MATH 104 M1 – PRE-CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCES

Instructor Information:
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Course Information:
Catalog Description: A selection of topics in algebra and elementary analytic geometry including, (but not restricted to): properties of real numbers, linear equations and inequalities, absolute value equations and inequalities, polynomials, rational expressions, exponents and radicals, quadratic equations, functions, linear, quadratic and polynomial models, rational, exponential and logarithmic functions. Applications and graphs are stressed throughout the course. This course is intended to prepare students who have only had one year of high school algebra to take MATH 134. Students may not use this course alone to satisfy the C.A.S. math requirement. Qualifying math placement exam score required. Students who are not prepared for this course should take MATHSHOP. Several sections offered each semester. *This course cannot be applied toward a departmental concentration in Mathematics by Sawyer Business School students. This course cannot be taken for credit by a student who already has credit for a more advanced course.
Prerequisites: Appropriate Math Placement Exam score.
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	170 pages x 10 minutes per page	28
Homework Exercises	19 sets x 1.5 hour per section	29
Quiz Preparation	9 quizzes x 45 minutes per quiz	7
Test Preparation	2 tests x 15 hours per test	30
Midterm and Final Prep.	2 exams x 15 hours per exam	30
Class Attendance	3 hours x 15 weeks	45
Recitation sessions	45 minutes x 15 weeks	11
Project (Optional)	20 hours	(20)
TOTAL		**180-200 HOURS**

Textbook/Course Materials:

Lial, Hungerford, Holcomb. Finite Mathematics with Applications in the Management, Natural and Social Sciences, Global Edition. 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:
The real number line	Use the properties of real numbers Perform operations in the right order Work with absolute values Use inequality symbols	Homework exercises section 1.1 Quiz 1 Exam 1 Midterm Exam
Polynomial and rational expressions	Operate and simplify polynomials Factor polynomials Operate and simplify rational expressions	Homework exercises sections 1.2 to 1.4 Exam 1 Midterm Exam
Exponents and radicals	Use properties of exponents Work with radicals Rationalize denominators	Homework exercises section 1.5 Quiz 2 Exam 2 Midterm Exam
Equations and Inequalities	Solve first-degree and second-degree equations Solve absolute value equations Use the quadratic formula Solve linear inequalities Solve absolute-value inequalities Set up and solve applied problems whose solution is found using an equation or inequality	Homework exercises sections 1.6. 1.7 and 2.4 Quiz 3 Exam 2 Midterm Exam
Functions	Apply the definition of a function to determine whether an equation, graph or table represents a function or not Use function notation Model using functions Graph functions Interpret graphs of functions	Homework exercises sections 3.1, and 3.2 Quiz 4 Exams 2 and 3 Midterm and Final Exams

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:
Special functions	Distinguish linear, quadratic, power, polynomial and rational functions Graph those functions, including parabolas and asymptotes Use the functions above in applications, including cost analysis, rates of change, break-even analysis, supply and demand Find appropriate linear, quadratic and polynomial models, including using regression	Homework exercises sections 3.3, 3.4, 3.5, 3.6, and 3.7 Quizzes 5 and 6 Exams 3 and 4 Final Exam
Exponential and logarithmic functions	Distinguish exponential and logarithmic functions Graph those functions and see their symmetrical relationship Use exponential and logarithmic functions in applications, including exponential growth and decay, logistic growth Find appropriate exponential and logarithmic models, including using regression	Homework exercises sections 4.1, 4.2, 4.3, 4.4 Quiz 7 Exam 4 Final Exam

Assignments/Exams/Papers/Projects:

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

Grading/Evaluation:

There is a 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 project   20% to 40%
Midterm and Final Exams   30% to 65%

For example, a student with average 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.*

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. The project is optional, you do not have to do it, but the decision to do it must be made early in the semester, see schedule below.

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. The final exam is not cumulative, since it covers the material covered after the midterm exam.

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 repeatedly 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 www.suffolk.edu/disability 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. 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 exercises or other assignments due
Sept.	Section 1.1 The Real Numbers	
	Section 1.2 Polynomials **Quiz 1**	Exercises 1.1 1 to 12, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51, 56, 59, 64, 67, 72, 75, 80, 83.
	Section 1.3 Factoring	Exercises 1.2 3, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51, 56, 59.
	Section 1.4 Rational Expressions **Quiz 2**	Exercises 1.3 3, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51, 56, 59, 64, 67, 72, 75, 80, 83.
	Section 1.5 Exponents and Radicals	Exercises 1.4 3, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51, 56, 59, 64.

Month	Topic covered and Main Activity	Homework exercises or other assignments due
	Exercises 1.6 3, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51, 56, 59, 64, 67, 72, 75. **Quiz 3**	Exercises 1.5 3, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51, 56, 59, 64, 67, 72, 75, 80, 83, 88, 91, 96, 99.
	Section 1.7 Quadratic Equations	Section 1.6 First-Degree Equations
Oct.	**Test 1**	Exercises 1.7 3, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51, 56, 59, 64, 67, 72, 75.
	Section 2.1 Graphs	
	Section 2.2 Equations of Lines **Quiz 4**	Exercises 2.1 3, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51, 56, 59, 64, 67, 72, 75, 80.
	Section 2.3 Linear Models	Exercises 2.2 3, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51, 56, 59, 64, 67, 72, 75. ***Project topic must have been discussed and decided by today***
	Midterm Exam	Exercises 2.3 1, 3, 8, 11, 16, 19.
	Section 2.4 Linear Inequalities	
	Section 3.1 Functions **Quiz 5**	Exercises 2.4 3, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51, 56.
	Section 3.2 Graphs of Functions	Exercises 3.1 3, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51, 56, 59.
	Section 3.3 Applications of Linear Functions **Quiz 6**	Exercises 3.2 3, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51, 56, 59.
Nov.	**Spanish national holiday–*Día de Todos los Santos* (Campus closed)**	
	Section 3.4 Quadratic Functions **Quiz 7**	Exercises 3.3 3, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51.
	Section 3.5 Polynomial Functions	Exercises 3.4 3, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51, 56, 59, 64.
	Madrid local holiday–*Ntra. Sra. de la Almudena (Campus closed)*	
	Section 3.6 Rational Functions **Quiz 8**	Exercises 3.5 1 to 4, 8, 11, 16, 19, 24, 27, 32, 35, 40.
	Section 4.1 Exponential Functions	Exercises 3.6 3, 8, 11, 16, 19, 24, 27, 32.
	Test 2	Exercises 4.1 3, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51.
	Section 4.2 Applications of Exponential Functions	***Project first draft is due today***
	Section 4.3 Logarithmic Functions **Quiz 9**	Exercises 4.2 3, 8, 11, 16, 19.
	Section 4.4 **arithmic and Exponential Equations**	Exercises 4.3 1 to 4, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51, 56, 59, 64, 67, 72.

Month	Topic covered and Main Activity	Homework exercises or other assignments due
Dec.	*Final exam preparation* **ect presentations**	Exercises 4.4 3, 8, 11, 16, 19, 24, 27, 32, 35, 40, 43, 48, 51, 56, 59, 64, 67, 72, 75, 80. ***Project final draft is due today***
	Final Exam	

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