Instructor: Prof. Jen-Mei Chang  
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Course url: http://www.csulb.edu/~jchang9/m113_flipped_spring.html

Class Info  
Section 01, Code 4180, Mon/Wed 11:00AM - 12:15AM, LH-150. Optional supplemental instruction course available: S/I 60 26 #5624 Mon/Wed 12:30PM - 1:45PM.

OHs: Mon 1:00pm-2:00pm; Tue 11:00am-12:00noon; Wed 8:50am-9:20am and by appointment.

Prereq  
Appropriate ELM score, ELM exemption, or MAPB 11.

Text  

Make sure you buy a hybrid book that comes bundled with Enhanced WebAssign (our on-line homework system). The bookstore has it, and you can find it on-line. Buying the text, even used, and access to the homework system separately will be more expensive. You can access your on-line WebAssign homework free for a couple of weeks, so you have time to order a textbook, without losing class credit.

Objectives  

Learning Goals  
“The best way to learn is to do; the worst way to teach is to talk.” — Paul Halmos.

This class will be run as a flipped classroom. This means, you, the student, will be put in the center of the learning where you will preview the course materials before each class meeting, actively engage in the discussions during class, and assess your learning through regular assignments and self reflections. I will play the role of the facilitator in this process as you initiate, synthesize, and analyze knowledge. This class is meant to prepare you for the upcoming 3-semester Calculus sequence, it is extremely important that you develop a habit of mathematical mind where you are able to create knowledge independently and collaboratively, solve problems using multiple approaches, and making connections to the real-world problems around you. Table 1 lists the six major learning goals for this course. Be mindful as you progress through the course and check-in from time to time to see how many on the list you have mastered!

HW: You are welcome to do the suggested “Check-Your-Understanding” (WebAssign) problems assigned on the course website for extra credit. Points will be pro-rated based on the percentage of the overall problems you complete correctly. This will add up to an equivalent of 5% of your overall grade.

Quiz: You are responsible for in-class group quizzes (all group members share a single grade) throughout the semester. Each person is responsible for working out their own version of the work with assistance from their peers on group quizzes. Through this exercise, you will learn to communicate the mathematics with your peers and be exposed to alternative ways of problem-solving. Group quizzes are worth 15% of your overall grade and they are generally due in the beginning of the next class meeting from the time they are first given. I purposely delay the due day for these quizzes because I want to devote the class time as “help session.” You are welcome to work on the quizzes on your own before coming to class to prepare yourselves for questions, use the class time to resolve your questions, and finish them after class.
Exams: You will have three in-class midterm exams that is each worth 20% of your grade and a comprehensive final exam that is worth 25%. Tentative dates for the exams are given in Table 2. Please make a note of these dates immediately.

Grading: Conventional without curves. I reserve the right to alter your final grade within a reasonable deviation when your class attendance and participation are considered. The distribution of each category for which your performance will be graded is given in Table 3.

Remarks:
- A detailed schedule of the class with specific learning materials is posted on the class website: [http://www.csulb.edu/~jchang9/m113_flipped_spring.html](http://www.csulb.edu/~jchang9/m113_flipped_spring.html)
- *No make-up exams will be given.* However, for verified emergencies, arrangements can be made ahead of the scheduled exam time, though no make-up quizzes will be given (Quizzes are always in groups, hence it makes little sense to allow for make-ups.).
- Since a lot of what we do in the class is in a group setting, your attendance is absolutely essential. Your group members need you! If you miss more than 3 times in the entire semester you will receive a F automatically.
- Any office hour may be canceled due to illness or necessary appointments, and students should not therefore depend on the faculty being in his or her office for a particular office hour. Students thus should secure any necessary signatures or other requirement well in advance of any deadline.
- The conditions under which students may withdraw and the documents which must be submitted are detailed in University Policy Statement 09-07, and described in the CSULB Catalog. The most current information on CSULB withdrawals is posted at: [http://www.csulb.edu/depts/enrollment/registration/details.html#anchor1](http://www.csulb.edu/depts/enrollment/registration/details.html#anchor1) It is the student’s responsibility to withdraw from classes. Instructors have no obligation to withdraw students who do not attend courses, and may choose not to do so. Each student is responsible to check their MyCSULB account weekly to be certain that the Class Schedule listed accurately reflects the courses s/he is enrolled in for the current semester. Students should also check for any notices the University has sent to them. That said, I would recommend that you do not drop this class since your group members need you!
- No instructor or office staff can add or change a class for you. Only YOU, THE STUDENT, can add or change classes in YOUR schedule. You may either add classes on-line through your MyCSULB account or in person at Enrollment Services during the registration period.
- Request for special need for accommodation of a University verified disability should be submitted within the first two weeks with all necessary documentation.
- The instructor reserves the right to alter anything on this syllabus at any time.
- Respect your classmates and yourselves. I am committed to your success and willing to do anything to ensure that happens. But you will have to work with me on that. Suggestions and comments are always welcome and strongly encouraged. Be an active learner! Ask lots of questions and answer lots of questions in class. The best way to learn math is by doing it and explaining to others.
1. Students relate representations of mathematics.
We represent mathematics in different ways, depending on what we want to do and with whom we are communicating. These representations include algebraic formulas, numerical data, graphs and verbal descriptions. One goal of this precalculus program is for students to translate between these ways of understanding mathematical concepts, so they are ready to apply what they know, no matter how it is presented in context.

2. Students develop a repertory of common mathematical objects.
Some types of functions (like quadratic, linear, exponential and log functions, and monomials, like $x^n$ or $\frac{1}{x^n}$), and geometric objects (like circles, or right triangles) arise frequently in a variety of applications. One goal of precalculus algebra is to prepare students to readily identify these, and use related facts and techniques from memory.

3. Students use the language and notation of functions.
A function is a rule that assigns an output to each input in a given domain. Questions about functions ask what happens to the output as you vary the input. For example, you might be asked to find inputs for which function is increasing or decreasing, or find inputs at which a function achieves its maximum value. One goal of precalculus is to prepare students to use the language of functions to analyze and describe quantities that arise in engineering and science.

4. Students manipulate algebraic expressions and equations into equivalent convenient forms; students identify which forms of algebraic expressions and equations are convenient.
In many cases using a formula to answer a questions means rewriting the formula in another way, so that the answer is evident. For example, by expressing the equation for a parabola in its standard Form $f(x) = a(xh)^2 + k$, you can immediately see the vertex ($h, k$) and which direction the graph opens ($a > 0$ means it opens up, and $a < 0$ means it opens down). Another more basic example of manipulating an algebraic expression is solving an equation. We start with an equation like $3x + 7 = 12$, and manipulate it into the equivalent form $x = 5/3$. One goal of precalculus is to enable students to practice manipulating algebraic expressions, and identifying when changes to an expression leave its meaning unchanged. (Is the operation “legal”? No! the algebra police are coming!)

5. Students construct models.
A model is a function whose input and output represent something in the real world. Some common models include exponential models, of the form, $n(x) = n_0e^{rt}$, where $n_0$ is an initial value, and $r$ is the percent relative rate of growth, or a linear model $f(x) = b + mx$, where $b$ is the initial value and $m$ is the rate of change, or slope. When you know something in the real world is changing linearly or exponentially, for example, you use what information you have to find the parameters in the model (like $n_0$, $r$, $b$, and $m$). One goal for precalculus is for students to construct models given verbal descriptions of the quantities of interest, and use the models to answer questions about the real world.

6. Students use correct mathematical reasoning and notation.
Correct notation and reasoning makes communication about mathematical concepts possible. One goal of precalculus is to enable students to practice their work in writing, correctly and without ambiguity.

Table 1: Content learning goals. I set high expectations for my students and I believe you can all achieve them.

Jen-Mei Chang

http://www.csulb.edu/~jchang9/m113_flipped_spring.html
Table 2: Tentative dates for exams.

<table>
<thead>
<tr>
<th>Exam</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>Wednesday, February 18, 2015</td>
</tr>
<tr>
<td>Exam 2</td>
<td>Wednesday, March 11, 2015</td>
</tr>
<tr>
<td>Exam 3</td>
<td>Monday, April 13, 2015</td>
</tr>
<tr>
<td>Final</td>
<td>Monday, May 11, 2015; 10:15am - 12:15pm</td>
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Table 3: Grade distribution of the required categories.

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>WebAssign HW</td>
<td>EC (∼ 5% of overall grade)</td>
</tr>
<tr>
<td>In-Class Group Quiz</td>
<td>15%</td>
</tr>
<tr>
<td>Midterm Exams</td>
<td>60%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
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