SUFFOLK UNIVERSITY
MADRID CAMPUS

MATH 130 – TOPICS IN FINITE MATHEMATICS

Instructor Information:
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Course Information:
Catalog Description: Linear Modeling (for example, using linear functions to model supply/demand situations), graphing, linear programming, financial functions (compound interest, annuities, and amortization of loans) sets, Venn diagrams, counting and combinatorics, discrete probability, conditional probability, Bernoulli experiments, Bayes theorem. *This course cannot be applied toward a departmental concentration in Mathematics by Sawyer Business School students.
Prerequisites: MATH-104, or MATH-121, or MATH level 3.
Credit Hours: 4

This course follows the US Federal Government's Credit Hour definition: "An amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutional established equivalence that reasonably approximates no less than:

(1) One hour of classroom or direct faculty instruction and a minimum of two hours of out of class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or
(2) At least an equivalent amount of work as required in paragraph (1) of this definition for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

For full up-to-date statement:
https://cihe.neasc.org/sites/cihe.neasc.org/files/downloads/POLICIES/Pp111_Policy_On_Credits-And-Degrees.pdf

To complete this course, students will need to dedicate, at a minimum, the following amount of time to the listed activities**:**

Assignments/Activities	**Engagement Estimate**	**Engagement Hours**
Primary Source Readings	310 pages x 10 minutes per page	52 hours
Homework Exercises	19 sets x 1.5 hour per section	29 hours
Quiz Preparation	9 quizzes x 30 minutes per quiz	5 hours
Test Preparation	2 tests x 10 hours per test	20 hours
Midterm and Final Prep.	2 exams x 10 hours per exam	20 hours
Class Attendance	3 hours x 15 weeks	45 hours
Recitation sessions	45 minutes x 15 weeks	11 hours
Project (Optional)	20 hours	(20) hours
TOTAL		**182-202 HOURS**

Textbook/Course Materials:

Lial, Hungerford, Holcomb. Finite Mathematics with Applications in the Management, Natural and Social Sciences. Pearson, 11th edition.

A graphing calculator is required: TI-82 STATS, TI-83 or TI-84. Instructions for these calculators *only* can be found in the textbook. The book and calculator must be brought to every class meeting. Questions about how to use calculators will not be answered during quizzes or exams, ask them earlier in class or office hours!

Course Goals & Learning Objectives:

Upon successful completion of this course, students will understand:	**Upon successful completion of this course, students will be able to:**	**How the student will be assessed on these learning outcomes:**
• Linear functions and linear modeling	• Determine slope and line equations • Correctly use the slope formula and definition, and line equations • Find a linear model describing a business or science situation • From data, obtain the linear equation of best fit, interpret it, and use to predict outcomes	• Homework exercises sections 2.1, 2.2 and 2.3 • Quizzes 1 and 2 • Test 1 • Midterm Exam
• Linear programming	• Set up constraints and objective function, and determine the feasible region by solving linear systems • Transfer a real life situation into a linear programming problem and to solve this to reach an objective • Obtain a desired maximum or minimum value (such as a maximum profit or a minimum cost) subject to constraints	• Homework exercises sections 7.1 to 7.3 • Quiz 2 • Test 1 • Midterm Exam
• Simple interest and compound interest	• Calculate amounts, principals, interest rates or investment times for simple and compound interest • Find effective rate • Change a compound interest rate to a nominal rate	• Homework exercises sections 5.1 and 5.2 • Quiz 3 • Midterm Exam
• Annuities and loans	• Calculate present and future values, interest rates or number of compounding periods for ordinary annuities • Find out the components of a loan and how it is paid back • Calculate periodical payments or time needed to pay back a loan, given an interest rate • Create amortization schedules	• Homework exercises sections 5.3 and 5.4 • Quiz 4 • Test 2 • Midterm and Final Exams
• Counting methods	• Use set notation and set operations–union, intersection, complement • Draw and interpret Venn diagrams • Use the multiplication principle, combinations and permutations, and to distinguish them • Calculate the number of outcomes for a certain experiment	• Homework exercises sections 8.1, 8.2, and 9.2 • Quizzes 5 and 7 • Test 2 • Final Exam
• Probability	• Calculate probabilities for different events • Apply counting techniques, sets and formulas to calculate probabilities • Calculate conditional probabilities • Test independence of events. • Set up discrete probability distributions and find their expected values	• Homework exercises sections 8.3, 8.4, 8.5, 9.1, and 9.3 • Quizzes 5, 6, and 7 • Test 2 • Final Exam

Upon successful completion of this course, students will understand:	Upon successful completion of this course, students will be able to:	How the student will be assessed on these learning outcomes:
• Bayes Theorem and Binomial problems	• Draw and interpret tree diagrams and use the binomial formula • Determine the correct procedure to solve a Bayes or Binomial problem	• Homework exercises sections 8.6, and 9.4 • Quiz 8 • Test 2 • Final Exam

Assignments/Exams/Papers/Projects:

Students will be evaluated in the following areas: Homework assignments, class participation, weekly quizzes, two projects, two exams, a midterm exam and a final exam. See below the percentage weight for each.

Grading/Evaluation:

There is continuous evaluation based on your participation, homework presented, quizzes and examinations. See the semester schedule below for more information. The following percentages indicate how the final grade is calculated. The actual percentages applied vary from student to student–within the given ranges below. The percentages applied in each case will be those which give the highest grade.

Homework, quizzes and class participation	15% to 30%
Tests and projects	20% to 40%
Midterm and Final Exams	30% to 65%

For example, a student with scores of 78, 89, and 72, respectively, in the above three areas will have percentage weights of 30%, 40% and 30%, but another student with scores of 84, 75, and 92 will have weights of 15%, 20% and 65%.

Class participation. In order to earn full class participation grade you must come prepared to class by having done the homework and engage during the class by solving problems on the board, asking questions, and participating actively in the proposed activities. *You may discuss homework with other students and with your tutor who can help you work similar problems, but the answers you submit should be your own.* See also the rubric section below for more information.

PARTICIPATION RUBRIC

POINTS	WHAT YOU NEED TO DO TO GET THOSE POINTS
5	Be punctual; have the homework written down in a separate paper (not in the textbook); have class materials ready–book, notebook, calculator; engage actively in class; be attentive; have your phone switched off and out of sight; don't chat; don't leave the classroom.
4	All of the things above granting 5 points, except one of them
3	All of the things above granting 5 points, except two of them
2	All of the things above granting 5 points, except three of them
1	None of the things above granting 5 points
0	You did not attend class

Quizzes. There will be a short quiz weekly with questions similar to homework problems. You may use your book and notes during quizzes, but not in tests or exams.

Tests. The tests cover a fair amount of material. Review all the homework and study well the quiz questions to prepare for them.

Project. Please come to Office Hours to discuss the topic and get guidance if you want to embark on a project. Then meet deadlines for full grade.

PROJECT RUBRIC

PERCENT	GRANTED FOR
20%	Meeting all deadlines
20%	Appropriateness of topic, chosen in consultation with the instructor, and sticking to it
20%	Quality and completeness in the first draft
20%	Final draft, in particular incorporating changes suggested by instructor
20%	Class Presentation

Midterm and Final. The midterm and final exams together cover all course material and their questions are mostly similar to questions in previous tests and quizzes.

Grading scale:

Percentage	**Grade**	**Percentage**	**Grade**	**Percentage**	**Grade**
93-100	A	79-82	B-	63-66	D+
90-92	A-	75-78	C+	59-62	D
87-89	B+	70-74	C	55-58	D-
83-86	B	67-69	C-	54 or less	F

Course and Classroom Policies:

Each topic will be covered in the classroom through lecturing or collaborative learning, using examples and illustrations. After new material has been presented, homework exercises corresponding to this material should be attempted and presented in the next class. Sometimes you will be asked to study a lesson at home on your own–flipped class–and then do homework in class. Homework corrections of the most challenging exercises will be shared by the professor or students who can solve them. The homework must be presented in the classroom the day it is due to earn credit for it.

The level of difficulty and type of exercises that you are asked to solve in exams are very similar as you find in the homework from the textbook. Thus, it is essential that you study the textbook and familiarize yourself with it. There will not be make-up exams, although a justified absence in an exam will allow you to recuperate it during the midterm or final exam. To encourage daily study of the material, short quizzes covering the homework assignments will be given weekly. If you miss a quiz due to a justified reason, you are encouraged to come to Office hours to do a make-up, but always before the next test or exam.

For students having difficulties with the material or falling behind the rhythm of the class, it is crucial to use office hours to recuperate. The teacher is always available for consultation, do not hesitate to approach with a difficulty, small as it may seem.

Punctuality:

Students must be punctual for classes. If a student arrives late (5 minutes or more), the professor may refuse entry and mark him/her absent.

Cellular phones, being ready for class:

Before you enter the classroom, be sure you have solved all your businesses so that you do not have to leave in the middle of the class, which is always an undesirable interruption. That includes taking care of all your physiological needs, bringing your own calculator, and a Kleenex or similar if you are having a cold and switching off your cellular phone. Thanks for your cooperation!

Any student who uses his/her cellular phone during class will be asked to leave the class immediately and will not be allowed to return.

Food and drinks:
Students may consume water during class but no other kind of drinks and no food may be brought to class. Students may not leave the classroom to get water, but should bring it at the beginning of the class. Just come prepared so that you do not have to leave the class.

Participation/Attendance Policy:
The SUMC Student Handbook states the following:

Once a student is registered for a course, attendance at every meeting of every class is expected, including those held in the first week of the semester. A maximum of two unjustified absences is permitted. Each additional absence will cause the final course grade to be lowered by one-third of a letter grade, i.e., from A to A-; A- to B+; B+ to B, etc.

Excessive absences in a course will have a negative effect on the final grade. When a student is absent, the quality of his or her work in a course will deteriorate since material missed in class sessions can rarely be made up satisfactorily, even though the student remains responsible for that work.

Please note that even when a student has a justified reason for missing class, such as illness, the negative academic impact on learning will be the same as if the absence were for spurious reasons.

In this course, any absence due to illness should be justified by a note from the student's physician or other health professional confirming the day(s) on which the student was unable to attend class. This note should be presented the class following the absence or the following week at the latest. Written justifications will not be accepted afterwards. Medicine prescriptions or plane tickets are not valid justifications.

If a justified absence occurs in an examination day, the make-up will occur during the midterm or final exam, or the make-up days assigned for these.
Students are responsible for all material and assignments for the days missed, regardless of the reason for the absence. Students are also expected to pay attention in class and to participate in classroom activities, such as solving problems in group or presenting them on the board to the other students.

In the event that a class meeting is unexpectedly cancelled, students will be expected to continue with readings or other assignments as originally scheduled. Any assignments due or class activities (e.g., a quiz, exam or presentation) planned for such a cancelled class are due at the next class meeting unless other instructions are communicated.

Disability Statement:
If you anticipate issues related to the format or requirements of this course, please meet with me. I would like us to discuss ways to ensure your full participation in my classroom.

If formal, disability-related accommodations are necessary, it is very important that you be registered with the Office of Disability Services (ODS) at the main Campus in Boston so that I am notified of your eligibility for reasonable accommodations. We can then plan how best to coordinate your accommodations. Check the ODS web site at http://www.suffolk.edu/campuslife/3797.php for information on accommodations.

Student Resources:
SUMC provides a range of student services, both academic and personal. To learn more about course-related tutorials and academic workshops, refer to the SUMC Student Handbook, Section 2 "Academic Policies and Services". Section 5, "Living in Madrid", contains information on the medical and mental health resources, including an English-speaking therapist, available to you.

Midterm Review
At midterm, around week 6, you will be given a midterm grade based on your progress to date and performance on assignments, quizzes and midterm exam. Midterm grades of C- or below will be reported to the Madrid Campus Academic Standing Committee, with an explanation of what I believe has contributed

to that grade: excessive absences, poor time management or study skills, lack of effort, difficulty with the course material or with writing or language skills, etc. The Academic Standing Committee or I may contact you to suggest strategies for addressing these difficulties, which may include mandatory participation in Math Tutorials. I strongly encourage you to visit me during my office hours so we may discuss how you can be successful in this class.

Academic Misconduct:
www.suffolk.edu/about/mission-history/policies-procedures/academic-misconduct-policy
Suffolk University expects all students to be responsible individuals with high standards of conduct. Students are expected to practice ethical behavior in all learning environments and scenarios, including classrooms and laboratories, internships and practica, and study groups and academic teams. Cheating, plagiarism, unauthorized collaboration, use of unauthorized electronic devices, self-plagiarism, fabrication or falsification of data, and other types of academic misconduct are treated as serious offenses that initiate a formal process of inquiry, one that may lead to disciplinary sanctions.

Student work will be thoroughly examined for academic integrity and may be scanned using plagiarism detection software. A faculty member suspecting academic misconduct will contact the student using the Suffolk email address to schedule a meeting and will make all effort to do so within five business days of detecting the incident. During the meeting, the faculty member will present the documentation that led to suspected academic misconduct. Resolution of the incident will be according to the procedures outlined in the SUMC Student Handbook.

Academic Grievances Policy:
www.suffolk.edu/student-life/student-services/student-handbook/university-policies-for-student-cas-sbs/grievances-academics

Course Schedule:

Month	**Topic Covered and Main Activity**	**Homework & Other Assignments**
September	Section 2.1 Graphs	
	Section 2.2 Equations of Lines	Exercises 2.1: 1, 6, 9, 14, 17, 22, 25, 30, 33, 38, 41-44, 49-52, 57-62, 65, 70, 73, 78, 81.
	Section 2.3 Linear Models **Quiz 1**	Exercises 2.2: 1, 6, 9, 14, 17, 22, 25, 30, 33, 38, 41, 46, 49, 54, 57, 62, 65, 70, 73, 78.
	Section 7.1 Graphing Linear Inequalities in Two Variables	Exercises 2.3: 1, 6, 9, 14, 17, 22, 25.
	Section 7.2 Linear Programming: The Graphical Method **Quiz 2**	Exercises 7.1: 1, 6, 9, 14, 17, 22, 25, 30, 33, 38, 41, 46, 51, 54.
	Section 7.3 Applications of Linear Programming	Exercises 7.2: 1, 6, 9, 14, 17.
	Section 5.1 Simple Interest and Discount **Quiz 3**	Exercises 7.3: 1, 6, 9, 14, 17, 22, 25.
October	Section 5.2 Compound Interest	Exercises 5.1: 1, 6, 9, 14, 17, 22, 25, 30, 33, 38, 41, 46, 49.
	Test 1	Exercises 5.2: 1, 6, 9, 14, 17, 22, 25, 30, 33, 38, 41, 46, 49, 54, 57, 62, 65, 70.
	Section 5.3 Annuities, Future Value, and Sinking Funds	

Month	Topic Covered and Main Activity	Homework & Other Assignments
	Section 5.4 Annuities, Present Value, and Amortization **Quiz 4**	Exercises 5.3: 1, 6, 9, 14, 17, 22, 25, 30, 33, 38, 41, 46, 49, 54.
	Spanish national holiday–*Día de la Hispanidad* (Campus closed)	
	Midterm exam preparation	Exercises 5.4: 1, 6, 9, 14, 17, 22, 25, 30, 33, 38, 41, 46, 49, 54, 57, 62, 65.
	Midterm Exam	***Project topic must have been discussed and decided by today***
	Section 8.1 Sets	
	Section 8.2 Applications of Venn Diagrams **Quiz 5**	Exercises 8.1: 1, 6, 9, 14, 17, 22, 25, 30, 33, 38, 41, 46, 49, 54, 57, 62, 65, 70.
	Section 8.3 Introduction to Probability	Exercises 8.2: 1, 6, 9, 14, 17, 22, 25, 30, 33, 38, 41, 46.
November	**Spanish national holiday–*Día de Todos los Santos* (Campus closed)**	
	Section 8.4 Basic Concepts of Probability	Exercises 8.3: 1, 6, 9, 14, 17, 22, 25, 30, 33, 38, 41, 46.
	Section 8.5 Conditional Probability and Independent Events **Quiz 6**	Exercises 8.4: 1, 6, 9, 14, 17, 22, 25, 30, 33, 38, 41, 45-50, 51-56, 61, 65.
	Madrid local holiday–*Ntra. Sra. de la Almudena (Campus closed)*	
	Section 8.6 Bayes' Formula	Exercises 8.5: 1, 6, 9, 14, 17, 21-22, 25, 30-33, 34- 41, 46-49, 57, 62.
	2	Exercises 8.6: 3- 6, 9-10, 17-18, 22-23, 25-26, 27, 30, 33.
	Section 9.1 **ɔability Distributions and Expected Value**	***Project first draft is due today***
	Section 9.2 The Multiplication Principle, Permutations and Combinations **Quiz 7**	Exercises 9.1: 1, 6, 9, 14, 17, 22, 25, 30, 33, 38, 41, 46.
	Section 9.3 Applications of Counting	Exercises 9.2: 1, 6, 9, 14, 17, 22, 25, 30, 33, 38, 41, 46, 49, 54, 57, 62, 65, 70, 73.
	Section 9.4 Binomial Probability ***Project presentations begin*** **Quiz 8**	Exercises 9.3: 1, 6, 9, 14, 17, 22-24, 30, 33, 38.
	Final exam preparation ***Project presentations end***	Exercises 9.4: 1-6, 13-16, 17, 24-28, 38-40, 41. ***Project final draft is due today***
	Final Exam	

Important: *The schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better student learning.*