Math 13 (Calculus with Elementary Functions I)

Instructor: Dr. Ellen Veomett

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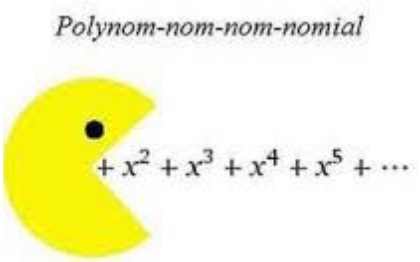


Office Hours: Monday: 10:30-11:30 AM, Wednesday: 11:00AM-12:00PM, Friday: 1-2 PM, and by appointment

Text: *Apex Calculus* Version 4.0 This is a free text which can be found here:

`http://www.apexcalculus.com/`

and *Precalculus: An Investigation of Functions* (2nd Ed) This is also free, and can be found:

`http://www.opentextbookstore.com/precalc/`

Course Web Site: Moodle page: go to *my.stmarys-ca.edu*, log in, and click on "Gael-Learn (Moodle)"

This site will have course handouts available for downloading. It will be updated with other information as the semester progresses.

Goals of Course: By the end of the course, you will be able to

- Have enough confidence in your algebra skills that you can focus on the content and interpretation of calculations and not simply the mechanic.
- Consistently display the mathematical skills of calculating limits, derivatives, and antiderivatives; graphing functions; and simplifying algebraic expressions by hand.
- Clearly and correctly express the fundamental theory and applications of differentiation and integration orally and in writing.
- Use your understanding of functions and rates of change to translate applied problems into precise mathematical language; and translate mathematical answers in terms of applications.
- Justify mathematical conclusions and communicate their implications in both oral and written form (especially pertaining to the primary study of functions and rates of change).

- Reason mathematically with all of these new concepts and applications clearly, logically, and with the appropriate mathematical language.

Requirements:

- Everyone in this class will treat every other person in this class with respect.
- We will all arrive to class on time, ready to learn and share ideas.
- Every person in this class will **read each section in the book** before or after the lecture for that section.
- You will **write your own solutions** to the homework and **not search for solutions online**.
- Each person in this class will **check their e-mail regularly** and completely **refrain from using a cell phone in class.**

Schedule: Please note that you are given an additional document which is a ***tentative*** schedule for the semester. We will likely stay close to the given schedule, but it is subject to change at any time.

Grading Policy: We will have 3 Midterm exams, 1 final exam, 1 Gateway, WebWork homeworks, and Written Homeworks. (Note: I use the terms "test" and "exam" interchangeably and they refer to any of the midterms or the final exam.) The break-down is as follows:

Each of the 3 Midterms	1/6 of grade each (total of 1/3 -1/2 of grade)
Final Exam	1/6 -1/3 of grade
Gateway	n\a
WebWork Homeworks	1/6 of grade
Written Homeworks	1/6 of grade

Exams We will have three tests during the semester. These will take place on Wednesday Sept 25, Wednesday Oct 23, and Wednesday Nov 20. Each midterm exam will be initially worth 1/6th of the final grade and the final exam will be worth 1/3rd, but the lowest exam will be dropped (if it is a midterm) or reduced in weight (if it is the final).

More precisely, if your lowest exam score is one of the three midterm exams, that exam score is dropped (so that the other two exams will be worth 1/6 of your final grade each, for 1/3 of your total grade between both exams). In that case, your final exam will be worth 1/3 of your grade. If your lowest exam score is the final exam, your midterms will all be worth 1/6 of your grade (for a total of 1/2 between those three exams) and the final exam will be worth 1/6 of your grade.

The tests will be taken in class *without the use of notes and without the use of a calculator*.

The final exam will be taken at the time designated by the final exam schedule, which can be found at this website:

`http://www.stmarys-ca.edu/node/5810`

WebWork Homeworks: After *every* class period where new material is covered, you will find a new homework available on the WebWork webpage:

`http://54.225.94.216/webwork2/Math-013-02-F2019/`

The assignment will be due at 10PM the next day that we cover new material. This will give you time to complete as much of the WebWork homework as you can, ask any questions you may have the next class period, and the finish the problems you had questions on before the assignment is due. For each problem, you will have an unlimited number of tries to submit a correct answer (up until the due date). There is a document describing how to log in to WebWork on the moodle website.

To complete the WebWork homework, begin it the day it appears, and write out all of your work in a notebook. That way, you can easily see your work in case your answer is incorrect and you would like to correct it, and you can also refer to those notes when you're studying for exams.

Written Homeworks: You will have written homework that is handed in once a week, except for exam weeks. **You will find the written homework assignments on the moodle website.** You may work with other students on the homework, however you should try it out first on your own. **Each student must write his/her own solution.**

The written homework is your chance to practice explaining mathematics. **For each problem on the written homework, you should explain the question, how you got your answer, and you should interpret your results.** Thus, your solution will frequently use full sentences. If diagrams, graphs, or charts help in making your answer more clear, use those as well. If you have any questions as to what is an appropriate written solution, please talk to me.

You are not allowed to use outside sources for homework solutions. That is, you may not use a solution text, search for solutions online, use another student's solutions, or otherwise use any outside source for solutions. You *may* use sources like your peers, me, or the STEM center for ***help***. Please feel free to ask me if you'd like more granularity on this distinction.

Gateway: Being able to differentiate is a fundamental requirement of this course. The Gateway exam allows us to ensure that anyone passing the class can differentiate basic functions, while also giving us the freedom to test *applications* of the derivative on the midterm exams.

Each gateway exam has 10 problems. A passing grade on the Gateway is an 8/10 or better score. Gateway exam testing will take place in the STEM Center (Assumption 200). Starting around half of the way through the semester, you will be allowed to take the Gateway exam up to once a day (Sunday-Friday) in the STEM Center, during STEM Center hours. If you pass the gateway in the first two weeks

it is available, you will get 5 extra credit points on your final exam. In the third week: 4 points, fourth week: 3 points, fifth week: 2 points, sixth week 4: 1 point. If you do not pass the gateway, you will not be able to earn a grade better than a D+. There will be practice gateway exams available to you; stay tuned for more details on the practice exams.

Late Work Policy: Written Homework will be turned in at the beginning of class on the day that it is due. I will not accept late Written Homework, and I will not accept late WebWork homework. I will drop the lowest written homework score, which should cover the rare unexpected absence that prevents you from handing in the homework on time.

If an emergency arises and you are unable to attend an exam, I expect to be notified by email or phone call *as soon as possible* (which, in the vast majority of cases, is within 24 hours). Most likely, the missed exam will be your dropped exam.

Technology: You may use a graphing calculator on your homework to **check your answers** and to give you a graphical perspective on what are often algebraic problems. You will also be introduced to Wolfram Alpha and Geogebra, which are free computer resources for mathematics. This may save you the expense of buying a calculator. In either case, you must (and it is your responsibility!) to make sure the technology you are using is enhancing your understanding of the material, rather than being used as an alternative to understanding. Remember that you are not going to be allowed technology on exams, and you are ultimately be responsible for utilizing technology appropriately.

STEM Center: Saint Mary's has a new STEM Center on the second floor of Assumption Hall for students studying **S**cience, **T**echnology, **E**ngineering, and **M**athematics. The STEM Center will provide several useful services, including:

- Math and Chemistry tutoring: Monday-Thursday 12-9 PM; Sunday 6-9 PM
- "Pathways to Science" speaker series featuring world-class scientists
- Social events with free food
- Study space and computer workstations

If you have any questions, please contact Dr. Roy Wensley (Dean, School of Science) at rwensley@stmarys-ca.edu.

Student Disability Services: The College strives to make all learning experiences as accessible as possible. Students who anticipate or experience academic barriers based on a disability are encouraged to contact Student Disability Services (SDS), a department of the Student Success Office, to set up a confidential appointment to discuss available services and options. The Student Disability Services office can be reached by emailing sds@stmarys-ca.edu; calling 925-631-4358; or visiting the

office located in Filippi Academic Hall FAH190. The SDS website can be found at `https://www.stmarys-ca.edu/student-disability-services`

Honor Code: Saint Mary's College expects every member of its community to abide by the Academic Honor Code. According to the Code, "Academic dishonesty is a serious violation of College policy because, among other things, it undermines the bonds of trust and honesty between members of the community." Violations of the Code include but are not limited to acts of plagiarism. For more information, please consult the Student Handbook at `www.stmarys-ca.edu/your-safety-resources/student-handbook`. If a reasonable suspicion arises that you have violated academic honor code, you will be referred to the Academic Honor Council for further review and or necessary sanctions.

Some Additional Thoughts and Suggestions

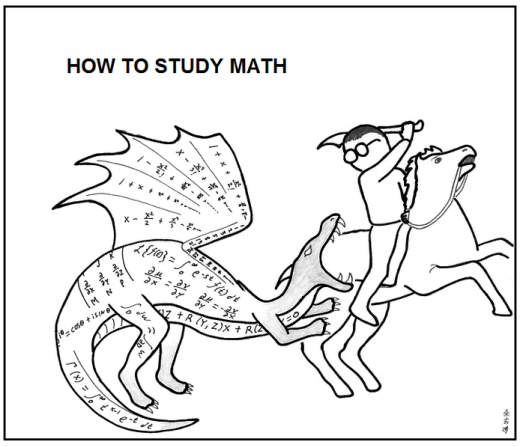
- Sleep, planning, and time management are super important. But don't take my word for it! Check out this blog post by an undergraduate student athlete (you can click on the link if you're reading this in a pdf reader)

  `https://preview.tinyurl.com/y2ya2k7f`

- I strongly recommend that you have two notebooks: one for taking notes in class, and one for keeping all your scratch work for the WebWork homework and the written homework. If that doesn't sound right to you, use whatever notebook method works for you; just make sure it is indeed working for you!

- The written homework solutions that you hand in should be clear, concise, and polished solutions. There should be enough explanation so that another Calculus student (perhaps not in our class) can read your solution and understand both what the question is and how you got your answer. In order to write these beautiful solutions, you'll need to do scratch work first. Don't be afraid of scratch work! *Anything* that you write while thinking about a problem will probably help you in the end. *Save your scratch work*, and it will help you in studying for exams later.

- College classes require about 2-3 hours of outside-of-class work for every 1 hour in class. Thus, since our class meets approximately 3 hours per week, you should plan to spend about 9 hours outside of class working on the online homework, written homework, reviewing notes, reading the book, studying for exams, etc. But just because you're studying 9 hours per week doesn't mean you understand the material. Which brings us to our next point:



Don't just read it; fight it!

— Paul R. Halmos

- Studying is all about efficiency; **using your time optimally** in order to learn the material as completely as possible. To do this, you will need to know what you

don't know. Once you understand which parts of the material you do and don't know, you will need to focus on what you don't know until you eventually know it.

This means spending a lot of time with material that you don't know, which can feel uncomfortable. This is the secret to studying mathematics: *becoming more comfortable with being uncomfortable*. We need to spend time on topics we don't yet understand in order to understand them.

- In recent years, I have found that students need to focus on increasing what I call their *mathematical stamina:* the amount of time they can work in a productive and focused way on solving mathematical problems. I encourage you to put aside all distractions for at least 45-75 minutes in a row at least 3-5 times a week and focus only on mathematical work. This will help increase your mathematical stamina. Having good mathematical stamina is key for performance on exams.

- I highly encourage you to talk with your peers and with me about mathematics. It can be fun, invigorating, and useful to discuss mathematics from different vantage points. But don't let someone's beautiful explanation of a homework problem trick you into thinking that you know how to do that problem. Until you can come up with that beautiful explanation on your own, you don't yet know it and thus must continue to learn that topic.

  There is a clear line between working with other students and exchanging information in an academically dishonest way. It's totally fine to talk with other students, to write while you're talking with those students, to listen to their responses, etc. It is academically dishonest to exchange written solutions or post written solutions. Similarly, it is academically dishonest to look for solutions online.

- Remember that part of your training in college is learning to be a professional so that you can be successful when you graduate. This includes interacting with your peers and professors in a professional manner, taking appropriate responsibility for your work, and asking for appropriate help when needed.

  For example, professionals must be punctual, prepared, and engaged. Professionals are aware of and plan for their responsibilities so that if several deadlines occur at the same time, they can successfully complete all of them. Professionals are courteous and respectful of others' time.

- Technology can be an extremely useful tool. It can help you to gain an intuition for the material, it can help you to check your work, and it can make the material more fun. But again, don't let technology trick you into thinking you understand something that you don't. It's your responsibility to use technology as a tool to help you gain understanding and not as a crutch to aid you in avoiding understanding.

- I love to talk math, and in general I love to talk! Please come to see me if you'd like to chat!