

NCSU DEPARTMENT OF MATHEMATICS

MA 114 Fall 2020

MA 114: Introduction to Finite Mathematics with Applications

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You can copy/paste any parts of this in putting together your own syllabus, as desired. I recommend using the syllabus tool (https://apps.delta.ncsu.edu/syllabus_tool/) to ensure you have all the required info and language.

Feel free to get in touch with me anytime with questions or concerns about your class. I'm happy to talk through issues with students or material.

Textbook

Finite Mathematics by Waner and Costenoble, 7th edition. The eBook is available in WebAssign.

Course Description

Elementary matrix algebra including arithmetic operations, inverses, and systems of equations; introduction to linear programming including simplex method; sets and counting techniques, elementary probability including conditional probability; Markov chains; applications in the behavioral, managerial and biological sciences. Computer use for completion of assignments.

Grades

This course uses standard NCSU letter grading, with no rounding.

$90 \leq A^- < 93$ $93 \leq A < 97$ $97 \leq A^+ \leq 100$

$80 \leq B^- < 83$ $83 \leq B < 87$ $87 \leq B^+ < 90$

$70 \leq C^- < 73$ $73 \leq C < 77$ $77 \leq C^+ < 80$

$60 \leq D^- < 63$ $63 \leq D < 67$ $67 \leq D^+ < 70$

$0 \leq F < 60$

Grade Component	Weight	Details
WebAssign Homework and Moodle Quizzes	20%	Homework will be done through WebAssign and will be due frequently. Moodle Quizzes will follow most of the videos. These will include guided examples similar to those

		worked in the videos/Webassign, and they will be due weekly.
In-Class Tests	60%	There will be three in-class tests, each worth 20% of your grade.
Final Exam	20%	The final exam will be given on TBD.

The emphasis in this course should be on using the mathematical ideas introduced in contexts that might be relevant for students interested in business or marketing. There are some complicated procedures covered like row reduction, inverting matrices, and the simplex method. Use your judgment about how many (if any) examples you or the students do by hand. Feel free to point them to computational tools they can use instead and put the emphasis on taking a word problem and turning it into a math problem a computer can solve. Then also emphasize how to verify the computer's answer and interpret it in the context of the real world.

Some websites that may be helpful to you:

<https://www.zweigmedia.com/tcpage.php?book=finite&lang=en&ed=6>

<http://finitemathonline.blogspot.com/> (This is NCSU's online version of the course)

<https://open.umn.edu/opentextbooks/textbooks/applied-finite-mathematics>

Schedule

We will be following the approximate schedule below. Make sure that your students have access to the relevant course materials each week on Moodle.

Week	Textbook Section and Topic	Comments
1	Section 3.1 (Systems of Two Equations in	Emphasize the elimination method when appropriate, as it will come up again via row operations/Gauss-Jordan reduction in 3.2.

	Two Unknowns) Section 4.1 (Matrix Addition and Scalar Multiplication)	
2	Section 4.2 (Matrix Multiplication) Section 3.2 (Using Matrices to Solve Systems of Equations)	With matrix computations, we recommend having them do some by hand but then showing them computational tools they can use such as spreadsheets, or apps available at https://www.zweigmedia.com/tcpage.php?book=finite&lang=en&ed=6 That website also has tutorials and problems students can use for extra practice. Emphasize that row reduction steps are the same as algebra steps you may have done in Section 3.1.
3	Section 3.2 (Using Matrices to Solve Systems of Equations) Section 3.3 (Applications of Systems of Linear Equations)	Emphasize that row reduction steps are the same as algebra steps you may have done in Section 3.1.
4 Week	Section 4.3 (Matrix Inversion) Review	
5	Test 1 Section 4.5 (Input-	

	Output Models)	
6	Section 5.1 (Graphing Linear Inequalities) Section 5.2 (Solving Linear Programming Problems Graphically)	Again, we recommend doing some graphing by hand but then using available online tools like Desmos or from the link above.
7	Section 5.3 and 5.4 (The Simplex Method)	<p>Explain that the simplex method is a way to ‘walk from corner to corner’ in a region. We recommend framing these problem sessions around 3 styles of problems:</p> <ol style="list-style-type: none"> 1. Given a word problem, turn it into something that can be solved via the simplex method. 2. Given the computer output from, what is the solution telling you in the context of the problem. Can you check that it is correct? <p>Take a nonstandard problem and adapt it into a standard problem</p>
8	Test 2 Section 6.1 (Sets and Set Operations)	
9	Section 6.2 (Cardinality) Section 6.3 (Decision Algorithms)	
10	Section 6.4 (Permutations and Combinations)	

	Section 7.1 (Sample Spaces and Events)	
11	Section 7.2 (Relative Frequency) Section 7.3 (Probability and Probability Models)	
12	Test 3 Section 7.4 (Probability and Counting Techniques)	
13	Section 7.5 (Conditional Probability and Independence) Section 7.6 (Bayes' Theorem and Applications)	
14	Section 7.7 (Markov Chains) Review	

Feel free to use or adapt any of the material below for your class syllabus.

Course Website

We will be using the Moodle learning management system (<http://wolfware.ncsu.edu>) for this course. You will log in using your Unity ID and password. (Refer to online information at <http://oit.ncsu.edu/unityid> or contact (919) 515-HELP or HELP@ncsu.edu for assistance with your Unity ID). After the beginning of the semester, you will see a link to our course site. Once in the site, you can Bookmark or add the site as a Favorite in your web browser so that you can return directly to that page.

All course videos and quizzes will be accessed via Moodle.

Course Communications

Modes of communication in use for this course include email, office hours, Moodle, and Piazza.

- The Piazza Q&A platform will be used to facilitate class discussion. Check these forums often and please feel free to reply to your fellow students' posts.
- I will do my best to respond to weekday e-mails and posts within 24 hours. Email messages or posts left after 4 pm Friday will be responded to by Monday evening.
- If you would like to speak with an instructor via Zoom and you can't make it to the posted office hours, please email me to schedule a time that is convenient. Include several time slots that would work for you in your email.

Please be aware that ALL email communications for this course will be sent to your NCSU unity email. If you do not regularly use your ncsu.edu account, there are settings within Gmail that allow you to forward your e-mail to another account. For more information, please see <http://google.ncsu.edu/what-best-way-forward-my-nc-state-gmail-non-nc-state-e-mail-address>.

If you have a question that is very specific to the work you have done (i.e. if you nearly finished your work but got stuck towards the end), you can email your instructor with your question. Including a scan or photo of your work can help. If an instructor receives an email with a question more appropriate to the forum, they may copy and paste the question there without identifying the student who sent it.

Attendance

University policy requires a record of attendance for all 100 level courses. Attendance via Zoom is expected for weekly assigned problem sessions, and it is in your best interest to attend class and be on time. Technical and/or medical issues should be reported to the instructor at your earliest convenience. Recordings of synchronous problem sessions will be provided.

Problem session assignments and Zoom links will go out before the first day of class. Reach out to your instructor with any concerns about your scheduled problem session.

Electronically-hosted Components: Please be advised this course is being recorded for current and potential future educational purposes. By your continued participation in this recorded course, you are providing your permission to be recorded.

Course Continuity

In the event that the synchronous elements of this course are completely disrupted due to COVID-19, extra content will be provided through additional pre-recorded practice problems, ungraded Moodle quizzes, and ongoing additional digital instructor and TA support (email, forum participation, Zoom, etc.).

Health and Well-Being Resources

These are difficult times, and academic and personal stress are natural results. Everyone is encouraged to [take care of themselves](#) and their peers. If you need additional support, there are many resources on campus to help you:

- Counseling Center ([NCSU Counseling Center](#))
- Health Center ([Health Services | Student](#))
- If the personal behavior of a classmate concerns or worries you, either for the classmate's well-being or yours, we encourage you to report this behavior to the NC State CARES team: ([Share a Concern](#)).
- If you or someone you know are experiencing food, housing or financial insecurity, please see the Pack Essentials Program ([Pack Essentials](#)).

Community Standards related to COVID-19

We are all responsible for protecting ourselves and our community. Please see the [community standards](#) (released on 7/28/2020) and Rule 04.21.01 regarding Personal Safety Requirements Related to COVID-19 [RUL 04.21.01 – Personal Safety Requirements Related to COVID-19 – Policies, Regulations & Rules](#).

Academic Integrity

Students are required to comply with the university policy on academic integrity found in the Code of Student Conduct found at <http://policies.ncsu.edu/policy/pol-11-35-01>. The [NCSU Student Code of Conduct](#) covers all work done in this course. Any suspected violations will be promptly reported. Academic dishonesty will result in an automatic failing grade for the course.

Course Evaluations

A formal evaluation is conducted by the University at the end of the semester and the goal is to achieve 100% class participation in this survey. Online class evaluations will be available for students to complete during the last two weeks of class. Students will receive an email message directing them to a website where they can login using their Unity ID and complete evaluations. All evaluations are confidential; instructors will never know how any one student responded to any question, and students will never know the ratings for any particular instructor.

Accommodations for Disabilities

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, student must register with the Disability Services Office (<http://www.ncsu.edu/dso>), 919-515-7653. For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation at <http://policies.ncsu.edu/regulation/reg-02-20-01>.

Non-Discrimination Policy

NC State University provides equality of opportunity in education and employment for all students and employees. Accordingly, NC State affirms its commitment to maintain a work environment for all employees and an academic environment for all students that is free from all forms of discrimination. Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation is a violation of state and federal law and/or NC State University policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or NC State University policy and will not be tolerated. Retaliation against any person who complains about discrimination is also prohibited. NC State's policies and regulations covering discrimination, harassment, and retaliation may be accessed at <http://policies.ncsu.edu/policy/pol-04-25-05> or http://www.ncsu.edu/equal_op/. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the Office for Equal Opportunity (OEO) at 919-515-3148.

Trans-Inclusive Statement

In an effort to affirm and respect the identities of transgender students in the classroom and beyond, please contact me if you wish to be referred to using a name and/or pronouns other than what is listed in the student directory.

Basic Needs Security

Any student who faces challenges securing their food or housing or has other severe adverse experiences and believes this may affect their performance in the course is encouraged to notify the professor if you are comfortable in doing so. Alternatively, you can contact the Division of Academic and Student Affairs to learn more about the Pack Essentials program <https://dasa.ncsu.edu/pack-essentials/>

Supporting Fellow Students in Distress

As members of the NC State Wolfpack community, we each share a personal responsibility to express concern for one another and to ensure that this classroom (as well as the campus as a whole) remains a healthy and safe environment for learning. Occasionally, you may come across a classmate whose personal behavior concerns or worries you, either for your classmate's well-being, for your well-being, or for the well-being of others. When this is the case, I would encourage you to report the behavior on the link located on NC State's Students of Concern website (<http://go.ncsu.edu/NCSUcares>).

List of Policies

Students are responsible for reviewing the NC State University PRRs (policies, rules and regulations) that pertain to their course rights and responsibilities:

- Equal Opportunity and Non-Discrimination Policy Statement <https://policies.ncsu.edu/policy/pol-04-25-05/> with additional references at <https://oied.ncsu.edu/equity/policies/>
- Code of Student Conduct <https://policies.ncsu.edu/policy/pol-11-35-01/>
- Grades and Grade Point Average <https://policies.ncsu.edu/regulation/reg-02-50-03/>
- Credit-Only Courses <https://policies.ncsu.edu/regulation/reg-02-20-15/>
- Audits <https://policies.ncsu.edu/regulation/reg-02-20-04/>

Copyrighted Materials

The course website contains copyrighted materials and was developed for instructional purposes to be used by students at North Carolina State University. Students currently registered in this course are permitted to print or make copies of parts of this site for their own personal use in conjunction with completing the course. Text, audio files, images or design of this website may not otherwise be distributed or modified in any manner without the prior written permission of the instructor.