources

We will provide you with all the tools and resources necessary to successfully complete your project. This includes a space to work, a machine to develop on, and devices needed to adequately test your product. You should not use any of these resources for tasks that are not related to your Design Studio project. While team rooms are primarily for Design Studio work, other quiet uses of the space that don't impact the other Design Studio teams are acceptable (such as using it as a quiet place to do homework outside of team time). You should not use personal computers for Design Studio related development and vice versa. If you choose to do Design Studio work on a personally owned computer, be aware that your computer and all its content may be subject to review by the sponsor. Also, be aware that anything you put on a University owned computer is not private and may be reviewed by UNL faculty and staff, or a member of the sponsor organization.

Employment

To balance time spent on Design Studio with all the other activities in which students are involved, and to prevent undue influence that may disrupt that balance, working for a Design Studio sponsor during the academic year is prohibited. Working for means being paid in any way for work that is being done during either the fall or spring semester. In a limited number of cases, exceptions to this policy can be made with the understanding that **no student may work for the sponsor of the project to which they are assigned under any circumstances.** This policy does not prevent you from seeking post-graduate employment or internships or accepting any offer of employment outside of the Design Studio year; you are encouraged to take advantage of the opportunities that are created by working with sponsors in Design Studio. Requests for an exemption to this policy must be made to the Director of Design Studio in writing (email is fine).

Sponsor Meetings

Weekly team meetings with sponsors are required. They may occur during regularly scheduled team times but may not be scheduled during class time when a class session is scheduled to be held. All team members must be present either in-person or virtually.

Release Meetings

Release meetings allow teams to hand off, demonstrate, and defend the current results while providing direction and planning for project completion. The goal of each release meeting is to provide the sponsor with releasable work product. Releasable work product is some iteration of the project that the sponsor can interact with outside of the meeting, share with others, and use to provide feedback independent of interaction with the team. Teams are encouraged to plan features around making each release as functional as possible and push aggressively towards production-ready releases. All Design Studio teams will release work product in a coordinated effort across all teams and tribes. See the Canvas course calendar or Slack for release dates.

Each release will involve the Design Studio project team, the sponsor team (including the product owner), and the assigned Design Studio program lead and/or tribe lead working together to demonstrate and discuss their progress on the project to the project executive sponsors. Release meetings must be scheduled within one week (before or after) of the scheduled release date and must take place between the hours of 9am and 5pm; without permission from Design Studio, a release meeting may not be scheduled to run later than 5pm. If a sponsor requires a release meeting that will run late, it should be scheduled with your team's program lead and tribe lead. Unless otherwise requested by and prearranged with the sponsor, in-person release meetings need to take place in Kauffman.

Teams are **strongly encouraged** to schedule release meetings as early as possible after the backlog for the release has been set. Program leads and tribe leads attend multiple meetings, and it may be difficult to coordinate schedules with them. There are a limited number of conference rooms available for in-person meetings or video conference rooms for online meetings with the team members taking place in Kauffman. A calendar meeting invitation should be sent to all required meeting participants.

Online Tools

Online management and collaboration tools will be detailed during the first several weeks of class. Teams are expected to utilize Design Studio supplied project resources for collaboration, issue tracking, and source code management. We use Slack, Canvas, SharePoint, GitHub, and ZenHub for these purposes. In cases where sponsors wish to provide their own tools, teams are expected to use those and ensure that the tribe lead and program lead have access during the project.

Meeting and Team Rooms

Each team will be assigned a team room and will have access to space for the various meetings that take place in Design Studio. Please be sure to choose meeting spaces most appropriate for the size and technology needs (i.e. video conferencing) of your planned meeting. The following spaces are available to Design Studio teams this year for meetings:

- Kauffman 127A – Small Video Conference Room
- Kauffman 127B – Small Video Conference Room
- Kauffman 127C – Small Video Conference Room
- Kauffman 127D – Large Video Conference Room
- Kauffman 127E – Large Video Conference Room
- Kauffman 102 – Large Conference Room (not equipped for remote participants, use only if no 127 rooms are available and all participants are in-person)

The following spaces are available to Design Studio teams this year for working team times:

- Kauffman 103 – 3 spaces
- Kauffman 104 – 3 spaces
- Kauffman 114 – 2 spaces
- Kauffman 115 – 2 spaces
- Kauffman 116 – 2 spaces
- Kauffman 125 – 3 spaces
- Kauffman 137/A – 5 spaces

Conference rooms in Kauffman can be scheduled for sponsor meetings throughout the semester using the UNL scheduling tool – instructions will be provided.

CSE Student Resource Center (SRC)

The Computer Science Resource Center (SRC) is committed to continuing to provide support for students enrolled in Computer Science and Software engineering courses.

HOURS: Monday – Friday, 10 a.m. – 5 p.m.

LOCATION: Avery Hall Room #12 with a Canvas (<https://canvas.unl.edu/courses/95368>) page for access

The CSE Student Resource Center is staffed by student tutors and teaching assistants who are available to help you with course work. The SRC is a community hub for CSE students. Even if you don't need help, the Student Resource Center is a great place to study with your peers.

Writing Center

The Writing Center can provide you with meaningful support as you write for this class as well as every course in which you enroll. Trained undergraduate and graduate peer consultants are available to talk with you about all forms of communication. You are welcome to bring in everything from lab reports, presentations, and research papers to cover letters, application essays, and graduate theses and dissertations. Writing Center Consultants can work with you at any stage of the writing process, from brainstorming and organizing your ideas through polishing a final draft.

In 2021-22, there are **three** ways you can connect with a Consultant: **Online** (a real-time, video conversation), **eTutoring** (email feedback), and **in person**. To learn more about online options and view video tutorials, visit <https://www.unl.edu/writing/online-writing-center-services>. For information about the Writing Center's COVID-19 policies, visit <https://www.unl.edu/writing/covid-19-policies>.

Sign up for an appointment any time by visiting unl.mywconline.com. For other information about the Writing Center, please visit [unl.edu/writing](https://www.unl.edu/writing).

Course Policies

Required Use of Face Coverings

Students in this course must work in close physical proximity to one another for extended periods of time in order to achieve the academic goals of the course. For this reason, the Raikes School has determined that face coverings will be required in this course. If you are unwilling to comply with this requirement, please visit with your advisor about possible alternative courses that you might take in lieu of this one.

Huskers Email Required

@huskers.unl.edu accounts became the primary email for all university communications to students beginning May 20, 2019. This email will ensure that students never miss important university communications and it will be connected to MyRED and Canvas accounts. Additionally, students will use it to access university library services and software — like Adobe Creative Cloud, Matlab, VidGrid, Zoom, Office 365 and more.

A @huskers.unl.edu address has been assigned to you. This will be the primary email for all Design Studio communications emailed to students this year. To access your @huskers.unl.edu email, simply log in to mymail.unl.edu to an external site. with your My.UNL username and password. If you aren't sure what your @huskers.unl.edu email address is, you'll find it listed under the Profile tab in MyRED or MyNCTA.

It's important to check your @huskers.unl.edu email frequently — we recommend daily — so you don't miss any time-critical messages from the university, especially from the offices of Scholarships and Financial Aid, University Registrar, Admissions, and Student Accounts. Instructors will communicate with you primarily through Canvas and Slack, but may use this email, as well.

Recording of Class-Related Activity

We invite all of you to join us in actively creating and contributing to a positive, productive, and respectful classroom culture. Each student contributes to an environment that shapes the learning process. Any work and/or

communication that you are privy to as a member of this course should be treated as the intellectual property of the speaker/creator and is not to be shared outside the context of this course.

Students may not make or distribute screen captures, audio/video recordings of, or livestream, any class-related activity, including lectures and presentations, without express prior written consent from DS Director Mark Antonson or an approved accommodation from Services for Students with Disabilities. If you have (or think you may have) a disability such that you need to record or tape class-related activities, you should contact Services for Students with Disabilities. If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Failure to follow this policy on recording or distributing class-related activities may subject you to discipline under the Student Code of Conduct.

ACE Requirements

The CSCE 401H course will satisfy ACE Learning Outcome #8: Explain ethical principles, civics, and stewardship, and their importance in society. Learning opportunities for ACE8 will include:

- reading, viewing, and discussing about the required materials,
- an investigative case study,
- hands-on design of your capstone project.

In this course, you will be given opportunities to learn, be assessed on what you have learned, and have specific critical skills reinforced. Specifically, through the required materials, you will learn about events due to poor ethics, lack of civic judgments, and inadequate stewardship exercised by the environment, and how these events impacted the society. The readings and other materials have been specifically chosen for that purpose. After going through these materials, quizzes will be given. First, you will be required to learn about general ethical principles expanded into applying those principles via several real-world case studies. Second, you will be quizzed regarding the application of the ethical principles. Quizzes related to these activities will count towards 10% of your semester grade. As part of the overall course grade, you will be assessed via the quizzes, your project reports, and how you practice ethical principles in the way you document your work and acknowledge others'.

The RAIK 402H and CSCE 402H courses will satisfy ACE Learning Outcome #10: Generate a creative or scholarly product that requires broad knowledge, appropriate technical proficiency, information collection, synthesis, interpretation, presentation, and reflection.

Design Studio is the capstone learning experience of the Jeffrey S. Raikes School in Computer Science and Management. In Design Studio, student teams partner with sponsoring businesses and government agencies to develop real-world, software-based solutions meeting their sponsor's needs. Design Studio gives students and sponsors the ability to interact, while benefiting from the support of Raikes School faculty and facilities. Students have opportunities to demonstrate their abilities, knowledge, and capacities by completing consulting based technology projects. Throughout these consulting based projects, student teams will be required to determine and meet the expectations set forth by the project sponsors. Each project goes through all phases of the development process including initiation, execution, and closing.

Students are evaluated based on 1) individual and team improvement, 2) achievement of learning objectives, and 3) project success. Graded assignments used to assess achievement of this outcome include:

- Presentation to the sponsor at completion of several checkpoints throughout the project to assess appropriate technical proficiency, information collection, synthesis, interpretation, presentation, and reflection.
- Iteration commitment/satisfaction forms to assess appropriate technical proficiency, synthesis, interpretation, and reflection.

- Sponsor documents to assess appropriate technical proficiency, information collection, synthesis, and interpretation.
- Project sponsor surveys and sign-off documents to assess broad knowledge, appropriate technical proficiency, information collection, synthesis, interpretation, presentation, and reflection.
- Project retrospective to assess information collection, synthesis, interpretation, presentation, and reflection.

[CSCE Policies](#)

Design Studio follows all Department of Computer Science and Engineering course policies:

- The CSE Department has an anonymous contact form (<http://cse.unl.edu/contact-form>) that you may use to voice your concerns about any problems in the course or department if you do not wish to be identified.
- All homework assignments, quizzes, exams, etc. must be your own work. No direct collaboration with fellow students, past or current, is allowed unless otherwise stated. The Computer Science & Engineering department has an Academic Integrity Policy (<http://cse.unl.edu/academic-integrity-policy>). All students enrolled in any computer science course are bound by this policy. You are expected to read, understand, and follow this policy. Violations will be dealt with on a case-by-case basis and may result in a failing assignment or a failing grade for the course itself.

[Accommodations of Students with Disabilities](#)

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience barriers based on your disability (including mental health, chronic or temporary medical conditions), please let one of the instructors know immediately so that we can discuss options privately. To establish reasonable accommodations, the instructor may request that you register with Services for Students with Disabilities (SSD). If you are eligible for services and register with their office, make arrangements with one of the instructors as soon as possible to discuss your accommodations so they can be implemented in a timely manner. SSD contact information: 117 Louise Pound Hall; 402-472-3787.

[Counseling and Psychological Services](#)

UNL offers a variety of options to students to aid them in dealing with stress and adversity. Counseling and Psychological & Services (CAPS) (<https://caps.unl.edu/>) is a multidisciplinary team of psychologists and counselors that works collaboratively with Nebraska students to help them explore their feelings and thoughts and learn helpful ways to improve their mental, psychological and emotional well-being when issues arise. CAPS can be reached by calling 402-472-7450. Big Red Resilience & Well-Being (BRRWB) (<https://resilience.unl.edu/big-red-resilience-well-being>) provides one-on-one well-being coaching to any student who wants to enhance their well-being. Trained well-being coaches help students create and be grateful for positive experiences, practice resilience and self-compassion, and find support as they need it. BRRWB can be reached by calling 402-472-8770.

[Diversity and Inclusion](#)

The University of Nebraska-Lincoln does not discriminate on the basis of race, ethnicity, color, national origin, sex (including pregnancy), religion, age, disability, sexual orientation, gender identity, genetic information, veteran status, marital status, and/or political affiliation.

If you have questions or concerns, please contact your instructor (tribe lead). If your instructor cannot answer your question or resolve your concern, please contact the Director of Design Studio. If further escalation is needed, please contact the Executive Director of the Raikes School.

For further information, you can also contact the Institutional Equity and Compliance office, <https://www.unl.edu/equity/>.

Satisfying Thesis Requirements

UNL Honors Program Thesis

Participation in Design Studio will satisfy the requirement for an undergraduate thesis in the UNL Honors program. The use of the Design Studio experience in satisfying these requirements is subject to all policies, deadlines, and requirements of the respective program. Teams will complete two documents in the spring (Project Retrospective and Executive Summary) that will be approved by Design Studio faculty and staff and can then be submitted to the Honors program to complete the thesis requirement. Additional instructions will be provided in the spring semester with the two documents on exactly how to submit your work for Honors thesis credit.

UNL Honors Thesis:

<https://honors.unl.edu/academics/thesis>

College of Arts & Sciences Undergraduate Thesis for Degrees with Distinction

Participation in Design Studio may be used to partially satisfy requirements for an undergraduate thesis for graduation with some level of distinction in the College of Arts & Sciences. The use of the Design Studio experience in partially satisfying these requirements is subject to all policies, deadlines, and requirements of the college. Students intending to complete a thesis are advised to familiarize themselves with the program requirements.

UNL College of Arts and Sciences:

<http://cas.unl.edu/degrees-distinction>

The work of writing a thesis must be supervised by a faculty member from the college (faculty advisor). If you do not have a preferred faculty advisor for your thesis, Dr. Steve Cooper, Executive Director of the Raikes School, will serve as your faculty advisor.

Requirements for an Undergraduate Thesis for Degrees with Distinction

The thesis must be the result of independent, sustained thought and intellectual curiosity. A survey of the literature about a particular topic is not sufficient however novel it may be. Ideally, there should be a clear formulation of a problem or question, scholarly study which illuminates or addresses it supported by the work done in Design Studio, and a conclusion supported by evidence. A bibliography and reference to existing literature in the field should be included where appropriate. The thesis should be a minimum of 20 pages. Students, working closely with their two thesis advisors, may develop a project that takes a form other than a traditional thesis (e.g. they may develop video, audio, or web-based project), but the research, knowledge, effort, and quality of work should be comparable to that of a thesis in the discipline.

Students should work closely with their faculty advisor as they complete their thesis. A final copy of the thesis must be submitted to their faculty advisor no later than **one month** prior to the program deadline for final thesis submission.

Exploring Graph Data Science Methods in Neo4j

Farm Credit Services of America

Design Studio Release 6

1 Introduction

In this document, we wish to explore possible methods to analyze graph-based data with a focus on interpretation. The nature of loan-provision services require some level of understanding of the underlying metadata and relevant domain knowledge to truly understand and make informed decisions. This would allow Farm Credit Services of America to better utilize NEO4J.

Hence, this proof of concept would describe the

1. Dataset used and Code
2. Description of Components and its Interpretation
3. Centrality Measures and what it means
4. Node Similarity Measures for Product Recommendation to be Explored

2 Dataset and Code

The dataset that we used for the following proof of concept is by querying the NEO4J database with the following code:

```
MATCH (c1:Customer)-[:HAS_FINANCIAL]->(f:Financial)<-[ :HAS_FINANCIAL]-(c2:Customer)
MERGE (c1)-[:SHARES_FINANCIAL {id: toInteger(c1.P_CustKey)+toInteger(c2.P_CustKey)}]- (c2)
WITH
MATCH (c1:Customer)-[:SHARES_FINANCIAL]-(c2:Customer)
RETURN c1.P_CustKey as customer_one, c2.P_CustKey as customer_two
```

This connects customers that shares financials, which allows us to create a graph that relates different customers based on **shared financial ties**. This is helpful especially for understanding how risks are shared across different customers in a business unit (as we would define later).

The reason behind exploring risks and financials (as apposed to products) is because the measures introduced here are **relatively simple and interpretable measures of node importance**. There are other methods described in Section 6 where we discuss algorithms that can be used for product recommendation.

The relevant code as a Jupyter Notebook and the data file `financial_graph.csv` accompanied.

3 Components of Related Business Units

3.1 Weakly-Connected Components

To define our definition of a business unit, we first have to define a **weakly-connected component**.

Formal Definition - A weakly-connected component is a maximal subgraph of a directed graph such that for every pair of vertices v_i , v_j in the subgraph, there is an undirected path from v_i to v_j and a directed path from v_j to v_i .

Human Definition - If customer A can reach customer B somehow, A and B are in a weakly-connected component.



Figure 1: Weakly-Connected Components of Financial Graph

Figure 1 shows all the weakly-connected components of the financial graph. There are 156 number of components, with the largest component having 15 number of nodes. This means that the percentage of nodes that are within the largest connected component of this graph is 3.59%.

This is a **relatively disconnected graph** since most social-network graphs has $\approx 99\%$ of nodes within the largest connected component. The observation should make sense since most customers who share financials are usually connected via family ties or are just a part of a bigger business operation.

3.2 Business Units as a Unit of Observation

Based on the observations stated above, we define a **business unit** as all the customers in the same weakly-connected component. Hence, there are 156 business units in this graph.

Note that business unit in this context refer to a grouping of customers based on the rule stated. To see how each customer in a business unit relate one another, we require metadata and additional domain knowledge to make any inference since customers can be connected operations or family members or other relationships.

We also use the business unit as a unit of observation since we are assuming that those who do not share financials do not pose financial risks to each other.

4 Centrality Measures & their Interpretations

Centrality measures are algorithmic methods to provide a metric to **determine the position, role and importance of a node**. There are different centrality measures that provide different understanding since the notion of importance is dependent on what we consider important.

4.1 Degree Centrality

Formal Definition - The number of links incident upon a node over the theoretical maximum links.

Human Definition - How many links over all possible links.

This is the simplest measure of the relative importance of a node with respect to other nodes. **A node with a high degree centrality means that it is connected to a lot of other nodes**, which gives a good measure of how important the node is.

From a risk perspective, a node with high degree centrality directly exposes risks (and distribute risks which makes the whole less risky) to the connected nodes.

4.2 Eigenvector Centrality

Formal Definition - A measure of the transitive influence of nodes where relationships originating from high-scoring nodes contribute more to the score of a node than connections from low-scoring nodes.

Human Definition - Am I connected to other highly connected nodes?

The most famous form of an algorithm that uses this measure is Google's PageRank algorithm. Nodes who are connected to other nodes that are more influential would be assigned a higher score.

From a risk perspective, **a high eigenvector centrality implies the strong influence of the node since it can spread and distribute risks to a wide part of the network**. This shows the importance of a node (like the main business line/operation) but it also implies that a contagion can occur. Contagion in this context means that if this line of business fails, the whole business unit could fail.

4.3 Betweenness Centrality

Formal Definition - Betweenness centrality measures the extent to which a vertex lies on paths between other vertices. Vertices with high betweenness may have considerable influence within a network by virtue of their control over information passing between others. They are also the ones whose removal from the network will most disrupt communications between other vertices because they lie on the largest number of paths taken by messages.

Human Definition - Am I a bottleneck (or star)?

Betweenness centrality measures a different kind of importance. While it does not imply its influence over the whole network, **a high betweenness centrality means that it exerts a strong influence on its direct neighbors**.

For an example, while the Farm Credit System is not the biggest financial service provider nationwide (low degree/eigenvector centrality) but can exert significant influence on the agriculture market (high betweenness centrality), assuming that the agriculture sector rarely borrows outside of the Farm Credit System.

4.4 Putting Things Together

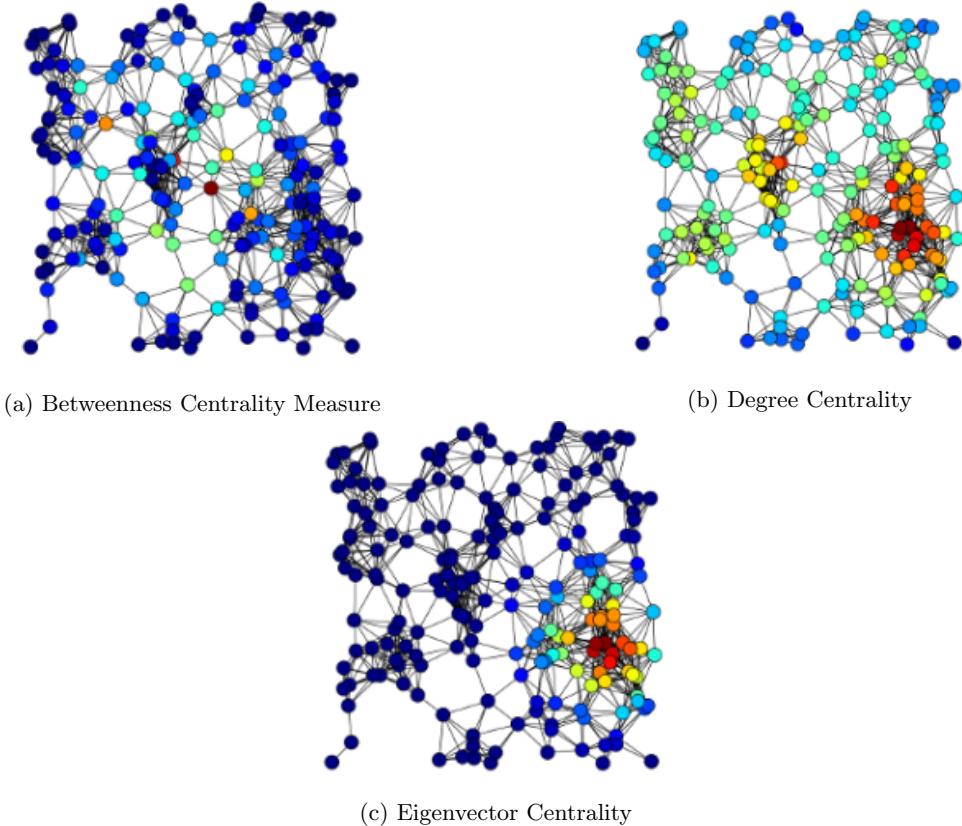


Figure 2: Different Centrality Measures on the Same Graph Reflecting Different Importance

Figure 2 shows the different centrality measures.

In Figure 2a, we see that the node with the highest betweenness centrality measure (the middle dark red node) is not considered important by other measures. However, it serves as a bottleneck (or star) that connects the two important components.

The eigenvector centrality in Figure 2c also differs from degree centrality in Figure 2b since it also accounts how connected the neighbors are. This is reflected in the cluster in the bottom-right corner where the eigenvector centrality has the largest measured value.

5 Case Study of a Business Unit

Looking at one of the business units obtained from the financial graph data. We observe some interesting patterns. Figure 3 provides a succinct visual interpretation of what the measure reflects and how we can understand this from a risk perspective as well as when considering providing a customer a loan.

5.1 Results from the Different Measures

| Customer Key | Degree Centrality | Eigenvector Centrality | Betweenness Centrality |
|---------------|-------------------|------------------------|------------------------|
| 448256 | 0.1 | 0.047 | 0.0 |
| 5122 | 0.8 | 0.42 | 0.18 |
| 66023 | 0.5 | 0.309 | 0 |
| 66024 | 0.5 | 0.309 | 0 |
| 299688 | 0.4 | 0.243 | 0 |
| 111533 | 0.5 | 0.309 | 0 |
| 363503 | 0.3 | 0.170 | 0 |
| 61719 | 0.9 | 0.449 | 0.281 |
| 229913 | 0.6 | 0.275 | 0.215 |
| 924 | 0.5 | 0.309 | 0 |
| 229917 | 0.5 | 0.268 | 0.015 |

Table 1: Results from Applying the Measures (**Bolded Red Values** are the Ones In Future Discussion)

Table 1 shows the results from different centrality measure of this business unit. While Customer 61719 (in blue) has the highest measure for three centrality measures, we want to look at Customers 5122 and 229913 where they have a significant difference between degree and betweenness centrality. This would inform us on their different type of importance of the customer in the business unit.

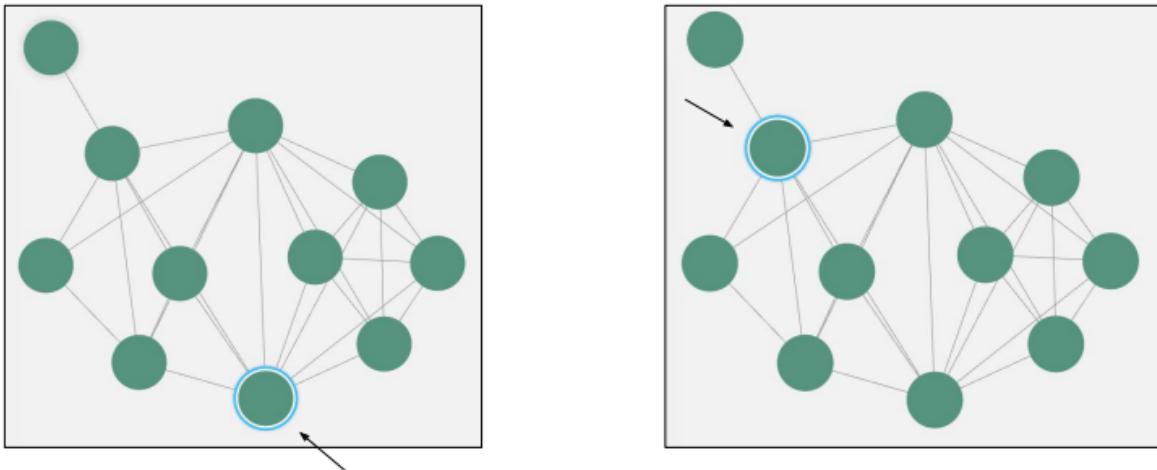
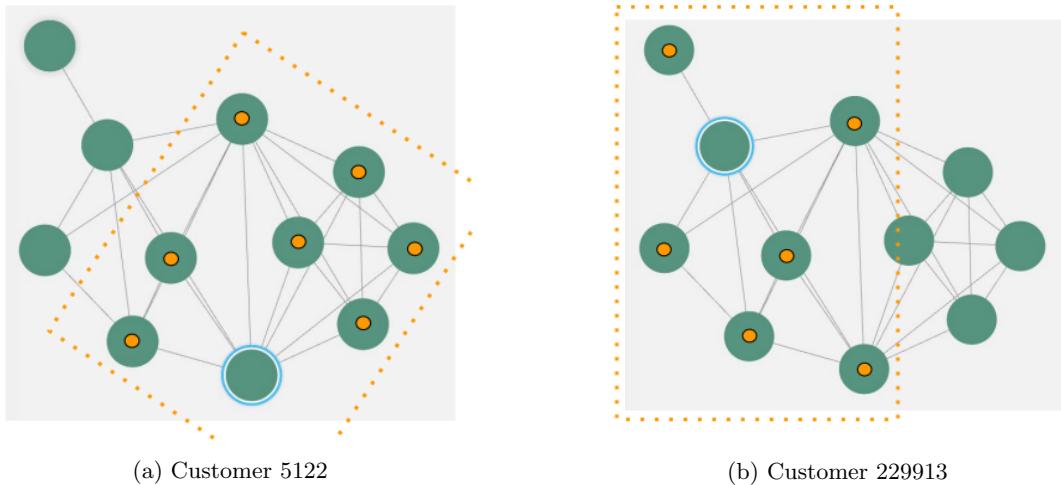


Figure 3: (Left) Customer 5122 has a higher eigenvector and degree centrality whereas (Right) Customer 229913 has a higher betweenness centrality

Note that from Figure 3, we can see that the highlighted node in the *right* frame is **connected to nodes that are less connected customers and one customer is entirely dependent on it**. On the other hand, on the *left*, **the node is connected to a lot of nodes that are strongly connected with each other**.

5.2 Interpreting and Inferring from the Measures



To make the example concrete, let us assume that this business unit raises cows and pigs, with cows being the central business. For Customer 5122 (who raises cows, or involved in raising cows like providing feed etc.) as shown in Figure 4a, it is **very well connected to other customers** who are involved in the cow raising business, and so **there is no dependence on a single customer within that group**.

On the other hand, Customer 229913 in Figure 4b might be the only supplier of feed for pigs, and the connected customers to 229913 have pigs as livestock. This means that they are **dependent on Customer 229913** though as a whole, they play a **smaller role in the business unit**.

5.2.1 Risks

With the connection of nodes being the relationship of *sharing financials with one another*, it is natural to first look at the problem from a risk perspective. In economic literature studying financial networks, sharing financial presents a risk (pun intended) and a reward:

1. **Risk** - Contagion, a very well connected and influential customer can cause other customers to fail if it fails, similar to a *domino effect*
 2. **Reward** - Diversification, fluctuations in performance of a customer can be ‘absorbed’ by other customers

Referencing Customer 5122 in Figure 4a, with a lot of connections, **small changes** to one of the nodes **can not truly affect the whole network** since the risk is ‘dissipated’ across the network. In this scenario, *unsystematic risks* for Customer 5122 in Figure 4a is lowered as a result of the connection. However, any **severe shocks** on one of the nodes **can lead to a contagion**, where all other customers might face financial difficulties as a result of *systemic risks*.

On the other hand, the **likelihood of a contagion** for Customer 229913 in Figure 4b is lower since it has relatively weak effect on the whole network. However, Customer 229913 **exposes a lot of unsystematic risks to its direct neighbors**, where it presents a bottleneck in the network.

5.2.2 Loan Provisions

For loan provisions, the idea behind this discussion stems from the **idea of contribution towards a financial statement** and we would be focusing on the discussion for situations like Customer 229913 in Figure 4b.

Customer 229913 has a ‘star’ shape within the network. Our intuition suggests that such patterns could arise if **Customer 229913 has a very good financial standing**, whereas the other customers that are

connected are simply **using its reputation to obtain more favorable loans**. This is analogous to Enron's financial statements and its 'special purpose entities' (*to be clear we are not accusing anyone of committing fraud*).

In the event that 'star' shaped financial relationships exists, it suggests that a **closer inspection in the individual contributions to the financial statement** has to be made to ensure that Farm Credit Services of America is not exposed to unexpected risks.

6 Node Similarity Measures

While we mostly described centrality measures and their interpretations, Machine Learning with graphs has other huge developments particularly in the unsupervised and semi-supervised methods. This is important because these developments would be able to help Farm Credit Services of America **recommend products to potential customers** based on certain characteristics that are important.

6.1 State of the Art Algorithms

A huge stride in Graph-based ML has been the ability to **measure the 'similarity' of nodes using unsupervised techniques**. The most famous of which are **DeepWalk**, **Node2Vec** and **Graph Neural Networks (and their spin-off architectures)**.

The three methods mentioned all **define the notion of node similarity based on shared neighbors** (nodes that are connected to one another, and on and on). They then **map this similarity to a vector space** where similarity measure such as the dot product or sin function can be applied

6.2 Collaborative Filtering

Node similarity is often used in the context of collaborative filtering, where we **recommend products to customers with some shared characteristics and connections**. In the context of Farm Credit Services of America, this means product recommendation and looking for potential leads.

6.3 Weaknesses of Such Methods

Although these methods have been successfully applied, they face the **weakness in interpretability**. This however, should not be too much of a problem for product recommendations since some recommendation is better than none at all. Furthermore, the mapping of vectors are based on similarity measures, which might not be applicable to measures of risks associations as discussed in the previous section.

CSE 423/823 Design and Analysis of Algorithms

Spring 2021

General Information

Synchronized Conferencing:

Zoom meeting ID: 928 3248 6295; passcode: 423823

Office hours of instructor and TA will use the same ID.

Instructor:

Juan Cui

Avery Hall, 122E

Phone: 402-472-5023

Email: jcui@unl.edu

Office Hours: Tue 11:00-12:00am & Thu 3:30-4:30pm via Zoom

Teaching Assistant:

Maria Salome Perez Rosero <mperezrosero2@huskers.unl.edu>

Office Hours: Fri 9:30 – 11:30 am (or by appointment) via Zoom

Lectures:

Tue/Thu 9:30 am – 10:45 am, meet via Zoom. Lecture slides with audio recording will be posted on Canvas.

Required Text:

Data Mining: Introduction to Algorithms, Third Edition by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, MIT Press, 2009.

Recommended Text:

Introduction to the Theory of Computation, Third Edition by Michael Sipser, Cengage Learning, 2012.

Introduction to the Design and Analysis of Algorithms, Third Edition by Anany Levitin, Pearson, 2011.

Prerequisites:

A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H

Communication:

A new means of communication for this course is Piazza, an online forum system designed for college courses, in addition to Canvas.

Sign up link: <http://piazza.com/unl/spring2021/cse423823>

With Piazza you can ask questions anonymously, remain anonymous to your classmates, or choose to be identified. Using this open forum system, the entire class benefits from the instructor and TA responses. In addition, you and other students can also answer each other's questions (again you

may choose to remain anonymous or identify yourself to the instructors or everyone). You may still email the instructor or TAs, but more than likely you will be redirected to Piazza for help. You are encouraged to check in and respond to the questions posed by other students. Extra credit will be given to students who actively participate in this activity, particularly to students who answer the questions posed by a student.

Course Overview

Algorithms for problems such as sorting, graph reachability, matching, etc. are at the heart of almost all real-life computer applications. Efficiency and correctness of these algorithms directly influence the overall efficiency and correctness of the applications that use them. Hence it is important to come up with very fast and correct solutions to these basic computational problems. As the name suggests, this course has mainly two aspects: designing algorithms for basic computational problems and analyzing their correctness and efficiency. These two aspects go hand in hand with each other.

Course Bulletin Description

Mathematical preliminaries. Strategies for algorithm design, including divide-and-conquer, greedy, dynamic programming and backtracking. Mathematical analysis of algorithms. Introduction to NP-Completeness theory, including the classes P and NP, polynomial transformations and NP-complete problems.

Course Learning Objectives

At the end of this course, students will be able to:

- Understand main concepts of algorithms
- Implement and apply algorithms
- Design and integrate algorithms
- Analyze correctness and complexity of algorithms

Tentative Course Schedule (All Information Subject to Change):

| Week | Date (week of) | Topic | Textbook Coverage |
|------|----------------|---|-------------------|
| 1 | 1/25 | Introduction | n/a |
| 2 | 2/01 | Median and order statistics | Chapter 9 |
| 3 | 2/08 | Dynamic programming and Greedy algorithms | Chapter 15 & 16 |
| 4 | 2/15 | Elementary graph algorithms | Chapter 22 |
| 5 | 2/22 | Minimum span tree | Chapter 23 |
| 6 | 3/01 | Single source shortest paths | Chapter 24 |
| 7 | 3/08 | Single source shortest paths | Chapter 24 |
| 8 | 3/15 | All-pairs shortest paths | Chapter 25 |

| | | | |
|--------------|---|--------------------------|------------|
| 9 | 3/22 | All-pairs shortest paths | Chapter 25 |
| 10 | 3/29 | Maximum flow | Chapter 26 |
| 11 | 4/05 | Maximum flow | Chapter 26 |
| 12 | 4/12 | NP-completeness | Chapter 34 |
| 13 | 4/19 | Approximation Algorithms | Chapter 35 |
| 14 | 4/26 | Course summary | n/a |
| Final | Exam 10:00 a.m. to 12:00 p.m. Tuesday, May 4 | | |

Course Elements

Homework

General Guidelines

- Homework will be assigned and announced. Due date will be clearly stated. Hard copies will not be collected during this semester.
- A majority of points will be awarded to the PROCESS of getting to the solution and not on the final answer.

Format Guidelines

- Your name should appear on each page.
- The pages of your homework (per assignment) must submitted as a single PDF format.
- You may include handwriting or pictures as long as they can be assembled into the single PDF file. If you copy and paste some online images or published resources, please refer to the website or resource name to avoid copy right violation.
- Poor quality of the document will lead to poor grades if critical steps or answers cannot be recognized. No further argument is allowed.
- Final answers must include correct units for full credit when applicable.

Group Homework Policy

- You are encouraged to work on your homework assignments in groups, and each student must turn in their homework by themselves or by their teammate (one copy for one team is enough).
 - If you do choose to work with a group, the names of the group members should be provided with the homework assignment.
 - If you choose to work on your own, please better notify “NO teammates”.
- Teammates names cannot be added or changed after the homework is submitted and past the deadline. If your name is missed or duplicated and thus your homework becomes invalid, you can still submit a late homework with 50% total points deduction next day.
- The team size can be 1-4 students. Each team should consist of only students from CSE 423 or from CSE 823.
- The team can be changed dynamically for each homework. You can propose names for future homework, otherwise we can randomly assign.

Late Homework Policy

- If a late due date is necessary, permission from the instructor is required.
- Late homework will have 50% deducted from the grade per school day.

- Under no circumstances will homework assignments be accepted after graded homework has been returned and solutions have been posted on canvas.
- Homework turned in late will not always be returned at the same time as the homework turned in on time.

Quizzes:

Multiple choices or simple questions are provided on Canvas directly. Every student should be responsible to finish it before deadline. The quiz has a time limit.

Exam:

- See “general guidelines” and “format guidelines” for “homework”.
- Due date is stricter. No late exam is allowed.
- Make-up exams are not always available unless there is a compelling and documented reason that you miss the exam. In absence of sufficient justification for missing an exam, zero will be assigned for that exam. Whenever possible, notify the instructor before you must miss an exam.

Communication Expectations:

Expectations for Behavior

- Students are expected to display tolerance and respect in all communication.
- For this class to be effective, you must be an active learner.
- Students should learn from each other with respect and dignity, in order to benefit from group studies.

Grading

Grades for the above course elements will be weighted as follows:

| | |
|-------------------------|-----|
| Classroom Participation | 0% |
| Homework | 30% |
| Quiz | 25% |
| Mid-term | 20% |
| Final Exam | 25% |

Grading Scale:

| Numerical score or class curved % (whichever is higher) | Letter grade |
|--|--------------|
| 97-100 | A+ |

| | |
|-------|----|
| 93-97 | A |
| 90-93 | A- |
| 87-90 | B+ |
| 83-87 | B |
| 80-83 | B- |
| 77-80 | C+ |
| 73-77 | C |
| 70-73 | C- |
| 67-70 | D+ |
| 63-67 | D |
| 60-63 | D- |
| <60 | F |

Attendance Policy

n/a

Accommodations for Students with Disabilities

It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodations to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 232 Canfield Administration, 472- 3787 voice or TTY.

UNL CSE Department Policies

It is CSE Department policy that all students in CSE courses are expected to regularly check their email so they do not miss important announcements.

The CSE Department's Student Resource Center is located in Avery 12:
<http://cse.unl.edu/src>. The office hours by the TAs are held there.

The CSE Department has an anonymous contact form that you may use to voice your concerns about any problems in the course or department if you do not wish to be identified.

Academic Misconduct

All homework assignments, programs, and exams must represent your own work unless otherwise stated. No collaboration with fellow students, past or current, is allowed unless otherwise permitted on specific assignments or problems. The Department of Computer Science & Engineering has an Academic Integrity Policy. All students enrolled in any computer science course are bound by this policy. You are expected to read, understand, and follow this policy. Violations will be dealt with on a case by case basis

Technology Policy

Technology is allowed in class only as it directly supports class learning and announced by professor. General internet surfing, texting, e-mailing, working on other coursework or personal items is not appropriate or acceptable. Out of respect for the class, students are expected to silence or turn off their phones and other notification devices during class and to refrain from texting, calling or using electronics, except as a part of classwork. If any of these behaviors occur during the class meetings the student will be asked to leave the class and will be counted as absent. This is also applicable to online zoom meetings.

Academic Honestly Policy

Student Code of Conduct, Section B. Conduct – rules and regulations, 1. Acts of Academic Dishonesty

Academic integrity is of the utmost importance at Nebraska. Be sure you understand expectations of you and your academic work. View the complete list of academic dishonesty violations in the Student Code of Conduct, specifically Article III: Proscribed Conduct, Section B. Conduct – Rules and Regulations, 1. Acts of Academic Dishonesty. For more information, please visit <https://studentconduct.unl.edu/>. If you are unsure what counts as academic dishonesty in this course, please visit me during office hours. The first instance of academic dishonesty will result in a score of zero for the assignment or exam. The second incidence of academic dishonesty will result in a failing grade for the course

<https://studentconduct.unl.edu/student-code-conduct>

Diversity and Inclusion Statement

It is my intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. I would like to create a learning environment for my students that supports thoughts, perspectives, and experiences, and honors your identities (including gender, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, culture, etc.). If you have any concerns, please feel free to contact me.

<https://diversity.unl.edu/student-resources>

Emergency Procedures

City Campus Emergency Information:

Please follow the link below for UNL's Emergency Preparedness Resources. Sign up for the UNL Alert service under the "Stay Connected" portion of the web-page.

Fire and Medical Emergencies: 911

University Police: 402-472-2222

Twitter: @NebPrepare

E-Mail: preparedness@unl.edu

<https://emergency.unl.edu/>

Scott Campus Emergency Information:

A number of resources are available for distributing and receiving critical information and instructions during an emergency.

- All-campus email
- [UNO Alert text message and email alerts](#)
- Posts on UNO's official [Facebook](#) and [Twitter](#) accounts
- Emergency banner on the [UNO homepage](#)
- Overhead pages and indicator lights on campus
- Emergency information line (402.554.2255)
- Media outlets

<https://www.unomaha.edu/emergency/index.php>

Student Resource Information

(please double check, some of them may only have online services at this moment)

Well-Being (Home Campus – Lincoln Campus):

UNL offers a variety of options to students to aid them in dealing with stress and adversity.

- Counseling and Psychological Services (CAPS) is a multidisciplinary team of psychologists and counselors that works collaboratively with Nebraska students to help them explore their feelings and thoughts and learn helpful ways to improve their mental, psychological and emotional well-being when issues arise.
 - CAPS can be reached by calling 402-472-7450.
- Big Red Resilience & Well-Being (BRRWB) provides one-on-one well-being coaching to any student who wants to enhance their well-being. Trained well-being coaches help students create and be grateful for positive experiences, practice resilience and self-compassion, and find support as they need it.
 - BRRWB can be reached by calling 402-472-8770.

Well-Being (Home Campus – Scott Campus):

UNO offers a variety of options to students to aid them in dealing with stress and adversity.

- Counseling and Psychological Services (CAPS) is dedicated to working with students to provide that can assist with challenges that have impacted their overall well-being. These could include adjusting to life events, relationship issues and mental health changes. Counseling staff work closely with Nebraska Medicine Health Services to provide on-campus referrals and collaboration with their services.
 - CAPS can be reached by calling 402-554-2409.

Math Resource Center:

The Mathematics Resource Center (MRC) is a free tutoring service and is the primary facility for undergraduate students who are enrolled in an have questions related to any precalculus or calculus course offered by the department. The Center also provides an excellent location for students to meet and work together on assignments or group projects.

- No appointments or reservations are needed.
- Staffed by Graduate Teaching Assistants and by undergraduate math majors hired for the center.
- Ask for assistance with math courses 100A, 101, 102, 103, 104, 106, 107, and 107H.

<https://www.math.unl.edu/resources/undergraduate/mrc>

The Writing Center:

At the Writing Center, our undergraduate and graduate Writing Consultants work with writers at all levels, from all disciplines, at all stages of the writing process. All members of the UNL community (students, faculty, and staff) are welcome.

Whether you are brainstorming or organizing ideas or polishing a final draft, we look forward to discussing your writing with you.

All forms of communication are welcome, from essays, lab reports, research papers, and journal articles to presentations, cover letters, personal statements, and theses/dissertations.

<https://www.unl.edu/writing>

Engineering Study Shop:

The College of Engineering provides FREE walk-in tutoring services for all engineering students! The courses and areas-of-study that the Engineering Study Stop tutors are able to assist with include: Math, Physics, Chemistry, Mechanical Engineering, and a variety of other engineering-related coursework. Click on the button below to meet our tutors and learn more about which courses they are able to assist you with. Study Stop allows you to study with other engineering students and trained tutors to gain more confidence and a better understanding of your course material... No reservations needed!

<https://engineering.unl.edu/current-students/study-stop-city-campus/>

ADA and Accommodation:

Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements.

To receive accommodation services, students must be registered with the Services for Students

with Disabilities (SSD) office, 232 Canfield Administration, 472-3787 voice or TTY.

Office of Services for Students with Disabilities:

The University of Nebraska-Lincoln is committed to ensuring equal access to curricular and co-curricular opportunities for students with disabilities. Providing a range of services, SSD implements reasonable accommodations for students with disabilities and offers students the opportunity to contribute and participate in the diverse campus experience at the University of Nebraska-Lincoln. This site is intended to provide you with the information you need to enjoy your life as a University of Nebraska student. <http://www.unl.edu/ssd/home>.

Syllabus - CSCE 451/851 Operating Systems Principles

Syllabus - CSCE 451/851 Operating Systems Principles

Department of Computer Science and Engineering
University of Nebraska – Lincoln
Spring 2021

Instructor:

Justin Bradley 290 Schorr
Office hours: By appointment via Zoom
Email: justin.bradley@unl.edu
Phone: (402) 472-5072

TAs:

Minh Vu
Office hours: Mondays 9:30-11:30 via Zoom
Email: minh.vu@huskers.unl.edu

Brennan Rhoadarmer
Office hours: Wednesdays and Thursdays 17:30-19:30 via Zoom
Email: brhoadarmer@huskers.unl.edu

1 Course Overview

This course will introduce students to key concepts of modern operating systems. These concepts include system organization, processes, threads, process management, process and thread synchronization, memory management, and storage management.

Topics covered: Organization and structure of operating systems. Processes and concurrent programming. Inter-process communication. Process synchronization using reads/writes, semaphores, and monitors. CPU scheduling. Deadlocks including detection, avoidance, prevention and recovery. Intro to real-time systems. Memory organization and management including paging, segmentation, virtual memory, and page replacement algorithms. File system concepts and structure. Protection and security. Topics are conveyed through lectures and a series of hands on programming assignments.

2 Course Requirements

Prerequisites: A grade of “P” or “C” or better in CSCE 230, CSCE 230H or CSCE 231 and CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.

Text: Bic, Lubomir. *Operating Systems Principles*. zyBooks, 2020, zyBook ISBN: 978-1-394-06717-6

3 Class Details

The two sections of the course will be identical with the (minor) differences indicated below.

3.1 Section 001 (CSCE 451/851-001)

This is a “Web Conferencing” version of the course. Asynchronous video lectures and readings in the book will be used to introduce concepts to students. Weekly synchronous, live Zoom lectures will be used to supplement those lectures with a focus on successfully completing the programming assignments. This allows students in this section to directly interact with me, ask questions, and receive feedback.

Class: Tuesdays 09:30 - 10:45 (all other lectures asynchronous)

Final exam: 00:00-23:59 Tuesday, May 4, 2021

3.2 Section 700 (CSCE 451/851-700)

This is an “Online” version of the course. Like Section 001 above, asynchronous video lectures and readings in the book will be used to introduce concepts to students. The weekly live Zoom lectures from Section 001 will be recorded and disseminated in this section.

Class: Asynchronous video lectures

Final exam: 00:00-23:59 Thursday, May 6, 2021

4 Website, Communication, and Other Logistics

4.1 Canvas

We will use Canvas to disseminate materials, host the class schedule, maintain all links, etc. To simplify everyone’s life the front page of the course is a module containing two pages:

- 1. Announcements:** this will be a regularly updated, running list of announcements. You need to check this regularly. Canvas, depending on your settings, may send you a notification that the page has been updated. You’ll then need to go check it. I do it this way to reduce the number of Canvas announcement emails you receive. But it’s on you to check the announcements so you’re informed!
- 2. Main Schedule:** this page holds a weekly-by-week schedule of the topics, resources, links, assignments, etc. Look here to find out what you should do, and where to get materials and resources. This will be updated over the course of the semester as topics, resources, and assignments are updated.

4.2 Other Resources

Other external materials, links, etc. will be used as follows (all links to these will be in the “Main Schedule” page in Canvas:

- **Piazza** will be used for all online discussion of homework, programming assignments, and logistics.
- **YouTube** will be used to host lecture videos.
- **Microsoft OneDrive** will be used to host programming assignments and other handouts.
- **Zoom** will be used for synchronous lectures (section 001 only).
- **zyBooks** will be used as our book. Readings and homework assignments will be given from this book, and homework assignments, based on the readings, will be given. You will have to subscribe to the book (it is much cheaper than the previous book).
- **CSE Handin** will be used to turn in programming assignments.

5 Policies

5.1 Grading Policies

This course will consist of 6 (graded) programming assignments, weekly reading check assignments, and a final exam. The grade breakdown will be:

- Programming Assignments: 60%
 - PA0 – 5%
 - PA1 – 11%
 - PA2 – 11%
 - PA3 – 11%
 - PA4 – 11%
 - PA5 – 11%
- Exams: 20%
 - Final Exam: 20%
- Homework - 20%
 - 7 reading/homework assignments – $20\% / 7 = \sim 2.86\%$
- Extra Credit:
 - Evaluation: 2% bump to final percentage (only if >80% of class fills out evaluation)

5.1.1 Late Work Policy

Late work will **NOT** be accepted. I *will* make exceptions for UNL-approved reasons. I *may* make exceptions for other reasons **if** you discuss it with me before the deadline.

Explanation: I have tried several variations on accepting late work. Accepting late work means more work for me and the TAs, and this class already has a high grading burden. My anecdotal evidence suggests the rate of students turning things in is about the same. Not accepting late work is simplest and encourages students to get started on assignments earlier.

5.1.2 Differences between 451 and 851

CSCE 851 students will take a different, more comprehensive final exam. Otherwise, assignments between 451 and 851 are identical.

5.1.3 A very important note on grading of programming assignments:

- Programming assignments will be graded on a 100 point scale.
- **Your program must compile and execute on the CSE servers (cse.unl.edu) - else you get 0/100. Make sure you check this prior to handing in.**
- All programming assignments must be handed into CSE web handin - else you get 0/100.
- Each programming assignment will indicate precisely how it will be scored. **Most** of the time points are gained by passing the test suites. Test suites are often broken into different parts so that you can get at least partial credit for partial implementations. You won't get any points for tests that you don't pass. This means there's no such thing as "being close" or "almost works."
- Despite the previous point, I also reserve the right to take off points for poor programming practices: poor commenting, function names, variable names, magic numbers, etc.

5.1.4 Explanations

Students have a variety of reactions to these policies. Here are some common ones, and associated explanations:

- “*That’s stupid!*”: When you develop code in industry you don’t get “credit” if you break the nightly build (i.e., your code doesn’t compile), or your program simply doesn’t do what it is supposed to do (i.e., test suite fails). Even so, most PAs have a suite of tests that allow you to get partial credit for implementing as much as you can.
- “*That doesn’t accurately reflect what I learned!*”: I’m in the business of preparing our students to be strong employees. As 4th year undergraduates, or graduate students, good programming practice is simply an expectation of a computer scientist. Writing programs that meet specifications is the *bare minimum* any computer scientist can do. In most PAs you will have access to the test suites or an approximate set of test suites, so it should be straightforward to test all your code, and make sure it compiles and runs on the CSE servers.
- “*Why not partial credit?*” or “*I was so close...*” You will get the indicated points for passing various tests within the test suite. If your code doesn’t pass a test you get 0 points for that particular test. There are several reasons for this:
 - I don’t know how to give partial credit. If the output of your code doesn’t match the required output, I (or the TA) would need to look at your code and make an assessment of how “close” you were to being correct. I’ve no idea how to do that fairly or efficiently.
 - I don’t have the time to do this sort of partial credit grading and I won’t ask the TAs to spend their time looking through and deciphering your code.
 - To my knowledge, there is no agreed upon metric for determining how close code is to being “correct.”

Bottom line: write *good* code that fulfills the specifications (i.e., passes all the tests) and you’ll get all the points.

5.1.5 Grading Appeals Policy

Sometimes you do your very best and something doesn't go right. You forgot a "\n" character in a printed statement, etc. In these minor cases, where you were *very* close, please write me an "appeals" email describing the scenario, submitting your new code, and I will, at my discretion, re-grade the assignment with a 10% penalty. All appeals must be filed within a week of grades being posted.

5.1.6 Grade Assignment

Grades will then be assigned using the following table:

| Grade | Percent |
|--------------|----------------|
| A+ | [98-10] |
| A | [93-98) |
| A- | [90-93) |
| B+ | [88-90) |
| B | [83-88) |
| B- | [80-83) |
| C+ | [78-80) |
| C | [73-78) |
| C- | [70-73) |
| D+ | [68-70) |
| D | [63-68) |
| D- | [60-63) |
| F | [0-60) |

5.2 Class Policies

1. Attendance is not mandatory, even at live sessions, but you are responsible for anything that transpires during class or a live

conferencing session. **Please** be on time to class!! If you're consistently late and/or disruptive in class I reserve the right to dock you points on an assignment.

2. Put your name, course, and section on everything you turn in. Sometimes we print things out for grading. Also, this is generally just good practice.
3. Exchange of ideas and techniques is **highly** encouraged but **your work must be your own**. If someone helps you, please give them credit in your code (even if it's the TA). Myself and the TAs will follow up with suspicions of academic dishonesty in accordance with department and university policy (see below).
4. Students have one week from time of grade posting to challenge a grade.
5. If you have *technical content* questions please follow this order of operations for getting help:
 - a. Look on Piazza and check for similar questions.
 - b. Post your question on Piazza – then everyone benefits from the answer!
 - c. Check the internet for similar questions or concepts.
 - d. Attend the TAs' office hours.
 - e. Email the TA asking your question or requesting a Zoom session.
 - f. Email me asking your question or requesting a Zoom session.
6. If you have *personal questions* about logistics or similar please skip straight to contacting me by email explaining the situation and your question.
7. Please use professional email communication. A saluation, description, request, closing, and concise subject line are appropriate for professional communication.
8. I'm particularly concerned with the mental and emotional distress our current circumstances could have on each of us. Don't hesitate to reach

out and let me know how things are going. Large doses of patience are in order during the global pandemic.

5.3 CSE Policies

1. The CSE Department has an [anonymous contact form](#) that you may use to voice your concerns about any problems in the course or department if you do not wish to be identified.
2. CSE Department policy dictates that students in CSE courses are expected to regularly check their email so they do not miss important announcements.
3. Consider the [Student Resource Center](#) in Avery 12 if myself or the TAs are not available, or you otherwise need help.
4. All homework assignments, quizzes, exams, etc. must be your own work. No direct collaboration with fellow students, past or current, is allowed unless otherwise stated. The Computer Science & Engineering department has an [Academic Integrity Policy](#). All students enrolled in any computer science course are bound by this policy. You are expected to read, understand, and follow this policy. Violations will be dealt with on a case by case basis and may result in a failing assignment or a failing grade for the course itself. The UNL College of Engineering also has an [academic integrity policy](#) you should read and understand.

5.4 UNL Policies

1. The University strives to make all learning experiences as accessible as possible. If you anticipate or experience barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can discuss options privately. To establish reasonable accommodations, I may request that you register with Services for Students with Disabilities (SSD). If you are eligible for services and register with their office,

make arrangements with me as soon as possible to discuss your accommodations so they can be implemented in a timely manner. SSD contact information: 232 Canfield Admin. Bldg.; 402-472-3787.

2. Academic honesty is essential to the existence and integrity of an academic institution. The responsibility for maintaining that integrity is shared by all members of the academic community. The University's Student Code of Conduct addresses academic dishonesty. Students who commit acts of academic dishonesty are subject to disciplinary action and are granted due process and the right to appeal any decision.
3. UNL offers a variety of options to students to aid them in dealing with stress and adversity. [Counseling and Psychological Services \(CAPS\)](#) is a multidisciplinary team of psychologists and counselors that works collaboratively with Nebraska students to help them explore their feelings and thoughts and learn helpful ways to improve their mental, psychological and emotional well-being when issues arise. CAPS can be reached by calling 402-472-7450. [Big Red Resilience & Well-Being](#) provides one-on-one well-being coaching to any student who wants to enhance their well-being. Trained well-being coaches help students create and be grateful for positive experiences, practice resilience and self-compassion, and find support as they need it. BRRWB can be reached by calling 402-472-8770.

CSCE 474/874: Introduction to Data Mining

Spring 2021

General Information

Instructor: [Ashok Samal](#)

Avery Hall, Room 359

Phone: 472-2217

Email: samal@cse.unl.edu

Office Hours: TR (12:15 – 1:15)

Teaching Assistant: Atharva Tendle (atharva.tendle@huskers.unl.edu).

Office Hours: M/T 10:00 am – 11:00 am (<https://unl.zoom.us/j/96441158653>)

Lectures: TR 11:00 am – 12:15 pm ([Web Conferencing](#))

Text: Introduction to Data Mining (Second Edition) by Tan, Steinbach, Karpatne, and Kumar, Pearson.

Prerequisites: CSCE310, STAT 380 or permission or equivalent.

1. **Mastery** of a high-level programming language.
2. **Familiarity** with calculus and statistics.
3. **Exposure** to linear algebra.

Course Objectives: Data mining is the process of automatically finding useful *hidden* patterns in data. The objective of data mining is to use discovered patterns to help *explain* current behaviors or to *predict* the future outcomes. Upon completing this course, students will understand:

- **Mastery** of basic data mining algorithms, including association rule mining, clustering, prediction and classification.
- **Familiarity** with data warehousing and its applications.
- **Familiarity** with role of data mining in knowledge discovery.
- **Familiarity** with data preprocessing and reduction techniques.
- **Exposure** to applications of data mining to practical problems.

Communication

To keep our inboxes clean and to ensure emails don't get lost, all communication should be done using Piazza. Piazza is an online communication tool where instructors can post notes, and students can ask questions. The Piazza site for this course is located at piazza.com/unl/spring2021/csce474874. You should have received an invitation to join. If you have not, you may sign yourself up at: piazza.com/unl/spring2021/csce474874.

Again, any general or homework questions you might have, or if you have questions about a graded assignment, please use Piazza. When you post a question, the instructor and the TA will see your question and respond as needed. You are encouraged to check-in and respond to the questions posed by other students. Extra credit will be given to students who actively participate in this activity, particularly to students who answer the questions posed by a student.

Please remember to use professional language and letter salutations in your emails to the instructor and the TA (no "Hey" or any kind of text jargons).

Assignments

There will be four assignments for this course. Together they will count for 40% of the overall grade. The assignments are due at the class time on the indicated dates. We will use a flexible, slip date system for the assignments. Each student is given an automatic extension of four (4) calendar days. You can use these on any assignment(s) during the course. However, the total number of late days cannot exceed 4. Slack days cannot be used for the project. **After you have used your "late" days, if you submit an assignment late, you will not get any credit for it.** Then, it is better to submit a partially completed homework than a late one. If you have a special reason for being late, get permission well ahead of the due date.

The assignments will be done in pairs and your partner will be randomly assigned and will change for each assignment.

You are required to submit the assignment online on Canvas. Do not turn in any hard copies. You are required to submit all source code, executable, report, etc.

While it can be informative to discuss the assignments with others, you should write your final programs independently. Make sure that all your files are protected. You are also responsible if somebody copies your files and hands them in.

Attendance

Attendance in class is required. 5% of the overall grade is reserved for class attendance and participation.

Tests and Quizzes

There will be no exams in this class. However, there will be periodic quizzes (both announced and unannounced). 20% of the overall grade is devoted to quizzes.

ICDM/KDD Session Summary and Presentation

Each student will be required to study a paper (from a selected set) presented either at IEEE International Conference on Data Mining (ICDM) or ACM Conference on Knowledge

Discovery and Data Mining (KDD), two leading conferences in data mining and present a summary to the class. This will be worth 5% of the overall grade.

Group Project

Students are required to work on a group project on some aspect of data mining. You must select a project from a list assigned in the class. Each team should consist of three to four students. All project documents will be kept online in Blackboard. The group project that will be worth 30% of the overall grade.

Students with Disabilities

Students with disabilities, including mental health disabilities like depression and anxiety, are encouraged to contact the instructor for a confidential discussion of their individual academic accommodation needs. The University of Nebraska-Lincoln provides individualized accommodations to students with documented disabilities that may affect their ability to participate in course activities fully or meet course requirements. Students must register with the Services for Students with Disabilities (SSD) office, 232 Canfield Administration, 472-3787 voice or TTY to receive the accommodations.

UNL CSE Department Policies

The CSE Department expects all students in CSE courses to check their email regularly, so they do not miss important announcements.

The CSE Department's Student Resource Center is located in Avery 12: <http://cse.unl.edu/src>. The office hours by the TAs are also listed there.

The CSE Department has [an anonymous contact form](#) that you may use to voice your concerns about any problems in the course or department if you do not wish to be identified.

Academic Misconduct

All homework assignments, quizzes, exams, etc. must be your own work. No direct collaboration with fellow students, past or current, is allowed unless otherwise stated. The Computer Science & Engineering department has an [Academic Integrity Policy](#). All students enrolled in any computer science course are bound by this policy. You are expected to read, understand, and follow this policy. Violations will be dealt with on a case by case basis and may result in a failing assignment or a failing grade for the course itself.

Those who share their code, and those who copy other's code will be penalized in the same way; both parties will be considered to have plagiarized.

The penalty for the violations are as follows:

- 1st violation — award a zero in homework or exam
 - 2nd violation — award an F in the course
 - 3rd violation — recommend the student be dismissed from the program
-

Final Grade

The distribution of points for the course is as follows.

| Category | Total Points |
|-----------------------|--------------|
| Participation | 50 |
| ICDM/KDD Presentation | 50 |
| Quizzes | 200 |
| Homework | 400 |
| Project | 300 |
| Total | 1000 |

The final grade will be based on the following scale.

| | | | | |
|------------------|------------------|------------------|------------------|--------------|
| $\geq 95\%$: A | $\geq 87\%$: B+ | $\geq 77\%$: C+ | $\geq 67\%$: D+ | |
| $\geq 90\%$: A- | $\geq 84\%$: B | $\geq 74\%$: C | $\geq 64\%$: D | $< 60\%$: F |
| | $\geq 80\%$: B- | $\geq 70\%$: C- | $\geq 60\%$: D- | |

CSCE 478/878 – Introduction to Machine Learning

Fall 2021

COVID-19: Policy on Face Coverings

Given current Center for Disease Control (CDC) and Lancaster county health guidance, and the current transmission level of COVID-19 in our community, I respectfully request that you join me in wearing a face covering during our classes.

Student conduct expectations: <https://studentconduct.unl.edu/covid-19-related-expectations-and-non-compliance>

Is this course suitable for you?

The Introduction to ML course (CSCE 478/878) is designed mainly for Computer Science and Engineering students, thus provides a rigorous theoretical treatment of the topics. It requires implementing various ML algorithms from scratch (using vanilla python and its scientific non-ML libraries). Students must have strong programming skills in Python as well as a background in probability & statistics, linear algebra, calculus, and algorithm complexity analysis. The assignments are programming-heavy and time-consuming. No support will be provided on coding or debugging for the programming assignments.

If you are a non-CS student and are only interested in how to use ML for practical applications, then this course is not suitable for you. You should instead do the “Practical Machine Learning” course, which is designed for Engineering students. It emphasizes less on the theory and mathematical foundation of the ML models as well as implementation of the ML algorithms. Also, the assignments are required to be done using ML APIs (e.g., Scikit-Learn, TensorFlow). So, a moderate level of programming skill in Python is enough. This course is offered in Spring.

Course Info

| | |
|---------------------|---|
| Instructor | Dr. M. R. Hasan hasan@unl.edu Avery Hall 123E https://cse.unl.edu/~hasan/ |
| Office Hours | See Canvas |
| Textbook | See Canvas |
| Teaching Assistants | See Canvas |

Prerequisite

Probability & Statistics, Linear Algebra, Calculus, Data Structure & Algorithm, Algorithm Complexity Analysis. **Strong programming skill in Python is a must.** If you don't know Python you will have to learn it independently. No help will be provided on Python programming (e.g., learning, coding, debugging).

Course Topics

This is a rough sequence of topics that we will cover in this course.

- Probabilistic Reasoning
- Linear Algebra for Machine Learning
- Classification & Regression: (Nonparametric Methods) Nearest Neighbors & K-Nearest Neighbors (K-NN)
- Classification: Performance Measures
- Kernel Density Estimator & K-NN
- Statistical Estimation of Distributions: Binomial, Bernoulli, Multinomial, Gaussian
 - Frequentist Learning (MLE)
 - Bayesian Learning (MAP)
- Regression: Linear Regression (Frequentist & Bayesian) – Closed form & Iterative Optimization Algorithm (gradient descent)
- Classification: Naïve Bayes Classifier
- Classification: Logistic Regression (Frequentist & Bayesian), Newton's Method
- Classification: Support Vector Machine; Kernel Trick
- Classification & Regression: Perceptron Algorithm & Artificial Neural Network
- Classification & Regression: Decision Tree & Random Forest
- Bagging & Boosting
- Unsupervised Learning:
 - K-means
 - Expectation Maximization (EM)
 - Gaussian Mixture Model (GMM)
- Dimensionality Reduction:
 - Principle Component Analysis (PCA)
 - Singular Value Decomposition (SVD)
 - Linear Discriminant Analysis (LDA)
- Graphical Models; Hidden Markov Model (HMM) (time permitting)
- Learning Theory (time permitting)
 - PAC
- Advanced Topics
 - Sampling Methods, MCMC, Reinforcement Learning, etc. (time permitting)

Text Resources

- Lecture slides (thorough and extensive) should provide a detailed account of the topics.

Though there is no required text for this course. However, my lectures will draw references substantially from the following three books.

- Machine Learning: A Probabilistic Perspective by Kevin P. Murphy
- Pattern Recognition and Machine Learning by Christopher M. Bishop
- Introduction to Machine learning by Ethem Alpaydin

For understanding implementation issues and hands-on insights, following text will be used:

- Hands-On Machine Learning with Scikit-Learn, Keras and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems (2nd Edition, 2019) by Aurélien Géron

Following books are useful as Python refresher/introduction:

- Data Science from Scratch by Joel Grus (O'Reilly)
- Python for Data Analysis (2nd Edition) by Wes McKinney (O'Reilly)
- Python Machine Learning by Sebastian Raschka (Packt Publishing)

Statistics, Linear Algebra & Calculus:

- Advanced Engineering Mathematics by Erwin Kreyszig
- All of Statistics: A Concise Course in Statistical Inference by Larry Wasserman
- Convex Optimization by Boyd and Vandenberghe

Discussion Through Piazza

We will be using Piazza for class discussion. The system is highly catered to provide you help fast and efficiently from classmates, TAs, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. Please note that posted questions or discussion will be moderated if appeared to be inappropriate or irrelevant. Also, if you have a **question for a specific instructor (me or the GTA)**, you must send an email to that person, otherwise don't expect to receive a quick response. See the signup/login link for the Piazza on the Canvas Home page.

878 Level

There will be higher expectations with regard to the quality and quantity of work for the 878 level students compared to the 478 level students. As a student in this course, you will be expected to meet or exceed those expectations, which may require more of your time and a more proactive approach to studying and greater diligence in completing assignments. In particular, each assignment contains additional requirements or activities.

Recitations

There will be weekly recitations. A set of problems will be posted prior to the recitation. During the recitation hour the GTA will be present to help you. However, **recitations are not graded and no submission is required**. You may want to use the recitation sessions and tasks as an opportunity to deepen your understanding of the Machine Learning models that we won't have time to go over in detail during the lecture.

Homework Assignments

There will be 4/5 assignments. Assignments are due at the beginning of class on the due date. Code and other relevant files must be submitted using CSE's webhandin (<http://cse.unl.edu/handin>). If there are

written portions of the homework, they should be typed. You should typeset code snippets using a monotype font (Courier for example) for readability.

In this course, the homework assignments are built on prior assignments. Therefore, it is extremely important for you to stay on task and not fall behind with assignments. You should start on assignments early and resolve any and all issues (bugs, design flaws) as soon as possible so they do not carry over to the next assignment.

Coding

There will be **no support for the coding, compilation, or debugging**. You are expected to use vanilla Python and some of its scientific libraries such as Pandas, NumPy, and Matplotlib for programming assignments. However, no Machine Learning libraries such as Scikit-Learn or TensorFlow are allowed.

Exams

There will be a midterm and a final exam. See the exam schedule on Canvas Home page (Schedule section). The questions will be multiple-choice type. The exams are open book/note/computer.

Grading

Grading will be based on homework assignments, project, and quality of presentation. Note that your course total score will be computed based on the stipulated weights (see below) associated with the following graded components. **The Canvas default total score does not reflect your weighted total score.**

| | |
|--------------|-----|
| Assignments | 70% |
| Midterm Exam | 15% |
| Final Exam | 15% |

Scale

Letter grades will be awarded based on the following scale. I will use an **absolute grading policy**. For example, scores within the range between 89.00 and 89.49 will be rounded to 89.00 while scores within the range between 89.50 and 89.99 will be rounded to 90.00. Therefore, a score of 89.49 will earn you a B+ grade but 89.50 will earn an A-(minus) grade.

| | | | | | | | | | |
|----|-------|----|-------|----|-------|----|-------|---|-----|
| A+ | >= 97 | B+ | >= 87 | C+ | >= 77 | D+ | >= 67 | F | <60 |
| A | >= 93 | B | >= 83 | C | >= 73 | D | >= 63 | | |
| A- | >= 90 | B- | >= 80 | C- | >= 70 | D- | >= 60 | | |

Grading Policy

We make every effort to grade and return materials within one academic week of the due date. You are expected to pick up your graded material in a timely manner. If you have questions about grading or believe that points were deducted unfairly, you must first address the issue with the grader it to see if it can be resolved. Such questions should be made within a reasonable amount of time after the graded

assignment has been returned. **No further consideration will be given to any assignment a week after it has been graded and returned (regardless of whether you fail to pick it up when handed back).**

It is your responsibility to **check Canvas regularly** and report missing/incorrect entry within one week of submission of your assignment or exam.

You need to report any missing/incorrect Canvas grade entry or questions related to grading **before I post your final grade** in Canvas. **I will not take any question/complaint after the final grade is posted.**

Late Work

In general, late submission will not be allowed. Exceptions may be made in certain circumstances such as health or emergency, but you must make every effort to get prior permission. Documentation may also be required.

Homework assignments have a strict *in-class* (at the beginning) due date. Any written portions should be handed in hardcopy in class while softcopies should be handed in using webhandin as specified in individual homework assignments. The webhandin program that you will use enforces a *strict* handin time based on the CSE server's clock. Programs that are even a few seconds past the due date/time will be considered late.

It is understandable that unforeseen events may interfere with your ability to submit all homework assignments on time. As such, this course allows the following late work policy: you may hand in **any one assignment up to 7 days late**. Any submissions after 7 days will not be considered and will be given an automatic zero. These 7 "free passes" can be used on multiple assignments.

Exceptions: You *CANNOT* use a late pass for the first assignment as well as on the last assignment.

Academic Integrity

All homework assignments, programs, and exams must be your own work unless otherwise stated. No collaboration with fellow students, past or current, is allowed unless otherwise permitted on specific assignments or problems. The Computer Science & Engineering department has an Academic Integrity Policy. All students enrolled in any computer science course are bound by this policy. You are expected to read, understand, and follow this policy. Violations will be dealt with on a case-by-case basis and may result in a failing assignment or a failing grade for the course itself. **If any student performs academic dishonesty (*complete or partial*), as defined by the UNL academic integrity policy, in any graded component of the course, her/his grade will be set to zero for that assignment/exam and she/he will be reported to the academic integrity committee of the CSE department.** The most recent version of the Academic Integrity Policy can be found at <http://cse.unl.edu/academic-integrity-policy>

Communication

The best way to communicate with your Professor is through email. The Professor and teaching assistants will communicate with you either directly or through the Canvas email system. You are responsible for ensuring that the email associated with your Canvas account is up-to-date and that you are regularly

checking it. Generally speaking, you should talk to Dr. Hasan for questions about course material and lecture. You should talk to the TA about grading and homework assignments.

In addition, the Department of Computer Science & Engineering also maintains an anonymous suggestion box that you may use to voice your concerns about any problems in the course or department if you do not wish to be identified. It is available at the following URL:

<http://cse.unl.edu/department/suggestion.php>

Finally, I will hold regular office hours and will make myself available by appointment; please email me to set one up.

Disabilities

Students with disabilities are encouraged to contact Christy Horn for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY.

Syllabus

This is a class about the digital economy, specifically the interplay between economic thinking and computational thinking as it relates to electronic commerce, incentives engineering, and networked systems. Topics covered vary each year, but include a subset of:

- game theory (including algorithmic game theory),
- auctions (including internet advertising and combinatorial auctions),
- incentive compatible mechanism design (including theoretical and algorithmic approaches),
- human computation, crowd sourcing, and peer prediction,
- matching algorithms,
- trust and reputation,
- cryptoeconomics,
- networks (network formation, cascades, games on networks),
- privacy (including differential privacy, privacy-protected advertising), and
- ethical considerations.

Emphasis is given to fundamental topics, and the class involves the discussion of theoretical and empirical content, as well as algorithm design. We hope to convince you that economic considerations matter in many computational settings, and that computation matters in many economic ones.

Prerequisites

We will assume familiarity with probability theory (as taught by, e.g., Stat 110), single-variable calculus (as taught by, e.g. Math 1b), linear algebra (as taught by, e.g., Math 21b/22a/25a/AM 21b), and the basics of theoretical computer science (e.g., complexity theory, asymptotic runtime analysis, as taught by CS 120, 121, or 124). You should also be prepared to write multi-file programs in Python (and prep from a course like CS 51 can help). No background in economic theory is assumed, although students without some economics background would benefit from a course that provides exposure to the basic ideas of utility maximization and rational behavior (e.g., from an AI course). Generally, we suggest students have completed *one of* Computer Science 181, Computer Science 182, Economics 1011a, Economics 1052, Economics 1071, or Economics 2056.

Book

The instructor is developing a textbook with Sven Seuken (U. Zurich), hopefully to be published by Cambridge University Press in early 2024, and we will follow a draft of the book in class. Chapters will be distributed during the course. [Networks, Crowds, and Markets: Reasoning About a Highly Connected World](#), by David Easley and Jon Kleinberg, also provides a good introduction to many topics (this is not required reading).

beginning of class. It is very important to keep on top of the reading, and familiarity with the reading will be assumed during lecture. **You should set aside two hours before each class for the reading.**

I do not expect you to fully understand everything before coming to class. Rather, the goal you should set for yourself is to familiarize yourself with new terminology and definitions, and be ready to ask about things that you find especially confusing. **It is strongly recommended to attend class** (lecture recordings will only be available 2-3 days after class).

Support Resources

Online Q+A. We will be using Ed. **All announcements will be made on Ed,** and we encourage you to answer each other's questions (but without giving away answers to homework questions).

Office hours. Please make use of staff office hours! You are welcome to come with specific questions about the material, to discuss final project ideas, or just chat about things you find interesting.

Philosophy

You can expect the course staff to work hard to make the course useful for you, be available throughout the semester and look forward to meeting you in person, promptly answer your questions, and return assignments and midterms to you in a timely manner. We expect that you will, in turn, be prepared to play an active role in your learning, and come to class prepared (having done the assigned reading), and participate in classroom discussions. In this way, we can use class time to work together to develop a deeper understanding of the material.

CS 136 is a challenging class because it covers interdisciplinary material. But we'll work together to try to get as much understanding as possible of the underlying principles and methodologies. If you feel confused about something and you have given yourself some time to try to understand on your own, you should seek help by discussing it with other students or with the staff, or asking a question in the classroom. Other students might well have the same confusion!

Learning outcomes

After successful completion of this course, you will be able to...

Apply principles of economics and computation to

- Understand, model and analyze the interplay between incentives and computation in the design of online platforms
- Solve mathematical and conceptual problems involving such systems, including problems you have not seen before

Organize your learned knowledge in Econ/CS, by

- Articulating the big ideas from each lecture
- Making connections between different concepts
- Synthesizing concepts with ideas from other branches of computer science, including machine learning, complexity theory, and artificial intelligence
- Having an appreciation for the way in which computational systems influence, and are influenced by, the aggregate behavior of groups of people

Collaborate and communicate clearly, in particular

- Justify your thinking by clearly articulating the principles that apply in a given setting
- Explain your solutions, either written or orally to peers and instructors

Logistics

Sections

There will be a recommended, but optional, 60 minute section each week. During section, you will work in groups to solve exercises that are designed to prepare you for the homework and midterms. The TF is there to help guide you and clarify confusions.

Assignments

There are two types of assignments: theory and programming.

Theory assignments include qualitative discussion questions as well as formal, theoretical analysis. The qualitative questions will help you gain an understanding of the assumptions behind the models that we discuss, and the connections to real-world problems. The theoretical questions will teach you to formally analyze simplified economic and computational systems, and to reason precisely. Some problems will require you to write proofs. **You should work by yourself on the theory assignments.**

Programming assignments are mainly in Python, and will let you experiment with simplified models of real problems. These flow into contests (and very good performance can lift up a grade at a grade boundary), where we pit submissions against each other. The assignments are designed to give you the chance to be creative and experiment with different ideas. **You are strongly encouraged to work in pairs on the programming assignments.**

Midterms

T₁ (i) will be **two in-class midterms**--- one is half-way through the semester, and the second in the last week of the semester (and non-cumulative).

There is a class project. The goals of the project are to allow you to explore independent interests, learn more about a particular area, and practice teamwork and presentation skills. The project will result in a final paper that is due during reading week. **Projects should be done in groups of 2 or 3, and may be primarily theoretical or primarily programming-based.**

A project can also involve an **exposition of a topic** related to topics covered in class, but in this case should **be done by a single student.**

Grading

Problem sets are **due at 5pm on Fridays (with two exceptions)**. Students have a maximum of six late days during the semester. There is a two day maximum on any pset, with no credit after two late days. For pair assignments, only one student needs the late days, but they will be counted against both students (if you have remaining credit!).

Submissions are to Gradescope. We will only give extensions for emergencies, and will need either a note from a doctor or your Resident Dean. In the case of regrade requests, the work will be regraded fully, and your grade may go up or down. **Regrade requests are due 1 week after the grades are released.**

We will evaluate the programming assignments according to the following criteria:

- Correctness: does it work?
- Write-ups: what did you do? Why? How well did it work? Why did you get the results you did? Is the writing clear?
- In class contests: How does your approach compare to those of your classmates? Doing well in contests will be worth a large amount of glory (!) but will only factor into your grade at grade boundaries.

We will evaluate your solutions to theory assignments according to the following criteria:

- Correctness: are your answers correct? This is precisely defined for mathematical questions, but includes having valid arguments in qualitative responses.
- Clarity: is your explanation clear? Is the main argument muddled by a lot of irrelevant discussion?

Your final grade will be determined as follows:

- Assignments: 45%
- In-class midterms: 30%
- Final project: 15%
- Participation/completing reading comments: 10%

E  **theory assignment will be equally weighted. The bottom theory assignment will not be counted in the final tally. Every student must attempt every assignment!**

The course philosophy is that we want you to work together and feel comfortable talking about the problem sets. Discussion and the exchange of ideas are essential to doing academic work. However, at the same time, we want to be able to grade your own work, and not the work of your friends. Please reach out to David Parkes if anything is unclear or you have concerns.

Comprehension Questions: You can discuss the reading with others but your responses should be your own.

Single-person Assignments (theory): For the theory assignments, you are encouraged to discuss with your classmates as you work on problem sets. **However, you should not share answers**, and after discussions with peers, you should make sure that you can work through the problem yourself and ensure that any answers you submit for evaluation are the result of your own efforts. In addition, you must cite any books, articles, websites, lectures, and such that have helped you with your work. Similarly, you must list the names of students with whom you have collaborated on problem sets.

Group assignments (programming): For the programming assignments, we expect you and your partners **to design and implement the solutions together**. You may also discuss with your classmates in other groups, **but not share code or answers**. Make sure that your group can work through the problem yourself, and ensure that any answers you submit are the results of your own efforts. In addition, you must cite any books, articles, websites, lectures, and such that have helped you with your work, and list the names of students from other groups with whom your group has collaborated.

Class project: You are encouraged to consult with your classmates on the choice of topic and to share resources. You may also find it useful to discuss your class project with other students. Otherwise, the guidelines are as above, depending on whether your project is a single-person or multi-person effort.

NEW Generative AI/LLM policy (1 of 2): If you find it helpful, you may use LLMs in answering problem sets, both theoretical and programming based, just as you may consult a text book or web source. As there, you should cite any tools that you use, and as there, **you should be able to provide a full explanation of your answers, so that these tools are used as a learning aid but not a replacement for your own learning**. You will not be able to access LLMs during the in-class midterms.

NEW Generative AI/LLM policy (2 of 2): For your end of class projects, you may choose to use LLMs as a tool to help with your writing, but as with all other work, you are responsible for the content of your paper, including its correctness and that it does not plagiarize other sources. In particular, you must have a full understanding of the paper that you turn in, and be able to explain its content (away from your AI helper!). Also, it is essential that you cite any tools that you use, **including a few sentences to explain how you used them**.

Math 106, Calculus I, University of Nebraska-Lincoln, Fall 2015

Text *Calculus: Single and Multivariable, Sixth Edition* Hughes-Hallett, et al.

ACE Outcome 3: This course satisfies ACE Outcome 3: “Use mathematical, computational, statistical, or formal reasoning (including reasoning based on principles of logic) to solve problems, draw inferences, and determine reasonableness.” Your instructor will provide examples, you will discuss them in class, and you will practice with numerous homework problems. The exams will test how well you’ve mastered the material. The final exam will be the primary means of assessing your achievement of ACE Outcome 3.

Placement: You may take Math 106 if you satisfy one of the following conditions:

1. You have passed UNL’s Math 102 or 103 with a grade of C, P or better.
2. You have a prior grade of D, D+, or C- in Math 106 from UNL.
3. You have passed the prerequisite courses in high school or at another college and have a qualifying score on the Math Placement Exam dated after March 2015. The Math Placement Exam is given at the College Testing Center (Burnett 127); see <http://www.math.unl.edu/resources/undergraduate/mpe/>.

Calculators: A graphing calculator can be useful for this course, and the TI-83, TI-84 and TI-86 are recommended. However, calculators that have a built-in computer algebra system (CAS), such as the TI-89, TI-92, TI-Nspire, HP-40, HP-41, Casio ALGEBRA FX 2.0, Casio ClassPad 300, and Casio ClassPad 330, **will not be permitted** during the final exam. Your instructor will determine the calculator policy for hour exams.

Cell Phones: As a courtesy to others, please turn off your cell phones and similar devices when you come to class.

Scheduling: A tentative schedule is included in this syllabus, as a guide. Your instructor will notify you of any changes.

Reading, Exercises, and Assignments: Your instructor will be planning class activities assuming you have done previously assigned reading and exercises. Keeping up is an essential prerequisite for getting the most out of class time. There may be graded projects, computer assignments, paper assignments, and quizzes, at the discretion of your instructor.

Mathematics Resource Center: You are encouraged to visit with your instructors when you have questions about the material or course and to use the Mathematics Resource Center (MRC) in Avery 13 as a meeting place for the course and a resource for assistance. The hours for the MRC are MTWR 12:30–8:30 pm, Fri 12:30–2:30 pm, and Sun 1:00–5:00 pm.

Calculus Readiness Activity: There is a mastery exam given on paper on **Thursday, August 27** in recitation. This exam covers prerequisite material essential to your success in the course. There are 15 questions and if you have a score of 13 or better, you get full points for the CRA. If you do not pass on paper, then you can take it again online at the Arts and Sciences Testing Center (Burnett 127; student ID required) up to once per day until **Wednesday, September 9**.

Gateway Exam: This exam consists of 8 questions in which you are asked to find the derivative without using calculators, notes, or tables. You must get at least 7 questions completely right to pass, with no partial credit and no points awarded for less than a passing mark. You may repeat the exam up to once a day during the exam period. The Gateway exam will be given once in class on **October 1**. Retakes will be given in the College Testing Center (Burnett 127, student ID required) from **October 2** through **October 23**.

Exams: Mid-term exams will be given on **September 24**, **October 29**, and between **November 30 and December 3**, all from 6pm to 7:30pm, and a Final Exam will be given on **Wednesday, December 16** from 6pm to 8pm, at locations TBA. (The precise date of Exam 3 will be announced as soon as it is scheduled, which will be before Labor Day.) You are expected to take these exams at the scheduled time, with exceptions made for students who have a conflict with another scheduled exam or who have three or more finals on one day. Makeups should be arranged with Lori Mueller in Avery 203 as soon as possible. Under no circumstances will exams be given early. **You are not allowed to have on your person during exams any device that can access the internet or communicate in any way. Cellphones, smart watches, etc. should be put away in backpacks/purses.**

Disability Accommodation: The University of Nebraska-Lincoln is committed to providing flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY.

Department Grading Appeal Policy: Students who believe their academic evaluation has been prejudiced or capricious have recourse for appeals to (in order) the instructor, the department vice chair, the department chair, the departmental appeals committee, and the college appeals committee.

Course Evaluation: The Department of Mathematics Course Evaluation Form will be available through your Blackboard account during the last two weeks of class. You'll get an email when the form becomes available. Evaluations are anonymous and instructors do not see any of the responses until after final grades have been submitted. Evaluations are important—the department uses evaluations to improve instruction. Please complete the evaluation and take the time to do so thoughtfully.

| Date | Section | Topic(s) | Exercises |
|--|---------|----------|---|
| Aug 24 | M | 1.2,4 | Exponentials and Logs p17: 7, 9, 13, 16, 32, 41; p33: 7, 10, 21, 25, 30, 31, 39, 42, 47, 54 |
| Aug 26 | W | 1.5,3 | Trig & PreCalc p42: 1, 15, 20 , 29, 31, 42, 43; p26: 1, 5, 11, 13, 18, 23, 28, 33, 57 |
| The CRA will be given in recitation on August 27. | | | |
| Aug 28 | F | 1.7 | Intro to Continuity p56: 1, 3, 5, 8, 9, 11, 12, 20, 33, 35, 37 |
| Aug 31 | M | 1.8 | Limits p64: 1, 3, 29, 31, 35, 36, 54, 55, 57, 65 |
| Sept 2 | W | 2.1 | Measuring Speed p80: 2, 3, 5, 7, 15, 17, 18, 20, 24, 25 |
| Sept 4 | F | 2.2 | Derivative at a Point p87: 1, 2, 8, 11, 13, 15, 17, 18, 20, 21, 24, 29, 35, 37, 41, 45 |
| September 4 is the last day to drop the course with no transcript record. | | | |
| September 7 : Labor Day | | | |
| Sept 9 | W | 2.3, 4 | Derivative Function p95: 1, 3, 4, 5, 19, 28, 36, 44, 47; p101: 1, 3, 10, 14, 15, 27 |
| September 9 is the last day to take the CRA. | | | |
| Sept 11 | F | 2.5, 6 | Second Derivative p108: 2, 4, 9, 10, 11, 19, 20, 26, 28; p114: 1–4, 8, 9, 16 |
| Sept 14 | M | 3.1,2,5 | Derivative Formulas p129: 4–5, 32, 42, 46, 58, 61, 73; p135: 1, 5, 21, 43, 44; p154: 63 |
| Sept 16 | W | 3.3 | Product Rule p139: 1, 3, 6, 8, 31; p153: 3, 12, 25–27, 36 |
| Sept 18 | F | 3.3 | Quotient Rule p139: 10, 15, 19, 27, 32, 35, 39, 45, 52; p153: 42, 44 |

| | | | | |
|--|---|------|----------------------------------|---|
| Sept 21 | M | 3.4 | The Chain Rule | p146: 3, 5, 10, 25, 34, 37, 51, 57, 59, 61; p153: 11, 16, 17, 24, 33 |
| Sept 23 | W | | Review for Exam | |
| Sept 24 | R | | EXAM 1 | 6 PM - 7:30 PM, Location TBA |
| Sept 25 | F | 3.6 | Inverse Functions | p159: 3–10, 17–20, 24, 29, 33, 38–40, 44, 47, 50, 52, 64; p153: 45 |
| Sept 28 | M | | Review for Gateway Exam | |
| Sept 30 | W | 3.7 | Implicit Differentiation | p164: 1, 5, 10, 13, 14, 17, 23, 24, 26, 28, 29, 31, 35, 41 |
| The Gateway Exam will be given in recitation on October 1. | | | | |
| Oct 2 | F | 3.9 | Linear Approximation | p172: 1–4, 7, 12, 16, 17, 25, 26, 40, 42 |
| Oct 5 | M | 3.8 | Hyperbolic Functions | p167: 1–8, 23, 24, 29, 33; |
| Oct 7 | W | 3.10 | Mean Value Theorem | p178: 1–9, 12–15, 19, 20 |
| Oct 9 | F | 4.1 | Local Extrema | p192: 1, 3, 10–14, 16–18, 21, 26–28, 33, 35, 37, 45 |
| Oct 12 | M | 4.2 | Global Extrema | p202: 1, 4, 6–8, 11, 13, 15, 18, 26, 31, 37 |
| Oct 14 | W | 4.3 | Optimization | p210: 1–4, 7, 9, 11, 12, 18, 20, |
| Oct 16 | F | 4.3 | Optimization | p210: 29, 34, 39, 41, 45, 46, 48 |
| October 16 is the last day to change your grade option to or from Pass/No Pass. | | | | |
| October 19–20 : Fall Break | | | | |
| Oct 21 | W | 4.4 | Families of Functions | p220: 1, 3, 5, 9–11, 13, 14, 30, 32, 43, 49 |
| Oct 23 | F | 4.6 | Related Rates | p237: 1, 3, 22, 24, 26–28, 33, 37, 44, 45, 50 |
| October 23 is the last day to take the Gateway Exam. | | | | |
| Oct 26 | M | 4.7 | L'Hôpital's Rule | p247: 1–8, 16, 21, 25, 27, 28, 30–32, 34, 38, 45, 46, 49, 56 |
| Oct 28 | W | | Review for Exam | |
| Oct 29 | R | | EXAM 2 | 6 PM - 7:30 PM, Location TBA |
| Oct 30 | F | 4.8 | Parametric Equations | p256: 1, 2, 12, 16, 18, 19, 27, 29, 38, 44 |
| Nov 2 | M | 4.8 | Parametric Equations | p256: 5–8, 37, 45–47, 49, 50 |
| Nov 4 | W | 5.1 | Distance Traveled | p277: 1–4, 9, 12, 13, 15, 17–19, 26, 27 |
| Nov 6 | F | 5.2 | The Definite Integral | p286: 1, 3, 4, 11–14, 18, 19, 29–31, 35, 39, 41, 43 |
| Nov 9 | M | 5.3 | Fundamental Theorem I | p294: 1, 2, 4, 5, 9, 12, 15, 19, 21, 30, 31, 38 |
| Nov 11 | W | 5.4 | Properties of Definite Integrals | p305: 1–7, 10–13, 18, 21, 27, 30, 31, 38–43 |
| Nov 13 | F | 6.1 | Antiderivatives from Graphs | p323: 1, 3–5, 14, 16, 17, 20, 22, 24, 25, 30 |
| November 13 is the last day you can withdraw from the course. | | | | |
| Nov 16 | M | 6.2 | Antiderivatives from Formulas | p330: 1–9 (odd), 20, 22, 31, 38, 45, 54, 58, 62, 66, 69, 74 |
| Nov 18 | W | 6.3 | Differential Equations | p337: 1–3, 14, 16, 19, 23, 24, 33 |
| Nov 20 | F | 6.4 | Fundamental Theorem II | p342: 1, 4, 7–12, 14, 17, 20, 23, 25, 26, 35, 36 |
| Nov 23 | M | 7.1 | Substitution | p360: 1, 2, 4, 6, 7, 9, 11, 15, 25, 27–31, 36, 42, 46, 59–64 |
| November 25–27 : Thanksgiving Break | | | | |
| EXAM 3 will be given from 6 to 7:30 PM one evening between Nov. 30 and Dec. 3 | | | | |
| Nov 30 | M | 7.1 | Substitution | p360: 66, 69, 70, 77, 80, 81, 85, 92, 114, 125, 128, 133, 142 |
| Dec 2 | W | | Review for Exam | |
| Dec 4 | F | | Review for Final Exam | |
| Dec 7–11 | | | Review for Final Exam | |
| Dec 16 | W | | FINAL | 6 PM - 8 PM, Location TBA |

COURSE SYLLABUS

MATH 107H: Honors Calculus II

UNL, Fall 2016, Section: 002, CRN: 4388

Dr. Adam Larios

Office: Avery Hall 305

Office Hours: M,W,F, 1:30 pm–2:20 pm, or by appointment

Text: *Calculus: Single and Multivariable, 6th ed.* by Hughes-Hallet, et al., ISBN: 978-0470-88861-2.

ACE Outcome 3: “Use mathematical, computational, statistical, or formal reasoning (including reasoning based on principles of logic) to solve problems, draw inferences, and determine reasonableness.” Your instructor will provide examples, you will discuss them in class, and you will practice with numerous homework problems. The exams will test how well you’ve mastered the material. The final exam will be the primary means of assessing your achievement of ACE Outcome 3.

Prerequisites: Students who take Math 107H must have passed Math 106 or an equivalent course with a grade of P or C or better. Students who are new to UNL must also pass a readiness test for Math 107H. Any students who do not meet this requirement will be dropped from the course.

Advanced Placement Program: If this is the first college mathematics course that you have attempted, then you may be eligible for 5 hours of free credit for Math 106, provided you get a grade of C, P or better in Math 107H this semester. To be considered for this credit, you should visit the Arts & Sciences Advising Center in 107 Oldfather to make a request by the end of the third week of classes, i.e., by Friday, September 9.

Calculators, Phones, etc.: A graphing calculator may be useful for this course, and the TI-83, TI-84 and TI-86 are standard devices, although there are many phone or computer applications that are equivalent or better. No calculators are allowed during quizzes or exams. **No phones or any devices capable of wireless communication** including smart-watches are permitted at any time. As a courtesy to others please **silence your phones** when you come to class.

Scheduling: A tentative schedule of assignments and exams is included in this syllabus. Your instructor may change the order of the topics, modify the list of exercises and introduce new assignments. It is your responsibility to keep track of the course details and the schedule for your section.

Attendance: Daily attendance for class lectures is expected and is extremely important. While attendance is not recorded, missing even one class will put you behind. Note that there is a strong correlation between class absences and poor grades. You are responsible for all material and announcements in class regardless of whether or not you attended. **You are also responsible for making arrangements with another classmate to find out what you missed. You should not ask me to go over material you missed (due to tardiness or absences) during office hours or over email.**

Reading and Homework: You are expected to read the appropriate sections of the text BEFORE coming to the class in which the topic is scheduled. You are expected to work the assigned exercises after the corresponding material has been presented in class, and BEFORE the next class meeting (lecture or recitation). The suggested exercises at the end of this syllabus are not graded, but are there to give extra practice. Some students may have to work additional exercises from the text to attain sufficient mastery of the material. It is HIGHLY recommended (though not technically required) that students work on these exercises in addition to the WebWork exercises (see below).

WebWork: Graded homework will be assigned through WebWork. It is your responsibility to let your instructor know as soon as possible if you are having any issues logging into WebWork, or submitted your assignments. Please work on assignments well before the deadline so that any problems are detected early enough to fix them. Your lowest two WebWork assignment scores (including missed assignments) will be dropped. Homework must be properly submitted to WebWork before the deadline.

Quizzes: Weekly quizzes will be given in the lab section. These quizzes will have mathematical information, but will also have brief questions about upcoming topics in the course. (For example: Which topics do we plan to cover next week?) Be sure to read ahead so that you are prepared for these.

Midterm Exams: There will be 3 midterm exams in class, given on the indicated days (see the schedule in this syllabus). Please let your instructor know immediately if you will be unable to make any of the exams, and be sure to get the necessary documentation to prove your absence was an excused one.

Grading: Your minimal course grade will be computed as follows.

| | | | | | |
|-------------|------------------------|---------|-----|---|--------|
| Homework: | 10% | A-/A/A+ | 90% | - | 100% |
| Quizzes | 5% | B-/B/B+ | 80% | - | 89.99% |
| Midterms: | $3 \times 20\% = 60\%$ | C-/C/C+ | 70% | - | 79.99% |
| Final Exam: | 25% | D-/D/D+ | 60% | - | 69.99% |
| Total: | 100% | F | 0% | - | 59.99% |

A “curve” (grade scale adjustment) may be applied in favor of the students if deemed necessary by your instructor.

Tentative Schedule

| Date | Day | Section and Topic | Exercises |
|---|------|---|---|
| Aug 22 | M | 5.2 The definite integral | p.???: 1, 2, 5, 7, 15, 16, 20, 32 |
| Aug 24 | W | Review of foundations | Worksheet |
| Aug 26 | F | 5.3 The fundamental Theorem | p.???: 2, 3, 4, 5, 6, 19, 21, 23 |
| Aug 29 | M | 6.2 Review of basic integration | p.330: 1-15 (odd), 21, 25, 26, 28, 33, 36, 41, 43, 46, 48-51, 53, 58 |
| Aug 31 | W | 7.1 Integration by Substitution | p.360: 1, 2, 3, 6, 7, 9, 11, 15, 25, 27-31, 33, 40, 42, 43, 57-62, 71, 72, 74 76, 77, 80, 81 |
| Sept 2 | F | 7.2 Integration by Parts | p.368: 1-3, 6, 7, 8, 10, 15, 20, 21, 25, 27, 28, 30, 31, 33-39 (odd), 41, 47, 48, 49, 53 |
| Last day to drop without a W | | | |
| Sept 5 | M | Labor Day, No classes | |
| Sept 7 | W | 7.3 Table of Integrals | p.???: 1, 7, 10, 11, 12, 15, 16, 20, 33, 34, 45, 46, 49 |
| Sept 9 | F | 7.4 Partial Fractions & Trig. Substitutions | p.384: 1, 3, 5, 10, 12, 16, 17, 18, 19, 33, 35, 41, 42, 45, 47, 49 |
| Sept 12 | M | Catch up/Review | |
| Sept 14 | W | Gateway practice exam (in class) | |
| Sept 16 | F | 7.4 Partial Fractions & Trig. Substitutions | p.384: 52, 20, 21, 55, 57, 55-63(odd), 62, 67, 69 |
| Sept 19 | M | 7.5 Numerical Integration | p.392: 1, 2, 7, 16, 29, 30 |
| Sept 21 | W | 7.6 Improper Integrals | p.401: 1, 2, 5, 7, 8, 9, 11, 12, 15, 16, 20, 22, 23, 26, 28, 29, 35, 48 |
| Sept 23 | F | 7.7 Comparison of Improper Integrals | p.406: 1-7(odd), 8, 11, 15-25 (odd) |
| Sept 26 | M | Catch up/Review | |
| Sept 28 | W | EXAM 1 (in class) | |
| Sept 30 | F | 8.1 Areas & Volumes | p.419: 2, 3, 7, 9-17 (odd), 18, 21, 24, 28, 29, 31, 32, 34, 36 |
| Oct 3 | M | 8.2 Volumes by Slicing & Arc Length | p.427: 5-13(odd), 13, 14, 15-17 (numer. integr.), 18, 20, 21-23, 25, 26, 29, 31, 32 43, 44, 45, 49, 53 |
| Oct 5 | W | 8.3 Area & Arc Length in Polar Coordinates | p.438: 1, 2, 5-8, 13, 15, 17, 18, 19, 25, 26, 27, 32, 33, 34, 39, 40, 43, 44 |
| Oct 7 | F | Catch up/Review | |
| Oct 10 | M | 8.4 Density (only) | p.446: 1-3, 5(c) (use trapez. rule), 13, 15, 16(b) |
| Oct 12 | W | 8.5 Applications to Physics (work only) | p.456: 1, 4-6, 11-15 (odd), 18, 19, 21, 23, 26(b) |
| Oct 14 | F | Catch up/Review | |
| Last day to change to or from Pass/No Pass | | | |
| Oct 17, 18 | M, T | Fall break, No class | |
| Oct 19 | W | 9.1 Sequences | p.495: 1, 2, 7, 9, 11, 13, 16, 20-25, 28, 29, 41, 43 |
| Oct 21 | F | 9.2 Geometric Series | p.502: 8-14, 19, 20, 23, 25-30, 40, 41 |
| Oct 24 | M | 9.3 Convergence of Series & the Integral Test | p.510: 4-7, 10, 11, 15, 16, 17, 21, 25, 26, 27, 28, 29, 46 |
| Oct 26 | W | 9.4 Tests for Convergence | p.518: 1, 3, 4-7, 8, 9, 10, 11, 12, 14, 15, 17, 18, 20, 21-24 |
| Oct 28 | F | 9.4 Tests for Convergence (Include the Root Test) | p.518: 25-28, 29-35 (odd), 36, 38-40, 41-47(odd), 53, 55, 61, 62, 65 66, 67, 69-77(odd), 79, 80, 81, 84-86, 94, 95 |
| Oct 31 | M | 9.5 Power Series | p.527: 1-3, 4, 5, 7, 10, 12, 13, 15, 17-20, 21, 28-32, 40, 43, 45 |
| Nov 2 | W | Catch up/Review | |
| Nov 4 | F | EXAM 2 (in class) | |
| Nov 7 | M | 10.1 Taylor Polynomials | p.544: 1-3, 6, 7, 12, 18, 19, 29, 31 |
| Nov 9 | W | 10.2 Taylor Series | p.550: 1, 4, 7, 9, 15, 17, 18, 19, 21, 22, 32, 33, 35, 36, 37, 44, 45 |
| Nov 11 | F | Defining Logs and Exp the right way | To be announced |
| Last day to drop with a W | | | |
| Nov 14 | M | 10.3 New Taylor Series from Old | p.557: 1, 3, 4, 6, 8, 9, 10, 11, 12, 14, 27, 32, 33, 37 |
| Nov 16 | W | 10.4 Error in Taylor Polynomials | p.563: Use Theorem 9.9 to work: 2, 3, 5, 17, 19 |
| Nov 18 | F | 10.4 Error in Taylor Polynomials | 1, 5, 6, 9, 15 16, 20, 21, 22 |
| Nov 21 | M | Catch up/Review | |
| Nov 23 | W | Thanksgiving, No class | |
| Nov 25 | F | Thanksgiving, No class | |
| Nov 28 | M | 10.5 Fourier Series | 5, 6, 8, 12, 17 |
| Nov 30 | W | Catch up/Review | |
| Dec 2 | F | EXAM 3 (in class) | |
| Dec 5 | M | Catch up/Review | |
| Dec 7 | W | Catch up/Review | |
| Dec 9 | F | Catch up/Review | |
| Dec 15 | R | FINAL EXAM, 10:00 am–12:00 pm | Location: OLDH 208 (our usual classroom) |

Course Schedule: The tentative schedule in this syllabus (given above) is a rough guide to the material covered in the course, but is subject to change. **Updates and changes to the content will be announced in class, over email, or on the course website. You are responsible for all material and announcements in class regardless of whether or not you attended class.**

Getting help: When you need help with something in the course, you have several options:

- Try discussing the material with your classmates; learning from and explaining to your peers often contributes most to your own understanding.
- Talk to your TA or the primary instructor during their office hours.
- Last but not least, there is the **Math Resource Center** (MRC) in Avery 13. The hours for the MRC are 12:30–8:30 p.m. Monday through Thursday, 12:30–2:30 p.m. on Friday, and 1:00–5:00 p.m. on Sunday.

Final Exam Policy: Students are expected to arrange their personal and work schedule to allow them to take the final exam at the scheduled time. Students who have conflicting exam schedules may be allowed to take an alternate final, which is always given after the regularly scheduled final. No student will be permitted to take the final exam early. The final exam for this course will be on:

Thursday, Dec 15, 10:00 am–12:00 pm (Location: OLDH 208, the usual classroom).

Incompletes: A grade of “incomplete” may be considered if all but a small portion of the class has been successfully completed , but the student in question is prevented from completing the course by a severe, unexpected, and documented event. Students who are simply behind in their work should consider dropping the course.

Disclaimer: While this syllabus was prepared carefully and according to information available at the beginning of the semester, changes may be necessary in the interest of good teaching. Changes to any of the information above will be announced in class and posted on the class web site. This includes in particular possible updates or corrections to the syllabus, and changes of exam dates.

Course Evaluation: The Department of Mathematics Course Evaluation Form will be available through your Blackboard account during the last two weeks of class. You'll get an email when the form becomes available. Evaluations are anonymous and instructors do not see any of the responses until after final grades have been submitted. Evaluations are important—the department uses evaluations to improve instruction. Please complete the evaluation and take the time to do so thoughtfully.

ADA Language: Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY.

Departmental Grading Appeals Policy: Students who believe their academic evaluation has been prejudiced or capricious have recourse for appeals to (in order) the instructor, the departmental chair, the departmental appeals committee, and the college appeals committee.

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COURSE SYLLABUS

Text: *Calculus: Single and Multivariable*, 6th ed. by Hughes-Hallett, et al., ISBN: 978-0470-88861-2. Note, this syllabus works also for the 7th edition.

ACE Outcome 3: This course satisfies ACE Outcome 3: “Use mathematical, computational, statistical, or formal reasoning (including reasoning based on principles of logic) to solve problems, draw inferences, and determine reasonableness.” Your instructor will provide examples, you will discuss them in class, and you will practice with numerous homework problems. The exams will test how well you’ve mastered the material. The final exam will be the primary means of assessing your achievement of ACE Outcome 3.

In-Person/Remote Teaching: Please consult your instructor’s policy sheet on class attendance and remote teaching. The current UNL policy on health and safety states: “Those who are fully vaccinated are not required to wear face coverings, but are strongly encouraged to do so indoors. Anyone who is not fully vaccinated is expected to wear a face covering.” Also, you can consult the UNL policy on COVID19 (which will be updated from time to time) at: <https://covid19.unl.edu/>

Course Evaluation: The Department of Mathematics Course Evaluation Form will be available through your Canvas account during the last two weeks of class. You’ll receive an e-mail when the form becomes available. Evaluations are anonymous and instructors do not see any of the responses until after final grades have been submitted. Evaluations are important—the department uses evaluations to improve instruction. Please complete the evaluation and take the time to do so thoughtfully.

Scheduling: A tentative schedule of assignments and exams is included in this syllabus. The pace of this course is necessarily fast since it is a four credit which meets 3 times plus one recitation per week. It is your responsibility to keep track of the course details and the schedule of your section. You can also see the Faculty Senate Class Attendance Policy for Fall semester at: <https://www.unl.edu/facultysenate/policies/Class-Attendance-Policy-081121.pdf>

Daily Work: Do an initial reading of the section(s) expected to be covered before coming to class each day—even if you don’t understand the details, that reading will help you to better understand the lecture. Rereading more carefully after the class can also be helpful. The exercises listed below represent a minimum assignment and should be done as the material is covered.

Exams/Quizzes/Homework: Please consult your instructor’s course information sheet or policy.

Calculators: Calculators will not be allowed on any of the exams or quizzes in this course.

Final Exam: The time for the final exam is **6:00-8:00p.m., Wednesday, December 15**. The final exam will be a comprehensive exam. More details/instructions will be provided by your instructor later during the semester. You are expected to arrange your personal and work schedule to allow you to take the exam at the scheduled time. Students with conflicting exam schedules may be allowed to take an alternate final, which is always given after the regularly scheduled final. No student will be allowed to take the final exam early.

Advanced Placement: If this is the first college mathematics course that you have attempted, then you may be eligible for 10 hours of free credit for Math 106 and Math 107, provided you earn a grade of P, C or better in Math 208 this semester. To be considered for this credit, you should register with the Department of Mathematics, 203 Avery Hall, by Friday, September 10, 2021.

ADA Language: Students with disabilities are encouraged to contact the instructor for confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY.

Department Grading Appeals Policy: The Department of Mathematics does not tolerate discrimination or harassment on the basis of race, gender, religion or sexual orientation. If you believe you have been subject to such discrimination or harassment in this or any math course, please contact the department. If, for this or any other reason, you believe that your grade was assigned incorrectly or capriciously, appeals should be made to (in order) the instructor, the department chair, the department grading appeals committee, and the college grading appeals committee.

| Dates | Sections/Topic | Exercises |
|---|--|--|
| Aug 23–27 | 12.1 Functions of Two Variables 12.2 Graphs of Functions of Two Variables 12.3 Contour Diagrams 12.4 Linear Functions | 1–4, 6, 10, 11, 13, 14, 17, 21, 23, 25, 29, 30 1, 2, 3, 7, 8, 10, 15, 16, 18–20, 23–25 1, 2, 4, 5, 7–9, 13, 16, 17, 24, 27(a,b) 1–5, 7–11, 13, 21, 23, 26, 27 |
| Aug 30–Sep 3 | 12.5 Functions of Three Variables 12.6 Limits and Continuity 13.1 Vectors 13.2 Vectors | 1–4, 8–11, 13, 15, 16–18, 23, 31 1, 2, 3, 6, 7, 9, 11–14, 19, 23 1, 2, 5, 7, 12, 15, 24, 25, 29, 31, 32, 39(b), 40, 41 1–5, 7, 10, 11, 16, 20, 30, 36 |
| Friday, Sep 3, is the last day to drop without a W. | | |
| Sep 6–10 | Labor Day Holiday, Sep 6 13.3 The Dot Product 13.4 The Cross Product | (no class) 1, 5–19(odd), 23, 25–27, 29, 31, 33, 38, 40, 41, 43, 45 2, 3, 7, 9, 11, 14, 15, 17, 19, 20, 23, 27, 29, 31, 33, 39 |
| Sep 13–17 | 14.1 The Partial Derivative 14.2 Computing Partial Derivatives 14.3 Local Linearity 14.4 Gradients and Directional Derivatives | 1, 3, 5, 10–12, 17–19, 21, 22, 24, 25, 30 1, 3–5, 9, 11, 18, 21–25, 31, 39–41, 44, 45, 49 1, 2, 3, 5, 6, 7, 9, 11, 13, 18, 20, 22, 23 1–8, 15, 17, 20, 21, 23–26, 29–33, 37 |
| Sep 20–24 | 14.4 Gradients and Directional Derivatives 14.5 Gradients and Directional Derivatives 14.6 The Chain Rule 14.7 Second-Order Partial Derivatives | 39, 45, 46, 49, 51, 53, 56–59, 61, 67, 69–71, 75 2, 3, 7, 9, 14, 17–19, 21, 25–27, 35, 37–41, 46, 47, 53, 56, 57 1, 2, 3, 5, 7, 9, 11–15, 17, 20, 23, 24, 28, 33, 38 1, 3, 6, 11, 13, 14, 16, 19–21, 23–31(odd), 34, 35, 37, 41, 44 |
| Sep 27–Oct 1 | 15.1 Local Extrema Catch up/Review Exam 1 15.2 Optimization | 1–4, 6, 7–35(odd) 2, 5, 7, 8, 9, 10–13, 15, 17, 19, 20 |
| Oct 4–8 | 15.3 Constrained Optimization Catch up/Review 16.1 The Definite Integral in the Plane 16.2 Iterated Integrals | 1, 3, 5, 6, 7, 9–13, 17–19, 22, 24, 30, 31, 32, 45 1, 3, 6–11, 13, 15, 22, 23 1–4, 9–23(odd), 29, 33–38 |
| Oct 11–15 | 16.2 Iterated Integrals 16.3 Triple Integrals 21.2 Change of variables (optional) 16.4 Double Integrals in Polar Coord. | 42, 43–51(odd), 52, 54, 55 1–9(odd), 11–27(odd), 28–30, 33, 34–37, 39, 41, 44, 45, 50, 57 1, 3, 4, 5–7, 9, 13, 15 1–8, 10–12, 14–17, 19, 21, 24, 25, 27, 28, 30, 31, 33 |
| Friday, October 15, is the last day to change your grade option to or from Pass/No Pass. | | |
| Oct 18–19 | Fall Semester Break | |
| Oct 20–22 | 16.5 Triple Integrals in Cylindrical Coord. 16.5 Triple Integrals in Spherical Coord. 17.1 Parameterized Curves | 1, 3–7, 9, 3–15, 21, 23, 27–37(odd), 48, 49, 57–59 8, 10, 11, 24, 30, 32, 39, 43, 47, 65 1–7, 10, 11, 13, 15, 19, 21, 26, 29, 33, 45–49(odd), 57, 62, 81 |
| Oct 25–29 | 17.2 Motion, Velocity and Acceleration Catch up/Review Exam 2 17.3 Vector Fields | 1, 3, 5, 9, 10–13, 15, 17, 21–23, 25, 27, 30, 36, 41, 45 1–5, 7, 9, 11, 13, 15, 16, 20, 21–27(odd), 28, 30, 31, 33 |
| Nov 1–5 | 18.1 The Idea of a Line Integral 18.2 Computing Line Integrals 18.3 Gradient Fields and Path-Indep. 18.4 Green's Theorem | 1–8, 11–13, 15–21(odd), 25–28, 31, 32, 36, 46 1–23(odd), 26, 29–35(odd) 1, 3,, 4, 5, 7, 8, 9, 10, 13, 15, 17–21, 27, 29, 31, 32, 38, 39, 48 1–17(odd), 19, 20, 22, 26, 27, 33, 34, 39 |
| Nov 8–12 | Catch up/Review 19.1 The Idea of a Flux Integral 21.1 Parameterized Surfaces 21.3 Flux Through Parameterized Surfaces | 1–9, 13, 14, 16–19, 21, 25, 26, 29–35(odd), 39, 48 1–8, 10–13, 17, 15, 17, 19, 20 1–3, 5–9, 11, 12 |
| Friday, Nov 12, is the last day to withdraw from the course and receive a grade of W. | | |
| Nov 15–19 | 19.2 Flux Integrals through graphs 19.2 Flux Integrals through graphs Catch up/Review 19.3 The Divergence of a Vector Field | 1–6, 7, 9, 11, 13, 15, 19, 29, 31, 41–43, 47 16, 17, 21–23, 25, 27, 35, 37, 49, 51, 52 1, 3, 4, 5–11(odd), 12, 17–20, 24, 29, 36 |
| Nov 22–23 | 19.4 The Divergence Theorem Catch up/Review | 1, 2, 3–9(odd), 8, 14–17, 19, 23, 25, 28, 32 |
| Nov 24–28 | Thanksgiving Holiday | |
| Nov 29–Dec 3 | 20.1 The Curl of a Vector Field Catch up/Review Exam 3 20.2 Stokes' Theorem | 1–5, 7, 11–16, 25 1–5, 7, 9, 11, 14, 17–19, 21, 23, 25–27 |
| Dec 7–11 | Catch up/Review | |
| Final Exam, 6:00–8:00p.m., Wednesday, December 15. | | |

Math 310 Introduction to Modern Algebra

Fall 2021 Syllabus

Instructor: Eloísa Grifo

email: grifo@unl.edu

Office: 339 Avery Hall

Class time and location: Tuesdays and Thursdays 12:30 – 1:45 pm in 112 Avery Hall

Office Hours: Tuesdays 3:30 – 4:30 pm, Thursdays 2 – 3 pm, and by appointment **OH zoom:** 97297545735

What are office hours? During the scheduled office hours, I'll be in my office and available to you, so you can either come in person to my office or attend on zoom, and you do not need an appointment — just show up! If the scheduled times are not compatible with your schedule, please email me to schedule an alternative time. Office hours are an excellent opportunity to discuss any questions you may have, including homework problems.

Face coverings: Per CDC guidelines, everyone is strongly encouraged to wear masks indoors, though for now masks are not required in our class. If you have vulnerable individuals in your household and would like to request that everyone in our class wears a mask, please contact me immediately.

Prerequisite: A grade of P, C, or better in Math 107 or Math 107H

Course Description: One central goal of this course is to teach you to read, write, and understand mathematical proofs. The only way to learn to write good proofs is by doing so, and thus there will be a heavy emphasis on problem sets in this course. Many of the assigned problems will require you to develop original, rigorous proofs of mathematical statements. This is a difficult skill to master and success in this course will require a sustained effort on your part.

Another goal is to learn about modern algebra, specifically focusing on the mathematical concept of a *ring*. The collection of integers (both positive and negative) along with the usual rules for addition and multiplication are an example of a ring; the collection of polynomials also forms a ring. In this course, we will explore the features that these two examples have in common, and we will meet other examples of rings.

Attendance: This is an in person class. I expect everyone to attend class every day; however, you should **definitely not** come to class if you are feeling ill or have the need to quarantine. I will forgive all absences for which *you notify me by e-mail in advance of your need to miss class*. Depending on the circumstances, I might require you to do something to make up for your absence.

Textbook: *Abstract Algebra — an introduction*, by Thomas W. Hungerford, 3rd Edition.

The textbook is recommended but **not required**; it provides many examples of well written proofs.

Class format: Rather than a more traditional lecture format, this class will employ the methodology of Inquiry Based Learning (IBL). This means that the vast majority of class time will be spent with you working together in small groups, on activities I have carefully designed. You will formulate conjectures, propose definitions, develop examples, and construct proofs of mathematical statements together with your peers. Sometimes I will have you share your work with the class as a whole, and throughout the process you will receive feedback from your peers and from me. On occasion, I will give short mini-lectures to clarify matters, as appropriate. Let me quote from the Conference Board of the Mathematical Sciences (CBMS) position statement:

Classroom environments in which students are provided opportunities to engage in mathematical investigation, communication, and group problem-solving, while also receiving feedback on their work from both experts and peers, have a positive effect on learning. (...) A wealth of research has provided clear evidence that active learning results in better student performance and retention than more traditional, passive forms of instruction alone.

Grade Breakdown: We will have homeworks, quizzes, 2 midterms, a final exam, and iClicker questions.

| Component | Value |
|----------------|----------------|
| Quizzes | 10% |
| Problem Sets | 40% |
| Midterms (two) | 30% (15% each) |
| Final Exam | 20% |

We will have problem sets, two midterm exams, quizzes, and a final exam.

- We will have a short **quiz** (almost) every Tuesday. In every quiz, you will be asked to write down a definition or cite a theorem from the previous week. Some quizzes might also contain short proofs.
- The **problem sets** will be assigned and collected approximately once per week. You are strongly encouraged to work together on the problem sets, but each of you will hand in your own solutions, written in your own words, and your work must demonstrate a true understanding of the material. Never hand in something that you do not completely understand. I ask that at the top of each assignment you list the students with whom you collaborated. Please hand in all assignments on time.
- There will be two **midterm exams** and a **final exam**.
 - * Midterm 1: September 28.
 - * Midterm 2: November 2.
 - * The final exam will be on Tuesday, December 14, 4–6 pm, in Avery 117.

Academic Dishonesty: Academic dishonesty includes cheating on any test, plagiarism, fabricating an otherwise justifiable excuse to avoid or delay timely submission of academic work, and helping or attempting to help another student commit academic dishonesty. For a comprehensive list, see Section 4.2 of the Student Code of Conduct. A student observed cheating in any manner during an exam or quiz will earn a score of 0 for that assignment and will be referred to the Vice Chair for academic sanction. A second offense will earn the student an F in the course.

Departmental Grading Appeals Policy: Students who believe their academic evaluation has been prejudiced or capricious have recourse for appeals to (in order) the instructor, the departmental chair, the departmental appeals committee, and the college appeals committee.

Accommodations: The University strives to make all learning experiences as accessible as possible. If you anticipate or experience barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can discuss options privately. To establish reasonable accommodations, please register with the [Services for Students with Disabilities \(SSD\)](#) office. If you are eligible for services and register with their office, make arrangements with me as soon as possible to discuss your accommodations so they can be implemented in a timely manner.

Resources: Here are some resources available to you:

[Counseling and Psychological Services \(CAPS\)](#) is a multidisciplinary team of psychologists and counselors that works collaboratively with Nebraska students to help them explore their feelings and thoughts and learn helpful ways to improve their mental, psychological, and emotional well-being.

[Big Red Resilience and Well-Being](#) provides one-on-one well-being coaching to any student who wants to enhance their well-being. Trained well-being coaches help students create positive experiences, practice resilience and self-compassion, and find support as they need it.

[Husker Pantry](#): Provides food and hygiene items for free to students who might need them.

[Equipment checkout](#): Free 7 day laptop and iPad loans.

[First Gen Nebraska](#).: For first generation college students.

You'll find many other useful resources on the [Student Affairs website](#).

MATH 314 – Section 005
Spring Semester 2020
MWF 11:30 am–12:20 pm, Avery Hall 019

1 Instructor

Dr. Xavier Pérez-Giménez
Assistant Professor
Department of Mathematics
University of Nebraska – Lincoln
Lincoln, NE 68588-0130, USA

Email: xperez@unl.edu
Website: <http://www.math.unl.edu/~xperezgimenez2/>
Office: Avery Hall 333
Office Hours: TR 8:30 am – 9:30 am (or by email appointment)
Grader: TBA

2 Textbook

Linear Algebra and Its Applications, by David C. Lay, Steven R. Lay, and Judi J. McDonald, 5th Edition.

3 ACE Outcome 3

This course satisfies ACE Outcome 3: “Use mathematical, computational, statistical, or formal reasoning (including reasoning based on principles of logic) to solve problems, draw inferences, and determine reasonableness.” Your instructor will provide examples, you will discuss them in class, and you will practice with numerous homework problems. The exams will test how well you’ve mastered the material. The final exam will be the primary means of assessing your achievement of ACE Outcome 3.

4 Contacting me

The best way to contact with me is by email, xperez@unl.edu. Please put “[MATH 314]” at the beginning of the title and make sure to include your whole name in your email. Using your official UNL email to contact me is strongly recommended. My office is Avery Hall 333. My office hours are TR 8:30 am – 9:30 am. If you want to meet at another time, please email me in advance, and we will try to schedule a time to meet.

5 Course Description

One can say that Linear Algebra is a mathematical branch studying system of linear equations, for example

$$\begin{cases} 4x + 5y + 6z = 7 \\ 2x + 6y + z = 2 \\ x + y + z = 4 \end{cases}$$

Linear Algebra has many applications to diverse scientific areas, and even has powerful uses in computer graphics, linguistics, audio engineering, artificial intelligence, humanitarian aide, and legal studies etc.

This course is a transition course from computational courses, like calculus, to more theoretical ones. You will need to understand definitions and theorems, be able to apply them, and sometimes, prove theorems. *The material in the course will tend to be more mathematically subtle than that encountered in your previous math courses, and will consequently require a significant effort on your part to master.*

The course covers sections from Chapters 1 to 7 of the text: systems of linear equations, matrix algebra, determinants, vector spaces, eigenvalues and eigenvectors, orthogonality, and inner product spaces, and quadratic forms.

6 Homework and quizzes

Homework is designed to help students understand the materials and to prepare them for exams. We would have homework almost every week. Pop quizzes will be given if needed. There are **no make-up quizzes**.

Collaboration is encouraged in this course. However, copying someone else's work and submitting it as your own is unacceptable. This act of academic dishonesty will be prosecuted in accordance with university policy.

Besides homework and quizzes, you are expected to read the appropriate sections of the text before coming to the class. You are also expected to work through the indicated exercises after the corresponding material is presented in class, and **before** the next class meeting.

7 Calculators and Electronics

You are **not** allowed to have on your person during exams or quizzes any devices that can access the internet or communicate in any way. Cell phones, Apple watches, etc. should be put away in backpacks/purses. Calculators, laptops, tablets, cell phones, and other non-medical electronic devices are not permitted during exams unless otherwise stated. During class, cell phones should be set on vibrate or off. If you need to take a call, send a text message, etc., please quietly leave the classroom to do so, so that you do not distract other students. You are welcome to return to class quietly when you are finished. If you wish to take notes using an electronic device, you must first demonstrate to me that you can type or write fast enough to do so properly, and that you can do it without distracting others, before the privilege to use such devices may be granted. If you are found to be abusing this privilege, you risk forfeiting it.

8 Grading

Your minimal course grade will be computed as follows.

| | |
|-------------------|--------------------------|
| Homework+Quizzes: | 30% |
| Midterms: | $2 \times 17.5\% = 35\%$ |
| Final Exam: | 35% |
| — | — |
| Total: | 100% |

| | | | | | | | | | | | |
|----|--------|---|--------|----|--------|---|--------|----|--------|---|--------|
| A+ | 95.00% | – | 100% | B- | 76.66% | – | 79.99% | D | 60.00% | – | 63.32% |
| A | 90.00% | – | 94.99% | C+ | 73.33% | – | 76.65% | D- | 56.66% | – | 59.99% |
| A- | 86.66% | – | 89.99% | C | 70.00% | – | 73.32% | F | 0% | – | 56.65% |
| B+ | 83.33% | – | 86.65% | C- | 66.66% | – | 69.99% | | | | |
| B | 80.00% | – | 83.32% | D+ | 63.33% | – | 66.65% | | | | |

9 Attendance

Daily attendance for class lectures is expected and is **extremely important**. While attendance is not recorded, missing even one class will put you behind. Note that there is a strong correlation between class absences and poor grades. You are responsible for all material and announcements in class regardless of whether or not you attended. **You are also responsible for making arrangements with another classmate to find out what you missed. You should not ask me to go over material you missed (due to tardiness or absences) during office hours or over email.**

10 Exams

There are three exams: two midterms and a final. Students are expected to arrange their personal and work schedule to allow them to take the final exam at the scheduled time. No student will be permitted to take the final exam early.

Make-up exams will only be given with written evidence of an official university excused absence.

11 Incompletes

A grade of “Incomplete” may be considered if all but a small portion of the class has been successfully completed, but the student in question is prevented from completing the course by a severe, unexpected, and documented event. Students who are simply behind in their work should consider dropping the course.

12 ADA Statement

Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY.

13 Grade Questions

Any questions regarding grading/scoring of homework, exams, or projects must be made **within two class days** from when they were handed back, or no change in grade will be made.

Because of privacy rights, **I cannot discuss grades over email or telephone. Please do not email or call me asking about your grade. I will not be able to give you any information.** Of course, I am happy to discuss grades in my office.

14 Special Dates

- | | |
|----------------------------|--|
| January 24, 2020 (Friday): | Last day to withdraw from this course and not have it appear on your transcript. |
| March 6, 2020 (Friday): | Last day to change your grade option to or from Pass/No Pass. |
| April 3, 2020 (Friday): | Last day to drop this course and receive a grade of W. (No permission required.) After this date, you cannot drop. |

15 Departmental Grading Appeals Policy

Students who believe their academic evaluation has been prejudiced or capricious have recourse for appeals to (in order) the instructor, the departmental chair, the departmental appeals committee, and the college appeals committee.

16 Course Evaluation

The Department of Mathematics Course Evaluation Form will be available during the last two weeks of class. You will get an email when the form becomes available. Evaluations are anonymous and instructors do not see any of the responses until after final grades have been submitted. Evaluations are important—the department uses evaluations to improve instruction. Please complete the evaluation and take the time to do so thoughtfully.

17 Tentative schedule:

The following table shows the material expected to be covered for each week of the semester. The exercises listed here are only recommended problems, they are *not* your official assignments. Note that what is shown here is approximate; your instructor may change the dates for each assignment and/or exam. It is your responsibility to keep track of the course details and schedule for your section.

| Week of | Section | Recommended (but not necessarily mandatory) Exercises |
|-------------|--|--|
| January 13 | 1.1 Systems of Linear Equations | 1, 3, 5, 9, 10, 11, 15, 18, 19, 20, 23, 24, 25, 31 |
| | 1.2 Row Reduction and Echelon Forms | 1, 3, 7, 11, 13, 15, 17, 19, 21, 22, 23, 24, 25, 26 |
| | 1.3 Vector Equations | 1, 3, 5, 7, 9, 11, 13, 14, 15, 17, 18, 19, 23, 24, 25, 28 |
| January 20 | Martin Luther King Day | |
| | 1.4 The Matrix Equation $Ax = b$ | 1, 3, 7, 9, 11, 13, 14, 15, 17–24 |
| | 1.5 Solution Sets of Linear Systems | 2, 5, 6, 7, 8, 9, 11, 12, 13, 15, 16, 20, 23, 24, 25, 40 |
| January 27 | 1.6 Applications | 3(a,b), 7, 14 |
| | 1.7 Linear Independence | 1, 3, 5, 7, 8, 9, 13, 14, 15, 17, 19, 21, 22, 23, 24, 28, 30 |
| | 1.8 Introduction to Linear Transformations | 1, 2, 3, 5, 7, 9, 11, 13–16, 19, 21, 22, 32, 33, 34 |
| February 3 | 1.9 The Matrix of a Linear Transformation | 1, 5, 7, 8, 13, 15, 17, 22–25, 38 |
| | 2.1 Matrix Operations | 1, 3, 5, 7–11, 15, 16, 19, 22, 24 |
| | 2.2 The Inverse of a Matrix | 1, 3, 5, 7, 8, 9, 10, 13, 20, 21, 23, 24, 29, 31, 32, 33 |
| February 10 | 2.3 Characterization of Invertible Matrices | 1–7(odd), 11, 12, 13, 16, 17, 19, 22, 33, 37 |
| | 2.5 Matrix Factorizations | 3, 5, 9, 11, 19 |
| | Catch Up and Review | |
| February 17 | Midterm Exam I | |
| | 3.1 Introduction to Determinants | 1–13 (odd), 39, 40 |
| | 3.2 Properties of Determinants | 1–8, 11, 15, 18, 19, 25, 27, 28, 31 |
| February 24 | 4.1 Vector Spaces and Subspaces | 1–15, 17, 19, 20, 21, 23, 24, 25, 27 |
| | 4.2 Null Spaces, Column spaces | 1, 2, 3, 5, 7, 11, 12, 15, 17, 19, 20, 21, 25–28, 30, 35, 37 |
| | 4.3 Linearly Independent Sets; Bases | 1–19 (odd), 21–25, 31, 32 |
| March 2 | 4.4 Coordinate Systems | 1, 3, 5, 7, 8, 11, 13, 15, 16, 27, 28, 29 |
| | 4.5 The Dimension of a Vector Space | 1–5, 7–17 (odd), 19, 20, 21, 29, 30, 31 |
| | 4.6 Rank | 1, 3, 4, 5–15 (odd), 17, 18, 19, 21, 25, 27–29 |
| March 9 | 4.7 Change of Basis | 1–9 (odd), 11, 12, 13, 15 |
| | 4.9 Applications/Catch Up | 1, 3, 5, 9, 11 |
| | 5.1 Eigenvectors and Eigenvalues | 1–15 (odd), 19, 21, 22, 23, 24, 25, 27, 31, 33 |
| March 16 | Classes cancelled | |
| March 23 | Spring vacation | |
| March 30 | 5.2 The Characteristic Equation | 1, 3, 7, 9, 11, 13, 17, 21, 22, 23, 24 |
| | 5.3 Diagonalization | 1, 3, 5, 7, 11, 15, 16, 19, 21, 22, 23, 24, 25, 27, 29 |
| | 5.4 Eigenvectors and Linear Transformations | 1, 3, 5, 8, 9, 11, 13, 19, 23, 27 |
| April 6 | 5.5 Complex Eigenvalues | 1, 5, 9, 13, 16 |
| | 6.1 Inner Product, Length and Orthogonality | 1–19 (odd), 20, 25–31 |
| | 6.2 Orthogonal Sets | 1, 5, 9, 11, 13, 15, 17, 23, 24, 27–29 |
| April 13 | Midterm Exam II | |
| | 6.3 Orthogonal Projections | 1, 5, 7, 9, 11, 13, 15, 17, 21, 22, 23, 24 |
| | 6.4 The Gram-Schmidt Process | 1, 5, 9, 11, 15, 17, 18, 19, 22 |
| April 20 | 6.5 Least-Squares Problems | 1, 3, 5, 7, 11, 15, 17, 18, 19, 21 |
| | 6.6 Applications | 1, 3, 7a, 9 |
| | 7.1 Diagonalization of Symmetric Matrices | 1–19 (odd), 23, 25, 26, 28, 29, 36 |
| April 27 | 7.2 Quadratic Forms | 1–13 (odd), 21, 22, 23, 24 |
| | 7.4 Singular Value Decomposition | 1, 3, 5, 7, 9, 11, 12, 13, 17, 18, 23 |
| | Catch Up and Review | |
| May 4 | Final Exam Week | |
| | The Final Exam is on Monday, May 4, 10:00 am – 12:00 pm | |

Course Documentation for Spring 2022 Math 325-002

Elementary Analysis

TR 11:00-12:15pm, Burnett Hall 121

| | |
|----------------------|---|
| Instructor: | Yvonne Lai |
| Office: | Avery Hall 306 |
| Office hours: | Tuesdays 12:30-1:30pm after class (and by appointment) |
| Contact information: | ylai3@unl.edu |

Overview

Analysis. Analysis is the wellspring of much of modern mathematics. It studies (very carefully) the properties of the real numbers, and of functions taking real values. There are some surprises lurking (enough to trip up several generations of the world's best mathematicians) and the careful resolution of these difficulties was simultaneously one of the crowning mathematical achievements of the 19th century, and the foundation for the 20th century's mathematical flowering.

We will start by developing a clear understanding of the real numbers (which will require us to solidify our understanding of rational numbers also) and then progress to studying the behavior of real-valued functions. Throughout the course we will be working on developing the skills crucial to a young mathematician—those of reading and writing proofs. These activities lie at the heart of mathematics.

Themes. Throughout this course, we will practice:

- Understanding the rigorous foundations of functions, derivatives, and integration
- Connecting visual heuristics with formal argument
- Writing clear, logical, rigorous proofs

Course requirements

Weekly Homework (270 points). This course has regular homework and it will be carefully graded. I expect to collect homework once a week, mostly on Thursdays. There will be two kinds of homework questions. Most will be graded in the usual way, with partial credit for partially correct reasoning.

Homework is typically scored out of 20 points each. If the homework does not total to 270 points, it will be scaled out of that many points (i.e., your total will be multiplied by $\frac{270}{\text{maximum possible weekly homework points}}$).

Mastery Homework (40 points). Other questions on the homework will be graded for mastery. You will not get credit until you have written a correct proof. Responses to these questions can be submitted until you get credit for them, but not exceeding 1 month after it is assigned. The reason for the 1 month deadline is that proof communication is essential for this course (and mathematics), and I would like to provide incentive for you to improve these skills, and for us to work together on them, within an amount of time that you can use these skills for as much of the course as possible.

Mastery homework is typically scored out of 5 points each. If the mastery homework does not total to 40 points, it will be scaled out of that many points (i.e., your total will be multiplied by $\frac{40}{\text{maximum possible mastery homework points}}$).

Midterm 1, 2, 3 and Final Exams (100 + 100 + 100 + 150 points). There will be three midterms and one final exam. They are scheduled as shown below in Course Timeline. The midterms take place in class, and they will typically have a take-home component due the next course meeting. Each take-home component will be worth 20% of the total midterm to which it is associated.

Required Materials

Main Reference. Abbott, S. (2016). *Understanding Analysis*. New York, NY: Springer.

Google Drive. We will have a course Google Drive on which notes and supplemental materials will be posted. Please make sure you can access this drive.

<https://tinyurl.com/UNL325Spring2022>

(The tinyurl points here: <https://drive.google.com/drive/folders/1zZ1x-w7gzjwXi17fcgMoB5AAJWVt-0-M>)

Course Timeline (approximate)

| Week | Ch. | |
|---|----------|--|
| W1, Jan 17-21 | §1.2 | Mathematical statements, quantifiers, and negation; set notation; equivalent statements. Proof techniques; good proof communication. (See: http://www.math.toronto.edu/preparing-for-calculus/3_logic/logic.html) |
| W2, Jan 24-28 | §1.1-1.4 | Induction. Archimedean Principle. Existence of square roots. Completeness. Infimums, supremums. |
| W3, Jan 31-Feb 4 | 2 | Limits and limit theorems of sequences, Monotone and Cauchy sequences. |
| W4, Feb 7-11 | 2 | Subsequences, lim sup and lim inf. Series. Open and closed sets in \mathbb{R} (§3.2). |
| Thursday, Feb 11 : Exam 1 : Material from Weeks 1-3 | | |
| W5, Feb 14-18 | 4 | Continuous functions and their properties |
| W6, Feb 21-25 | 4 | Limits of functions, Uniform continuity |
| W7, Feb 28-Mar 4 | 5 | Derivatives |
| W8, Mar 7-11 | 6 | Power series, Uniform convergence, Weierstrauß's Approximation Theorem |
| Thursday, Mar 10 : Exam 2 : Material from Weeks 4-7 | | |
| March 13-20, 2022 : Spring Break | | |
| W9, Mar 22-25 | 6, 7 | Mean Value Theorem, Taylor's Theorem |
| W10, Mar 28-Apr 1 | 7 | The Riemann integral and its properties |
| W11, Apr 4-8 | 7 | Fundamental Theorem of Calculus |
| W12, Apr 11-15 | 8 | Improper integrals |
| (Week 14) April 14 : Exam 3 : Material from Weeks 8-11 | | |
| W13, Apr 18-22 | 7 | Exponents and Logarithms |
| W14, Apr 26-29 | 7 | The constant e |
| W15, May 2-6 | 7 | Continuous nowhere but differentiable functions |
| Tuesday May 10: Cumulative Final Exam: 3:30-5:30 p.m. | | |
| Location: Our Regular Classroom | | |

Departmental and University Policies

Course Evaluations. The Department of Mathematics course evaluation form will be available through Canvas during the last two weeks of class. Evaluations are anonymous and instructors do not see the responses until after final grades have been submitted. Evaluations are important – the department uses them to improve instruction. Please complete the evaluation and take the time to do so thoughtfully.

Academic Honesty Policy. Please see Student Code of Conduct, Section B. Conduct – Rules and Regulations, 1. Acts of Academic Dishonesty.

Accommodations for Students with Disabilities Policy. The University strives to make all learning experiences as accessible as possible. If you anticipate or experience barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can discuss options privately. To establish reasonable accommodations, I may request that you register with Services for Students with Disabilities (SSD). If you are eligible for services and register with their office, make arrangements with me as soon as possible to discuss your accommodations so they can be implemented in a timely manner. SSD contact information: 232 Canfield Admin. Bldg.; 402-472-3787.

Participation in pandemic times. This class builds your knowledge through listening, writing, and speaking mathematics. Given current CDC guidance and the current transmission level of COVID-19 in our community, I respectfully request that you join me in wearing a face covering during our classes, particularly when we are working in close proximity.

Grading Appeals Policy. The Department of Mathematics does not tolerate discrimination or harassment on the basis of race, gender, religion, or sexual orientation. If you believe you have been subject to such discrimination or harassment, in this or any other math course, please contact the department. If, for this or any other reason, you believe your grade was assigned incorrectly or capriciously, then appeals may be made to (in order) the instructor, the vice chair, the Department grading appeals committee, the College of Arts and Sciences grading appeals committee, and the University grading appeals committee.

Assessment Criteria

You have the potential to earn 760 points through the activities of this term.

A course grade of *A* in this course is likely to result from 93% or higher of these 760 points, an *A*– from 90% to 93%, a *B*+ from 86% to 89%, *B* from 83% to 85% etc. An *A*+ is reserved for exceptional, sustained performance. Point potentials are summarized below.

Point potentials for Spring 2022 Math 325-002

| Homework | | |
|------------------|-----------------|-------------------|
| Weekly homework | 270 | |
| Mastery homework | 40 | } |
| Exams | | |
| Midterm exams | 100 + 100 + 100 | |
| Final exam | 150 | } |
| Total | | 760 points |

Statistics and Applications

Instructor: Ruizhi Zhang

Email: rzhang35@unl.edu

Lecture Video: The lecture video will be posted on Canvas at 12:30 PM on Tuesdays and Thursdays

Office Hours: 2:00 PM - 3:00 PM Tuesdays online via Zoom, or By appointment

TA: Rachel Rogers

Email: rachel.rogers@huskers.unl.edu

Office Hours: 3:00 PM - 4:00 PM Monday, and 4:00 PM-5:00 PM Thursday online via Zoom, or By appointment

TA: Liangrui Sun

Email: liangrui2016@huskers.unl.edu

Office Hours: 3:00 PM - 4:00 PM Wednesday, and 3:00 PM - 4:00 PM Friday online via Zoom, or By appointment

Textbook: *PROBABILITY AND STATISTICS FOR ENGINEERS AND SCIENTISTS*, 9th edition; Walpole, Myers, Myers and Ye.

Prerequisites: MATH 107 (MATH 107H): Analytic Geometry and Calculus II

Course Description: The STAT/MATH 380: Introduction to Probability and Statistics Concepts is the second-level course in “undergraduate statistics and mathematics” sequence. The course provides an introduction to probability concepts, i.e., random variables, probability distributions, expectation, variance, covariance, correlation; and statistical concepts, i.e., fundamental sampling distributions and data descriptions, one- and two-sample estimation and testing problems, and simple linear regression. This course lays the foundation for many 400-level courses in Engineering, Mathematics and Statistics, and is also offered for Honors credit.

ACE Outcome 3: The STAT/MATH 380 course is accredited as Achievement Centered Education (ACE) course and satisfies ACE outcome 3: to use mathematical, computational, statistical, or formal reasoning (including reasoning based on principles of logic) to solve problems, draw inferences, and determine reasonableness. Therefore, the reinforced skill for STAT/MATH 380 is Critical Thinking.

Course Goals: This course will help you learn to think and reason statistically, and to construct arguments based on numerical evidence. My role as the instructor is to facilitate this type of learning by providing you with a variety of meaningful activities and opportunities to learn, as well as creating an environment conducive to learning. This will manifest in a variety of ways: direct instruction, individual practice, exploration and discovery activities, writing, discussions panel. Ultimately, **you are responsible for your own learning**, so please put into the class what you hope to get out of it.

- Students will understand essential theoretical concepts (and logic behind them) including common discrete and continuous probability distributions, sampling distributions and data description techniques, hypothesis testing problems, and modeling approaches.
- Students will be able to recognize a classical distribution model when are presented with details of an experiment, translate a research question into a logical probability statement in terms of a mass/density or cumulative probability function, perform calculations, and comment on the result.
- Students will be able to state a hypothesis testing (or estimating) problem (out of the ones considered in the course) for a given research question, perform testing (construct the corresponding confidence interval) and draw statistical inferences.
- For a given data set, students will be able to fit a simple linear regression model (obtain regression coefficients), provide an equation of a fitted model, interpret the observed relationship in words, and use the model to make predictions.

Course Content: Introduction to Statistics and Data Analysis (sample, population, observational and experimental studies, measures of location and variability, basics of data cleaning, graphical methods and data description)

Probability

Random Variables, Probability Distributions and Expectation

Discrete and Continuous Probability Distributions

Fundamental Sampling Distributions and Data Descriptions (random sampling, key statistics, sampling distributions of a sample mean and sample variance)

One- and Two-Sample Estimation Problems (statistical inference, confidence intervals for the mean, difference between two means, proportion and the difference between two proportions: their derivations and applications)

One- and Two-Sample Testing Problems (statistical hypotheses and their testing, tests for a single mean and the difference between two means: cases with known and unknown variances; large sample tests for a single proportion and the difference between two proportions, applications)

Simple Linear Regression

Course Expectations: In this course, you are expected to have professional behavior. You are expected to listen to all lecture videos, be curious, ask questions, seek opportunities to learn, and be open and responsive to constructive feedback. You are also expected to exhibit a professional demeanor (language, attitude) toward others. Disagreement during discussions is welcome and often productive in developing a deeper understanding of the concepts being discussed. However, disagreement does not warrant yelling or disrespectful language or behavior. Unprofessional behavior will not be tolerated, and appropriate actions will be taken to prevent future occurrences.

Online Lectures: Lecture video and slides will be posted on Canvas at (or before) 12:30 pm on Tuesday and Thursday. Students are expected to make notes to supplement the slides. If a student plans to miss a lecture then he/she should notify the instructor in advance.

| | | | | |
|-----------------|----------|-----|------------|-----|
| Grading: | Homework | 15% | Exam 1 | 20% |
| | Quizzes | 15% | Exam 2 | 20% |
| | | | Final Exam | 30% |

| Grade | Final Percentage Range |
|-------|------------------------|
| A | 94.0-100 |
| A- | 90.0-93.99 |
| B+ | 88.0-89.99 |
| B | 84.0-87.99 |
| B- | 80.0-83.99 |
| C+ | 78.0-79.99 |
| C | 74.0-77.99 |
| C- | 70.0-73.99 |
| D+ | 68.0-69.99 |
| D | 64.0-67.99 |
| D- | 60.0-63.99 |
| F | <60.0 |

Homework: Each student should download/print out and complete each homework assignment, and also take an on-line homework test on Canvas. Answer keys are posted on Canvas after the due date. Students are expected to compare their solutions with the answer keys and discuss their questions and concerns with the instructor or TAs. Homework tests are equally weighted. All assignments should be submitted before the deadline. There is **no makeup possible** for any assignments unless prior arrangements with the instructor have been made.

Quizzes: All quizzes need to be done online on Canvas before the due date. Any missed quiz is given 0 points. All quizzes are equally weighted. There is **no makeup possible** for any quizzes unless prior arrangements with the instructor have been made.

Exams: Three exams will be given during the course: **EXAM1: 12:30pm -1:45pm, Sep. 17 (online); EXAM2: 12:30pm -1:45pm, Oct. 20 (online); FINAL: 7:30am -9:30am, Nov. 25(online).**

Exams are open-book and open-notes. But **NO discussions are allowed**. You are not allowed to share the questions or your answers with anyone. You are expected to take exams at the scheduled times on Canvas. If this is impossible due to extreme circumstances (illness, death in the family, previously scheduled activities vital to academic program), please notify me. **No make-up exams will be given if I am not notified prior to the examination.** You will be required to obtain a note from your physician or adviser explaining the nature of the conflict.

Discussion and Bonus : We will open the discussion panel on Canvas. Each week, we will open a new discussion session. Students are welcomed to ask any questions related to the lecture taught in that week (but should not relate to the homework, quiz, and exams). Students who know the answers are encouraged to answer the questions. In the end of this semester, active students in answering questions in the discussion panel can receive **additional one point** to their final grades.

Department Grade Appeal Policy: Students who believe their academic evaluation has been prejudiced or is capricious have recourse for appeals to, in order: their instructor; the Chair of the Statistics Department; the undergraduate academic grading appeals committee; and lastly, the college grading appeals committee.

Disabilities: Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 404-472-3787.

Academic Integrity: You are encouraged to work together on problems and exercises, but the work you turn in must be your own (unless the assignment specifically states otherwise). Work on exams must be your own (no discussion allowed). University policy will be followed in cases of academic dishonesty:

In cases where an instructor finds that a student has committed any act of academic dishonesty, the instructor may in the exercise of his or her professional judgment impose an academic sanction as severe as giving the student a failing grade in the course. Before imposing an academic sanction the instructor shall first attempt to discuss the matter with the student. If deemed necessary by either the instructor or the student, the matter may be brought to the attention of the student's major adviser, the instructor's department chairperson or head, or the dean of the college in which the student is enrolled.

For additional details see <http://stuafs.unl.edu/ja/code/three.shtml>.

| | | |
|-------------------------|--|---------|
| Important Dates: | Class Begins | Aug. 18 |
| | Last day for late registrations and adds | Aug. 24 |
| | Last day to drop with 100% refund | Aug. 28 |
| | Last day to file a drop to remove course from student's record | Aug. 28 |
| | Exam 1 12:30 PM-1:45 PM | Sep. 17 |
| | Exam 2 12:30 PM-1:45 PM | Oct. 20 |
| | Last Class | Nov. 19 |
| | Final Exam 7:30 AM-9:30 AM | Nov. 25 |

Disclaimer: Information contained in this syllabus was, to the best knowledge of the instructor, considered correct and complete when distributed at the beginning of the term. However, the instructor reserves the right, acting within the policies and procedures of UNL, to make changes in course content or instructional technique without notice or obligation. However, any changes will be explained to the class as a whole including reasons for the change.

TENTATIVE COURSE OUTLINE

Due to the natural variation in the progress of lectures, the schedule is **tentative**.

| Week | Day | Topic | Book Section(s) |
|-------------------------|---------------|--|--|
| August. 17 Week 1 | Tues Thurs | Syllabus, Introduction to Statistics Introduction to Data Analysis | Chapter 1 Chapter 1 |
| August. 24 Week 2 | Tues Thurs | Probability, counting techniques; Probability rules, Conditional probability | Chapter 2.1-2.4 Chapter 2.5-2.6 |
| August. 31 Week 3 | Tues Thurs | Random variables, Discrete distribution Continuous distribution, Joint distribution | Chapter 3.1-3.2 Chapter 3.3-3.4 |
| September. 7 Week 4 | Tues Thurs | Expectation, Variance Linear Combinations of Random Variables, Chebyshev's Theorem | Chapter 4.1, 4.2 Chapter 4.3, 4.4 |
| September. 14 Week 5 | Tues Thurs | Review EXAM 1 (Sep. 17) | |
| September. 21 Week 6 | Tues Thurs | Discrete distributions, Bernoulli distribution Binomial distribution, Poisson distribution | Chapter 5.1, 5.2 Chapter 5.2, 5.5 |
| September. 28 Week 7 | Tues Thurs | Continuous distributions, Uniform, Normal distributions Gamma and Exponential Distribution | Chapter 6.1-6.4 Chapter 6.6 |
| October. 5 Week 8 | Tues Thurs | Sampling Distributions, Sample mean, Sample variance Sampling Distributions of Means, Central Limit Theorem | Chapter 8.1-8.2 Chapter 8.3-8.4 |
| October. 12 Week 9 | Tues Thurs | Sampling Distributions of Sample Variances Review | Chapter 8.5 |
| October. 19 Week 10 | Tues Thurs | EXAM 2 (Oct. 20) Statistical inference, Point estimator, Interval estimator | Chapter 9.1-9.3 |
| October. 26 Week 11 | Tues Thurs | Confidence interval Two-sample estimation | Chapter 9.4-9.5, 9.10 Chapter 9.8, 9.11 |
| November. 2 Week 12 | Tues Thurs | Test of Hypotheses Test on single mean, single proportion | Chapter 10.1-10.3 Chapter 10.4, 10.8 |
| November. 9 Week 13 | Tues Thurs | Tests on two means Simple linear regression, least squares estimators | Chapter 10.5 Chapter 11.1-11.3 |
| November. 16 Week 14 | Tues Thurs | Properties and inference of least squares estimators Review | Chapter 11.4,11.5 |
| November. 23 Week 15 | Wed | FINAL EXAM (Nov. 25) | |

Instructor: Dr. Tefjol Pllaha

Office: 238 Avery Hall, office hours Tuesday 4–5 pm (or by appointment)

Email: tefjol.pllaha@unl.edu

Class Times and Location: TR 11:00–12:15 pm, Avery Hall – Room 118.

Optional Text Book: *Contemporary Abstract Algebra*, 10th edition by Joseph A. Gallian.

Our primary source will be lecture notes provided by the instructor and worksheets, but the text will be helpful as a secondary resource to enhance your understanding.

ACE 10: This course satisfies ACE (Achievement-Centered Education) outcome 10, with which the learning outcomes include *the ability to generate a creative or scholarly product that requires broad knowledge, appropriate technical proficiency, information collection, synthesis, interpretation, presentation, and reflection*.

Course Description: The primary goal of this course is to understand groups, whatever they are. This course will be inquiry-based, meaning that there will be very little conventional lecturing. Rather, we will explore known objects – such as an equilateral triangle or Rubik’s cube – and try to discover associated features. The course will also be somewhat flipped, meaning that, often, you will have preparatory readings ahead of class time, which will then be used as a base for worksheets.

Grades: Grades for the course will be computed as follows:

| | |
|----------|-------------|
| Homework | 50% |
| Midterms | 30% (2×15%) |
| Final | 20% |

Guaranteed grade cutoffs are below; these may be lowered based on the course difficulty.

A 93 % A- 89 % B+ 85 % B 81 % B- 78 % C+ 74 % C 70 %

To be successful in this course, plan to budget at least 6 hours of work outside of class weekly.

Homework: There will be weekly homework assignments. The purpose of the homework is to simultaneously deepen and complement concepts discussed in class. The homework will be graded for logic, ability to reason abstractly and the rigorous presentation of your arguments, but also for clarity and appropriate use of language, including full sentences. Collaboration among students in this class on homework is not only allowed, but encouraged as the best way to come up with a solution and to understand it is to explain it to your peers and get their feedback. However, each student is required to turn in their own assignment, written in a way that indicates their individual understanding of the solutions. The (one) lowest homework score will be dropped.

Any student who posts homework questions online or turns in solutions to homework that are taken from any source outside of class material will be charged with academic dishonesty. Identical (or nearly identical) homework will receive 0.

Worksheets: Most class periods we will be working in groups using worksheets. It is your responsibility to take individual notes based on class work.

Midterm Exams: There will be two midterm exams. Makeup midterms are only allowed for reasons limited to serious illness or travel to university approved events. Proof of these circumstances will be required. The *tentative* dates for the midterm exams are

Thursday, October 6 and Thursday, November 10.

Final Exam: The final exam is cumulative. Students are expected to arrange their personal and work schedules to allow them to take the final exam at the scheduled time. Our final exam is on

Wednesday, December 14, 3:30 – 5:30 pm

Course schedule The following table shows the material expected to be covered each week and the important academic schedule events. The numbers in parentheses refer to corresponding sections of the optional textbook. Note that what is shown below is *tentative and subject to change*. Please be alert for changes. Any changes will be announced in class.

| Date | Chapter covered |
|--|---|
| Week of August 22 | Introduction to Groups (Chap. 1) |
| Week of August 29 | Groups (Chap. 2) |
| <i>Friday, September 2 is the last day to remove a course from a student's record.</i> | |
| Week of September 5 | Finite Groups and Subgroups (Chap. 3) |
| Week of September 12 | Cyclic Groups (Chap. 4) |
| Week of September 19 | Group homomorphisms, Isomorphisms (Chaps. 10 & 6) |
| Week of September 26 | Permutation Groups and Cayley's Theorem (Chaps. 5 & 6) |
| Week of October 3 | Exam 1: Thursday, October 6 |
| Week of October 10 | Cosets and Lagranges Theorem (Chap. 7) |
| <i>Friday, October 14 is the last day to change the grading option to Pass/NoPass.</i> | |
| <i>October 17–18 Enjoy Fall break!</i> | |
| Week of October 17 | Normal Subgroups and Factor Groups (Chap. 9) |
| Week of October 24 | Isomorphism Theorems (Multiple Chapters) |
| Week of October 31 | External Direct Products (Chap. 8) |
| Week of November 7 | Exam 2: Thursday, November 10 |
| <i>Friday, November 11 is the last day to withdraw from the course.</i> | |
| Week of November 14 | Fundamental Theorem of Finite Abelian Groups (Chap. 11) |
| <i>November 23–25 Enjoy Thanksgiving break!</i> | |
| Week of November 28 | Group Actions (Notes) |
| Week of December 5 | Applications (Notes) |
| The Final Exam is 3:30 – 5:30 pm on Wednesday, December 14. | |

Course Evaluations: The Department of Mathematics course evaluation form will be available through Canvas during the last two weeks of class. Evaluations are anonymous and instructors do not see the responses until after final grades have been submitted. Evaluations are important – the department uses them to improve instruction. Please complete the evaluation and take the time to do so thoughtfully.

Grading Appeals Policy: The Department of Mathematics does not tolerate discrimination or harassment on the basis of race, gender, religion, or sexual orientation. If you believe you have been subject to such discrimination or harassment, in this or any other math course, please contact the department. If, for this or any other reason, you believe your grade was assigned incorrectly or capriciously, then appeals may be made to (in order) the instructor, the vice chair, the Department grading appeals committee, the College of Arts and Sciences grading appeals committee, and the University grading appeals committee.

Students with Disabilities: Students with disabilities are encouraged to contact me for a confidential discussion of their individual needs for academic accommodation. It is the policy of UNL to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office in 117 Louse Pound Hall.

UNL Course Policies and Resources: Students are responsible for knowing the university policies and resources found on this page <https://go.unl.edu/coursepolicies>:

- University-wide Attendance Policy
- Academic Honesty Policy
- Services for Students with Disabilities
- Mental Health and Well-Being Resources
- Final Exam Schedule
- Fifteenth Week Policy
- Emergency Procedures
- Diversity & Inclusiveness
- Title IX Policy
- Other Relevant University-Wide Policies

Math 428/828 Course Outline

Instructor: Steve Cohn (Avery 226, scohn@unl.edu)

Text: *Introduction to Operations Research*, 9th Edition, by F. Hillier and G. Lieberman. (**Note:** This book and the solutions manual is available at various sites as a free pdf file. You can also find inexpensive used hardcover copies. You do **not** need the additional online material that comes with new copies.)

Office Hours: Monday 2:30-3:20, Thursday 10:00-10:50 and by appointment.

Time and Place: 12:30-1:20 pm, Monday, Wednesday and Friday, in Avery 119.

Prerequisites: The nominal prerequisites are Math 314 and Math/Stat 380. To follow the lectures, you'll need calculus, linear algebra and basic probability.

Course Log: This is a daily course log in the Canvas/Files folder. If you miss class, you can check the update to find which topics and sections were covered, announcements, changes to the syllabus, etc.

ACE Outcome: Math 428 satisfies ACE outcome 10: Generate a creative or scholarly product that requires broad knowledge, appropriate technical proficiency, information collection, synthesis, interpretation, presentation, and reflection. The scholarly product will consist of oral and written group project reports. Your instructor will provide you with background material and guidance when needed.

UNL Covid Policies and Updates can be found here.

UNL Policies and Resources for

- Attendance,
- Academic Honesty,
- Services for Students with Disabilities,
- Mental Health and Well-Being,
- Final Exams (15th Week),
- On Campus Emergency Procedures,
- Diversity and Inclusiveness,
- Title IX,

can be found here.

Special Dates: Some dates to bear in mind are:

- The last day to file a drop to remove a full semester course from student's record is **January 28**.
- The last day to change your grade option to or from **Pass/No Pass** is **March 11**. If you choose the Pass/No Pass grading option, you need to earn a C or better in order to pass.
- The last day to **withdraw** from the course is **April 15**.

You can find more detail here.

Course Evaluation: The Department of Mathematics Course Evaluation Form will be available through your Canvas account during the last two weeks of class. You'll be notified when the form is made available. Evaluations are anonymous and instructors do not see any of the responses until after final grades have been submitted. Evaluations are important—the department uses evaluations to improve instruction. Please complete the evaluation and take the time to do so thoughtfully.

Course Outline: We'll try to cover all or part the following topics and sections:

- Formulation of Linear Programs: Sections **3.1, 3.2, 3.4, 3.5**
- Solution of Linear Programs: Sections **4.1-4.7**
- Theory of the Simplex Method: Sections **5.1-5.3**
- Duality, Sensitivity Analysis and the Simplex Method: Sections **6.1-6.5**
- Dynamic Programming: Sections **10.1-10.4**
- Queueing Theory: Sections **17.1-17.6**

Additional Material: In the unlikely event that we have time left over, we will choose additional material from these sections:

- Integer Programming: Sections **12.1-12.5**
- Inventory Theory: Sections **18.1-18.6**
- Decision Analysis: Sections **16.1-16.4**
- Simulation: Sections **20.1-20.5**

Math 828 Students in 828 will be graded on the same as those in 428, but should expect longer and more demanding exams and homework and project assignments.

Project: There will be a project, possibly broken into up into two or more parts. You may work on the project alone or in a group of at most three students.

Midterms: We'll have three 100-point midterms. The tentative dates are **February 23, March 23** and **April 27**. The tests will be given in class. Exam problems will be based *mostly* on the homework, lectures and assigned reading.

Final Exam: A 200-point, comprehensive final exam will be given **3:30 - 5:30 PM on Monday, May 9**. Students are expected to arrange their personal and work schedule to allow them to take the final exam at the scheduled time. No student will be permitted to take the final exam early.

Missed Exams: If you must miss a midterm because of UNL-mandated activities, injury or illness, you may be allowed to make it up. The rules governing makeups are:

- You must provide documentation.
- A request to make up a midterm can be made no later than 10:00 am on the day of the midterm.
- A missed exam that is not made up receives a score of zero.
- The foregoing rules may be suspended in the event of an emergency or extended crisis or illness.

Calculators: You may use a simple scientific calculator during an exam, but nothing else. In particular you **may not** use a graphing or programmable calculator, or any internet-enabled device. This includes smart phones and smart watches. For homework and the project, you may use any software and any device.

Homework: The facts and policies are:

- Homework will be assigned regularly. You are responsible for all assigned problems, though only a few in each week will be collected for grading. Exam problems will be based mostly on the homework.
- There are free **solutions manuals** in pdf form available online, as well as inexpensive paper copies. Even if you take a solution from a such a written source, I urge you to work the problem yourself. That is the best way to learn the material and prepare for exams.
- To receive full credit for a homework problem, you must have a correct, **clearly written** solution that is supported by appropriate work. A poorly written solution earns you one point at most. The point will be awarded if the answer is correct and supported by sufficient work.
- Late homework will not be accepted.
- You may be excused from a homework assignment because of illness, injury, some personal or family crisis, etc. I may ask for documentation.

Semester Grades: Your semester grade depends on your three midterms, the final, the project and the homework.

| Activity | Value |
|--------------|-------|
| Midterms | 300 |
| Final Exam | 200 |
| Project | 100 |
| Homework | 100 |
| Total | 700 |

Letter grades correspond to percentages as follows:

| | | | | | | | | | | | | |
|--------------|----|----|----|----|----|----|----|----|----|----|----|----|
| Percentage | 96 | 90 | 88 | 86 | 80 | 78 | 76 | 70 | 68 | 66 | 60 | 58 |
| Letter Grade | A+ | A | A- | B+ | B | B- | C+ | C | C- | D+ | D | D- |

Grading Appeals: Students who believe their academic evaluation has been prejudiced or capricious have recourse for appeals in order, to: their instructor; the Chair of the Mathematics Department; the Mathematics Department grading appeals committee; and lastly, the College grading appeals committee.

Class Times and Location: MWF 2:30 - 3:20 p.m. in Brace Laboratory.

Professor: Richard Rebarber, Avery 330, rebarber@unl.edu. If you have any questions, e-mail me to make a Zoom appointment (you can also contact me through Canvas email). Also, I'll be available after most class periods.

Teaching Assistants: Lawrence Seminario-Romero (lseminario-romero2@huskers.unl.edu), Stephen Becklin (sbecklin2@huskers.unl.edu)

Prerequisites: Two of MATH 221, MATH 221H, MATH 314, MATH 314H, RAIK 270H, STAT 380. This semester Math 221 (or any introductory differential equations class) will be especially useful.

Course Documents: All Course Documents will be kept on Canvas.

Textbook: We will occasionally use *An Introduction to Mathematical Epidemiology* by Maia Martcheva. This book is available on Canvas, and also for download at the UNL Libraries website.

Course description: This semester in Math In The City we will focus on modeling infectious diseases, especially COVID-19. Approximately the first six weeks of the course will consist of lecture, homework and in-class activities designed to get you comfortable with epidemic modeling. During the rest of the course you will be doing a group project.

Journals: There are electronic files that you will continuously update throughout the semester. A template will be provided and you will submit your journals electronically every Monday starting January 24. During the first part of the course you will use your Journal entries to let us know what material you have questions about - if you don't have any questions, say so. Once we start the projects, your Journal entries will give details about what work you personally did on the project; we will use this part of the journals to determine your project participation.

Homework: During the first half of the course, there will be occasional homework assignments. You are encouraged to discuss the problems with your colleagues and instructors, but you have to write up anything you hand in by yourself. Sometimes homework will be done in class so you can talk to us and your fellow students. You are expected to upload a clear file (PDF, JPEG, or PNG) with organized and clean work. Usage of an app to scan your work is recommended, for example, Microsoft Office Lens or Evernote Scannable are free. A sloppy, convoluted work that is not readable for grading may (shall) be returned without grades and you need to arrange for a resubmission.

Project: Around 6 weeks into the semester, the class will work together to formulate some projects, and you will choose which project you wish to work on. You and your group will be to find references and learn material that is specific to your project, and to find relevant data. We will be available to answer questions and give suggestions. About two weeks before the project is due, you will hand in a rough draft so that we can give you pointers about how to improve the report.

Final Report: Part of understanding advanced concepts and doing research is describing these concepts and that research in writing. Therefore, the quality of your written exposition will be graded. Guidelines for good technical writing will be discussed in class. The Final Report

will be due Wednesday of Finals Week. The grade on the Final Report will be the same for all members of a group. The project participation grade may vary between members of a group.

Data: Most of the projects will use data. There is a huge amount of data that is publicly available, and part of the project will be to find and use relevant data.

Technology : You are allowed to use any software/programming language. You will write your reports in LaTeX, using the online environment Overleaf so that everybody in your group can work on the same file easily. We will provide LaTeX training.

During the second half of the semester, it might be helpful to bring a laptop to class. During the first half of the semester I might suggest bringing your laptop to some classes.

Do not use cellphones or other technology in class unless you are looking up information relevant to projects.

Final presentation: During Dead Week we will have a mini-conference where all groups can present their work. This will be advertised in the Math and Biology Departments, and will be open to anybody who is interested. Each group will be given 30 minutes to present their work. Taking part in the group presentation is compulsory and you are expected to adjust your schedule accordingly. Please attend the talks from the other groups if you can. Later in the semester details about what should be in the presentation will be given.

Illness Policy: If I cannot come in for class because of illness, I will give the class via Zoom (I'll send a link via email) or ask Lawrence and/or Stephen to take over.

If you cannot attend class because of illness *before* we start working on projects, please use the detailed written course material (notes, description of class activities) that will be on Canvas. Also, make sure you let me know if you miss a class, so I can give you a rundown of what you missed. If you have trouble with any of the material, find a time to Zoom with me, Lawrence or Stephen.

If you cannot attend class because of illness *after* we start working on projects, if you're feeling well enough you should Zoom in to your group meetings.

Grading: Grades for the course will be computed as follows:

- Homework = 25%
- Final project report = 25%
- Project participation = 20%
- Final presentation = 22%
- Attendance and Class Participation = 8%

University Policies: Policies on Academic Honesty, Services for Students with Disabilities, Mental Health and Well-Being Resources, Inclusiveness, and Title IX can all be found at <https://executivevc.unl.edu/academic-excellence/teaching-resources/course-policies>. You can ignore the parts about the Final Exam, since we don't have a Final Exam.

Course Evaluation: The Department of Mathematics Course Evaluation Form will be available through your Canvas account during the last two weeks of class. You'll get an email when the form becomes available. Evaluations are anonymous and instructors do not see any of

the responses until after final grades have been submitted. Evaluations are important - the department uses evaluations to improve instruction. Please complete the evaluation and take the time to do so thoughtfully.

ACE Outcome: This course satisfies ACE Outcome 10.

- Generate a creative or scholarly product that requires broad knowledge, appropriate technical proficiency, information collection, synthesis, interpretation, presentation, and reflection.

The outcome objectives will be demonstrated by a written report, an oral presentation, group meetings, and assignments or quizzes. The lectures and group meetings will provide the skills necessary for these assignments. Anonymous copies of your group written project and a sampling of journal entries will be kept as examples of the scholarly product that requires broad knowledge, appropriate technical proficiency, information collection, synthesis, interpretation, presentation, and reflection.

ACCOUNTING 201

INTRODUCTION TO FINANCIAL ACCOUNTING

Spring 2019

OBJECTIVE

This is not a math class. It is true that accounting relies heavy on numbers however; the math is generally limited basic algebra. Accounting is an information system and as Warren Buffet is fond of saying the *language of business*. This course introduces the fundamentals, concepts, and terminology of accounting and financial reporting for businesses. This will help you learn where the numbers come from; thereby enabling you to analyze and interpret accounting information to make decisions. By the end of the term, you should:

- Understand the role, purpose, and importance of accounting in business and society;
- Have developed skills required to prepare and analyze basic financial accounting information;
- Have developed an ability to apply accounting skills and concepts to various accounting settings;
- Understand ethical issues, evaluate and apply actions in response to ethical issues.

REQUIRED

For this course, you will be required to purchase McGraw-Hill Education Connect® access for *Financial Accounting*, Fourth Edition, Spiceland/Thomas/Herrmann. You may choose not to buy a print text since Connect contains the full online textbook. However, I highly recommend you purchase the print version. Connect is included with the purchase of a new textbook, but must be purchased separately if you buy a used book. Purchase or activate your Connect account online directly from the course page in CANVAS by clicking on the first assignment. You will be prompted to either log in with an existing Connect account username and password, or to create a new account. Then enter your access code, purchase access online or begin your **14-day Courtesy (Free) Access period**. Once you have completed your selection, you will arrive at the start of your first Connect assignment.

INSTRUCTOR

Dr. Steven Hegemann, DPS, CPA, CFE

Office: CoB 435E
Office Phone: 402-472-4211
E-mail: shegemann4@unl.edu

The best way to reach me is via e-mail (when e-mailing please indicate which class section you are in).

Office Hours

- Monday and Wednesday 10:30 – 12:00 and 13:00-14:00
- Friday 10:30 – 11:30
- Make an appointment via email

TEACHING ASSISTANT

Fares Afshoon Kar

Office: 445A
E-mail: fares.afshoonkar@gmail.com
Office Hours: Monday and Wednesday 10:30 – 12:00
Tuesday 10:45 – 12:00

Tutors

Samantha Kaus(samkaus1999@gmail.com), Edmond Liu(edmondliu13@yahoo.com) and/or Grace Corrigan (gracec1112@gmail.com) will attend classes, have office hours to answer questions and lead a review session each week.

| Tutor | Last | Class | Review Day | Review Time | Review Room | Office Day | Office Time | Office Room |
|--------|----------|----------|------------|-------------|-------------|------------|----------------------------|-------------|
| Samee | Kaus | MWF 9:30 | Fri | 10:30-11:30 | 18 | T/R | 9:30-12 | 19 |
| Edmond | Liu | MWF 7:30 | Wed | 11:00-12:00 | 10 | MWF | 11:00-1:00 | 23 |
| Grace | Corrigan | MWF 9:30 | Mon | 3:00-4:00 | 10 | M/T/F | 4:00-5:00/12-2/10:30-12:30 | 21 |

An exam review session will be held the Sunday prior to the exam from 7-9PM in CoB 002.

Be sure to work your homework on paper before the office hours so the mentors can see what you have done.

BETA ALPHA PSI (BAP) Tutoring Lab

The Tutoring Lab for Accounting 201 students is in the Teaching and Learning Center. The Lab is staffed by accounting and finance honor society members who have expertise in financial accounting. They are available to help you with homework and practice problems. Hours and location will be posted on Canvas.

CANVAS DISCUSSION BOARD

Students should use the CANVAS Discussion Board to ask general and homework questions. **Ask your homework questions on Discussion Board rather than email.** My assistants and I will monitor the Discussion Board on all weekdays. Students should feel free to share insights on questions posted. If you have a question, look at the Discussion Board where you might find someone else has previously asked the same question and there is an answer. **I will not answer homework questions via email.**

COURSE GRADE

I do not round grades. Grades will be assigned as follows:

| | | |
|-----------------|------------------|------------------|
| 97.5- 100% = A+ | 92.5 – 97.5% = A | 90 – 92.5% = A- |
| 87.5 – 90% = B+ | 82.5 – 87.5% = B | 80 – 82.5% = B- |
| 77.5 – 80% = C+ | 72.5 – 77.5% = C | 70 – 72.5% = C- |
| 67.5 – 70% = D+ | 62.5 – 67.5% = D | 60 – 62.5 % = D- |

GRADING

| | |
|--|-------|
| Examinations (4 equally weighted) | 67.5% |
| Connect Learn Smart | 5.0% |
| Connect Homework | 10% |
| Connect Quizzes | 10% |
| Great Adventure Continuing Problem | 5.0% |
| Professional Behavior and Class Attendance | 2.5% |
| | 100% |

Students are expected to attend all classes, take all examinations at the scheduled times and complete all assignments on time. *Late assignments are not accepted.*

EXAMINATIONS (67.5% of your final grade)

Examinations will consist of problem and theory questions in a multiple-choice format. Exams are based on the material in the textbook, assignments, class discussions, and lectures. Assignments are intended to provide examples to develop your working skills, but they cannot represent all the problem situations you may encounter on examinations. There are 4 exams including the final. They are all equally weighted. Although the exams are not specifically designed to be comprehensive, because of the nature of accounting and the material covered they will effectively be comprehensive.

Exams 1, 2, 3 are given on Wednesday nights. All students will be provided an answer sheet and calculator to complete each of the multiple-choice exams. Exams are not given in the regular classroom. Exam room assignments will be posted on CANVAS. You may NOT use your phone as a calculator or your personal calculator. If you use any outside material (including a calculator) your exam will be confiscated and you will receive a 0% for the exam.

Make-Up Exams – My teaching assistant **Fares Afshoon Kar** coordinates the exams and make-up exams. You may contact his via e-mail: fares.afshoonkar@gmail.com.

Make-up examinations will be given only to those students with a **documented university-approved excuse** as follows:

1. Participation in authorized university activities as an official representative of the university (e.g., sporting events, delegate to regional or national meetings or conferences, participation in and necessary travel to and from university-sponsored performances);
2. Participation in activities directly related to university course work and part of the course requirements;
3. Medical issues;
4. The death of an immediate family member.

Students qualifying for the make-up exam must fill out a "Request for Makeup Exam" form found in CANVAS at least **one week in advance** (or as reasonable) and email it to my teaching assistant Fares Afshoon Kar. **Failure to take an exam at the regularly scheduled time for any reason other than the above-mentioned documented university-approved excuses will result in an exam score of zero.**

LEARN SMART (5% of your final grade) – Completed in Connect

These assignments require you to read chapter material and answer associated questions. Each chapter should require approximately between 1 and 1.5 hours to complete. Learn Smart assignments are typically due prior to the chapter's material being covered in the classroom. The best nine (9) Chapter Learn Smart assignment grades will be included in your final grade. This will protect you against any last-minute technical issues that may prevent you from completing your assignment on time.

CONNECT – HOMEWORK (10% of your final grade) – Completed in Connect

You are allowed unlimited attempts and three (3) ‘Check My Works’ per question, this ensures the maximum learning opportunity as well as maximum points. Your highest score is used for grading purposes. Most of the questions are from the end of the textbook chapters. Students will see their total scores, question response with scores, correct or incorrect indicators and explanations after each attempt. Study attempts are available after the due date. Reworking the questions can be used to better learn the material in preparation for exams. However, study attempts worked after the due date will not count towards your grade. Only the best nine (9) homework grades will be included in your final grade. This will protect you against any last-minute technical issues that may prevent you from completing your assignment on time.

CONNECT - QUIZZES (10% of your final grade) – Completed in Connect

You are allowed two (2) attempts and one (1) ‘Check My Works’ per problem. Your highest score is used for grading purposes. Most of the exercises and problems are algorithmically generated version of the homework, which means that each student will have unique numbers as correct answers. Quizzes require you to demonstrate you have mastered the material covered in the homework. After the due date, students can click on the green key (show correct answer) icon. Only the best nine (9) quiz grades will be included in your final grade. This will protect you against any last-minute technical issues that may prevent you from completing your assignment on time.

GREAT ADVENTURES CONTINUING PROBLEM (5.0% of your final grade) – Completed in Connect

The Great Adventures Continuing Problem progresses from chapter to chapter, encompassing accounting issues introduced throughout the semester. This problem allows students to see how each chapter’s topics can be integrated into the operations of a single company. You are allowed unlimited attempts and three (3) ‘Check My Works’ are available on the Great Adventures assignments. None of the Great Adventure grades is dropped.

PROFESSIONAL BEHAVIOR AND CLASS ATTENDANCE (2.5% of your final grade)

By enrolling in this class, you are demonstrating your desire and intent to join the professional community. With that in mind, I expect you to conduct yourself in a professional manner at all times. That includes, but is not limited to, always showing respect to others, showing up to class on time, being prepared for class when you do arrive and contributing to classroom discussions.

2.5% of your grade will be awarded based on your professional behavior. This grade is primarily based on class attendance. A seating chart will be circulated the second week of classes. It is important to sit in your assigned seat or you will be counted absent. **Phones, laptops, smart watches or other personal electronic devices are not allowed to be used during class.** Academic studies have shown that students who use laptops or phones during class retain less information and perform worse on exams than students who do not use them. Those who **have electronic devices out**, arrive late, leave early, chat with classmate or otherwise disrupt class will be counted as absent for the day and have points deducted.

EXTRA CREDIT OPPORTUNITIES - No extra credit points are available so please do not ask.

ACCOUNTING MAJOR REQUIREMENTS Accounting majors will not be allowed to attempt an ACCT course more than twice (repeats and withdrawals). Students who do not achieve the required grade for progression on their second attempt will be administratively changed to BSAD majors. Non-accounting major students with more than two repeats and/or withdrawals in an ACCT course will not be allowed to declare accounting as a major.

All students will not be allowed to attempt a 300- or 400-level accounting course more than twice.

Students may petition the School of Accountancy Undergraduate Curriculum Committee in writing to take an ACCT course a third time. Petitioning does not guarantee permission.

CONNECT – TECHNICAL SUPPORT

If having trouble registering or accessing Connect, please contact McGraw-Hill's Customer Support for the fastest help. Live chat, email, and phone support are available almost every hour of the day.

Website: www.mhhe.com/support

Phone: (800) 331-5094

Hours (EST)

Sunday: 12 PM - 12 AM

Monday - Thursday: 24 hours

Friday: 12 AM - 9 PM

Saturday: 10 AM - 8 PM

CBA POLICY ON ACADEMIC INTEGRITY

In the accounting field the perception of integrity and honesty are what will determine your career success or failure. Be mindful of your integrity as you prepare assignments and take exams. Per the UNL Student Code of Conduct: "The maintenance of academic honesty and integrity is a vital concern of the University community. Any student found guilty of academic dishonesty shall be subject to both academic and disciplinary sanctions".

A. Academic dishonesty includes, but is not limited to, the following: Copying or attempting to copy from an academic test or examination of another student; using or attempting to use unauthorized materials, information, notes, study aids or other devices for an academic test, examination or exercise; engaging or attempting to engage the assistance of another individual in misrepresenting the academic performance of a student; communicating information in an unauthorized manner to another person for an academic test, examination or exercise; plagiarism; tampering with academic records and examinations; falsifying identity; aiding other students in academic dishonesty, and other behaviors in the student judicial code of conduct, Article III section B (stuafs.unl.edu/dos/code)

B. The penalties for academic dishonesty will be severe, and may range from receiving a failing grade on the test or assignment, failing the course in which academic dishonesty took place, or the possibility of expulsion from the university. Faculty will report all cases of academic dishonesty to the Dean of Students at UNL, who will place a report in the student's permanent file. A file of academic integrity violations will also be maintained by the College of Business.

ACCOUNTING 201 - STATEMENT OF ETHICS AND ACADEMIC INTEGRITY

Academic dishonesty of any kind will **not** be tolerated. **Cheating means an F in the class.** The following steps will be taken when academic dishonesty is suspected:

- Meet with instructor to discuss the misconduct
- If suspicions are warranted, you will fail the course and an Academic Honesty Report will be filed with the Dean of Student. I will also notify:
 - School of Accountancy Director
 - Department Chairperson applicable to student
 - Assistant Dean of the College of Business
 - College of Business Advising Office

Academic dishonesty includes, but is not limited to

- Copying or attempting to copy (in whole or in part) from another student's assignment.
- Allowing a student to copy or attempt to copy (in whole or in part) from your assignment.
- Copying (in whole or in part) from the solutions manual (by hand or electronically).
- Using or attempting to use unauthorized materials (including calculators) or notes during an examination or quiz.
- Sharing information during an examination or quiz.
- Talking during an exam.
- Copying from or unauthorized sharing of homework assignments.
- Helping or attempting to help another student to commit an act of academic dishonesty.
- Attempting to take credit for the intellectual creation of others as one's own work.
- Fabricating an excuse (such as illness, injury, accident) in order to avoid or delay timely submission of any graded assignment or exam.
- Leaving an exam, exam review, or office hours with any exam material. You are not allowed to keep or copy exams. You may review your past exams in my office during office hours or by appointment.
- Giving or receiving information about a test, quiz or assignment to other students.

"There's plenty of ways you can make money in business doing the right thing. You don't need to look to do the wrong thing"
Bernard Madoff

HOW TO SUCCEED IN ACCOUNTING 201:

Accounting is a demanding course and experience has shown that for students to perform at their best, they should study a minimum of eight to ten hours each week outside of class. Regular study time is important, as well as proper preparation for class.

- **Study accounting at least one (1) hour every day.**
- **Attend class, pay attention, be prepared and take notes.**
- **Ask questions in class.** If you have a question, chances are other students have the same question.
- **Do not be afraid to struggle with homework.** Plan to struggle as you work out the homework. Do not email classmates or me if at first you do not succeed. You will learn more if you struggle to figure answers for yourself.
- **Discussion Board.** Use the Discussion Board to ask questions or see if another student has already had the same question.
- **Do not wait until the last hour to complete your online assignments.** Assignments are due at 10:59 PM. Do not procrastinate. There have been occasions when CANVAS and/or CONNECT were down when an assignment was due.
- **Keep up – do not cram.** There is no time to catch up if you fall behind in this course. You must make a commitment to yourself on day one. Doing this will allow you to pick up on the intricacies of the material in class, rather than just struggling to follow along.
- **Ask for help if you need it.** Please see me or one of my assistants as soon possible if some of the material is just not sinking in. There is no time to come back to it later, as we must move through the material very quickly. Most of what we cover at the beginning of the course is a foundation for later chapters. You must understand those concepts early on, and you must understand them well. Take advantage of the Peer Mentors, Beta Alpha Psi tutoring labs, and exam review sessions.
- **Form study groups outside of class.** (Study group does not mean copying one another's work!)

COMMON COURTESIES

- **Cell phones.** Turn off cell phones before class begins and put them out of sight. **Be professional!**
- **Personal electronic devices.** Personal electronic devices are not allowed in the classroom. This means any device that a student is in possession of which electronically communicates, sends, receives, stores, reproduces or displays voice and/or text communication or data. These include, but are not limited to cell phones, smart watches, gaming devices, tablets, iPads, and laptop computers.
- **Tardiness.** Please avoid disrupting the class by coming in late. We keep very busy in class, and begin right at the scheduled start of class. Announcements given at the beginning of class will not be repeated. **Be professional!**
- **Early Exits.** You are expected to stay for the entire class period. If you must leave before the end of the scheduled class time, please see the instructor before class begins. **Be professional!**
- **Talking.** Do not chat with your neighbor, as your chatter is annoying to other students. After one warning, you will be asked to leave the classroom. **Be professional!**
- Socialism always leads to starvation and genocide.

STUDENTS WITH DISABILITIES

UNL policy provides flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. Students with disabilities who anticipate the need for course accommodations should, during the first week of class, contact the Services for Students with Disabilities (SSD) office, so I can implement appropriate accommodation measures immediately. I will provide accommodations whenever requested, however, accommodations are not retroactive. To receive accommodation services, students must be registered with SSD. Students requiring course accommodations should use the following resources to develop suitable accommodation plans:

- a) Office of Services for Students with Disabilities, 232 Canfield Administration Building, 402-472-3787 voice or TTY, or;
- b) ADA/504 Compliance Officer, 209 Teachers College Hall, 402-472-8404.

GRADE APPEALS/CHANGES

You are responsible for checking your grades on CANVAS/CONNECT on a regular basis. If you believe an error has been made in grading or recording an assignment/exam, you must submit to the instructor a written request for review within three class days of the date the assignment/exam score was made available. Any requests made after this time cannot be considered.

“Be a really useful engine.” Sir Topham Hatt

“Don’t hurt people and don’t take their stuff.” Matt Kibbe

“For age and want save while you may, no morning sun lasts a whole day.” Benjamin Franklin

“Money can’t buy happiness, but it can buy me a boat.” Chris Janson

“Alles hast ein Ende, nur die Wurst hat zwei.” Ancient Germanic Proverb

COURSE SCHEDULE (subject to change)

| Week of: | TOPICS | |
|--|---|---|
| Before 1st Class | Review Syllabus Chapter 0: Pre-class Review Material (Optional) | Go onto CANVAS/CONNECT and review syllabus and class requirements. Get required materials. The assignment section in CANVAS will automatically link you to CONNECT NOTE: Chapter 0 is optional in Connect. However, it can be used to replace your next lowest homework score. |
| Jan 7th | <i>Introduction! Ask me Anything!</i> | |
| | Chapter 1: A Framework for Financial Accounting Great Adventures <i>Review of CANVAS &CONNECT</i> | Read text. See Canvas for assignments. Read Great Adventures continuing problem p. 49 |
| Jan 14th | Chapter 2: The Accounting Cycle: During the Period | Read text. See Canvas for assignments. |
| Jan 21th | Jan 21st Martin Luther King DAY – NO CLASSES | |
| | <i>Continue Chapter 2</i> | |
| Jan 28th | Chapter 3: The Accounting Cycle: End of the Period | Read text. See Canvas for assignments. |
| Feb 4th | <i>Review and catch up on any remaining items.</i> | |
| EXAM #1 | Wednesday February 6th EXAM 1: CH 1 – 3; 6:00 – 7:30 PM (Exam rooms posted on CANVAS) | |
| Feb 11th | Chapter 4: Cash and Internal Controls | Read text. See Canvas for assignments. |
| Feb 18th | Chapter 5: Receivables and Sales | Read text. See Canvas for assignments. |
| Feb 25th | Chapter 6: Inventory and Cost of Goods Sold | Read text. See Canvas for assignments. |
| Mar 4th | <i>Review and catch up on any remaining items.</i> | |
| EXAM #2 | Wednesday March 6th EXAM 2: CH 4 – 6; 6:00 – 7:30 PM (Exam rooms posted on CANVAS) | |
| Mar 11th | Chapter 7: Long-Term Assets | Read text. See Canvas for assignments. |
| Mar 18th | March 17 – 24 Spring Break – NO CLASSES | |
| Mar 25th | Chapter 8: Current Liabilities | Read text. See Canvas for assignments. |
| Apr 1st | Chapter 9: Long-Term Liabilities App C: Time Value of Money | Read text. See Canvas for assignments. |
| Apr 8th | <i>Review and catch up on any remaining items.</i> | |
| Exam #3 | Wednesday April 3rd EXAM 3: CH 7 – 9, APP C; 6:00 – 7:30 PM (Exam rooms posted on CANVAS) | |
| Apr 15th | Chapter 10: Stockholders' Equity | Read text. See Canvas for assignments. |
| Apr 22th | Chapter 11: Statement of Cash Flows | Read text. See Canvas for assignments. |
| Apr 29th | FINALS WEEKS | |
| May 1st Final Exam | FINAL EXAM – Wednesday May 1st 6:00 – 8:00 PM (Exam rooms posted on CANVAS) | |

Accounting 202: Introductory Accounting II

Instructor:

Jina Morris, CPA, MPA
Office Location: HLH 435F

Email Address: jmorris7@unl.edu

Office Hours: 1:00- 3:15 Mondays & Wednesdays and 11:30-12:30 on Fridays

I check my email regularly during the day. I do not check my email regularly during nights and weekends.

Teaching Assistant

Bailey Gardner

Email Address: bgardner814@aol.com

Office Hours: TBA

Options for Assistance

There are organized study sessions each week led by multiple helpers. It is important to remember that there are many assistance options available. Ask for help when you first begin to feel 'lost', before you get too far behind. Remember you can contact me any time with any questions you may have. The following are other resources available to you.

Free College of Business Tutoring

Grace Corrigan is an upper-level accounting student that will be working with the Teaching and Learning Center as a tutor. Tutors are students identified by faculty who are available to clarify concepts covered in class and aid in preparing for assignment submissions and exam completion. All sessions are free and can be scheduled through the Teaching and Learning Center.

Beta Alpha Psi Tutoring Labs

The accounting honorary society conducts one-on-one tutoring labs each Monday-Friday. Upper-level accounting students staff the labs. The tutors have access to the textbook and solutions manual and should be able to help you with specific homework questions. The tutoring lab schedule will be announced soon.

Tutoring labs begin the third week of the semester and continue through dead week.

Prerequisites

To enroll in this course you must have completed a minimum of 26 credit hours, have at least a 2.5 cumulative GPA AND have completed Accounting 201 with a grade of "C" or better. The accounting department will review your records. If you do not meet all the prerequisites, you should drop the course on a timely basis to avoid a tuition penalty.

Textbook and Required Materials

This course is participating in an Inclusive Access Pilot referred to as IncludeED. This pilot is part of the STAR (<https://teaching.unl.edu/star-initiative/>) Initiative working to lower cost for textbooks for students at UNL. Your required textbook for this class is ***Managerial Accounting third edition, by Whitecotton, published by McGraw-Hill*** and will be delivered electronically through Canvas. As a part of our commitment to lowering student cost participating in this pilot is a part of a 2-year process where we will reduce the costs of your books.

All required course materials including **the e-book will automatically be loaded into your course** and be made available to you when your Canvas course is published. No access codes will be required for this process. If you experience any difficulties accessing your e-book, please reach out to **McGraw-Hill (800-331-5094)** or myself at jmorris7@unl.edu. Please do this ASAP to avoid difficulty accessing course material.

If you like to read from a physical text book you could always purchase a loose-leaf copy to have as well as the eBook.

The cost of this book will appear on your student bill as "Inclusive Access Material", and can be applied toward any available financial aid. If you have any questions on this, please contact Student Accounts at 402-472-2887 studentaccounts@unl.edu.

As a student you always have the choice to not purchase course materials. Thus, students may opt out of the purchase of these materials up to the last day to add a course (September 3). Opt out information will be available to the student once the course has begun. If you opt out then change your mind and decide you would like to have access to the book, you may opt back in before September 3. If you choose to opt out of this process you may not have access to all the materials you need to be successful in this course. If you have questions about how to access or opt out of the required course materials, please email Brad Severa at bsevera@nebraska.edu ([Links to an external site.](#)) and copy your instructor.

Required— A basic calculator is required for calculations.

Required—Internet access to retrieve course documents, see announcements, access grades and complete assignments.

Canvas

You should use Canvas to access the syllabus, schedule, announcements, lectures, Excel Project, handouts and Internet links.

I will also use Canvas as your grade book, so you can access your grades at any time. Please take a minute to update your personal information (such as e-mail address) in MyRed. I do communicate with individual students via email.

Canvas Technical Support

The Information Technology Support Help Desk is located in Love Library South. The ITS Help Desk is open daily Sunday through Saturday 7:30 A.M. to 11:30 P.M. The ITS Help Desk e-mail address is helpdesk@unl.edu and the phone number is (866) 472-3970 (this is a toll free number.) Please contact technical support with all questions about Canvas, email or viewing or downloading documents from Canvas.

MCGRAW-HILL'S CONNECT

The instructor has limited capability to help you with technology issues related to CONNECT. If you are having problems using CONNECT, contact CONNECT Technical Support at 800-331-5094.

Course Description

Principles of Managerial Accounting, Accounting 202, focuses on providing information to decision makers within a company (internal use). The course focuses on techniques and analysis methods used by business decision makers to evaluate and improve business operations and profitability. We discuss and analyze differences between financial and managerial accounting; relationships between costs, sales volume and profitability; methods of tracing or allocating costs to products, divisions, or clients; budgeting; performance evaluation; production decisions (such as investment in new technology and outsourcing); marketing decisions (which products to advertise); and financing decisions (when to invest in new technology.)

I expect you to be knowledgeable about preparation and analysis of financial statements and identification and classification of general ledger accounts (for example, what is accounts receivable and where in financial statements would you find accounts receivable?) Financial and managerial accounting are very different types of accounting—we will not discuss debits and credits or review concepts you should have learned in accounting 201. There is a link to a tutorial website in the ‘accounting web links’ area of CANVAS if you feel you might need a refresher on financial accounting concepts.

Course Objectives

1. Motivate you to learn accounting, not just to do the minimum amount of work necessary to achieve the grade you desire. I expect and will assess your ability to understand managerial accounting concepts and techniques, not your ability to memorize solutions or previous exam questions. **My exams are created with the intention to assess true learning and to challenge you.**

2. Provide opportunities for you to demonstrate the ability to analyze business problems, issues and opportunities in logical and methodical ways using managerial accounting techniques.
3. Help you feel comfortable incorporating proper accounting terminology into everyday business vocabulary. Reinforce basic accounting terminology as well as data gathering and recording procedures that you studied in Accounting 201.
4. Prepare you for upper-level managerial accounting courses, whether or not you are an accounting major.
5. Encourage you to consider accounting as an exciting, lucrative and fulfilling career option.

Academic Integrity

I will not tolerate academic dishonesty of any kind. If, after investigation, I believe you are guilty of academic dishonesty, you will **fail** the course. I will report the incident to the Dean of Students for the University of Nebraska.

Academic dishonesty includes, but is not limited to:

1. Copying or attempting to copy (in whole or in part) from another student's assignment.
2. Allowing a student to copy or attempt to copy (in whole or in part) from your assignment.
3. Copying or downloading another student's Excel assignment (in whole or in part) and submitting it as your own work.
4. Copying (in whole or in part) from the solutions manual (by hand or electronically).
5. Engaging or attempting to engage the assistance of another individual in misrepresenting academic performance on any graded assignment.
6. Abuse of academic materials by destroying or making inaccessible library or resource material.
7. Helping or attempting to help another student to commit an act of academic dishonesty.
8. Changing or destroying scores or grading marks on any graded assignment.
9. Fabricating an excuse (such as illness, injury, accident) to avoid academic work in order to avoid or delay timely submission of any graded assignment.

References to 'students' means any student currently enrolled in any accounting 202 class and any student who has previously enrolled in (whether or not they successfully completed) any accounting 202 class.

Cheating will result in an "F" for the course!

General Policies

- I only give a grade of "I" for the reasons listed in the Undergraduate Bulletin.
- I expect all students to adhere to all parts of the Student Honor Code at all times. Please review the Honor Code in the Undergraduate Bulletin.
- I expect all students to adhere to all parts of the Student Code of Conduct (SCC) at all times. Please review the SCC in the Undergraduate Bulletin.

- Academic Dishonesty (Cheating). You should specifically read the section of the Student Code of Conduct in the Undergraduate Bulletin for the definition and examples of academic dishonesty.
- I expect all students to practice common courtesy and good manners during class and during group meetings outside class time. I will not tolerate degrading, humiliating, harassing, threatening or foul language or comments.
- I will investigate any suspected violations of the SCC and the common courtesy rule above and will vigorously pursue the disciplinary sanctions outlined in the Undergraduate Bulletin.

Any student who needs special accommodations pursuant to Americans with Disabilities Act (ADA) should coordinate such accommodations with the office for Services to Students with Disabilities (132 Canfield Administration Building, 472-3787). Refer to the Undergraduate Bulletin. Please advise me of any necessary accommodations as soon as possible.

Exams

There are three (3) mid-term exams and one (1) comprehensive final exam. You are expected to take all exams as scheduled.

ALL exams will be given in the Digital Learning Center in Love Library North. Days and times can be found in CANVAS.

ANOTHER option is to use **ProctorU** to take your exams. There will be a fee for this service, \$28 total for all 4 exams plus extra fees if not set-up in advance. I have included a flyer of this service in CANVAS.

Make-up examinations will not be given unless the case of an emergency, if an emergency comes up let me know as soon as possible.

Quizzes

I announce quizzes and they will be given in class. I give make-up quizzes for some absences. You must arrange with me **in advance** to take a make-up quiz due to an absence. If you suffer a medical emergency within a few hours of a class day when a quiz is given, you should contact me as soon as possible to schedule a make-up time.

Homework & LearnSmart

You must complete all assignments in CANVAS. The links in CANVAS takes you to the CONNECT web-site to complete the assignments. As a general rule assignments will be due Wednesday & Sunday evenings by 11:59 PM. You have unlimited attempts for the homework assignments and 3 “check my works”.

Total points are earned for LearnSmart assignments as completed. These are great practice to master the concepts in the course.

There are many resources available for practice within CONNECT that you can access at any time during the course. These are for extra practice and will **not** count for any points.

Master Budget Excel Project

Each student will complete a Master Budget Excel project. A Master Budget Module explaining the project will be available on CANVAS. **YOU ARE REQUIRED TO USE MICROSOFT EXCEL FOR THIS PROJECT.**

Participation

Often during class you will work in small groups to discuss accounting issues and solve problems. I will call on a specific group to give solutions to problems or answers to questions. It is each group's responsibility to stay on task during discussions (not talk about other topics) and to motivate all group members to actively participate (not allow freeloaders). There will be an opportunity to earn participation points by joining and participating in your group. If your group is absent at the time I call on your group, you cannot earn the participation points for that day and there is no opportunity to make up those points.

Extra Credit

I do not allow extra credit work that is not available to everyone in the class. This means, in part, that you may **not** request extra credit assignments once course work is complete for the semester. We will be using TopHat to answer some of the concept questions and your participation with this may be awarded with extra credit points towards the end of the semester.

Grading Policies

I will assign final grades according to points earned, as follows:

| | |
|----|--------------------|
| A+ | 985 – 1,000 points |
| A | 895 – 984 points |
| B+ | 875 – 894 points |
| B | 795 – 874 points |
| C+ | 775 – 794 points |
| C | 695 – 774 points |
| D+ | 675 – 694 points |
| D | 595 – 674 points |

F 0 – 594 points

Different elements of the course carry different weights, as follows:

| | |
|-----------------------------------|---------------------|
| Exam #1 (25 questions X 7 points) | 175 points |
| Exam #2 (25 questions X 7 points) | 175 points |
| Exam #3 (25 questions X 7 points) | 175 points |
| Final exam (partially cumulative) | |
| (35 questions X 7 points) | 245 points |
| Quizzes (8 @ 4 points each) | 32 points |
| Homework & LearnSmarts | 168 points |
| Master Budget Excel Project | 26 points |
| Class participation | <u>4 points</u> |
| Total points possible | <u>1,000 points</u> |

If you feel the grading on a specific assignment is incorrect contact me as soon as possible.

The grading scale will NOT be curved at the end of the semester. There are NO discretionary points (i.e. I will not “give” you an extra point at the end of the semester if you are close to the next highest letter grade.)

I reserve the right to change the syllabus and schedule as needed throughout the course.

Accounting Major Requirements:

Accounting majors will not be allowed to attempt an ACCT course more than twice (repeats and withdrawals). Students who do not achieve the required grade for progression on their second attempt will be administratively changed to BSAD majors. Non-accounting major students with more than two repeats and/or withdrawals in an ACCT course will not be allowed to declare accounting as a major.

All students will not be allowed to attempt a 300- or 400-level accounting course more than twice.

Students may petition the School of Accountancy Undergraduate Curriculum Committee in writing to take an ACCT course a third time. Petitioning does not guarantee permission.

ECONOMICS 215-001
Statistics
Spring 2023
12:30PM – 1:45PM, M/W
HLH 018

Instructor: Dr. Yuxi Yao
Office: HLH 525B
Email: yyao10@unl.edu
Office Hours: M/W: 3:30PM-5:00PM or by appointment

Prerequisites: Sophomore standing; MATH 104 or equivalent or MATH 106/108H; BSAD 50; 2.5 GPA

Course Description

The course is an introduction to basic probability and statistical methods that are used in conjunction with economic and business information. Topics include descriptive statistics, probability foundations, probability distributions, sampling distributions, methods of statistical inference, and bivariate relationships. This course lays the foundation for subsequent courses.

Class Materials

1. Essentials of Statistics for Business and Economics; Anderson, et al., 9th edition, 2020 (textbook).
2. PowerPoint Slides: As the semester progresses, you will be able to view/download the slides and other materials used in the lecture in Canvas.
3. Assignments: Assignments and grades will be posted in Canvas. Submissions of assignments should be done through Canvas as well.
4. Microsoft Excel: We will use Microsoft Excel for group assignments. UNL students have subscriptions to Office 365, which includes Microsoft Excel. Check this link for installation instructions.
5. Calculator: You will need a calculator for assignments and exams.

Textbook Purchase Options

Option 1. Through the UNL Bookstore's Inclusive ACCESS program.

Note: The bookstore's Inclusive ACCESS program is provisioning eBook access for every student enrolled in this course; every student receives an email from "donotreply@redshelf.com" to their @huskers.unl.edu email address with information for how they access the digital material, and an email from "noreply@follett.com" explaining ACCESS and referencing the opt out process. For Spring 2023 students have through **February 1st** to opt out (or to opt back in after initially opting out) if choosing to obtain the required material through another means. If a student opts out of the eBook access, the digital access will be revoked and UNL will remove the eBook fee from the student's account.

Option 2. eBook from Cengage: Anderson/Sweeney/... 9th ©2020, Essentials of Statistics for Business & Economics, 9780357045435. Click [here](#) to access eTextbook.

Grading

Total course points for this course will be a combination of the following:

i) 4 Individual Assignments (5 Points each, 15 Points total)

Your lowest score will be dropped and only the highest 3 will count towards your grade. *Late submissions will not be accepted.*

ii) 3 Group Excel Assignments (5 Points each, 10 Points total)

Your lowest score will be dropped and only the highest 2 will count towards your grade. You need to form your own groups with a maximum group size of 5 students and inform me by **February 10th**, 2022. Students who do not form groups by **February 10th** will be randomly assigned to a group. For each group, one student should send me an email with the names and UNL emails of all group members. Please include all your group members in the mailing list. Upon receiving the email, I will reply to all students in the group to confirm. For each assignment, each group needs to make one and only one submission. ***Late submissions will not be accepted.***

All students in the group receive the same grades for the assignments. ***Exception: In the case where a student does not respond to other group members and/or refuses to work on a group assignment (as confirmed by other group members), the student's grade for that group assignment will be zero and this student will be put in a separate group for all remaining group assignments.*** Please keep in mind that, while I will let you decide exactly what and how much work each group member needs to do, the expectation is that all students should contribute to the completion of the group assignments.

iii) 4 Module Exams (15 Points each, 45 Points total)

Your lowest score will be dropped and only the highest 3 will count towards your grade. Module Exams will be held in the Digital Learning Center. The (tentative) exam dates are provided below.

iv) A Final Cumulative Exam (30 points)

Bonus Points: To help you learn the material and prepare for the exams, I will provide one practice quiz for each chapter covered in this class (11 quizzes in total). You are encouraged to work on those quizzes as the semester progresses. To provide some extra incentive, for each practice quiz completed, you will obtain 0.5 extra course point.

Tentative Module and Final Exam Dates

Module Exam 1: February 17 (Friday) – February 19 (Sunday)

Module Exam 2: March 9 (Thursday) – March 11 (Saturday)

Module Exam 3: April 14 (Friday) – April 16 (Sunday)

Module Exam 4: May 5 (Friday) – May 7 (Sunday)

Final Cumulative Exam: May 16 (Tuesday) – May 18 (Thursday)

The final cumulative exam will also be held in the Digital Learning Center. A review session for the final exam will be scheduled during the week before the final exam. Details will be confirmed and communicated later in the semester.

Make up exams:

There will be no makeup exams after the exam period in this class. If you need to write the exam

before the exam period for valid reasons, please contact me at least one week before the exam period. If you miss one module exam, it will be considered as the module exam with the lowest score and will be dropped. Should you miss the final exam or miss more than one module exam, I will require proof of the reason and will decide the validity of the excuse on a case-by-case basis. Should I find your excuse valid, 1) if you miss two module exams, the remaining two module exams will be scaled up to count for 45% of your grade; 2) if you miss the final exam and no more than one module exam, the module exams that you take will be scaled up to count for 75% of your grade; 3) if you miss a) three or more module exams or b) the final exam and two or more module exams, you may be given the grade "Incomplete." The final decision rests with me.

Standard Grading Scale:

| Your Score | Grade | Your Score | Grade |
|-------------------|--------------|-------------------|--------------|
| 90% to 100% | A/A+ | 68% to 75% | C |
| 88% to 90% | A- | 65% to 68% | D+ |
| 85% to 88% | B+ | 61% to 65% | D |
| 81% to 85% | B | 58% to 61% | D- |
| 78% to 81% | B- | Below 58% | F |
| 75% to 78% | C+ | | |

Achievement-Centered Education (ACE) Designation

Institutional Objective and Learning Outcome #3: Use mathematical, computational, statistical, or formal reasoning (including reasoning based on principles of logic) to solve problems, draw inferences, and determine reasonableness.

Course Objectives: (1) Acquaint students with the roles that probability and statistics play in examining and evaluating economic and business information; (2) Provide students with opportunities to become proficient with selected statistical methods that are commonly encountered in the business world; (3) Expose students to problem-solving environments where inferences and decisions must be made on the basis of statistical evidence, calculations, and probabilistic reasoning.

Learning Outcome Assessments: Exams, computer-based assignments and regular assignments.

NOTES

1. Students at the University of Nebraska are members of an academic community in which academic integrity and responsible conduct are essential for the community to function. To ensure that students know what is expected of them, the University has adopted the [Standards of Academic Integrity and Responsible Conduct](#) ("Standards").
2. If you need special accommodations in order to meet any of the requirements of this course, please contact me as soon as possible so we can make the necessary arrangements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office. Please visit the [SSD webpage](#).
3. Stress, depression, anxiety, alcohol abuse, eating disorders, and other mental health challenges affect at least one in five college students. Resources for supporting student mental health can be found [here](#).
4. If in-person classes are canceled and the campus follows instructional continuity plans, the

information will be communicated via Canvas announcements.

5. For other university-wide information and policies, please use this [link](#).

TENTATIVE COURSE OUTLINE

Module 1:

- **Topic 1**

Data and Statistics (Chapter 1)

- Applications in Business and Economics
- Data
- Data Sources
- Descriptive Statistics
- Statistical Inference
- Ethical Guidelines for Statistical Practice

- **Topic 2**

Descriptive Statistics: Tabular and Graphical Displays (Chapter 2)

- Summarizing Data for a Categorical Variable
- Summarizing Data for a Quantitative Variable
- Summarizing Data for Two Variables Using Tables
- Summarizing Data for Two Variables Using Graphical Displays

- **Topic 3**

Descriptive Statistics: Numerical Measures (Chapter 3)

- Measures of Locations
- Measures of Variability
- Measures of Distribution Shape
- Measures of Association Between Two Variables

Module 2:

- **Topic 4**

Introduction to Probability (Chapter 4)

- Random Experiments, Counting Rules, and Assigning Probabilities
- Events and Their Probabilities
- Some Basic Relationship of Probability
- Conditional Probability

- **Topic 5**

Discrete Probability Distributions (Chapter 5)

- Random Variables
- Developing Discrete Probability Distributions
- Expected Value and Variance
- Bivariate Distributions and Covariance
- Binomial Probability Distributions

- **Topic 6**

Continuous Probability Distributions (Chapter 6)

- Uniform Probability Distribution
- Normal Probability Distribution

Module 3:

- **Topic 7**
Sampling and Sampling Distribution (Chapter 7)
 - Selecting a Sample
 - Point Estimation
 - Introduction to Sampling Distributions
 - Sampling Distribution of the Mean
 - Sampling Distributions of the Proportion
- **Topic 8**
Interval Estimation (Chapter 8)
 - Population Mean: Known Population Variance
 - Population Mean: Unknown Population Variance
 - Population Proportion
 - Determining the Sample Size
- **Topic 9**
Hypothesis Tests (Chapter 9)
 - Developing Null and Alternative Hypothesis
 - Type I and Type II Errors
 - Population Mean: Known Population Variance
 - Population Mean: Unknown Population Variance
 - Population Proportion

Module 4:

- **Topic 10**
Inference About Means and Proportions with Two Populations (Chapter 10)
 - Difference Between Two Population Means: Known Population Variances
 - Difference Between Two Population Means: Unknown Population Variances
 - Difference Between Two Population Means: Matched Samples
 - Difference Between Two Population Proportions
- **Topic 11**
Simple Linear Regression (Chapter 14)
 - Simple Linear Regression Model
 - Least Squares Method
 - Coefficient of Determination
 - Model Assumptions
 - Inferences and Predictions

TENTATIVE COURSE SCHEDULE

| Module | Areas of Focus | To do list and due dates |
|----------|----------------------|--|
| Module 1 | Chapters 1, 2 and 3 | Individual Assignment 1: Due on Feb 14 at 11:59PM Module Exam 1: Feb 17 – Feb 19 |
| Module 2 | Chapters 4, 5, and 6 | Individual Assignment 2: Due on Mar 7 at 11:59PM Group Excel Assignment 1: Due on Mar 8 at 11:59PM Module Exam 2: Mar 9 – Mar 11 |
| Module 3 | Chapters 7, 8, and 9 | Individual Assignment 3: Due on Apr 11 at 11:59PM Group Excel Assignment 2: Due on Apr 19 at 11:59PM Module Exam 3: Apr 14 – Apr 16 |

| | | |
|----------|--------------------|--|
| Module 4 | Chapters 10 and 14 | Individual Assignment 4: Due on May 2 at 11:59PM Group Excel Assignment 3: Due on May 10 at 11:59PM Module Exam 4: May 5 – May 7 |
|----------|--------------------|--|

Disclaimer:

I reserve the right to modify this syllabus as the semester progresses to meet what I believe to be the needs of the class.



ECON311: Intermediate Macroeconomics

| | | |
|------------------|------------|---|
| Section: | 002 | <i>The study of the aggregate economy. This course introduces theories of production, consumption, investment, international trade, inflation, and unemployment. Discussion includes the New Keynesian model used by central banks throughout the world to analyze the macroeconomy and conduct policy.</i> |
| Semester: | Fall | |
| Year: | 2019 | |
| Room: | HLH-020 | |
| Days: | MWF | <i>Statistical analysis is used to test relationships and predict policy outcomes.</i> |
| Time: | 9:30-10:20 | |

Contact Info

Instructor: Chris Mann
✉ cmann3@unl.edu
☎ 402-472-3083
↳ HLH-525R
⌚ MW 10:30-11:30

Teach. Asst: Sudeep Dahal
✉ sudeep.dahal@huskers.unl.edu
↳ HLH-015
⌚ TR 12:00-2:00

Course Tutor: Zoe Zheng
✉ szheng6@huskers.unl.edu
↳ HLH-215
⌚ T 3:30

Please include your **name**, the **course**, and **section number** in each email. The TA or I will do our best to respond within 48 hours of receiving your email.

We reserve the right not to respond to any questions that are either adequately answered in this syllabus, covered extensively throughout the semester, or are inappropriate. If you have questions about your grade, please see the instructor in person. **Questions about your grade will not be answered through email due to privacy concerns!**

Course Info

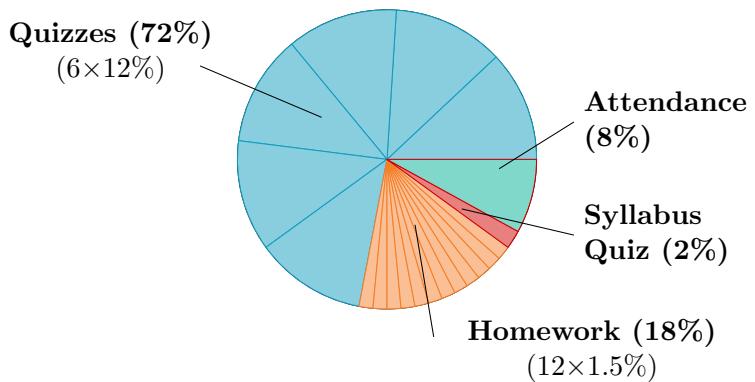
Prerequisites:

ECON 211 *Principles of Macroeconomics.*
ECON 212 *Principles of Microeconomics.*
ECON 215 *Statistics.*
MATH 104 *Applied Calculus.*

Materials

All required material will be provided to you. Other intermediate textbooks and online resources are highly recommended.

Grading Policy:



Grade Scale:

| | |
|-------------|---------------------|
| [90, 97): A | [97, ∞): A+ |
| [80, 87): B | [87, 90): B+ |
| [70, 77): C | [77, 80): C+ |
| [60, 67): D | [67, 70): D+ |
| [0, 60) : F | |

Assignments

| Module | Topic | Start |
|--------|--------------------------|-------|
| 1 | Measuring the Economy | 8/26 |
| 2 | Consumption | 9/16 |
| 3 | Production | 9/30 |
| 4 | Market Analysis | 10/14 |
| 5 | Unemployment & Inflation | 10/30 |
| 6 | Financial Markets | 11/13 |
| 7 | The IS-MP-PC Model | 12/2 |

Quizzes (72%)

7 quizzes will be given throughout the semester, each worth 12%. The lowest quiz grade will be dropped. Quizzes can be found through Canvas and will be given at the Digital Learning Center Exam Commons in Love Library North. You will have 60 minutes to take each quiz and are allowed to bring a calculator. It is each student's responsibility to schedule an appropriate time to take each quiz and to show up at the scheduled time. The dates that each quiz is open is listed on the table to the right.

DLC exam policies can be found on the next page. To schedule your quiz, please visit <http://dlc-reserve.unl.edu>. Please schedule each quiz as soon as possible. If you wait too long and no spots are available, you will not receive a make-up quiz. Furthermore, if you show up to the DLC at the wrong time and are unable to take the quiz, you will not receive a make-up quiz.

Attendance (8%)

Attendance will be taken during most lectures. Failure to come to class for any reason counts as an absence. Students can miss up to 3 times before it negatively impacts their grade. Each additional class period that is missed reduces the student's grade by 1 point. It is the student's responsibility to ensure that they have signed the attendance sheet. Students who are caught signing in for other students forfeit all of their attendance points.

Online Homework (18%)

Two homework assignments will be given through Canvas, or two for each of the modules listed on the left. Each homework assignment will be worth 1.5% of your grade; the lowest two grades will be dropped. The assignments will be due on Tuesdays by 11:59pm , unless otherwise mentioned. Failure to complete an assignment by the due date will result in a grade of 0 without exception.

Syllabus Quiz (2%)

A short quiz on the syllabus will be given on Canvas, worth 2% of your grade. The syllabus quiz must be completed before 11:59pm on Sept 13.

| Quiz | Start | End |
|------|-------|-------|
| 1 | 9/15 | 9/20 |
| 2 | 9/29 | 10/4 |
| 3 | 10/13 | 10/18 |
| 4 | 10/30 | 11/5 |
| 5 | 11/13 | 11/19 |
| 6 | 12/2 | 12/7 |
| 7 | 12/13 | 12/20 |

Missed Assignments

Students who miss a quiz during the window of time at the Exam Commons will receive a zero for the grade. There are no exceptions. Please make sure you sign up early, remember your time correctly, and show up prepared with your N-card. Your first missed quiz will be dropped automatically. Late homework also will not be accepted. Complete assignments early to avoid technical issues.

Resources

Online Lecture Notes & Videos

- MIT Opencourseware [1] [2]
- David Latzko's Notes
- Barany's Course
- Logan Kelly - Youtube
- economicurtis - Youtube

News & Opinion

- Project Syndicate
- The Economist
- New York Times
- Washington Post
- Real Time Economics - WSJ
- Financial Times
- Forbes
- Bloomberg

Economic Data

- Federal Reserve Economic Database
- Bureau of Labor Statistics
- Bureau of Economic Analysis
- International Monetary Fund
- World Bank
- Congressional Budget Office
- US Census Bureau
- OECD
- Penn World Tables

Economics Blogs

- Economist's View - Mark Thoma
- Conversable Economist - Tim Taylor
- Grasping Reality - Brad Delong
- macroblog - Fed Atlanta
- Noahpinion - Noah Smith
- Mainly Macro - Simon Wren-Lewis
- Marginal Revolution - Tabarrok & Cowen
- Calculated Risk - Bill McBride
- Econbrowser - Hamilton & Chinn
- Bank Underground - Bank of England
- Macro Musings - David Beckworth
- Econometrics Beat - Dave Giles
- Economic Principals - David Warsh
- Debtwatch - Steve Keen
- Modern Monetary Theory - Bill Mitchell
- MacroMania - David Andolfatto
- Economics One - John Taylor
- Supply-Dide Liberal - Miles Kimball
- Paul Krugman
- Larry Summers
- Greg Mankiw
- Robert Reich
- Roger Farmer
- Cafe Hayek
- Naked Capitalism

Policies

Academic Integrity

Per the UNL Student Code of Conduct: The maintenance of academic honesty and integrity is a vital concern of the University community. Any student found guilty of academic dishonesty shall be subject to both academic and disciplinary sanctions.

1. Academic dishonesty includes, but is not limited to, the following: Copying or attempting to copy from an academic test or examination of another student; using or attempting to use unauthorized materials, information, notes, study aids or other devices for an academic test, examination or exercise; engaging or attempting to engage the assistance of another individual in misrepresenting the academic performance of a student; communicating information in an unauthorized manner to another person for an academic test, examination or exercise; plagiarism; tampering with academic records and examinations; falsifying identity; aiding other students in academic dishonesty, and other behaviors in the student judicial code of conduct, Article III section B (stuafs.unl.edu/dos/code)
2. The penalties for academic dishonesty will be severe, and may range from receiving a failing grade on the test or assignment, failing the course in which academic dishonesty took place, or the possibility of expulsion from the university. Faculty will report all cases of academic dishonesty to the Dean of Students at UNL, who will place a report in the students permanent file. A file of academic integrity violations will also be maintained by the College of Business.
3. If you copy, or substantially copy, work from anyone else on a paper, the work must be put in quotes and the source(s) cited. Otherwise, it is plagiarism. If plagiarism or other forms of academic dishonesty are found on a group work assignment, it is possible that every member of the group will be punished. It is to your advantage to check out anything that does not seem like the work of your group members or colleagues. Written assignments are subject to verification using Safe Assignment for plagiarism.

★ If you fail to follow instructions during an exam, including but not limited to talking (for any reason), using unauthorized material, viewing an outside website, or ignoring the professor or proctors, your exam will be taken, you will receive a 0, and you will be reported to the university. The final punishment may include being expelled from the university. ★

Disability Statement

For students with disabilities, it is UNL policy to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. Please make an appointment with me as soon as possible to discuss any course accommodations that may be necessary. I am more than happy to work with you and the Service for Students with Disabilities (SSD) office to develop an appropriate accommodation for this course. The SSD office is located in 132 Canfield Administration, 402-472-3787.

Grades

It is each students responsibility to keep track of their grades and ensure that everything is ok. You will have up to one week after each assignment is returned to challenge any errors. If you wait longer, your grade will not be corrected or changed. Please do not trust the Total Grade column in Canvas as it may not accurately reflect your grade. Instead, use the weights listed in the syllabus to keep track of your grade yourself.

Other

DLC Exam Commons

Exams and quizzes for this course will be taken under electronic supervision at the Digital Learning Center, which is located in the Adele Coryell Hall Learning Commons. All testing times are pre-scheduled and exams will be completed on a computer. Before you begin an exam, you must place your personal items in your pre-assigned locker and check-in with Digital Learning Center staff at the front desk. When you have completed your exam, you must check-out at the front desk. Guidelines:

- All testing times are pre-scheduled by students. All students are responsible for self sign-up and early sign-up is recommended. Time slots fill up quickly.
- All students are required to have their current N-Card to test. Other forms of ID will not be accepted as a substitute for N-Cards. DLC staff reserve the right to ask for a second ID if needed for identity verification.
- All students will receive two pieces of barcoded scratch paper for their exam. This paper will be scanned in to students upon check-in and scanned out upon check-out.
- Only permitted items are allowed at your computer station during testing, including your N-Card, DLC provided barcoded scratch paper, and writing utensils. Nothing else is allowed at your computer station unless your instructor has made prior arrangements with the DLC.
- All exams must be submitted for grading at the posted closing time. Students will not be given additional time to finish their exams past the posted closing time.

To schedule your exam, please visit <http://dlc-reserve.unl.edu>. For more information about the Exam Commons location, operating hours and student guidelines, please visit <http://dlc.unl.edu>.

Keys to Success

- Attend every lecture. I have found that each missed class is associated with an 8 point reduction in exam or quiz grades on average. Furthermore, any extra credit opportunities that arise throughout the semester will likely to be tied to attendance.
- Read lecture material *before* and *after* each lecture. Take detailed notes.
- Complete the homework early. Do not wait until the last minute!
- See either the instructor, TA, or course tutor as soon as you encounter difficulty in understanding a concept. We are here to help.
- Find the data used in class and replicate the results from the lecture. Explore the data in ways not used in class and look for new relationships.
- Browse news stories and blogs related to economics. Connect each story with concepts learned in class.
- Visit <https://fred.stlouisfed.org/> to look up and study macroeconomic data.

ECONOMICS 321-001
Introduction to International Economics
Spring 2019
12:00PM – 1:15 PM, MW
HLH 020

| | |
|-------------------------|--|
| Instructor: | Dr. Uchechukwu (Uche) Jarrett |
| Office: | HLH 525T |
| Email: | ujarrett2@unl.edu |
| Office Hours: | M/W: 9:00AM-11:30AM or by appointment |
| TA: | Riaj Mahmud |
| TA Email: | riaj.mahmud@huskers.unl.edu |
| Recitation Days: | Fridays before Assignment due dates |
| Peer Tutor: | Brett Holtzen |
| Review sessions: | Tuesdays at 5PM in HLH 010 |
| Office Hours: | Mondays from 12 to 3PM in HLH 027B |
| Prerequisites: | ECON 211 and 212 or ECON 210 |

Course Description

This course provides introductory topics of international economics encompassing both aspects of trade and finance. Through the various trade models and financial market interactions discussed in this class, a more macroeconomic view of the way world economies work will be presented. Some of the topics covered include international trade and factor movements (effects and consequences), balance of payments, exchange rates and international monetary systems.

Course Objectives

By the end of this course, you will be able to:

1. Identify, write and pronounce the name of the Nigerian currency (I say it a lot)
2. Identify and predict trade flow patterns due to comparative advantage
3. Analyze the potential effects of trade policies
4. Identify potential winners and losers from International trade and pre-empt groups that may be opposed to certain trade policies
5. Analyze the impact on different factors of production due to international trade
6. Analyze the relationship between exchange rates and international trade
7. Make basic predictions about the impact of monetary policy on exchange rates and therefore trade.
8. Make basic predictions about the direction of exchange rate changes based on domestic factors
9. Make basic predictions about the direction of investment in different countries given the degree of fluctuation of exchange rates
10. Adapt theoretical practices to real world scenarios including trade, investment and multinational business practices.

Class Materials

1. Most Critical: **YOU!!!**
2. **Your email:** Please check your email regularly for class updates and announcements
3. I will make use of **Top hat** for discussions, attendance, and in class questions. The Top hat course for this class is **S19 Econ 321-001: Introduction to International Economics and the join code is 115807**
4. **Your cell phone**, (yes I know, o happy day), to use the top hat app (only when prompted)
5. I will also make use of **Canvas** to create groups for assignments, upload class materials, assignments and grades. Module zero created on canvas will contain the necessary information to assist with class logistics, e.g. Class syllabus, syllabus quiz, tophat join code, Peer tutor information and the grade simulator. Should you have any question, check module 0, if your concerns are not addressed then send me an email.
6. **Text Book: Robert C. Feenstra and Alan M. Taylor. International Economics. 4th Edition. ISBN-13: 978-1-319-26438-3.**

Note: A special edition of this book has been created primarily for this class that focuses only on the chapters we will cover, as a result, it is much cheaper than buying the whole text book. In addition resale value is high because I intend to continue using this version for this class. **The ISBN for this special edition is what has been provided above.**

Grades

Final grades for this course will be a combination of the following:

Discussion Participation (through tophat): 5%

There will be 13 discussion topics throughout the semester and you will have one week to provide your thoughts on the discussion points. These are participation points and as such, there are no right or wrong answers. 85% completion is all that is required to get the full 5%, this means **you can miss two discussions only and still get full points.**

In class questions (through tophat): 10%

There will be 80 in class questions given throughout the semester (10 after each major topic we cover). Since these are primarily for review purposes, half the points awarded will be participation and the other half will be correctness. As with the discussions, 85% score on this is all that is required to get the full 10%, which means you can miss 12 questions and still get full points.

Note: Given the Leeway built into the discussions and in class questions, there will be no makeup should you miss either one for ANY reason. The only exception to this will be University sponsored activities and proof must be provided before allowance is made. Just make sure not to miss any beyond the cap. This will be your responsibility.

Syllabus Quiz: 2%

You will have to take two quizzes that test your knowledge of the syllabus and how to calculate your grades. The first will be on canvas during the first week of classes and the second will be shortly after the second exam is completed. Each of these will count for 1% of your grade and you will have multiple attempts to complete each.

Mini Projects: 8%

You will have a total of 4 mini projects, each being assigned twice, one at the start of a model we cover and one after it is completed. These projects are designed to highlight the relevance of this course outside the class room. I will explain more when we convene in class on day one and again before each mini-project is assigned.

Assignments: 15%

You will have three group assignments throughout the semester, one before every exam (groups will be randomly assigned in the 2nd week of class to give students enough time to make up their minds regarding what classes to take). Completing all three assignments and turning them in before the deadline gets you half the assignment points and the degree of correctness gets you the remaining points. There will be a group member assessment after each assignment is due. These will be an average rating from your group members. **Useful** participation in the assignment is the requirement and as such points will not be awarded for that, however, you will lose points if you do not participate **usefully**. The system of the group assessment as well as how it will impact your assignment score will be provided with the assignment instructions for each exam.

Note: “Useful” here is defined as any meaningful contribution that leads to a successful assignment. This includes but is not limited to two or more of the following: answering questions, scheduling, going over your group member’s work, aggregating different answers, meeting with group members, attending recitations, and meeting with the peer tutor and/or Professor.

Exams: 60%

You will have a total of three (3) exams in this class (two midterms and a final), all of which are independent self-contained exams (this means that the exams are not cumulative (see tentative course outline below for what will be covered in each exam). Each exam will consist of 50 multiple choice questions and will last 70 minutes. I use what I call an individually redemptive grading system for your aggregate exam grade such that your best exam will count for 30% of your final grade, with the other two each counting for 15%. Due to this system, you will not be able to check your grade on canvas during the semester. To address this inconvenience, I have provided a grade simulator to help calculate your grades throughout the semester, more on that below. These, in combination with your assignments, discussion, mini-projects, syllabus quizzes, and in class problems, give you your final grade.

Exams for this course will be taken under electronic supervision at Digital Learning Center, which is located in the Adele Coryell Hall Learning Commons. All exam times have been pre-scheduled and will be taken on a computer provided by the testing center.

Before you begin an exam, you must place your personal items in your pre-assigned locker and check-in with Digital Learning Center staff at the front desk. When you have completed your exam, you must check-out at the front desk.

All Exam times are pre-scheduled **by students**. All students are responsible for self sign-up and early sign-up is recommended. Time slots fill up quickly.

All students are required to have their **current N-Card to test**. Other forms of ID **will not be** accepted as a substitute for N-Cards. DLC staff reserve the right to ask for a second ID if needed for identity verification.

All students will receive two pieces of barcoded scratch paper for their exam. This paper will be scanned in to students upon check-in and scanned out upon check-out.

Only permitted items are allowed at your computer station during testing, including your **N-Card, DLC provided barcoded scratch paper, calculator and writing utensils**. Nothing else is allowed at your computer station.

All exams must be submitted for grading at the posted closing time. Students **will not be given** additional time to finish their exams past the posted closing time.

To schedule your exam, please visit <http://dlc-reserve.unl.edu>. For more information about the Exam Commons location, operating hours and student guidelines, please visit <http://dlc.unl.edu>.

Exam dates

Midterm 1: (From Monday, February 11th, 2019 to Friday, February 15th, 2019)

Midterm 2: (From Monday, April 1st, 2019 to Friday, April 5th, 2019)

Final Exam (From Monday, April 29th, 2019 to Friday, May 3rd, 2019)

Make up exams:

There will be make up exams for people who miss the exams in the 5-day window provided, but they must have a very compelling reason to have done so. Proof of the reason will be extremely helpful, but I understand that some excuses might be valid and have no proof, so whatever the reason is, bring it forward and I will decide on a case by case basis.

Grade Simulator: A grade simulator in the form of an excel sheet will be provided on canvas that will help you calculate and predict your final grade showing you what points you will need to achieve certain grades. This will serve as a guide throughout the semester that keeps you on track for your required goal.

Standard Grading Scale:

| Your Score | Grade | Your Score | Grade |
|-------------|-------|-------------|-------|
| 93% to 100% | A/A+ | 70% to 76% | C |
| 90% to 92% | A- | 67% to 69% | D+ |
| 87% to 89% | B+ | 63% to 66% | D |
| 83% to 86% | B | 60% to 62% | D- |
| 80% to 82% | B- | Below 59.5% | F |
| 77% to 79% | C+ | | |

Note: There are no extra credit opportunities in this class and the grading structure will not be changed.

NOTES

1. This Class is conducted in accordance with UNL Academic Policies and Procedures. Please visit
<https://bulletin.unl.edu/undergraduate/other/Academic+Policies+%26+Procedures>
2. If you need special accommodations in order to meet any of the requirements of this course, please contact me as soon as possible so we can make the necessary arrangements. To receive accommodation services, students must be registered with the Services for students with Disabilities (SSD) office in 132 Canfield Administration. Please visit their webpage at <http://www.unl.edu/equity/dservices.shtml>
3. This University has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for the respect of others' academic endeavors. Student academic misconduct information can be found at:
<http://stuafs.unl.edu/dos/code>
But let me save you the trouble of a long read... DON'T DO IT!!!!
4. The UNL Writing Center can provide you with meaningful support as you write for this class as well as for every course in which you enroll. Trained peer consultants are available to talk with you about all forms of communication, including lab reports, presentations, research papers, cover letters, and application essays. You can visit at any stage of the process, from brainstorming and organizing ideas through polishing a final draft. The UNL Writing Center is located in 102 Andrews Hall, with evening hours in the Adele Hall Learning Commons and other satellite locations. You can schedule 25- and 50-minute appointments any time by visiting <unl.mywconline.com> ([Links to an external site.](#))[Links to an external site.](#). For more information about the Writing Center, including hours and other locations, please visit unl.edu/writing.
5. This class satisfies a general education requirement, and meets the following Achievement-Centered Education (ACE) requirement (See Undergraduate bulletin: <https://bulletin.unl.edu/undergraduate/other/General+Education+Requirements+%28ACE%29>)
“ACE 9: Exhibit global awareness or Knowledge of human diversity through analysis of an Issue.”
6. This is a 3-credit course that meets two times a week. On average, students are expected to put in 6-7 hours per week reading the material, studying, and working on assignments to achieve the learning goals of this course. Some weeks will take more time than others, so this timeframe is only a guideline.
7. Safety Information
Weather
Every UNL campus building has emergency shelter and evacuation plans. Please familiarize yourself with the plans of each building in which you take classes or attend meetings. Make sure to note the routes to the lowest level of the buildings for shelter during

inclement weather, as well as exits from the buildings in the event of fire or other emergency. For more information on emergency procedures visit emergency.unl.edu.

Medical

In the event of a medical emergency in the classroom immediately call **9-1-1** and take steps to assist the individual as needed. For details on what to do during Medical Emergencies, [visit the Medical Emergencies handbook](#).

Active Shooter/Physical Attack

- **Run** - If there is a clear and safe escape route.
- **Hide** - If there is no escape and you can get to a secure location to hide.
- **Fight** - If your only option is to defend yourself, fight as if your life depended upon it.

For more details and video training for all emergency procedures visit emergency.unl.edu.

TENTATIVE COURSE OUTLINE (with corresponding text book locations)

Section 1: International Trade

Module 1 (This is what we will cover for Assignment 1 and Midterm 1)

- **Topic 1**
Trade in the Global economy (Chapter 1)
 - The basics of world Trade
 - Trade distortion
 - Trade compared to GDP
 - Barriers to Trade
 - Migration and Foreign direct Investment
- **Topic 2**
Trade and Technology: The Ricardian Model (Chapter 2)
 - Review of production possibilities frontiers (PPFs) and Indifference Curves
 - Absolute and Comparative Advantage
 - Reasons for trade
 - The Ricardian Model
 - Determining the Pattern of International Trade
 - Determining International Prices
- **Topic 3**
Gains and Losses from Trade in the Specific Factors Model (Chapter 3)
 - Specific Factors Model
 - Earnings of Labor
 - Earnings of Capital and Land
 - Impact of Trade on owners of Labor, capital and land

Module 2 (This is what we will cover for Assignment 2 and Midterm 2)

- **Topic 4**
Trade and Resources: The Heckscher-Ohlin Model (Chapter 4)
 - Heckscher-Ohlin Model (H-O Model)
 - Testing the assumptions of the H-O Model: Leontief's paradox
 - Effects of trade on Factor prices

- **Topic 5**

Increasing Returns to scale and Monopolistic Competition (Chapter 6)

- Basics of Imperfect competition
- Returns to scale
- Trade under monopolistic competition
- Gains from Trade under monopolistic competition
- Intra-Industry trade
- The gravity equation

- **Topic 6**

Import Tariffs and quotas under perfect competition (Chapter 8)

- The gains from Trade: Consumer and Producer surplus
- Import Tariffs for a small country
- Import tariffs for a large country
- Import Quotas in a small country

Section 2: International Finance

Module 3 (This is what we will cover for Assignment 3 and Final)

- **Topic 7**

Introduction to exchange rates and the foreign exchange market (Chapter 13)

- Exchange rate essentials
- Exchange rates in Practice: Fixed vs. Floating exchange rates
- The Foreign Exchange market
- Arbitrage and Spot Exchange rates

- **Topic 8**

Exchange Rates 1: The monetary approach in the long run (Chapter 14)

- Exchange rates and prices in the long run
- Purchasing Power Parity (PPP) and Goods Market equilibrium
- Absolute and Relative PPP
- Money, Prices and Exchange rates in the long run
- Money market equilibrium in a simple model

- **Topic 9**

National and International Accounts: Income, Wealth, and the Balance of Payments (Chapter 16)

- Measuring Macroeconomic activity
- Income, product and Expenditure
- The Balance of Payments
- Financial account, capital account and current account
- Double entry book keeping

Disclaimer:

I reserve the right to modify this syllabus as the semester progresses to meet what I believe to be the needs of the class. This could include but is not limited to the addition of extra material, assignment of additional quizzes (mostly to use as a tool when people ignore in class practice problems), and the provision of supplemental videos to be viewed outside of class (in case time becomes an issue)

Course Syllabus

SCMA 331

Operations & Supply Chain Management

Spring 2021



Contact Information

**👤 Shawntell Kroese****◆ Teacher****✉ skroese2@unl.edu (<mailto:skroese2@unl.edu>)**

Course Description

SCMA 331, Operations and Supply Chain Management (3 credit hours): Pre-req: Sophomore standing, 2.5 GPA, Business Qualified (MATH104 or MATH106/106B or MATH107 or MATH208; BSAD220; ACCT201 and ACCT202; ECON211 and ECON212; ECON215 or equivalent. Cannot be taken Pass/No Pass.

Operations and Supply Chain Management is an exciting field that applies to all different kinds of organizations. We will study activities that relate to the creation of goods and services and we will learn important tools and techniques that drive value by transforming inputs into outputs. We will spend time in this class building a strong foundation that can be applied throughout the world to virtually all productive organizations. Our focus will be in learning this new language of operations and supply chain management and practicing how we apply these tools and knowledge. We will learn about how the supply chain is transforming businesses and discuss and debate these changes. The overall objective for this class is to build confidence and practice application of these tools and techniques in the operations and supply chain field, which can be used and built upon in all business areas.



Course Objectives

My objectives for this class are:

1. To create a classroom environment that questions and examines current events and current issues in Supply Chain Management
2. To build your confidence and create awareness on what Operations Management is and apply what you learn
3. To apply these operations management and supply chain concepts and "sell" your ideas and engage in the classroom discussion
4. To gain real-world insight and take-aways that help you achieve your future goals and objectives



Canvas Information

Canvas is "the where" course content, grades, and communication will reside for this course.

- The URL to access Canvas is: <http://canvas.unl.edu> (<http://canvas.unl.edu>)
- For Canvas, passwords, or any other computer-related technical support contact the [IT Help Center](https://its.unl.edu/helpcenter/mysupport-team) (<https://its.unl.edu/helpcenter/mysupport-team>) .
 - Phone: 402-472-3970
 - Website: <http://mysupport.unl.edu/> (<http://mysupport.unl.edu/>)
 - Submit a support ticket: mysupport@unl.edu (<mailto:mysupport@unl.edu>)



Textbook & Required Materials

Textbook:

Principles of Operations Management: Sustainability and Supply Chain Management, Heizer, Render and Munson. Eleventh Edition. 2020.

Canvas:

Canvas will serve as an important area for updates and upcoming assignments. You will need stable internet access to complete assignments.



Assignments

Homework/Assignments (22 @ 50 points each = 1100)

We will be working on the application of what we are learning. Generally, there will be some time allocated in most class periods to work on your homework assignments. Each assignment will be due the following class period from when it is assigned.

Knowledge Checks/Quizzes (13 @ 50 points each = 650)

We will have one knowledge check each week on Thursdays. This quiz will summarize the key takeaways of the chapters covered each week.

Yellowdig Discussions (14 weeks @ 100 points per week = 1400)

Each week, you can earn a maximum of 100 points participating in Yellowdig. For maximum points, you need to author three posts a week and comment on two of your classmate's posts. Article topics should be about anything happening in the supply chain management area – changes for commodities / companies, economic changes influencing supply chains, etc. Business magazines and websites, or newspapers would be great places to find relevant articles

Projects (2 @ 250 points = 500)

There will be a team project and an individual project. These projects will be a combination of written case studies responses/solutions, writing an executive summary, and a recorded presentation.

✓ Grading Policies

Late Work Policy

No late work will be accepted.

Grade Breakdown

Grades will be based on Assignments, Knowledge Checks, Yellowdig Discussion, and the Final Project. There will be a total of 3,650 points for this class.

☒ Grade Breakdown

Grades will be based on Assignments, Quizzes, Current Event Articles and Presentation and the Final Project. There will be a total of 3,650 points for this class.

| Percent | Minimum | Maximum | Grade |
|---------|---------|---------|-------|
| 97% | 3541 | 3650 | A+ |
| 92% | 3358 | 3540 | A |
| 90% | 3285 | 3357 | A- |
| 87% | 3176 | 3284 | B+ |
| 82% | 2993 | 3175 | B |

| | | | |
|-----|------|------|----|
| 80% | 2920 | 2992 | B- |
| 77% | 2811 | 2919 | C+ |
| 72% | 2628 | 2810 | C |
| 70% | 2555 | 2627 | C- |
| 67% | 2446 | 2554 | D+ |
| 62% | 2263 | 2445 | D |
| 60% | 2190 | 2262 | D- |
| 0% | 0 | 2189 | F |

Expectations and Requirements for Student Professionalism and Respectful Communication

My expectations for this class:

- This class will be a safe place for intelligent debate and discussion and it will provide practical experience that will help you in your future endeavors.
- I expect all students to be engaged in class and be prepared to "practice" their presentation and selling skills. It is important to me that real examples are used and we practice practical application.
- This class is less about the tests - and more about building good problem solving skills, which is critical in Operations and Supply Chain classes. I want you to be exposed to real-world examples and current events that help bring this subject and course material to life. I am excited to share my passion for this industry.

Under the Course and University Policies you'll find the College of Business Academic Integrity policy. For this course that means:

- Do your own work on all assignments and exams.
- Do not attempt to gain any advantage by the fabrication of events.

Course Outline Details

Download a copy of the Spring 2021 Schedule by clicking on the link below:

- [Spring 2021 SCMA331 Tentative Schedule \(https://canvas.unl.edu/courses/105640/files/8351418?wrap=1\)](https://canvas.unl.edu/courses/105640/files/8351418?wrap=1)

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Course and University Policies



Accessibility Support

The University strives to make all learning experiences as accessible as possible. If you anticipate

or experience barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can discuss options privately. To establish reasonable accommodations, I may request that you register with Services for Students with Disabilities (SSD). If you are eligible for services and register with their office, make arrangements with me as soon as possible to discuss your accommodations so they can be implemented in a timely manner. SSD contact information: 117 Louise Pound Hall.; 402-472-3787

Academic Honesty

Academic honesty is essential to the existence and integrity of an academic institution. The responsibility for maintaining that integrity is shared by all members of the academic community. The University's [Student Code of Conduct \(<https://stuafs.unl.edu/DeanofStudents/Student%20Code%20of%20Conduct%20May%20Rev%202014%20a.pdf>\)](https://stuafs.unl.edu/DeanofStudents/Student%20Code%20of%20Conduct%20May%20Rev%202014%20a.pdf) addresses academic dishonesty. Students who commit acts of academic dishonesty are subject to disciplinary action and are granted due process and the right to appeal any decision.

College of Business students are held to the standards set by the UNL Student Code of Conduct. In the Student Code of Conduct, acts of dishonesty are specified as, but not limited to: cheating, fabrication or falsification, plagiarism, abuse of academic materials, complicity in academic dishonesty, falsifying grade reports, impermissible collaboration, or misrepresentation to avoid academic work. The penalties for academic dishonesty will be severe and may range from receiving a failing grade on the test or assignment, failing the course in which academic dishonesty took place, or the possibility of expulsion from the university.

Writing Support

The Writing Center can provide you with meaningful support as you write for this class as well as every course in which you enroll. Trained undergraduate and graduate peer consultants are available to talk with you about all forms of communication. You are welcome to bring in everything from lab reports, presentations, and research papers to cover letters, application essays, and graduate theses and dissertations. Writing Center Consultants can work with you at any stage of the writing process, from brainstorming and organizing your ideas through polishing a final draft.

In 2020-21, there are two ways you can connect with a Consultant: Online (a real-time, video conversation) and eTutoring (email feedback). To learn more about these options and view video tutorials, please visit [https://www.unl.edu/writing/online-writing-center-services \(<https://www.unl.edu/writing/online-writing-center-services>\)](https://www.unl.edu/writing/online-writing-center-services). Sign up any time by visiting [unl.mywconline.com \(<https://unl.mywconline.com/>\)](https://unl.mywconline.com). For more information about the Writing Center, please visit [unl.edu/writing \(<http://www.unl.edu/writing>\)](https://www.unl.edu/writing).



Counseling and Psychological Services

UNL offers a variety of options for students to aid them in dealing with stress and adversity.

Counseling and Psychological & Services (CAPS) (<https://caps.unl.edu/>) is a multidisciplinary team of psychologists and counselors that works collaboratively with Nebraska students to help them explore their feelings and thoughts and learn helpful ways to improve their mental, psychological and emotional well-being when issues arise. CAPS can be reached by calling 402-472-7450 (even after hours).



Required Use of Face Coverings for On-Campus Shared Learning Environments

As of July 17, 2020, and until further notice, all University of Nebraska–Lincoln (UNL) faculty, staff, students, and visitors (including contractors, service providers, and others) are required to use a facial covering at all times when indoors except under specific conditions outlined in the COVID 19 face-covering policy found at [https://covid19.unl.edu/face-covering-policy_\(https://covid19.unl.edu/face-covering-policy\).](https://covid19.unl.edu/face-covering-policy_(https://covid19.unl.edu/face-covering-policy).)



COVID Testing Policy

For Spring 2021, the university will provide mandatory saliva-based diagnostic testing to protect our campus community in the spring. All students, faculty, and staff who will be on campus in the Spring Semester are required to be tested via this convenient saliva-based testing during the week of January 19-24.

Students will also be required to adhere to an updated [Cornhusker Commitment \(<https://covid19.unl.edu/we-are-cornhusker-committed>\)](https://covid19.unl.edu/we-are-cornhusker-committed) prior to the beginning of the Spring semester, which includes an affirmative pledge to comply with all testing requirements and to follow campus safety protocols. This can be found in [MyRed \(<https://myred.unl.edu/>\)](https://myred.unl.edu/) and will need to be completed prior to scheduling your re-entry test.

After completing your first test, the Safer Community app will let you know the date when your next test result is due, likely around 10 days. Please schedule your second test at least one day prior to that date, to ensure your new results are posted and your access to campus buildings isn't disrupted. Once we have the results from the re-entry tests, a determination will be made in close consultation with LLCHD about what level of additional testing might be needed. This may include tests of particular subsets of the community that warrant additional testing. We will continue to

adapt and adjust our testing as the semester progresses.

More information can be found at <https://covid19.unl.edu/spring-testing> (<https://covid19.unl.edu/spring-testing>).



International Technology Access Policy

The College of Business online classes have been designed to give students the freedom to complete course work from anywhere in the world with reliable internet access; however, a country which has proven to be an exception has been brought to our attention. In the last few years, we have been notified by students taking online courses (particularly during visits to China) that they have not been able to access Canvas and some other websites due to internet censorship stemming from China's unique regulatory requirements (Google and YouTube are also subject to this censorship). Given that Canvas is the main resource for online class delivery, this could present difficulties especially when dealing with hard deadlines and completing synchronous class activities (virtual meetings, discussions and group work). In addition to Canvas, many online classes are using an online proctoring service which requires access to the company's website to enable proctoring appointment registration, to make required payments, and to sign on to take the exam. As such, a delay or an unforeseen change in internet access could have adverse effects on a student's grade. There have been some success stories of students being able to gain access to these restricted websites through the use of VPN, but this does not guarantee access, and, given that it subverts the country's regulations, is not something we wish to condone. So before you commit to taking online classes, please ensure that the places you plan to visit do not impose any such restrictions on internet access. Issues with internet access will not be accepted as an acceptable excuse for missing deadlines or failing to complete assignments.

ProctorU, the exam proctoring service used by many instructors, provides [a page for students to test their system prior to taking an exam](https://www.proctoru.com/testitout) (<https://www.proctoru.com/testitout>). This test should be done as early as possible in order to assure that your computer system meets the minimum requirements.



Technology Access Policy

The College of Business online classes have been designed to give students the freedom to complete course work from anywhere in the U.S. or the rest of the world with **reliable internet access**.

Issues with internet access will not be accepted as an acceptable excuse for missing deadlines or failing to complete assignments. Examples of these issues could be lack of internet access, cessation of internet access (in particular if right before a deadline), or blocked access to Canvas

and other sites from foreign countries (e.g., China), or any other.

The general recommendation for students is to avoid waiting until right before a deadline to work. If you are in Lincoln, you can always come to campus to use local computers and internet access if your personal computer or internet fails. For students outside Lincoln, having time to spare is also a good idea, as you can work on your assignments as soon as your internet access is restored. If you know in advance that you will be away from a reliable internet connection for a period of time during this class, please contact your instructor as soon as possible to see if accommodations can be arranged.

Course Summary:

| Date | Details | Due |
|-----------------|--|-----------------------------------|
| Mon Feb 1, 2021 |  Activate Yellowdig Discussions (https://canvas.unl.edu/courses/105640/assignments/877005) | due by 11:59pm |
| Tue Feb 2, 2021 |  Office Hour (https://canvas.unl.edu/calendar?event_id=245656&include_contexts=course_105640)  Weekly Live Class (https://canvas.unl.edu/calendar?event_id=245662&include_contexts=course_105640) | 10am to 11am 12:30pm to 1:45pm |
| Sun Feb 7, 2021 |  Assignment #1: GAPS Analysis (https://canvas.unl.edu/courses/105640/assignments/877015) | due by 11:59pm |
| |  Assignment #2: Making a Difference Video (https://canvas.unl.edu/courses/105640/assignments/877016) | due by 11:59pm |
| |  Assignment #3: Supply Chain Organizations (https://canvas.unl.edu/courses/105640/assignments/877017) | due by 11:59pm |
| |  Assignment #4: Unilever (https://canvas.unl.edu/courses/105640/assignments/877019) | due by 11:59pm |

| Date | Details | Due |
|------------------|--|-------------------|
| |  Assignment #5: Gantt Charts (https://canvas.unl.edu/courses/105640/assignments/877020) | due by 11:59pm |
| |  Knowledge Check 1: Chapter 1 (https://canvas.unl.edu/courses/105640/assignments/877004) | due by 11:59pm |
| |  Knowledge Check 2: Chapter 2 (https://canvas.unl.edu/courses/105640/assignments/877000) | due by 11:59pm |
| |  Knowledge Check Chapter 3 (https://canvas.unl.edu/courses/105640/assignments/876997) | due by 11:59pm |
| Tue Feb 9, 2021 |  Office Hour (https://canvas.unl.edu/calendar?event_id=245657&include_contexts=course_105640) | 10am to 11am |
| |  Office Hour (https://canvas.unl.edu/calendar?event_id=223421&include_contexts=course_105640) | 10:30am to 11am |
| Tue Feb 9, 2021 |  Weekly Live Class (https://canvas.unl.edu/calendar?event_id=245663&include_contexts=course_105640) | 12:30pm to 1:45pm |
| Sun Feb 14, 2021 |  Extra Credit: Speaker - Dan Colvin, Momentive (https://canvas.unl.edu/courses/105640/assignments/944064) | due by 11:59pm |
| Sun Feb 14, 2021 |  Assignment #6: Fashion Industry (https://canvas.unl.edu/courses/105640/assignments/877022) | due by 11:59pm |
| |  Assignment #7: Interview Prep (https://canvas.unl.edu/courses/105640/assignments/877024) | due by 11:59pm |

| Date | Details | Due |
|------------------|--|-------------------|
| |  <u>Knowledge Check 4:</u> <u>Chapter 4 (https://canvas.unl.edu/courses/105640/assignments/877001)</u> | due by 11:59pm |
| Tue Feb 16, 2021 |  <u>Office Hour (https://canvas.unl.edu/calendar?event_id=223422&include_contexts=course_105640)</u> | 10am to 11am |
| |  <u>Office Hour (https://canvas.unl.edu/calendar?event_id=245658&include_contexts=course_105640)</u> | 10am to 11am |
| |  <u>Weekly Live Class (https://canvas.unl.edu/calendar?event_id=245664&include_contexts=course_105640)</u> | 12:30pm to 1:45pm |
| Sun Feb 21, 2021 |  <u>Assignment #8: Baldrige Award (https://canvas.unl.edu/courses/105640/assignments/877025)</u> | due by 11:59pm |
| Tue Feb 23, 2021 |  <u>Knowledge Check 5:</u> <u>Chapter 6 (https://canvas.unl.edu/courses/105640/assignments/876998)</u> | due by 11:59pm |
| Thu Feb 25, 2021 |  <u>Extra Credit: Greg Hamm, Werner Enterprises (https://canvas.unl.edu/courses/105640/assignments/949656)</u> | due by 11:59pm |
| Sun Feb 28, 2021 |  <u>Extra Credit: Susan Hrabik, Platform Ventures (https://canvas.unl.edu/courses/105640/assignments/951026)</u> | due by 11:59pm |
| |  <u>Assignment #10: Supplement 7 (https://canvas.unl.edu/courses/105640/assignments/877006)</u> | due by 11:59pm |
| |  <u>Assignment #9: How Baby Carrots are Made (https://canvas.unl.edu/courses/105640/assignments/877027)</u> | due by 11:59pm |

| Date | Details | Due |
|------------------|--|-------------------|
| Tue Mar 2, 2021 |  <u>Knowledge Check 6: Supplement 7 (https://canvas.unl.edu/courses/105640/assignments/876996)</u> | due by 11:59pm |
| |  <u>Office Hour (https://canvas.unl.edu/calendar?event_id=245660&include_contexts=course_105640)</u> | 10am to 11am |
| |  <u>Weekly Live Class (https://canvas.unl.edu/calendar?event_id=245666&include_contexts=course_105640)</u> | 12:30pm to 1:45pm |
| Sun Mar 7, 2021 |  <u>Assignment #11: Starbucks (https://canvas.unl.edu/courses/105640/assignments/877007)</u> | due by 11:59pm |
| Tue Mar 9, 2021 |  <u>Knowledge Check 7: Chapters 8-10 (https://canvas.unl.edu/courses/105640/assignments/876995)</u> | due by 11:59pm |
| |  <u>Office Hour (https://canvas.unl.edu/calendar?event_id=223423&include_contexts=course_105640)</u> | 10am to 11am |
| Sun Mar 14, 2021 |  <u>Assignment #12: Speaker Week! (https://canvas.unl.edu/courses/105640/assignments/877008)</u> | due by 11:59pm |
| Tue Mar 16, 2021 |  <u>Office Hour (https://canvas.unl.edu/calendar?event_id=223424&include_contexts=course_105640)</u> | 10am to 11am |
| |  <u>Zoom Optional Class (https://canvas.unl.edu/calendar?event_id=276229&include_contexts=course_105640)</u> | 12:30pm to 1:30pm |
| Sun Mar 21, 2021 |  <u>Assignment #13: XPO Audiocast (https://canvas.unl.edu/courses/105640/assignments/877009)</u> | due by 11:59pm |

| Date | Details | Due |
|------------------|--|----------------|
| |  Knowledge Check 8: Chapter 11 (https://canvas.unl.edu/courses/105640/assignments/877003) | due by 11:59pm |
| Tue Mar 23, 2021 |  Office Hour (https://canvas.unl.edu/calendar?event_id=223425&include_contexts=course_105640) | 10am to 11am |
| |  Extra Credit: Graham Brisben, CEO of PLG Consulting (https://canvas.unl.edu/courses/105640/assignments/961257) | due by 11:59pm |
| Sun Mar 28, 2021 |  Assignment #14: Amazon & Inventory (https://canvas.unl.edu/courses/105640/assignments/877010) | due by 11:59pm |
| Sun Apr 4, 2021 |  Knowledge Check 9: Chapters 12 & 13 (https://canvas.unl.edu/courses/105640/assignments/876999) | due by 11:59pm |
| |  Assignment #15: Toyota (https://canvas.unl.edu/courses/105640/assignments/877011) | due by 11:59pm |
| Tue Apr 6, 2021 |  Knowledge Check 10: Chapter 16 (https://canvas.unl.edu/courses/105640/assignments/877002) | due by 11:59pm |
| |  Office Hour (https://canvas.unl.edu/calendar?event_id=223426&include_contexts=course_105640) | 10am to 11am |
| Sun Apr 11, 2021 |  Extra Credit: Mark Kelehan, Union Pacific Railroad (https://canvas.unl.edu/courses/105640/assignments/967023) | due by 11:59pm |
| |  Team Project: Executive Summary (https://canvas.unl.edu/courses/105640/) | due by 11:59pm |

| Date | Details | Due |
|------------------|--|-------------------|
| | <u>assignments/877041</u> | |
| |  <u>Team Project: Powerpoint slides</u> (https://canvas.unl.edu/courses/105640/assignments/877042) | due by 11:59pm |
| Thu Apr 15, 2021 |  <u>Corporate Presentations - Live Class</u> (https://canvas.unl.edu/calendar?event_id=280211&include_contexts=course_105640) | 12:30pm to 1:30pm |
| |  <u>"Live" Weekly Class Time to Discuss Weekly Material</u> (https://canvas.unl.edu/calendar?event_id=223418&include_contexts=course_105640) | 1pm to 1:45pm |
| |  <u>Corporate Presentations - Powerpoint and Delivery- Link for Live Session and Instructions</u> (https://canvas.unl.edu/courses/105640/assignments/877028) | due by 11:59pm |
| Sun Apr 18, 2021 |  <u>Assignment #16: Presentation Practice</u> (https://canvas.unl.edu/courses/105640/assignments/877014) | due by 11:59pm |
| Tue Apr 20, 2021 |  <u>Office Hour</u> (https://canvas.unl.edu/calendar?event_id=223427&include_contexts=course_105640) | 10am to 11am |
| |  <u>Optional Class on Writing an Executive Summary</u> (https://canvas.unl.edu/calendar?event_id=223420&include_contexts=course_105640) | 12:30pm to 1:30pm |
| |  <u>Extra Credit - Erica Denney, Trucking U - Tuesday, April 20th</u> (https://canvas.unl.edu/courses/105640/assignments/972868) | due by 11:59pm |

| Date | Details | Due |
|------------------|---|-------------------|
| Thu Apr 22, 2021 |  Tableau Introduction with Crete Carriers (https://canvas.unl.edu/calendar?event_id=223419&include_contexts=course_105640) | 12:30pm to 1:30pm |
| Sun Apr 25, 2021 |  Assignment #17: 1st Quarter 2021 Earnings Season (https://canvas.unl.edu/courses/105640/assignments/877012) | due by 11:59pm |
| Fri Apr 30, 2021 |  Extra Credit: Course Evaluation (https://canvas.unl.edu/courses/105640/assignments/877032) | due by 11:59pm |
| Fri May 7, 2021 |  SCMA331 Executive Summary (https://canvas.unl.edu/courses/105640/assignments/877038) | due by 11:59pm |
| |  SCMA331 Final Presentation (https://canvas.unl.edu/courses/105640/assignments/877039) | due by 11:59pm |
| |  Team Project Description and Podcast: Rare Earth Minerals Global Supply Chain (https://canvas.unl.edu/courses/105640/assignments/877040) | |

Course Syllabus

SCMA 350

Business Data Analytics

Fall 2020

A word doc file of syllabus is [here ↗ \(https://app.box.com/embed_widget/s/yjbrv7lh11rqdi9o4ekuvmd8wojh5wcy?view=list&sort=name&direction=ASC&theme=dark\)](https://app.box.com/embed_widget/s/yjbrv7lh11rqdi9o4ekuvmd8wojh5wcy?view=list&sort=name&direction=ASC&theme=dark).

Read (print) it, especially for details on the explanations on types of the assignments and grading composition/scores. Also, there are details on weekly work/content coverage. I will update this file if changes happen (in deadlines or assignments).



● **Silvana Trimi, Ph.D.**
● Teacher
✉ [Contact by \(mailto:silvana@unl.edu\)](mailto:silvana@unl.edu) :

- [\(mailto:silvana@unl.edu\)](mailto:silvana@unl.edu)
 - will try to respond to your emails within 24 hours (right away if not in classroom, or if very late in the evening). May not reply on Saturdays, but am available on Sundays.
- By (zoom) appointment (during the week days) and zoom office hours (Wednesday 11:00-11:30).



● **John Strasheim**
● TA
✉ [\(mailto:jstrasheim@huskers.unl.edu\)](mailto:jstrasheim@huskers.unl.edu)
⌚ Contact via Slack channel



Contact Information

Instructor Communication Policy

I will be available in many ways to make this class as easy as possible in these hard times that we all are going through. Below are the ways I will be communicating with you.

- We have **in-classroom classes twice a week**. To keep social distancing, we will have half of the number of students coming to classroom on Tuesday, and the other half on Thursday. You will need to sign up in the scheduler appointment related to that. [Here ↗
\(https://community.canvaslms.com/t5/Student-Guide/How-do-I-sign-up-for-a-Scheduler-appointment-in-the-Calendar/ta-p/536\)](https://community.canvaslms.com/t5/Student-Guide/How-do-I-sign-up-for-a-Scheduler-appointment-in-the-Calendar/ta-p/536) are the instructions how to do that.
 - class time will be used for you to work on labs, cases, and ask me questions or ask me to (re) demonstrate the tool or (re) explain concepts.
 - I will pre-record (video) explanations for all:
 - concepts (textbook/ppts), labs (explanation/jmp), cases
 - In the classroom, I can show you more, and will answer questions you may have
 - I will zoom and record this sessions too
- I will send out an **announcement** (Canvas - please make sure your setting in Canvas is set such) **every Sunday** (by 5 pm), regarding to what we will cover, and the assignments that will be due on **next week**.
- The old:) email - always efficient: can write me at any time; I will try to respond within two hours (except on Saturday).
- We will use Slack for communicating and Q & A
- For questions related to Lab grading, you will contact GA. For question related to Lab content, you will contact me.
- For any question related to group Cases, you will contact me.

Office Hours

- I will have virtual (zoom) office hours every Wednesday 11:00-11:30, and by request - any time before 5 PM Central time, excluding w/e, and teaching hours (T, R 2 - 6:15 PM - I will be unable to have zoom meeting during these times, but you can join the zoom classes).
- Office hours are for questions: related to class. But you are welcome to 'stop by' for any concern that you may have, even not related to class issues. I am here to help you more than for this subject, especially during these hardship times.



Course Description

Data and information as important resources to be managed in modern organizations. Development of quantitative analytical skills and presentation in business decision making. Basic information system concepts with primary focus on data analysis and related business decisions.

Prerequisite:

Sophomore standing; [SCMA 250 \(https://catalog.unl.edu/search/?P=SCMA%20250\)](https://catalog.unl.edu/search/?P=SCMA%20250); 2.5 GPA; Business Qualified (MATH104 or MATH106 or MATH107 or MATH208; BSAD220; ACCT201 and ACCT202; ECON211 and ECON212; ECON215 or equivalent.) Prereqs differ for RAIKES, ACTS, and ABUS majors - see catalog.

Notes: Cannot be taken Pass/No Pass.



Course Objectives

By the end of this course you will be able to understand, apply, and report business (make decisions) data analytics (by using data and statistical analyses).

1. Learn how to use tools (JMP) to do data analytics
2. Learn to provide recommendations and make decisions based on findings from analytics
3. Learn how to write managerial reports (on findings from data analytics)
4. Learn statistical problem solving - steps in solving real-world business problems by using data and statistical analysis



Textbook & Reading Materials

- JMP internal documentation - under the Help menu, and in JMP wre
- Sharpe, De Veaux & Velleman, Business Statistics, 3d Edition, 2015, Pearson



Course Schedule Details

Note: Syllabus is based on in-the-classroom teaching weeks. Thus, I am considering first week (this asynchronous one) as "week 0". Therefore, syllabus starts with *first week of synchronous/split classes* (finals' week shows as Week 15 - which is (the official) week 16 of the semester).

Course Schedule

| Date | Details |
|---------|--|
| Week 1 | What is data, introduction to JMP, how to do a lab |
| Week 2 | Univariate analysis: variable modeling types, describing single variables (graphs and summary statistics - differences for categorical and numerical variables) |
| Week 3 | Bivariate analysis - describing and analyzing relationships between two variables |
| Week 4 | Case 1 - Medical Malpractice: work in groups |
| Week 5 | Case 1 - Work in group and presentations |
| Week 6 | Case 2 (time series) - Airline Performance: working in groups |
| Week 7 | Case 2 - presenting; Normal and continuous distributions |
| Week 8 | Sampling distributions, CI |
| Week 9 | Inferences: Single Variable - One sample HT |
| Week 10 | Inferences: Two Variables - Two-sample HT |

| Date | Details |
|------------------|--|
| Week 11 | ANOVA; Case 3 - Cost of Living: work in groups |
| Week 12 | Case 3 presentation, Inference for Regression: Simple (single variable) Linear |
| Week 13 | Case 4 - Direct Mail: work in groups and presentation |
| Week 14 | Inference regression: multiple (variables) regression; Case 5 - Housing |
| Week 15 Final | Case 5 - presentation |



Canvas Information

Canvas is where the course content, grades, and communication will reside for this course.

- The URL to access Canvas is: <http://canvas.unl.edu> (<http://canvas.unl.edu>)
- For Canvas, passwords, or any other computer-related technical support contact the [IT Help Center](https://its.unl.edu/helpcenter/mysupport-team) (<https://its.unl.edu/helpcenter/mysupport-team>) .
 - Phone: 402-472-3970
 - Website: <http://mysupport.unl.edu/> (<http://mysupport.unl.edu/>)
 - Submit a support ticket: mysupport@unl.edu (<mailto:mysupport@unl.edu>)

Course Policies



Grading Policies

Feedback

- We (TA and I) will be grading all your assignments online in Canvas (therefore, your submissions' files should be in word document format, not in pdf).
 - I will grade group cases, and TA will be grading your labs (so questions related to lab grading should be directed to TA. However, you can ask me questions for any type of grading, and any issue/concern/question).
- Grading will be based on rubrics (different for labs, and cases)
 - check them before you do and submit the assignments so you know what is required and expected of your work).
- We will try to finish grading of the week during the w/e after the assignments have been submitted, or the latest the following week.
- I will also post samples (especially at the beginning of the semester) of previous student works or from your peers' work to provide you with some examples of how a good work should look like/be, and for you to also learn from (content of labs/cases). For labs, I will also provide the (brief) summary of the main (learning) points of the lab.

Late Work Policy

Late assignments are not good for neither you (students) or the graders.

- You will fall behind as work will pile up; for sure it will increase stress and anxiety and will affect the quality of your work. In addition, the concepts covered in each week are built on the previous week's concepts and assignments, so you will fall even farther behind if you fail to keep up.
- Graders (including myself) are also busy: they have to grade during the w/e (to give you a quick feedback; and they have lots of work of their own to do). In addition, consistency (having to grade all the same work in one sitting/same day) makes the grading not only faster and easier for graders, but most important, it makes it fairer to you (same "hand" is used for every students (tested and proven by studies)).

Therefore, I will enforce the no-late assignment policy for the good of all. If you have a good reason (particularly on these hard times) for late submission, I will accept late submissions with a **10% penalty** for each overdue day (up to **max 3 days** – after that, no more submission is allowed). Of course, unless you fall ill with Corona (fingers crossed, none does).

Finally, to make sure, please **save all your work in this course until you have received your final course grade.**

Assignment Weighting

| | | |
|---------------------|-----------|-------|
| ▪ Group: | 50 points | 28.5% |
| ▪ Individual Labs: | 60 points | 34% |
| ▪ Quizzes: concepts | 40 points | 23% |
| ▪ Quizzes: JMP | 20 points | 11.5% |
| ▪ Yellowdig | 5 points | 3% |



Grade Scheme

The following grading standards will be used in this class:

Grade Range

| | |
|----|-------------------|
| A | 100 % to 94.0% |
| A- | < 94.0 % to 90.0% |
| B+ | < 90.0 % to 87.0% |
| B | < 87.0 % to 84.0% |
| B- | < 84.0 % to 80.0% |
| C+ | < 80.0 % to 77.0% |
| C | < 77.0 % to 74.0% |
| C- | < 74.0 % to 70.0% |
| D+ | < 70.0 % to 67.0% |
| D | < 67.0 % to 64.0% |
| D- | < 64.0 % to 61.0% |
| F | < 61.0 % to 0.0% |



Expectations for Student Conduct

- Read my overview at the beginning of each week module
- Read PPTs (they are really good summaries of the textbook). Then watch my video.

Finally, read the textbook (if you feel comfortable after looking at PPTs, and watching my videos, just screen through the chapter).

- For sure check the Guided Examples in each related (weekly reading) chapter in the textbook (they show you the statistical problem solving steps/process - which you will use for all your labs and cases, and which is the goal of the course; they also show you how to interpret the results and (write) report).
- Watch (JMP, instructors, other)videos; practice (while watch, open same files as do what you watch in the video); do individual work absolutely by yourself - plagiarizing/cheating is not acceptable. It is much better to ask me to tell you how/give you answers than copy from each other or worse. Keep in mind that skills you will learn in this class are the most wanted by companies - you will gain an advantage in the job market. Take this class in a very selfish way - go beyond what we can cover in this class. Benefit from many resources/links in Canvas, and learn and dig deeper on your own).
- Do contribute to your group's project:
 - Not only it is fair (there is no free ride), but also (again) you are in this class to learn, push yourself, push your teammates and me, to learn more.
 - In addition, you will also evaluate each other (on the amount and quality of work each of you contributed) - I use those weights to (literally) correct your score (from group into your individual score).
 - Do not let your grade "in the hands of other students" - not everyone in the group may have the same grade and knowledge ambitions, or time. Thus, each one of you should read the whole group's report (don't just divide and patch up the work together without knowing what the other people have written/done), so you make sure it is up to your quality level (again, not every students cares the same, and does the same quality of work).
- Be respectful to each other and your professor and TAs. We are all going through difficult times and are stressed in many different ways. Be kind, be understanding, be mindful, and work hard.

Attendance & Engagement

I will not require attendance, not only because UNL prevents it (*please read below*), but I agree with it, as there are many good reasons for it:

- first, safety - if you don't feel well or are suspicious, please stay home. I will try to help and accommodate you with all I can. We hope for the best (no outbreaks), but we may not know until it happens. This is the reason why I will record everything online (so you can watch and work at home).
 - I will use the classroom time (synchronous part) for you to work on/finish assignments, demonstrate how to use JMP, to further clarify/explain concepts,

assignment requirements. Based on last semester experience (when classes were switched online), many of students did find coming to classroom much more helpful.

- Remember that we will record in-class sessions; or if there will be no class, relevant materials will be recorded and available online.
- There will be some learning curve: of assignment (how to do and expectations), concepts, my style of teaching (and accent :))
 - therefore, coming to classroom at the beginning of the semester particularly will be very helpful and needed. As the semester goes on, and as the pandemic situation may change or not, we will be flexible
 - to help on learning curve, I also have much longer recorded videos (explanations for concepts and assignments) at the beginning of the semester - do not get frustrated or scared, as it won't be the same as we all get acquainted and used to each other and class. Instructor's videos will get shorter as we go along the semester :).
- second - some of you may not be here in Lincoln, or even in the USA, therefore you will not be able to physically attend class.

However, regardless of the possibility of physical attendance, you are all required to be engaged: thus I will use the phrase "attendance and engagement" in lieu of "attendance".

- Engage with your peers: for sure to do the group work. Interact to do the work, ask questions, answer/learn/teach each other - I always have gotten from previous classes the feedback that students learn from their peers in this class quiet a lot. Make friends, and enjoy social (distancing) interaction.
- Ask/answer questions, discuss, engage - to me and your peers, in Q&A in Canvas; in the classroom; in zoom; in working in groups; in online communities (yellodig, slack)

Even though this class is split-synchronous, the university has established a policy that prevent attendance requirements in light of COVID-19.

The Faculty Senate Policy on Class Attendance, updated in April 2018, can be found at <https://registrar.unl.edu/academic-standards/policies/class-attendance/> (<https://registrar.unl.edu/academic-standards/policies/class-attendance/>). While that policy remains fully in effect, the Faculty Senate endorses the following interpretation and guidance for it for the Fall 2020 semester.

We know that, especially in the face of a pandemic, it is crucial that individuals who are sick stay home. At the same time, we know that regular engagement with a course is key to students' abilities to be successful in that course. Therefore, for the Fall 2020 semester, "attendance" should be interpreted to mean "physical attendance in the classroom, remote synchronous attendance, or engagement with the course in ways specified by the instructor in the course syllabus." Moreover, the phrase "attendance and engagement" will be used in lieu of "attendance".

Students who are sick or who are engaging in self-quarantine in accordance with guidance

from the Lincoln-Lancaster County Health Department or their health care professional should not physically attend in-person classes. They must notify the instructor of their absence and must still meet the stated engagement expectations of the course, and they must adhere to the usual codes of conduct and rules of academic integrity that remain in place. For students who are absent for these reasons, we ask instructors to be flexible with any attendance policies they may have for their courses. Again, students in this situation must still fulfill the engagement expectations of their classes and should follow the stated guidelines for their courses in communicating with their instructors and staying current in the coursework. If the majority of the course work is completed but the absence makes it impossible for the student to adequately complete all course requirements, a grade of incomplete may be an appropriate option. Note, however, that if the student has not already completed most of the graded work for the course, then a late withdrawal would be more appropriate than an incomplete.

Classroom Roles and Responsibilities

We will use classroom time for finishing up the assignments (labs) and working on cases. I want you all to have prepared and worked on the labs before you come to class (recordings on how-to-do labs will be available online) - we will use class time for any further clarification, questions, learning that you may want/have. I am very open and flexible to adjustments (of using class time better or collaborating/engaging better). Therefore, *I would like your input on what expectations you have of me as well. This can be a great first-day-of-class discussion with you. But will continue throughout the semester too.*

Technology Use

We will come to class to learn, and use JMP. This is can be considered a "sacrifice" (we will make in this contagious time) for the sake of learning. Therefore, I am sure that we all agree that class time should be used for learning only (and not do non-related activities on computers in the classroom, or playing with your phones, etc.).

Netiquette

- **Participate:** This is a shared learning environment. No lurking in the cyberspace background. It is not enough to login and read the discussion thread of others. For the maximum benefit to all, everyone must contribute.
- **Report Glitches:** Discussion forums are electronic. They break. If for any reason you experience difficulty participating, please call, email, or otherwise inform me of the issue. Chances are others are having the same problem.
- **Help Others:** You may have more experience with online discussion forums than

the person next to you. Give them a hand. Show them it's not so hard. They're really going to appreciate it!

- **Be Patient:** Read everything in the discussion thread before replying. This will help you avoid repeating something someone else has already contributed. Acknowledge the points made with which you agree and suggest alternatives for those with which you don't.
- **Be Brief:** You want to be clear—and to articulate your point—without being preachy or pompous. Be direct. Stay on point. Don't lose yourself, or your readers, in overly wordy sentences or paragraphs.
- **Use Proper Writing Style:** This is a must. Write as if you were writing a term paper. Correct spelling, grammatical construction and sentence structure are expected in every other writing activity associated with scholarship and academic engagement. Online discussions are no different.
- **Cite Your Sources:** Another big must! If your contribution to the conversation includes the intellectual property (authored material) of others, e.g., books, newspaper, magazine, or journal articles—online or in print—they must be given proper attribution.
- **Emoticons and Texting:** Social networking and text messaging has spawned a body of linguistic shortcuts that are not part of the academic dialogue. Please refrain from :-) faces and c u l8r's.
- **Respect Diversity:** It's an ethnically rich and diverse, multi-cultural world in which we live. Use no language that is—or that could be construed to be—offensive toward others. Racists, sexist, and heterosexist comments and jokes are unacceptable, as are derogatory and/or sarcastic comments and jokes directed at religious beliefs, disabilities, and age.
- **No YELLING!** Step carefully. Beware the electronic footprint you leave behind. Using bold upper-case letters is bad form, like stomping around and yelling at somebody (NOT TO MENTION BEING HARD ON THE EYE).
- **No Flaming!** Criticism must be constructive, well-meaning, and well-articulated. Please, no tantrums. Rants directed at any other contributor are simply unacceptable and will not be tolerated. The same goes for profanity. The academic environment expects higher-order language.
- **You Can't Un-Ring the Bell:** Language is your only tool in an online environment. Be mindful. How others perceive you will be largely—as always—up to you. Once you've hit the send button, you've rung the bell.

College and University Policies



Required Use of Face Coverings for On-Campus Shared Learning Environments

As of July 17, 2020, and until further notice, all University of Nebraska–Lincoln (UNL) faculty, staff, students, and visitors (including contractors, service providers, and others) are required to use a facial covering at all times when indoors except under specific conditions outlined in the COVID 19 face-covering policy found at <https://covid19.unl.edu/face-covering-policy> (<https://covid19.unl.edu/face-covering-policy>).



Counseling and Psychological Services

UNL offers a variety of options for students to aid them in dealing with stress and adversity. [Counseling and Psychological & Services \(CAPS\) \(https://caps.unl.edu/\)](https://caps.unl.edu/) is a multidisciplinary team of psychologists and counselors that works collaboratively with Nebraska students to help them explore their feelings and thoughts and learn helpful ways to improve their mental, psychological and emotional well-being when issues arise. CAPS can be reached by calling 402-472-7450 (even after hours).



Accessibility Support

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can discuss options privately. To establish reasonable accommodations, I may request that you register with Services for Students with Disabilities (SSD). If you are eligible for services and register with their office, make arrangements with me as soon as possible to discuss your accommodations so they can be implemented in a timely manner. SSD contact information:

117 Louise Pound Hall.; 402-472-3787



Academic Honesty

Academic honesty is essential to the existence and integrity of an academic institution. The responsibility for maintaining that integrity is shared by all members of the academic community. The University's [Student Code of Conduct \(https://stuafs.unl.edu/DeanofStudents/Student%20Code%20of%20Conduct%20May%20Rev%202014%20a.pdf\)](https://stuafs.unl.edu/DeanofStudents/Student%20Code%20of%20Conduct%20May%20Rev%202014%20a.pdf) addresses academic dishonesty. Students who commit acts of academic dishonesty are subject to disciplinary action and are granted due process and the right to appeal any decision.

College of Business students are held to the standards set by the UNL Student Code of Conduct. In the Student Code of Conduct, acts of dishonesty are specified as, but not limited to: cheating, fabrication or falsification, plagiarism, abuse of academic materials, complicity in academic dishonesty, falsifying grade reports, impermissible collaboration, or misrepresentation to avoid academic work. The penalties for academic dishonesty will be severe and may range from receiving a failing grade on the test or assignment, failing the course in which academic dishonesty took place, or the possibility of expulsion from the university.



Writing Support

The Writing Center can provide you with meaningful support as you write for this class as well as every course in which you enroll. Trained undergraduate and graduate peer consultants are available to talk with you about all forms of communication. You are welcome to bring in everything from lab reports, presentations, and research papers to cover letters, application essays, and graduate theses and dissertations. Writing Center Consultants can work with you at any stage of the writing process, from brainstorming and organizing your ideas through polishing a final draft.

In 2020-21, there are two ways you can connect with a Consultant: Online (a real-time, video conversation) and eTutoring (email feedback). To learn more about these options and view video tutorials, please visit [\(https://www.unl.edu/writing/online-writing-center-services\)](https://www.unl.edu/writing/online-writing-center-services). Sign up any time by visiting unl.mywconline.com (<https://unl.mywconline.com/>). For more information about

the Writing Center, please visit [unl.edu/writing](http://www.unl.edu/writing).



Weather/Fire

Every UNL campus building has emergency shelter and evacuation plans. Please familiarize yourself with the plans of each building in which you take classes or attend meetings. Make sure to note the routes to the lowest level of the buildings for shelter during inclement weather, as well as exits from the buildings in the event of fire or other emergency. For more information on emergency procedures visit emergency.unl.edu.



Medical

In the event of a medical emergency in the classroom immediately call **9-1-1** and take steps to assist the individual as needed. For details on what to do during Medical Emergencies, [visit the Medical Emergencies handbook](http://wellness.unl.edu/wellness_documents/medical_emergencies.pdf).



Active Shooter/Physical Attack

Run - If there is a clear and safe escape route.

Hide - If there is no escape and you can get to a secure location to hide.

Fight - If your only option is to defend yourself, fight as if your life depended upon it.

For more details and video training for all emergency procedures visit emergency.unl.edu.

If you would like to save a PDF copy of this syllabus for your records you can open your browser's Print dialog and set your print destination to "Save as PDF" or "Microsoft Print to PDF."

Course Description

Finance 361 is the finance course all business majors must take and it is a prerequisite to all finance courses needed for the Finance major.*

The course is taught from the perspective of problem solving. It covers key types of problems that you will encounter in your personal finance life and those in your careers. As such, it is condensed into necessary components. This means you should not “gloss over” any of the material.

The objective of the course is that you learn and retain the material. The pedagogical techniques chosen are targeted toward this purpose.

The course uses a mastery approach. With a mastery approach, you may do the exercises as many times as necessary, but you must master them (defined in this course as 80% or above) to proceed to the next topic.

The topics covered are:

1. Time Value of Money
2. Bonds – valuation, return and types of risk
3. Components of the Interest Rate and the Term Structure
4. Stocks – valuation and return
5. Capital Budgeting
6. Cost of Capital
7. Free Cash-Flow Estimation

The arrangement of the topics is such that each later topic builds on the preceding.

* You must earn a C or better in FINA 361 to take all Finance courses required for the Finance major.

The course is presented in a "flipped" format, which means the content for the course is presented outside of class. I will work problems in class and answer questions.

The flipped format means that you must come to class prepared by completing the material or tasks assigned to you.

Course Description

-

Finance 361 will introduce you to concepts and techniques that form the foundation of modern finance. These include

1. Time Value of Money (TVM),
2. Bonds – Valuation – Return Composition - Risk
3. Discount Rates and Rates of Return
4. Stock Valuation
5. Capital Budgeting
6. Cost of Capital
7. Free Cash-Flow

Finance 361 will prepare you for more advanced finance courses, but will also prepare you to make informed financial decisions you will encounter in everyday life.

Answer the questions below. The more items you check “yes” the more the material in this course will be useful to you.

| | Yes | No | Maybe |
|--|-----|----|-------|
| Do you have a student loan? | | | |
| Do you have (or will you have) a car loan? | | | |
| Do you (or will you) use a credit card? | | | |
| Do you plan to save for retirement sometime in the future? | | | |
| Do you plan on owning a house some day? | | | |
| Do you see yourself owning your own business some day? | | | |
| Do you see yourself owning stocks and bond and other investments some day? | | | |
| Do you aspire to be a | | | |

| | | | |
|--|--|--|--|
| top executive (Chief Executive Officer CEO, etc.)? | | | |
|--|--|--|--|

Resources for the Class

It is particularly important that you be self-motivated, disciplined and organized under the current Covid-19 circumstances.

I have provided you with a variety of resources that have been shown to be effective teaching instruments.

Mini Lectures are YouTube videos provided as links in your text. Most of these are short (5-15 minute) narrated step-by-step guides to working problems. These allow you to get virtual “one-on-one” help with specific types of problems you may have. They will provide you with lecture material to prepare you to work problems in class. These have the advantage that you can review them any time you need to refresh your memory. Also, it frees up class time so that I can answer questions.

Repeatable (In-Class Exercise) Quizzes are small point quizzes that count toward your grade. You may do these quizzes as many times as you want. Your high score is the score that will count toward your grade.

Success at solving problems results from repetition and from doing problems until the techniques become automatic. The frequent quizzes allow you to recall repeatedly what you have been taught, which based on the “testing effect,” aids in long term retention.

Your classmates are a valuable resource to you in this course. I encourage you to work with your classmates. You will be assigned a study group on Canvas so that you can meet new people and have a group to work with. Of course, you are welcome to work with others as well. Any work that is graded must be done by yourself.

There is substantial evidence that learning from and explaining material to others increases your depth of understanding and retention.

ATTENDANCE

ATTENDANCE IS OPTIONAL – because of the social distancing requirement, not everyone can attend class at the same time. I will create a sign-up sheet that you will need to use to reserve yourself a spot in the classroom.

If there is repeatedly more demand than seats, I will assign you to days that you can come in person.

You will be able to attend class at the scheduled time via Zoom and all Zoom classes will be recorded and available.

The course material is designed such that you can do well without attending class.

A Peer Tutor is available to provide you with one-on-one tutoring to supplement the other resources in the course.

| Professor | Tutor | Tutoring | Review Session | Room | Zoom Link |
|------------------|---------------|--------------------------------|-----------------------|-------------|---|
| Geppert | Khiana Blizek | Review Sessions & Appointments | Fridays 9am | HLH 032 | https://unl.zoom.us/j/96798190093 |

Tutoring will begin Monday, August 31 and run until Friday, November 20.

I am available to help you once you have availed yourself of the other resources available in the course. I am happy to help you, but my goal is to help you to transition to an independent (life-long) learner.

DO NOT email me with questions regarding problems in the course. Use the Discussion Board or attend my Office hours. If you have a question regarding the course that applies just to you feel free to email me.

Discussion Board

Canvas Discussion Boards will be posted so that you may ask me questions regarding the material in the course. If you have a question regarding a problem, do the following:

1. Type the entire question into the Discussion Board
 2. Write how you attempted to solve the problem
 3. Ask for clarification

Do not say “I don’t know how to do #5 from In-Class Questions 3. I expect you to try the problems first and then I am happy to help you.

Office Hours

I will have office hours Monday 10:00 AM – 11:00 AM via zoom

Wednesday 8:00 PM – 9:00 PM via zoom

My Contact Information

John Geppert

CoB 425P

402-472-3370

jgeppert1@unl.edu

Prerequisites

Sophomore standing;

2.5 GPA;

Business Qualified

(MATH104 or MATH106 or MATH107/MATH107H or MATH208/MATH208H;

ACCT201 or ACCT201H or RAIK181H;

ACCT202 or ACCT202H or RAIK282H;

ECON211 or ECON211H or RAIK282H;

ECON212 or ECON212H or RAIK182H;

ECON215 or ECON215H or STAT218 or equivalent.

The College will drop you from the course if you fail to meet the requirements for this course. The above list of courses are prerequisites and cannot be taken simultaneously with finance 361. If you are incorrectly dropped from the course, go to the Undergraduate Advising Office.

Calculator

A financial calculator

You may use any calculator you like, but the illustrations in the book and Mini-lectures use the Texas Instrument BA II Plus.

Textbook & Reading Materials

Introductory Finance

FINANCE 361

A WORKED PROBLEM APPROACH

John Geppert

University of Nebraska–Lincoln

ISBN 978-1-5339-2477-3

Everything is based on the book so the book is absolutely required. The book is available at the bookstore or online.

I recommend you get a hard-copy because the book is also a workbook.

If you cannot get a hard copy the book can be rented using the following link:

<https://www.vitalsource.com/products/introductory-finance-finance-361-a-worked-john-geppert-v9781533933119?term=978-1-5339-3311-9>

Grading Policies

Your course grade is composed of a series of quizzes, two exams and a final.

| Type | Number | Repeatable | Minimum Required | Points | Total Points |
|--------------------|--------|------------|-----------------------------------|----------------|--------------|
| In-Class Exercises | 22 | YES | NO | 6 points each | 132 |
| Unit Quizzes | 7 | YES | YES 32 points required on each | 40 points each | 280 |
| Exam 1 | 1 | NO | NO | 144 | 144 |
| Exam 2 | 1 | NO | NO | 144 | 144 |
| Final Exam | 1 | NO | NO | 300 | 300 |

In-Class Exercises quizzes are just like the exercises in the book. You may do these quizzes as many times as you like throughout the semester. Your highest score on each is what will count toward your course grade.

Unit Quizzes are similar to the questions that will be on the exams. You may do these quizzes as many times as you like throughout the semester. Your highest score on each is what will count toward your course grade. You

MUST score at least 32 points (80%) on these quizzes to be able to take the exams. You may retake them before the final exam if you want to further raise your course score.

Exam 1, Exam 2 and the Final will be taken at a time TBA (to account for time zones). These exams may only be taken once.

If you miss exam 1 or exam 2 with a DOCUMENTED SERIOUS, REASON the points from the missed exam will be moved to the final

Late Work Policy

Late work will be counted without penalty EXCEPT for exam 1, exam 2 and the final exam, unless special arrangements have been made.

Note: once you take an exam, that score is what will be counted toward your course grade. If for some reason you are not able to take an exam to the best of your ability, contact me BEFORE the exam to discuss the circumstances

Grading Scale

| Points | Course Grade |
|----------|--------------|
| 970-1000 | A+ |
| 930-969 | A |
| 900-929 | A- |
| 870-899 | B+ |
| 830-869 | B |
| 800-829 | B- |
| 770-799 | C+ |
| 730-769 | C |

| | |
|-----------|----|
| 700-729 | C- |
| 670-699 | D+ |
| 630-669 | D |
| 600-629 | D- |
| Below 600 | F |

This is a fixed scale.

There is NO EXTRA CREDIT

The grade of Incomplete is given only in rare circumstances. By that I mean you are not able to complete the course due to circumstances beyond your control. If you complete an assignment, exam or quiz it will count toward your grade, so if you need an incomplete grade, make these arrangements prior to completing any class component which contributes to your grade. Unsatisfactory performance on exams is not grounds for the grade of I. If you are not doing well in class, please speak to me immediately.

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SYLLABUS UPDATED 3/29/2020

Changes due to our move online are highlighted in red

Professor:

Brenden Timpe
Assistant Professor of Economics
btimpe@unl.edu
402-472-2327

Office: <https://unl.zoom.us/j/3461974131>
Office hours: 10:45am-12:15pm Thursday
1:00-2:00pm Wednesday
or by appointment

Teaching Assistant:

Henrietta Ankomah

Office: **Zoom**
Office hours: **By appointment**

COURSE DESCRIPTION

This course is designed to help you develop practical data analysis skills and gain hands-on experience working with real-world data. We are motivated by a central question: How can we use increasingly abundant and accessible sources of data to better understand the world around us? You will be asked to find or collect data that can shed light on important economic and social issues, analyze the data using modern statistical software, and communicate your results in a way that is accessible and compelling to a wider audience. Along the way, we will talk about effective ways to explore and summarize data, the methodology behind data collection and its implications for how we use and interpret it, and general principles of data visualization. **We will meet for our regular classes via Zoom at <https://unl.zoom.us/j/3461974131>, but a recording will be posted on Canvas for those who cannot attend at the regular time.**

The prerequisites for this course are ECON 210 or both ECON 211 and 212, plus ECON 215 or an equivalent course in probability and statistics. Please note that you alone are responsible for ensuring that you meet these formal prerequisites.

COURSE MATERIALS

There is one required textbook for this course: **“Mind on Statistics” by Jessica M. Utts and Robert F. Heckard.** Copies are available for rent or purchase at the campus bookstore or your favorite alternative to the campus bookstore. Note that while the book is on its fifth edition, the second, third, or fourth editions would suffice for the purposes of this course.

In addition to the textbook above, we will make use of the following textbooks that are freely available online:

- “**Doing Economics**” by Eileen Tipoe and Ralf Becker, <https://www.core-econ.org/project/doing-economics/>
- “**Data Visualization: A Practical Introduction**,” by Kieran Healy, <https://socviz.co/>
- “**Cookbook for R**,” by Winston Chang, <http://www.cookbook-r.com/>
- “**R for Data Science**,” by Hadley Wickham, <https://r4ds.had.co.nz/>

This course is designed to provide hands-on experience working with data, and so you will need access to statistical software. We will use **R**, an open-source programming language that is an increasingly common tool for economists and other data analysts. If you have never used R, don't worry! You need no familiarity with either to take this course; we will learn as we go. R is available free of charge online (I recommend RStudio at <https://www.rstudio.com/>). If you'd rather not install R on your personal computer, you can also use the web-browser version (<https://rstudio.cloud>) or use R Studio in the School of Business computer lab. Note that laptops can also be checked out through UNL's Information Technology Services (follow [this link](#) for more information).

Finally, we will also use a series of journal articles, news stories, and blog posts that are available either through the UNL library or online. I will distribute these as we go.

I will use the course **Canvas** site to distribute slides, assignments, readings, and other course-related materials. Please make sure you have access to the site and *check it regularly*. If you do not have access to the site, your first step should be to check MyRED, which provides your Canvas ID.

The topics of data analysis and data visualization have spawned a vast literature that would be impossible to cover in a one-semester course. Below is a handful of additional references that I have found compelling. These are not required or even necessarily recommended for this course, but I list them here as a reference for those wishing to explore the topic further in your future pursuits:

The Visual Display of Quantitative Information, by Edward Tufte

Visual Explanations, by Edward Tufte

Show Me the Numbers: Designing Tables and Graphs to Enlighten, by Stephen Few

Exploratory Data Analysis, by John W. Tukey

Visualize This: The FlowingData Guide to Design, by Nathan Yau

Storytelling with Data: A Data Visualization Guide for Business Professionals, by Cole Nussbaumer Knaflic

COURSE EVALUATION

The primary objective of this course is to help you learn to be a sophisticated producer and consumer of data analysis. In line with this objective, you will be asked to complete a research project. This will include the development of a research question that interests you, an analysis of the question using economic theory, identification of a source of data that could shed light on this question, and an *original* analysis of this data. The project is due **May 4**, but you will also need to produce a short project proposal (due February 18) and mid-semester project update (due **March 31**). Including the proposal and mid-semester update, this project will comprise **45%** of your grade. More details will follow early in the semester.

In addition, you will complete a total of 10 homework assignments and **1 formal exam** over the course of the semester. The **exam makes up 15%** of your grade in all, while the homework assignments will comprise the final **40%**. The homework is designed to reinforce the concepts we discuss in class, as well as to build your experience working with R. As such, the homework is graded primarily on effort, rather than on getting the right answer. In addition, I drop your two lowest homework scores. This means that you don't need to worry if you do poorly on a single homework, but it also means that *I cannot accept*

Spring 2020

Econ 409: Economic Data Visualization and Analysis

TTh 9:30am

homework that is late for any reason. Please be aware that I cannot provide special opportunities to obtain extra credit or otherwise make up for poor performance.

Breakdown:

Course project: **35%**

2 project updates: 5% each

10 homework assignments (drop lowest 2): **40%**

Midterm exam: 15%

Final exam: 15%

Exam Schedule:

MID-TERM EXAM: March 5 in HLH 211 during class time

~~FINAL EXAM: May 7, 10:00am - 12:00pm in HLH 211~~

Grading scale:

| | | | | | |
|--------|----|-------|----|-------|----|
| 99-100 | A+ | 80-81 | B- | 68-69 | D+ |
| 92-98 | A | 78-79 | C+ | 62-67 | D |
| 90-91 | A- | 72-77 | C | 60-61 | D- |
| 88-89 | B+ | 70-71 | C- | 0-59 | F |
| 82-87 | B | | | | |

CORRESPONDENCE

The best way to get in touch with me is by email or attending office hours. When emailing, please include ECON 409 in the subject line. I will do my best to respond within 24 hours, but reserve the right to ignore questions that are adequately answered in the syllabus.

CLASSROOM STANDARDS

Please be courteous to your fellow classmates. Cell phones should be silenced and remain unused.

Laptops and tablets will often be used in the classroom because this is a data analysis course. However, research suggests they can hinder learning for you and – perhaps more importantly – those sitting around you. I reserve the right to ask students to leave if their behavior becomes a distraction to others.

ACADEMIC INTEGRITY

Per the UNL Student Code of Conduct: "The maintenance of academic honesty and integrity is a vital concern of the University community. Any student found guilty of academic dishonesty shall be subject to both academic and disciplinary sanctions."

Academic dishonesty includes, but is not limited to, the following: Copying or attempting to copy from an academic test or examination of another student; using or attempting to use unauthorized materials, information, notes, study aids or other devices for an academic test, examination or exercise; engaging or attempting to engage the assistance of another individual in misrepresenting the academic performance of a student; communicating information in an unauthorized manner to another person for an academic test, examination or exercise; plagiarism; tampering with academic records and examinations; falsifying identity; aiding other students in academic dishonesty, and other behaviors in the student judicial code of conduct, Article III section B (stuafs.unl.edu/dos/code)

The penalties for academic dishonesty will be severe, and may range from receiving a failing grade on the test or assignment, failing the course in which academic dishonesty took place, or the possibility of expulsion from the university. Faculty will report all cases of academic dishonesty to the Dean of Students at UNL, who will place a report in the student's permanent file. A file of academic integrity violations will also be maintained by the College of Business.

If you copy, or substantially copy, work from anyone else on a paper, the work must be put in quotes and the source(s) cited. Otherwise, it is plagiarism. If plagiarism or other forms of academic dishonesty are found on a group work assignment, it is possible that every member of the group will be punished. It is to your advantage to check out anything that does not seem like the work of your group members or colleagues. Written assignments are subject to verification using Turnitin for plagiarism.

ACCESSIBILITY SUPPORT

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can discuss options privately. To establish reasonable accommodations, I may request that you register with Services for Students with Disabilities (SSD). If you are eligible for services and register with their office, make arrangements with me as soon as possible to discuss your accommodations so they can be implemented in a timely manner. SSD contact information: 232 Canfield Admin Bldg.; 402-472-3787.

WEATHER/FIRE

Every UNL campus building has emergency shelter and evacuation plans. Please familiarize yourself with the plans of each building in which you take classes or attend meetings. Make sure to note the routes to the lowest level of the buildings for shelter during inclement weather, as well as exits from the buildings in the event of fire or other emergency. For more information on emergency procedures visit <http://emergency.unl.edu>.

In the event of a medical emergency in the classroom immediately call 9-1-1 and take steps to assist the individual as needed. For details on what to do during Medical Emergencies, visit the Medical Emergencies handbook (http://wellness.unl.edu/wellness_documents/medical_emergencies.pdf).

ACTIVE SHOOTER/PHYSICAL ATTACK

If there is a clear and safe escape route:

Run – If there is a clear and safe escape route.

Hide – If there is no escape and you can get to a secure location to hide.

Fight – If your only option is to defend yourself, fight as if your life depended upon it.

For more details and video training for all emergency procedures visit <http://emergency.unl.edu>.

WRITING SUPPORT

The UNL Writing Center can provide you with meaningful support as you write for this class as well as for every course in which you enroll. Trained peer consultants are available to talk with you about all forms of communication, including lab reports, presentations, research papers, cover letters, and application essays. You can visit at any stage of the process, from brainstorming and organizing ideas through polishing a final draft. The UNL Writing Center is located in 102 Andrews Hall, with evening hours in the Adele Hall Learning Commons and other satellite locations. You can schedule 25- and 50-

Spring 2020

Econ 409: Economic Data Visualization and Analysis

TTh 9:30am

minute appointments any time by visiting <https://unl.mywconline.com>. For more information about the Writing Center, including hours and other locations, please visit <http://www.unl.edu/writing>.

ECON 417-002: INTRO TO ECONOMETRICS

Spring 2021

INSTRUCTOR

Daniel Tannenbaum

Email: dtannenbaum@unl.edu

Class Lecture:

Location: HLH 032 and Zoom (both live and recorded)

Meeting Time: 2:00PM-3:15PM

Zoom Lectures:

Meeting ID: 951 0287 4295

Passcode: 4321

Course Webpage: <https://canvas.unl.edu>

Office Hours:

Meeting Time: Wednesdays, 4:00-5:30PM

Location: Zoom

Meeting ID: 920 1719 6473

Passcode: 4321

These office hours are open and do not require an appointment. Students should feel free to join and leave the Zoom meeting as desired. I am also available by appointment, and students should feel free to email me to set up a time to meet outside the scheduled office hours.

TEACHING ASSISTANT

Anupam Ghosh

Email: aghosh4@huskers.unl.edu

Office Hours: Tuesdays, 4-5:30PM

Location: Zoom

Meeting ID: 965 9608 4078

Passcode: 199

COURSE DESCRIPTION AND GOALS

This course presents an introduction to univariate and multivariate regression and its uses in economics. These methods lay the foundation for empirical work in economics and public policy. Students will be introduced to Stata, an econometric software package, which we will use to apply the tools we develop in class and to answer empirical questions using data from the real world.

By the end of the course students will be able to read empirical economics papers and answer two questions: (1) What are the needed statistical assumptions to interpret the results in the way the author is advocating? (2) What would pose a threat to these assumptions, in the context of the

problem the author is studying, and how would the potential threats change the interpretation of the results? These two questions will be a recurring theme throughout the course.

An additional theme of the course is for students to learn how to take a public policy question and to develop a precise econometric framework for answering the question, which can then be implemented with data.

I will be assuming the mathematical background provided in the prerequisites for the class. The class will make use of calculus and basic probability and statistics. Some of this material will be reviewed during the course, but this review will be done very quickly. If you have any questions about your own level of preparedness, come to office hours.

TEXTBOOK

The main textbook will be ***Introduction to Econometrics, 3rd Edition***, by James H. Stock and Mark W. Watson. Other good undergraduate econometrics texts are ***Introductory Econometrics***, by Jeffrey M. Wooldridge and ***Basic Econometrics***, by Domodar N. Gujarati and Dawn C. Porter.

You are strongly advised to supplement class lectures with your own personal study of an econometrics text. My lectures will not follow Stock and Watson exactly but I will adopt their notation. I will often provide more mathematical details than found in the texts, so you are also strongly advised to attend each of the lectures and try to follow them closely. If you need to miss a class, contact one of your classmates and arrange to get a copy of their notes.

A class schedule will be uploaded to Canvas, containing a rough outline of the lectures and exact dates for the exams. Each lecture topic is referenced with chapter numbers from each of the three books above. **Anything covered in lecture is testable material.**

PROBLEM SETS

Problem sets will be assigned semi-weekly and are to be turned in at the beginning of the lecture during which it is due.

Computational Problems: Some of the problem sets will involve applied empirical problems with data using the econometric software package Stata. This software is widely used by applied researchers, both academic and professional. You will not be tested on Stata commands or syntax. However, there may be Stata-related exam questions – for example, asking you to interpret Stata regression output. You should be familiar with this aspect of the software and be able to interpret it. We have a license for Stata available for students. I will provide a class roster with names and NUID numbers to the CoB IT department to obtain permissions for each student to access Stata.

Problem set policies:

- Late problem sets will be penalized.

- You may work in groups of up to 4 students, but each student must submit their own set of solutions. On each problem set, you must write the names of the other students with whom you worked. **No two students' answers should be identical on any question.**
- Code for computational problems should be turned in via Canvas. We will create a folder for each assignment to which you can upload your code. Non-computational problems can be written by hand or typed but please print out a copy and bring to class. (The few students who have exemptions from attending in-person classes may upload a pdf of their problem sets to Canvas.)

Please keep in mind that it is in your interest to work through the problem sets on your own, as the majority of your grade will be determined by tests, for which collaboration is not possible.

GRADING

There will be 8-10 problem sets, two in-class midterm exams, and one in-class final exam. The midterms are tentatively scheduled for Week 5 (Thursday, February 25) and Week 10 (Thursday, April 1st). The final exam is scheduled by the Registrar. Final grades will be calculated by applying the following weights:

Problem Sets: 15%

Midterm Exams: 40%

Final Exam: 35%

Attendance and Participation: 10%

Grading policies:

- The lowest two problem set grades will be dropped.
- All grades are final except for obvious clerical errors. This rule applies equally to problem sets and exams. We award partial credit systematically, so we cannot revise up one student's grade without implicitly penalizing their classmates. If you would like guidance on missed points, feel free to discuss questions first with the TA and then with me during office hours.
- We will be happy to go through your exam or homework and help explain how you can improve your performance going forward.

The final course grades will be curved. Below is the grading scale that will serve as the starting point for final grades. I reserve the right to be more generous with the assignment of letter grades to percentages.

93-100: A

90-92: A-

87-89: B+

83-86: B

80-82: B-

77-79: C+

73-76: C

70-72: C-
65-69: D+
50-64: D
<50: F

ACADEMIC HONESTY

Students are expected to create and submit original research and written work. Plagiarism is taken very seriously and students will be held to UNL's Student Code of Conduct, section B.1.1c, which defines plagiarism as: "Presenting the work of another as one's own (i.e., without proper acknowledgment of the source) and submitting examinations, theses, reports, speeches, drawings, laboratory notes or other academic work in whole or in part as one's own when such work has been prepared by another person or copied from another person." Both undergraduate and graduate students will be held to the University's "zero tolerance" policy with respect to all aspects of the Student Code of Conduct, including plagiarism. Anyone caught violating the code of academic honesty on any written assignments will fail the course and be referred to the Dean's office for further disciplinary action.

UNL RESOURCES FOR STUDENTS WITH DISABILITIES

The University of Nebraska-Lincoln is committed to ensuring equal access to curricular and co-curricular opportunities for students with disabilities. Providing a range of services, SSD implements reasonable accommodations for students with disabilities and offers students the opportunity to contribute and participate in the diverse campus experience at the University of Nebraska-Lincoln.

Services for Students with Disabilities (SSD)

Office Location: 232 Canfield Administration
Building Phone: (402) 472-3787

UNL NON-DISCRIMINATION POLICY

The University of Nebraska does not discriminate based on race, color, ethnicity, national origin, sex, pregnancy, sexual orientation, gender identity, religion, disability, age, genetic information, veteran status, marital status, and/or political affiliation in its programs, activities, or employment. The following office has been designated to handle inquiries regarding non-discrimination policies:

Title IX or Discrimination Inquiries

Institutional Equity and Compliance
128 Canfield Administration Building
(402) 472-3417
equity2@unl.edu

COVID-19 POLICY

Face Covering Policy

All University of Nebraska–Lincoln (UNL) faculty, staff, students, and visitors (including contractors, service providers, and others) are required to use a facial covering at all times when indoors on the UNL campus, with the following exceptions:

- When eating; however, social distancing practices must be observed.
- When alone in a room.
- When alone in a motor vehicle.
- When an alternative is necessary as indicated by a medical professional during patient care.*
- When exercising either in a campus recreation facility or during a university-sponsored activity when use of a campus recreation facility is not practicable.
- When in one's assigned apartment or residence hall room.
- When the task requires the use of a NIOSH-approved respirator.
- When pertaining to children under the age of 2 years.

Facial coverings are also required in outdoor settings on the UNL campus if safe social distancing and gathering practices are not possible unless subject to an exception. This policy shall remain in effect until further guidance is provided from the Office of the Chancellor.

Rationale

An overarching principle to which the University of Nebraska–Lincoln ascribes is that Every Person and Every Interaction Matters. This facial covering policy has been established because we respect and care for ourselves and every person that we encounter on campus.

The Centers for Disease Control and Prevention (CDC) has acknowledged that use of facial coverings can help to slow the spread of COVID-19 in our communities. A facial covering can reduce the trajectory of expelled respiratory droplets, which pose risk to those around you. When you wear a face covering, you demonstrate care about the health and safety of those in our campus community.

What constitutes a face covering?

There are no universal design standards for facial coverings. However, the covering must extend from the bridge of the nose to below the chin.

- Reusable cloth facial coverings are acceptable, as are disposable paper masks.
- A face shield is an acceptable alternative.
- Regardless of the type used, a mask should not be designed with an exhalation valve.

*Requesting Alternatives

Individuals whose unique and individual circumstances require an alternative face covering, as indicated by a medical professional during patient care, may request one. To request an alternative,

students should contact the Office of Services for Students with Disabilities. Faculty and staff should contact Faculty/Staff Disability Services.

Wearing and Caring for Your Facial Covering

Each individual is responsible to care for their own facial covering. Disposable facial coverings are to be discarded as ordinary refuse after a single day's use. Reusable cloth facial coverings should be washed regularly. Reusable face shields should be cleaned thoroughly with soap and hot water after each day's use. Facial coverings that are visibly soiled or in poor condition should not be used.

Instruction for properly caring for and donning (putting on) and doffing (taking off) a face mask is provided at the Environmental Health & Safety website.

Additional Protective Measures

This policy on facial coverings complements other important community and self-protection measures which are to be consistently practiced by all faculty, staff, students, and visitors. These measures include:

- Self-monitoring for symptoms and staying home when ill or after having been exposed to someone known or suspected of having COVID-19.
- Washing hands often and thoroughly.
- Refraining from touching the face, eyes, nose, and mouth.
- Practicing social distancing, by maintaining 6 feet of distance from others.
- Regularly cleaning and disinfecting surfaces.

Compliance

Any employee, student or visitor who fails to abide by these guidelines may be asked or directed to leave the campus space. Employees and students who are directed to leave a campus space for failure to comply with these guidelines may be taken off duty and/or subject to disciplinary action.

Procedures for ensuring compliance in classrooms and similar places are described in the required syllabus statement, "Required Use of Face Coverings for On-Campus Shared Learning Environments."

Counteracting Existing Marginalization

In implementing this policy, we must ensure protocols to optimize safety and provide a sense of well-being for all members of our community. We recognize that a policy to wear facial coverings may exacerbate implicit biases and existing racial stereotypes. Thus, we will provide training and professional development for members of campus units regarding face coverings in order to prevent racial profiling and targeting.

| WEEK | TOPIC | READINGS | | |
|--|--|----------------|---------------------|-------------|
| | | Stock & Watson | Gujarati & Porter | Wooldridge |
| 1 | Introduction to Empirical Methods in Economics STATA PRIMER | | | |
| 2 | Probability & Statistics: Bivariate and multivariate distributions | Ch 1-3 | Appendix A | Appendix B |
| 3 | Estimators, small sample properties | Ch 1-5 | Appendix A | Appendix C |
| 3 | Estimators, large sample properties | Ch 1-6 | Appendix A | Appendix C |
| 4 | Central limit theorem (asymptotic distribution of the sample mean), convergence. MLE and analogy principle | | | |
| 5 | Simple linear regression: Intro and interpretations | Ch 4 | Ch 1-3 | Ch 2 |
| MIDTERM I | | | | |
| 6 | Simple linear regression, ordinary least squares | | | |
| 6 | Simple linear regression: R^2 , properties of OLS | Ch 4 | Ch 3, 4 | Ch 2 |
| 7 | Simple linear regression: Inference | Ch 5 | Ch 5 | Ch 2 |
| 7 | Simple linear regression: Inference, | Ch 5 | Ch 6 | Ch 2, 8 |
| 8 | Intro to Multivariate Linear Regression | | Appendix B, | Appendix D, |
| 8 | Multivariate Linear Regression: Estimation | Ch 6 | Ch 7.4, 7A.1 | Ch 3 |
| 9 | Multivariate Linear Regression: R^2 , adjusted R^2 , properties of OLS | Ch 6 | Ch 7.8 | Ch 3, 5, 6 |
| MIDTERM II | | | | |
| 11 | Multivariate Regression: Inference | Ch 7 | Ch 8 | Ch 4 |
| 12 | Dummy Variables and Non-Linear (In Variables) Models | Ch 8, 9, 11 | Ch 9, 6.4-6.8, 7.10 | Ch 6, 7 |
| 13 | Differences-in-Differences | | | |
| 14 | Instrumental Variables (IV) I: Using IV to solve omitted variables | Ch 12 | | Ch 15, 16 |
| 14 | Instrumental Variables II | Ch 12 | | Ch 15, 17 |
| 15 | Instrumental Variables IV (time permitting) Heterogeneity and LATE | | | |
| IN-CLASS REVIEW: Examples and Applications FINAL EXAM (Time and Location Scheduled by the University) | | | | |

ECONOMICS 423-001
Economics of Less Developed Countries
Fall 2021
2:00 PM – 3:15 PM, MW
HLH 138

| | |
|-----------------------|---|
| Instructor: | Dr. Uchechukwu (Uche) Jarrett |
| Office: | HLH 525T |
| Email: | ujarrett2@unl.edu |
| Office Hours: | M/W: 11:00AM-1:00 PM or by appointment (You can also meet me via Zoom by appointment using https://unl.zoom.us/my/uche.jarrett |
| TA: | Lahiru Somaratne |
| TA Email: | lahiru.somaratne@huskers.unl.edu |
| Prerequisites: | ECON 211 and 212 or ECON 210 |

Course Description

This course provides an advanced survey of development problems and goals; roles of land, labor, capital, entrepreneurship, and technical progress in economic growth of the less developed countries. Theories and strategies relating to international trade and economic development, as well as the potential for other international economic relationships or resource abundance that could influence the development of these countries.

Course Objectives

By the end of this course, you will be able to:

1. Properly identify poverty in all its forms in any given country
2. Separate the concept of economic growth from economic development
3. Quantitatively and qualitatively measure poverty
4. Identify and analyze the relationship between poverty, inequality and economic development
5. Identify potential sources of (or reasons for) economic deficiencies
6. Prescribe solutions that improve economic growth and development
7. Identify problematic poverty alleviation policies
8. Advise policy makers on best practices where economic development is concerned
9. Analyze the relationships between developed and developing countries
10. Identify and synthesize the effect of trade on development discerning between developed and developing countries.

Class Materials

1. Most Critical: YOU!!!
2. Your email: Please check your email regularly for class updates and announcements
3. I will make use of **Top hat** for attendance, and in class questions. The Top hat course for this class is **F20 Econ 423-001: Economics of Less Developed Countries and the join code is 640670**

4. **Your cell phone**, (yes I know, o happy day), to use the top hat app (only when prompted)
5. **Zoom**: This is a cloud based web collaboration that connects remote users for meetings and group projects. This will be the primary method of video communication with me (either one on one meetings or group meetings) for students as an alternative to in-person office hours. This should be installed on your computer or you can get the app on your smartphone.
6. I will also make use of **Canvas** to create groups for assignments, upload class materials, assignments and grades. Module zero created on canvas will contain the necessary information to assist with class logistics, e.g. Class syllabus, tophat join code, and the grade simulator. Should you have any question, check module 0, if your concerns are not addressed, then send me an email.
7. **Michael P. Todaro and Stephen C. Smith. *Economic Development*. Twelfth edition**

All Inclusive access: You will have access to the e-text of the book immediately through UNL's Follett Access program.

To access the e-text, go to Module 0 and click on the red shelf link. You have until September the 1st to decide if you want to opt out of this program and get your materials elsewhere.

If you DO NOT opt out, the cost of these materials will be billed directly to your MyRed account. I selected this program as it ensures the best possible price for the package. If you find a better deal, please feel free to opt out and let me know so I can put some pressure on the publishers.

You should have received an email with details on how to opt out of the program

Note: the access code above provides access to the course. It does not provide payment for the course.

Grades

Final grades for this course will be a combination of the following:

Discussion Participation (through Yellowdig engage): 5%

In studying a topic like economic development, practical examples are required and as such, we will be going beyond just what is discussed in the classroom to gain a better (and deeper) understanding of the issues facing developing countries using relevant, appropriate and sometimes current examples. In this class, we will further this understanding through discourse and theoretical association through Yellowdig engage on canvas.

Yellowdig is a social learning platform designed to encourage student engagement through discussions around content relevant to the course. This platform will allow you share videos, articles, and other web-based content, all of which should be relevant to the issues addressed in the course. Points will be earned based on number of words in pins and comments, likes, instructor badges. Note that full points will only be realized at the end of the class as yellowdig requires students to participate consistently over the entire semester so that points are accumulated gradually. Regularly participating via Yellowdig will account for 5% of your grade.

To sync your discussion participation with the grade book in Canvas, you must first click on the YellowDig Activation assignment. Once you have activated your account, you can access Yellowdig from the menu on the left hand side of canvas. Post your first pin to start seeing your points accrue. **Note that your points will build up to 100% each week, based on the number of weeks that have passed. For example, in week 1, 100% will be based on 1 week's worth of discussions, for week 2 however, 100% will be based on 2 weeks' worth of discussions. So at the start of the new week, you will most likely see an automatic reduction of your yellowdig grade.** Let this serve as a reminder of what you have left to do for that week to get back to 100%.

Every week, I will post a discussion prompt to help guide you in your discussion, you are free to follow the prompt and provide any appropriate web based content to make your case, discuss a previous or future topic, or go off script completely as long as your pin is relevant to International economics.

Within Yellowdig points break down

Total Points Possible on Yellowdig for 15 weeks: 15,000 (Not a typo)

Maximum points per week 1,250 points

Posting a pin (minimum of 50 words): 250 Points

Commenting on a pin (minimum of 30 words): 150 points

Receiving comments on your pin: 100 points

Each reaction to your pin (likes, thumbs up and such): 50 points

Instructor Badges: Ranging from 75 to 400 points

Note that any points earned after 1:00AM CST on Monday morning will not count towards the previous week.

You can always check on your progress on the left hand side of your YellowDig engage Feed

In class questions (through tophat): 10%

There will be a minimum of 80 in class questions given throughout the semester (10 after each major topic we cover). Since these are primarily for review purposes, half the points awarded will be participation and the other half will be correctness. As with the discussions, 85% score on this is all that is required to get the full 10%, which means you can miss 12 questions and still get full points.

Note: Given the Leeway built into the discussions and in class questions, there will be no makeup should you miss either one for ANY reason. The only exception to this will be University sponsored activities and proof must be provided before allowance is made. Just make sure not to miss any beyond the cap. This will be your responsibility.

Group Assignments: 15%

You will have three group assignments throughout the semester, one before every exam (groups will be randomly assigned in the 2nd week of class to give students enough time to make up their minds regarding what classes to take). Completing all three assignments and turning them in before the deadline gets you half the assignment points and the degree of correctness gets you the remaining points. There will be a group member assessment after each assignment is due. These will be an average rating from your group members. **Useful** participation in the assignment is the requirement and as such points will not be awarded for that. However, you will lose points if you do not participate **usefully**. The system of the group assessment as well as how it will impact your assignment score will be provided with each assignment.

Note: “Useful” here is defined as any meaningful contribution that leads to a successful assignment. This includes but is not limited to two or more of the following: answering questions, scheduling, going over your group member’s work, aggregating different answers, meeting with group members, attending recitations, and meeting with the peer tutor and/or Professor.

Note that all assignments have hard deadlines and as such, late submissions are not allowed

Group observational Assignments: 10%

An important part of this class is to be able to recognize the issues we discuss in whatever form they present themselves in the world and come up with potential plans and ideas to address these issues. To facilitate this process, we will have three observational assignments to emphasize these skills. One will focus on a grand tour episode where three English men visit Mozambique, the second will focus on the Black Panther movie, and the third will focus on a company and an article. All of these are designed to test your ability to identify different issues and come up with ideas that could provide a solution.

Exams: 60%

You will have a total of three (3) exams in this class (two midterms and a final), all of which are independent self-contained exams this means that the exams are not cumulative. I use what I call an individually redemptive grading system for your aggregate exam grade such that your best exam will count for 30% of your final grade, with the other two each counting for 15%. Due to this system, you will not be able to check your grade on canvas during the semester. To address this inconvenience, I have provided a grade simulator to help calculate your grades throughout the semester, more on that below. These, in combination with your assignments, discussion, mini-projects, syllabus quizzes, and in class problems, give you your final grade.

Respondus lockdown and monitor: In this course, we will be using the LockDown Browser which is a custom browser that locks down the testing environment in Canvas which many of you may be familiar with from exams in the Digital Learning Center. Monitor integrates with LockDown Browser to monitor you with your webcams and microphones during your exams, and also records and analyzes your exam sessions.

[Click this link to download the Respondus LockDown Browser](#)

Click this link for a [student guide on installing respondus on Mac and windows](#) as well as instructions for accessing your exams

Monitor needs a webcam and microphone to work, so do not start the testing session until you are using a device with these hardware components. You will also need to present an identification card to Respondus as part of the Monitor start-up sequence and should have this nearby (This should be your NUID, but a government issued license can also be substituted). To get you familiar with respondus, I will provide a practice exam so that all kinks can be worked out before the first exam. Please let me know if you have any issues as soon as possible so that we can find a suitable alternative.

Midterm 1: (Available from Thursday, 30th of September, 2021 to Sunday, 3rd of October, 2021)

Midterm 2: (Available from Thursday, 18th of November, 2021 to Sunday, 21st of November, 2021)

Final Exam (Available from Monday, 13th of December, 2021 to Thursday, the 16th of December, 2021)

Exams can be taken at any point during these periods and will only be available during these periods. Remember to complete the practice exam before the first exam is due to ensure that issues with the lock down browser have been dealt with.

Make up exams:

There will be **NO makeup exams** in this class given the 3-day window allowed for the exam. If there are legitimate reasons for missing exams, your grade will be recalculated with just the exams you take. However, valid documentation or any proof of why you missed the exam will be **required** for this accommodation. **Taking less than 2 exams in the class will result in an automatic "F" grade as you will not have completed enough of the class to earn a passing grade.**

Grade Simulator: A grade simulator in the form of an excel sheet will be provided on canvas that will help you calculate and predict your final grade showing you what points you will need to achieve certain grades. This will serve as a guide throughout the semester that keeps you on track for your required goal. Given the complexity of my grading system, standard canvas calculations can be misleading, so I will be disabling the total score function on canvas until final grades are posted.

| <u>Standard Grading Scale:</u> | | | |
|---------------------------------------|--------------|-------------------|--------------|
| Your Score | Grade | Your Score | Grade |
| 93% to 100% | A/A+ | 73% to 76% | C |
| 90% to 92% | A- | 70% to 72% | C- |
| 87% to 89% | B+ | 67% to 69% | D+ |
| 83% to 86% | B | 63% to 66% | D |
| 80% to 82% | B- | 60% to 62% | D- |
| 77% to 79% | C+ | Below 59.5% | F |

Note: There are no extra credit opportunities in this class and the grading structure will not be changed.

NOTES

An individual in this course has a documented need for face coverings to be required in this course. Without divulging personal or identifying information, such a documented need might be that a member of their household is unable to be vaccinated or has a health condition that makes vaccines less effective for them. As a result, the College of Business has determined that ***face coverings will be required in this course.*** If you are unwilling to comply with this requirement, please visit with your advisor about different sections or possible alternative courses that you might take in lieu of this one.

1. **Physical Distancing Waiver:** This course has an exemption from the physical distancing guidelines. Plexiglas shields have been placed on the round movable tables where two seats are available in order to mitigate risk in this classroom. This mitigation qualifies this classroom for a physical distancing guidelines exemption.
2. This Class is conducted in accordance with UNL Academic Policies and Procedures. Please visit the [policies and procedures link](#)
3. If you need special accommodations in order to meet any of the requirements of this course, please contact me as soon as possible so we can make the necessary arrangements. To receive accommodation services, students must be registered with the Services for students with Disabilities (SSD) office in 132 Canfield Administration. Please visit the [SSD webpage](#)
4. This University has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for the respect of others' academic endeavors. Please see the relevant [Student academic misconduct information](#)
But let me save you the trouble of a long read... DON'T DO IT!!!!
5. This class satisfies a general education requirement, and meets the following Achievement-Centered Education (ACE) requirement (See [Undergraduate bulletin](#))
“ACE 9: Exhibit global awareness or Knowledge of human diversity through analysis of an Issue.”
6. The UNL Writing Center can provide you with meaningful support as you write for this class as well as for every course in which you enroll. Trained peer consultants are available to talk with you about all forms of communication, including lab reports, presentations, research papers, cover letters, and application essays. You can visit at any stage of the process, from brainstorming and organizing ideas through polishing a final draft. The UNL Writing Center is located in 102 Andrews Hall, with evening hours in the Adele Hall Learning Commons and other satellite locations. You can schedule 25- and 50-minute appointments any time by visiting [unl.mywconline.com](#). For more information about the Writing Center, including hours and other locations, please visit [unl.edu/writing](#).

7. This is a 3-credit course that meets two times a week. On average, students are expected to put in 6-7 hours per week reading the material, studying, and working on assignments to achieve the learning goals of this course. Some weeks will take more time than others, so this timeframe is only a guideline.
8. Safety Information

Weather

Every UNL campus building has emergency shelter and evacuation plans. Please familiarize yourself with the plans of each building in which you take classes or attend meetings. Make sure to note the routes to the lowest level of the buildings for shelter during inclement weather, as well as exits from the buildings in the event of fire or other emergency. For more information on emergency procedures visit emergency.unl.edu.

Medical

In the event of a medical emergency in the classroom immediately call **9-1-1** and take steps to assist the individual as needed. For details on what to do during Medical Emergencies, [visit the Medical Emergencies handbook](#).

Active Shooter/Physical Attack

- **Run** - If there is a clear and safe escape route.
- **Hide** - If there is no escape and you can get to a secure location to hide.
- **Fight** - If your only option is to defend yourself, fight as if your life depended upon it.

For more details and video training for all emergency procedures visit emergency.unl.edu.

TENTATIVE COURSE OUTLINE (with corresponding text book locations)

1. Introducing Economic Development: A global Perspective (**Chapter 1**)
2. Comparative Economic Development (**Chapter 2**)
3. Classic Theories of Economic growth and Development (**Chapter 3**)
4. Contemporary Models of Development and Underdevelopment (**Chapter 4**)
5. Poverty, Inequality and Development (**Chapter 5**)
6. Population Growth and Economic Development: Causes, consequences, and controversies (**Chapter 6**)
7. Urbanization and Rural-Urban Migration: Theory and Policy (**Chapter 7**)
8. Human Capital: Education and Health in Economic Development (**Chapter 8**)
9. Agricultural Transformation and Rural development (**Chapter 9**)

10. The Environment and Development (**Chapter 10**)

11. International Trade Theory and Development Strategy (**Chapter 12**)

**12. Foreign Finance, Investment Aid, and Conflict: Controversies and opportunities
(Chapter 14)**

Disclaimer:

I reserve the right to modify this syllabus as the semester progresses to meet what I believe to be the needs of the class. This could include but is not limited to the addition of extra material, assignment of additional quizzes (mostly to use as a tool when people ignore in class practice problems), and the provision of supplemental videos to be viewed outside of class (in case time becomes an issue)