Repetitio est mater studiorum
(Repetition Is the Mother of Learning)
Latin wisdom

Interest increases as a result of success,
and success is the outcome of hard work
Professor Yaroslav Tagamlizki

Eastern Connecticut State University
MAT 135-03, Math for Liberal Arts, Fall 2020

Instructor: Christian Yankov

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Web Page: www.easternct.edu/yankovc

Time and Place: MWF 12:00-12:50 pm, ONLINE on Webex (see more explanation below).

Text: Tannenbaum, **Excursion in Modern Mathematics, 5th Custom Edition for Eastern,** published by Pearson, **ISBN-13: 978-1-2693-4188-2.**
Being a custom edition, it can be bought only at the University bookstore.

Calculator: You will need a calculator for some topics. A simple one will do, but it should be capable of computing powers and logarithms.

Office hours: M and W 11:00-12:00 noon, and 2:00-3:00 pm, **F** 11:00-12:00 noon. The Office hours will take place also virtually, on Webex.

Prerequisites: Placement at this level.

Course description: Mathematics will be applied to solving practical problems in a variety of disciplines. Mathematical topics include voting theory, management science, and financial mathematics. This course is for **non-STEM disciplines only** and thus cannot be used to satisfy the Precalculus Mathematics Plus (MAT 155P) or Precalculus Mathematics (MAT 155) prerequisite for Calculus I with Technology (MAT 243).

Course topics: Most of chapters: 1. The Mathematics of Elections, 2. The Mathematics of Power, 5. The Mathematics of Getting Around, 6. The Mathematics of Touring, and the chapter titled The Mathematics of Finance.

Eastern Liberal Arts Curriculum (LAC) Tier I Mathematics Outcomes: This course meets the Tier I requirements for the Mathematics category of the Liberal Arts Core Curriculum. This course will achieve the following outcomes:

- Use mathematical thinking as a model of deductive reasoning (lecture content, class activities, homework, quizzes, and/or exams);

- Understand the importance of variation - both how a single quantity can vary and how one quantity varies in relation to another (i.e. functional relationships) (lecture content, class activities, homework, quizzes, and/or exams);

- Understand the important mathematical idea of growth (linear, quadratic, exponential, etc.) (lecture content, class activities, homework, quizzes, and/or exams);

- Apply quantitative reasoning to problems encountered in other academic areas (lecture content, class activities, homework, quizzes, and/or exams);

- Use appropriate technology (e.g. graphing calculators, spreadsheets, mathematical manipulation software) to solve quantitative problems (lecture content, class activities, homework, quizzes, and/or exams);

- Effectively communicate ideas orally, visually, and in writing (group activities, student responses to questions during lectures, quizzes, and/or exams);

- Understand the value of rigorous inquiry and research, academic integrity, and active engagement in the ECSU learning community and beyond (contributing to class activities, timely completion of homework, clearly crediting work of others, penalties for violations of academic integrity)

- Discern the ethical dimensions of the production and acquisition of knowledge within disciplines (penalties for violations of academic integrity, contributing to class activities);

- Ability to think critically (lecture content, class activities, homework, quizzes, and/or exams);

- Effectively seek and employ information to achieve academic goals (lecture content, class activities, homework, quizzes, and/or exams).

Ethical Behavior in the Mathematical Sciences: Ethical behavior in the mathematical sciences is embedded throughout the course. The key concepts are discussed in lecture and students demonstrate these principles through various modes such as class activities, group activities and assessments such as homework, quizzes and exams. These key principles include, but are not limited to, financial math (obtaining a mortgage within your budget, responsible use of credit cards, identifying unscrupulous lending practices, and saving for future necessities), and voting theory (understanding the pros and cons of different voting techniques, evaluating which method is the most fair given the situation, and the importance of exercising your right to vote).

Voting Learning Outcomes: We will look at various techniques of voting. In this course, students will:

1. Analyze and interpret preference ballots and schedules.
2. Apply the Plurality voting method to determine the winner in an election.
3. Understand and explain the Majority criterion.
4. Understand and explain the Condorcet criterion.
5. Apply the Borda count method to determine the winner in an election.
6. Apply the Plurality with Elimination voting method to determine the winner in an election.
7. Apply the Method of Pairwise Comparisons to determine the winner in an election.
8. Understand and explain the Monotonicity criterion and the Independence of Irrelevant Alternatives criterion.

Finance Learning Outcomes: We will cover the basics of finance, which include topics about saving and borrowing money. In this course, students will:

1. Understand the meaning of the terms principal and interest.
2. Apply the simple interest formula to calculate the balance of a savings account.
3. Apply the compound interest formula to calculate the balance of a savings account.
4. Understand the difference between arithmetic and geometric growth.
5. Apply the interest formula for continuous compound interest to calculate the balance of a savings account.
6. Use the Future Value formula to determine required deposits into a sinking fund.

7. Use the Present Value formula to determine the payments required to fully amortize a loan.

Class format: This will be an online class held in *synchronous mode*. This means that at the scheduled class times you will have to be logged into ***Christian Yankov's Personal Webex Room:*** https://easternct.webex.com/meet/yankovc
You may choose to download the Webex App, or join from your browser. The class meeting will consist of a lecture and include related problem solving, just like a regular on-ground class. You will hear my voice and see what is being written on your screen. You will also have a chance to ask questions. Occasionally, I will call on someone with a question, which he/she is supposed to answer. This will also serve to check for your presence behind the screen. I will make an effort by the end of each day to post the class notes in pdf format on Blackboard.

Attendance: It is Department policy that a student **with more than 5 absences of class meetings for the semester will receive a grade of "F" for the course.** Under rare circumstances this policy may be waived by the Department Chair. In addition, I reserve the right to lower grades in lesser cases of poor attendance. You are responsible for all material covered in class or given for homework, independently of your attendance of a class. Attendance is essential and will be recorded!

Homework: After each class you will get a homework assignment. It will not be collected and graded, but must be completed and should prepare you for the quizzes. I cannot stress enough the importance of doing the homework. It is a critical factor in building and reinforcing your knowledge, as well as helping you identify your weak points.

Quizzes: Quite often at the beginning of class time there will be a short quiz, often unannounced in advance. This should keep you alert and following the material carefully, closely and timely.

Exams: There will be two longer exams throughout the semester. The first one will be given around the 5th week of classes and the second one around the 10th week.

Final Exam: There will be a cumulative final on **Mon., Dec. 14, 2020, 11:00am-1:00pm.**

Assignment Submission Rules: Each assignment will be allotted a time frame within which it will have to be completed and submitted to Blackboard. The submission should be a **PDF** file titled ***Lastname-Firstname-assignmentname.pdf***. For example, if I am to submit Quiz 3, it will be titled ***yankov-christian-quiz-3.pdf***. To produce a pdf file you may use various methods. If you own a scanner, then you can scan your work straight as a pdf file. Alternatively, you may take a picture of your work with a smart-phone. This will typically produce a jpg, or some other format picture file. There are apps both for Android and IoS, which convert picture formats into pdf. This requires some practice. Then you should make sure that the final outcome is what it is supposed to be, and is readable, and then you should submit it to Blackboard. I will not accept other file formats, so please invest the time and effort to comply with these rules.

Evaluation: Quizzes will account for 15% of your grade, the two longer exams will account for 25% each, and the final exam will account for the remaining 35%.

Grades: The ranges for the grades are the following:

| A-, A | 90% and above | B-, B, B+ | 80% - 89% |
| C-, C, C+ | 70% - 79% | D, D+ | 60% - 69% |

How to get help: You should log in to my personal room on Webex during my office hours, if you have difficulties with the subject matter.

MAC Tutoring: The Mathematics Achievement Center (MAC) will provide both in-person and virtual tutoring for the fall 2020 semester. In-person tutoring will take place Monday

through Friday 9-5pm on the first floor of the J. E. Smith Library, Room 107. The MAC has a Covid cap of 8 students. Virtual tutoring will take place using Webex. Please check the posted schedule on the MAC website
https://www.easternct.edu/mathematical-sciences/mathematics-achievement-center.html
for available virtual tutoring. Instructions for signing up for a virtual tutoring session will be posted on Blackboard.

Make-ups: There will be no make-ups for quizzes, since I will drop the lowest one (or, two). Make-ups for exams are strongly discouraged and might be allowed for truly exceptional reasons only, and with my prior permission.

Students with disabilities: Eastern Connecticut State University is committed to following the requirements of the Americans with Disabilities Act and Section 504 of the Rehabilitation Act. If you are a student with a disability (or think you may have a disability), and require adaptations or accommodations, or assistance evacuating a building in the case of an emergency, please contact the Office of AccessAbility Services (OAS) at 860-465-0189 to discuss your request further. Any student registered with the OAS should contact the instructor as soon as possible for assistance with classroom accommodations. Please note that accommodations are not retroactive, and must be communicated through a Letter of Accommodation which is drafted by the OAS.

Academic Misconduct: Students should read and understand Eastern's Academic Misconduct Policy, which can be found in the student handbook or at the following website:
https://www.easternct.edu/academic-misconduct/index.html
All violations will be handled under the procedures established in this policy.

Disclaimer: *The instructor reserves the right to make changes to this syllabus during the semester as necessary.*