CLASS WEB PAGE: I will keep a day-to-day calendar for this course, indicating what we talked about in class, the homework assignment, announcements, and I will post copies of (most) handouts, etc.

http://cerebro.cs.xu.edu/math/math150/15s06/calendar.html

Bookmark this URL in your browser and visit the site regularly!!!


COURSE DESCRIPTION: Beginning with the Fall 2015 semester, this course will be offered as an option to satisfy "Mathematical Perspectives" of Xavier's core. Here is a brief statement from the mathematics faculty concerning such a course:

Mathematical Perspectives
Mathematics is the study of patterns. It provides a unique way of investigating and understanding the world around us, using as its primary tools exploration, conjecture, and logical argumentation. In this course, by exploring rich mathematical problems, you will further develop your abilities to reason critically; to defend the correctness and validity of your conclusions; to present your results clearly in both written and oral forms; and to experience fresh perspectives on the nature of mathematics.

What we will do in this course, how we will do this, and what your instructor expects from you are all guided by the above description. Consequently, your experience in this course may differ greatly from what you are used to in a mathematics course. For instance, it is likely that you have become convinced, that what you need to do in a mathematics course is to memorize formulas you are told in class, and to figure out when to use which formula and how to "get the right answer". It is easy to recognize that a "Mathematical Perspective" cannot be gained by memorizing and practicing the use of formulas. Instead, the goal is to learn that mathematics is ONE way to make sense of certain aspects of this complex world we live in.

We will always work in a real-world context, we will be given data about the context, and we will explore what "Calculus" was designed to do, where these ideas come from, and how the ideas are used - and why they are useful - in just about any area of interest where "measurements" are or can be made. For example, we know that the size of the US economy can be measured, and
that this measurement changes over time. Similarly, we know that air-pressure or temperature changes with altitude above the earth's surface, and the number of people interested in joining a fitness club depends (at least in part) on what a membership to the club costs.

One of the things all of the mentioned examples have in common is that two different quantities are related: "Time" and the "Size of the US economy" are related: At every point in time the US economy has a certain size; "Altitude" and the "Air-pressure" are related: As you go up in altitude, the amount of air above you shrinks, which causes lower air-pressure; through surveys it is possible to determine how the "number of people interested in joining a fitness club" changes with different "membership fees". However, most of you may know that the "health" of the economy is not determined by how large it is - but by how fast it grows! Now, one of the main general purposes of Calculus is to tell us "how fast a quantity is shrinking or growing" from the information about "how much is there". The other main purpose is the same thing backwards: From information about how fast some quantity grows and how much of it was there at some point in time, Calculus allows us to determine how much of the quantity is there at any other time.

The real world context will allow us to ask meaningful questions - by which I mean questions which do have real meaning (to YOU), if you think about the context using your experience and common sense. We will progress from there entirely logically, and you will be able and are expected to follow the logical thread through (and throughout) the whole course. More than that, you will be expected to describe in words what you do, to explain in words why you do it, and to be aware of the conclusions you can or cannot draw from what you did. In short: **Strong emphasis in this course is placed on clearly interpreting and communicating contexts, questions, processes, meaning, and answers. Simply "doing something" and hoping that "the answer is right" will not be enough to pass the course, even if you are good at choosing what to do.**

**How to get into trouble, and how to avoid it**
There are two ways to get yourself into trouble, almost certainly:
(1) Not to come to class
(2) Not to do the homework, diligently and regularly, even when it is not collected
I will try to keep track of attendance, but I do not like wasting class time this way. Nor do I like spending my own energy in this way, or checking who does HW and who does not. After all, this is not Kindergarten. As an adult, it is your choice and your self-discipline that counts - not the fear of a reprimand from an authority. There will be natural consequences of the un-disciplined and un-adult-like behavior of not contributing your own part to your education. You may not notice right away that a problem has been created through your own neglect, but show up later in the course. Whenever you have to resort to "memory" of how to do something or what to do, and it is not "clear" (logically) to you what needs to be done or how to do it, then something is wrong. That is your best indicator for coming to my office hour for a conversation, immediately.
So, your highest two priorities for this course MUST be to come to class and to always do your homework, no exceptions, if possible. Furthermore, you must NOT believe that you can just "study for the test the night before", and make up for missed class or HW.
Different goals and outcomes call for different approach and emphases
You will be asked to make sense of what we do, to think logically, and to explain what you do. This can not be substituted by memorizing and practicing procedures. Memorization will not get you through the course. Cramming before an exam will not be enough, because you will have to explain what you did, and what everything means. These things cannot be memorized. You will be expected to be active in class, to participate, to think, to ask questions, etc.

COURSE PHILOSOPHY AND GOALS: The pace, the format, and the variety of examples you will encounter are intended to show in which way the ideas of Calculus are useful (and used!). They are not just "practice Problems". I believe that Calculus is one of the most astounding and consequential creations of the human mind, in that it has become our key language to investigate and to express how things that can be measured are related, and how they affect each other. This language is used in science, business/economics, as well as many areas of the humanities, where the connection between quantities is important. Much of our work will occur in written/spoken language using words and sentences, to avoid hiding ideas and meaning behind symbols you can not appreciate. Your thinking and understanding most naturally occurs in words; explanations are easiest for you to follow if they are given in words; we will use words. But we must use them carefully, and that may be a new and a difficult aspect of this course for you, but it will also be an invaluable skill for whichever path your life will take.

PREREQUISITE: You need to understand how data pairs are graphed in the plane, and you should be able to do basic, routine algebra.

CALCULATORS: A Texas Instruments TI-83 or 83 Plus (or 84/84 Plus) is required for this course. You will need it in class, for homework, and on the exams. Other calculators are NOT adequate nor allowed.

HOMEWORK: Every day, homework will be assigned and posted on the course web page. You are expected to work ALL assigned exercises, keeping in mind that these exercises are not necessarily repetition of things that were done in class, but that the exercises are a tool to bring up questions, or to ask you, the students, to apply recently discussed concepts, ideas, and procedures creatively. It is important for your success in this class that you take the homework seriously, that you practice answering in complete sentences (instead of simply coming up with "the right answer"), and that you provide reasons for and explain the meaning of your conclusion(s). Explanation and answers in complete sentences will be expected on all quizzes and tests. I hope to secure a grader for the homework and plan to collect your work occasionally. (This will be announced on the course web-page.)

ATTENDANCE: Class attendance is crucial. The class meetings provide the introduction and explanation of new topics/concepts/variations, we will go over how the calculator is used, and you will learn how to solve certain problems. Take complete notes in class! These notes will be your best resource. If you have to miss an exam for any reason, you must discuss it with me beforehand to avoid a score of 0. Missing classes excessively (more than four) will result in lowering your semester grade by one letter (so will every two classes missed above four.)
QUIZZES: Quizzes may be given at the beginning, or during class, at any time, without previous announcements. There will be 8-10 such quizzes spread out through the course. Quizzes cannot be made up after a class, because they are often part of the learning process in class.

GRADING:

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<tr>
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<th>Points</th>
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<tbody>
<tr>
<td>3 Exams</td>
<td>100</td>
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<tr>
<td>Quizzes + HW</td>
<td>100 - 150</td>
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<tr>
<td>Final Exam</td>
<td>100</td>
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The semester grade will be calculated as the percentage of points you accumulate from the available total.

The grading scale is

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
<th>Description</th>
<th>Transitional Grade</th>
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<tbody>
<tr>
<td>90 - 100 %</td>
<td>A</td>
<td>&quot;outstanding&quot;</td>
<td>(90- &lt; 93 will be A-)</td>
</tr>
<tr>
<td>80 - &lt; 90 %</td>
<td>B</td>
<td>&quot;good&quot;</td>
<td>(80- &lt; 83 will be B-)</td>
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<tr>
<td>70 - &lt; 80 %</td>
<td>C</td>
<td>&quot;satisfactory&quot;</td>
<td>(70- &lt; 73 will be C-)</td>
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<tr>
<td>60 - &lt; 70 %</td>
<td>D</td>
<td>&quot;minimal passing&quot;</td>
<td>(60- &lt; 63 will be D-)</td>
</tr>
<tr>
<td>&lt; 60 %</td>
<td>F</td>
<td>&quot;fail&quot;</td>
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There is no A+

> 87- < 90 will be B+

> 77- < 80 will be C+

> 67- < 70 will be D+

Participation and overall engagement will be taken into account, especially in borderline cases.

(1) "in-class": being active and helpful when working in groups, asking and/or answering questions,...

(2) "out of class": utilizing office hours to discuss your questions and ideas with me individually, any other initiative you show to better understand the material.

GETTING HELP: The best thing for you to do, besides attending class and doing the HW exercises diligently, is to come and see ME during office hours. To get help with any particular issue, the next best thing for you to do is to visit the Math Lab, Conaton Learning Commons Room 419. This room is staffed by knowledgable mathematics majors who are there to help you! Hours of operation are M-R 10-8, F 10-2, Sunday 2-8. Take advantage of this place - especially when I am not available.

GROUP WORK: You will often be asked to work in small groups (probably pairs) in class. I encourage you strongly to study and to do HW with your classmates! Form HW or study groups! Working in a group is beneficial, as long as you make sure that everyone is making contributions and that no one is left out. Asking a question is just as important a contribution as is answering it.

Finally: I ask that you use a ring binder, so that materials, such as notes, handouts, quizzes, in-class activities, and so on can easily be removed and inserted. It will help greatly if you put dates at the top of each page or packet.

Asking "Why?" is not only acceptable, it is exactly what I will ask you to do, all the time. Don't just accept and believe things! Make sense of them, and understand why they are true. To get into this habit is a great way to foster improved critical thinking.

Do not try to simply "remember" what we say and do in class, but try to make sense of it!

Take notes in class, as this will be your most coherent summary of what we have done. (We will not always follow the text.)