"If you want to understand nature, you must be conversant in the language in which nature speaks to us."— Richard Feynman

Contact Info
Email barry.brunson(at)wku.edu, mathisfun(at)mac.com
Phones 745-6221 (my office); 745-3651 (Math Dept office)
Blackboard https://ecourses.wku.edu
Physical office STH 4106

Office Hours
(MF 9:10 - 10:05 and 11:30 - 12:25; TR 11:10 - 12:30 plus by appointment or capture I’m around a lot more than the listed office hours. If you want to see me at other times, feel free to drop by, or let me know and we can set up a time. If I am not in my office (especially if I am supposed to be there), look for a note on my door; it should say where I am or when I’ll be back. Leave a note on my door if you want me to call you. I encourage you to use e-mail (in the evenings I check the mac.com address more often). If you need help, I will find time to meet with you. Talking with me early is important if you are having problems.

Blackboard
The Blackboard Learning System website will contain announcements, a calendar of HW due dates, exams, your assignment grades, etc. Visit it often, especially if you miss a class (which you won’t do except in the most extraordinary circumstances, of course!). You login with your ordinary WKU email username and password.

Prerequisites
You should have
• EITHER four years of high school mathematics from the pre-college curriculum, including Advanced Integrated Math 1, 2, and 3, or two years of algebra and geometry, and either
  ◦ an algebra score of at least 20 on the Math Placement Exam (MPE), or
  ◦ a Math ACT score of at least 27 and a GPA of at least 3.0 in high school mathematics
• OR Math 117 or Math 118 with a grade of C or better

Course goals
Mathematics is the science of patterns. Mathematics is NOT just a collection of facts and formulas. This course provides an introduction to the fundamental ideas of differential and integral calculus, and to the fascinating way that those two branches are unified. Many of these ideas have been around for almost 300 years; far from being "cut and dried"; however, new insights into these ideas, and new applications of them, continue to be discovered. Mathematics is at the foundation of science, and calculus is one of the pillars of modern mathematics.

Text and approximate syllabus
Single Variable Calculus — Early Transcendals, by Jan Rogawski, W. H. Freeman and Co. We will cover most or all of Chapters 1 - 5 and part of Chapter 6.
Course materials
The policy of the Department of Mathematics is to use a graphics hand calculator in each calculus class, and so you should have one. A calculator at the level of the TI-84 or higher is best. At least eventually, you will want to do many things with Mathematica that you might otherwise do with your calculator.

Diversity
If an animal or plant species lacks genetic diversity, then it will become susceptible to disease. The same is true socially and intellectually: diversity is important! I believe that all students can learn mathematics, regardless of gender, age, color, ethnicity, sexual orientation, religious or cultural inclinations (or lack thereof), and nationality. Certainly, I want all students to reach their potential, and I will treat all students fairly with regard to all of those characteristics. I do especially encourage members of groups who historically have been excluded from science and mathematics, such as women and ethnic minorities.
I also recognize diversity in learning styles: what works for one student in learning a particular idea, may not work as well for another. Along similar lines, I encourage you as a student also to be flexible, and to consider the advantage of diversity in approach; be open to new learning styles and new ways of learning!

Course format
A typical class will include both lecture and discussion. The proportion of each will vary and will depend to some extent on you. There always will be some time for questions on the previous homework, and you are always free to ask questions during class. Some of your work will be done in small groups.

Homework
Many things are important in the learning process, including reading the text (yes, you do need to read it!), listening and participating in class (I will ask you lots of questions also!), and so on. But the only way you will really learn what’s going on is by sitting down and solving problems. Here are some things to remember about homework (HW) problems:
• The "answer" is not what's important. When I assign problems, it's not because I want to know what the answer is; it's not even because I want to know if you know what the answer is. The process is what counts. The problems are there to help you learn the process, and I want to know if you understand the process.
• Some of the problems will be "drill" -- similar problems with slightly different ingredients. If these seem boring and hard for you, then you probably haven't learned the process well enough yet. When they get boring and easy, then you probably have done enough of them.
• If you are not sure about a problem, you need to ask about it—in class, in my office, a classmate, a group partner, or whatever. Ask sooner rather than later; otherwise, it likely may come back to haunt you. Remember Rule #1!
From the large number of HW problems assigned, I will sometimes designate a smaller number that I will collect and grade. Those are the problems you should work last, not first.

Quizzes
We will have several quizzes, usually quite short. It's even possible that you will have a "class entrance" quiz now and then.

Exams
We will have four regular in-class exams, tentatively scheduled for Tue 16 Feb, Fri 5 Mar, Tue 6
Apr, and Tue 27 Apr. The final exam is Tue 11 May (with M126-001 at 8 - 10 and M126-003 at 1 - 3). Note that the second in-class exam is the last day before Spring Break. Don’t make travel plans that will have to be changed later.

**Additional features**

- *Mathematica*
  Among the many tools we will use in revealing the secrets of calculus, one of the most useful will be the astonishingly powerful software known as *Mathematica*. At WKU, we are in the happy position of having *Mathematica* available in every computer lab on campus! You will be encouraged to use *Mathematica* to check work done by hand, and required to use it on many assignments. *Mathematica* not only relieves us of the need for some types of ugly, tedious "grunt" work; it also enables us to do many things that would be entirely impossible by hand. Overall, *Mathematica* allows us to ask "What if …?", and obtain an answer immediately.
- *Math in the News*
  There will be occasional assignments, group or individual, based on current events in the real world. These Math in the News assignments will be included as part of the HW grade.
- *Discussion board*
  The Blackboard learning environment includes a discussion board feature. This is a good place for asking—and answering—questions about the class, about topics that need clarification, about connections with other parts of mathematics and science. It is *not* appropriate just to post answers to assigned problems! (See the discussion under "Homework" above.)

**General philosophy**

- "It ain't so much the things we don't know that gets us in trouble, it's the things we know that ain't so" (attributed to Will Rogers, Mark Twain, and Artemus Ward, among others). Plan on:
  - reviewing the things you know
  - learning the things you don't know that we need to know
  - unlearning the things you know that aren't so.
- Mathematics is not a spectator sport. People learn best by doing.
- Write for your peers, not for your professors.

**How much work?**
The amount of work you will have to put in depends on a combination of your abilities, your prior math background, and the grade you want to achieve. Most people should count on spending at least two hours outside of class for every hour in class.

**Grades**
Your course grade will be determined approximately by the formula:
HW (20%) + Quizzes (20%) + In-class exams (40%) + Final exam (20%) = Total (100%)

**Grading scale**
90%, A; 80%, B; 70%, C; 60%, D; < 60%, F.

**Attendance**
You need to attend every class. You are required to be prepared for each class and to participate in discussions of material in class as well as on-line. (The online discussions will be on Blackboard discussion boards.) Your participation will help shape the class, and without it this class cannot be successful.
Cooperation and groups
I encourage you to discuss and work together on the homework; this can be one of the best ways to learn. Copying is a silly waste of time, and is not acceptable. Some of your work will be done in small groups. Whenever you do work as a group, than hand in one copy, with the names of all group members. The composition of the assigned groups will change from time to time; some will work better than others. I encourage you to find folks with whom you work well together, and then actually work together; that includes studying.

Cheating
Cheating on any student work (homework assignments, quizzes, tests) may result in a failing grade; this is WKU policy. Turning in a solution that you don’t understand is a form of cheating. Plagiarism is a form of cheating. For information on plagiarism and how to avoid it see http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml. Copying and pasting from the internet (or any other source) without giving due credit is cheating. Turning in computer output that looks correct, but is not generated by your computer code is cheating. Signing an attendance sheet for someone else is cheating. (Note: This paragraph is copied almost verbatim from the standard course outline for another WKU course.)

Students with disabilities
In compliance with university policy, students with disabilities who require accommodations (academic adjustments and/or auxiliary aids or services) for this course must contact the Office for Student Disability Services in Downing University Center, A-200. The phone number is 270.745.5004. Please do not request accommodations directly from the instructors without a letter of accommodation from the Office for Student Disability Services.

General education
This course satisfies the General Education mathematics requirement in Category D-II, with the goal of providing students with the ability to understand and apply mathematical skills and concepts. After completing M126, students will be able to: use fundamental mathematical reasoning principles; use graphical, symbolic, and numeric methods to solve practical problems; and interpret information presented in tables or graphical displays.

Questions: Rule #1
There is no such thing as a "dumb" question. If you are confused or not sure about something, ASK! This is Rule #1. I take it very seriously, and I hope that you will too.
"... mathematics offers special opportunities ... to learn the power of thought, as distinct from the power of authority. This is a very important lesson to learn, an essential step in the emergence of independent thinking."
— National Research Council, Everybody Counts, p. 4