

Essentials

- Math 123, Calculus I
SDSMT, Fall 2008, 4 credits
- Section 3 meets Monday, Wednesday, Thursday, and Friday from 11:00–11:50 PM in McLaury 306.
Section 5 meets Monday, Wednesday, Thursday, and Friday from 1:00–1:50 PM in McLaury 205.
- The course text is *Calculus* (eighth edition), by Larson, Hostetler, and Edwards. We will cover Chapters P, 1, 2, 3, 4, and 7.
- A tentative course outline can be found on the class webpage.

Instructor information

- Dr. Travis Kowalski (either “Travis” or “Dr. K” is fine)
- Office: McLaury 314D
Phone: (605) 394-6146
Email: travis.kowalski@sdsmt.edu
- Webpage: <http://www.mcs.sdsmt.edu/tkowalsk/>
- Office hours: Monday through Friday from 2:00-2:50 PM, Thursdays at noon, and Fridays at 11:00 AM. Or, as always, you can make an appointment with me; just contact me by email or after class.

Course objective and description. Calculus I is the gateway to the math curriculum of South Dakota Tech. It is intended for students majoring in mathematics, physics, chemistry, engineering and related fields. Students will apply the concepts of limits, derivatives and integrals in solving problems in their respective disciplines. They will be able to identify, graph, integrate, and differentiate polynomial, trigonometric, and algebraic functions.

Prerequisites. There are two:

1. *College algebra*: A Math 102 grade of “C-” or better, or an acceptable ACT score.
2. *Trigonometry*: A Math 120 grade of “C-” or better, or an acceptable score on the COMPASS test.

Note that Calculus II (Math 125) requires a grade of C- or better in Calculus I (Math 123) and Trigonometry (Math 120).

Technology. Access to the SDSMT’s Tablet PC program (<http://sdmines.sdsmt.edu/tabletprogram>) is *mandatory* for this section. We will be using a number of programs installed on the Tablet PCs (Journal, Maple, DyKnow) as well as an interactive course website; see below for details. Consequently, it is encouraged you pursue the leasing option or find out more about the proposed rental program.

No other technology is required for the class, although continuing students who are not enrolled in the Tablet PC program should invest in a durable graphing calculator.

Grading. The grading is based on the following:

Assignments: 200 points
3 midterm exams: 100 points (each)
1 final exam: 200 points

The final is on Thursday, December 18, from 4:00–5:50 AM. This is not negotiable.

Letter grades will be assigned according to the following scale:

A: 630-700 points
B: 560-629 points
C: 490-559 points
D: 420-489 points
F: less than 420 points

Plus or minus grades are not allowed (Board of Regents policy, Fall 2003). I reserve the right to *lower* these values as I see fit.

Instruction and attendance. Class will take the form of lecture and discussion. Your daily attendance is expected, though not required. I will not take roll, nor will I note frequent absences: I'm not your mother. However, I will often have class activities for which no make-up will be allowed, as outlined below — *you snooze, you lose*. It is expected that you should spend about **2 hours of study for every hour in class**.

However, when you attend class, be sure you are on-time and ready to participate for the duration of class. I work hard at making class useful and informative for you, and will strive to make calculus, if not fun exactly, then at least engaging. Arriving to class late or attempting to pack up early are extremely disrespectful behaviors, both towards the instructor and to other students, and I have little patience for either. Further details about classroom behavior are outlined below.

Assignments. The only way to *learn* mathematics is to *do* mathematics. As a result, I will challenge you with frequent assignments, in class and out, to help you develop skill and proficiency with calculus. Assignments will come in three flavors:

- *Classwork.* As indicated above, in class we will have brief, unannounced activities to be turned in during class using *DyKnow*. No make-ups will be allowed for such assignments, so keep this in mind should you choose to miss class or leave your Tablet PC behind.
- *Homework.* I will assign homework problems for you to work on every day in class, which I expect you to work on in a dedicated “homework notebook,” either on your Tablet or on paper. These problems will give you the best training in the mechanical aspects of the course, and are one of the ways I can gauge how much effort you are putting into the course.

I will not, however, collect any of these problems. Instead, each Wednesday I will post a 4-problem “homework quiz,” which will be available on *Desire2Learn* from 7:00 AM until midnight. These problems are to be written up using *Windows Journal* and submitted via *D2L* no later than midnight of the day assigned. I will drop the lowest quiz score from the grading.

- *Projects.* During the semester we will have occasional written projects or computer labs, designed specifically to give you exposure to working with the calculus concepts from class in cooperative group settings and dealing with more real-world based applications. These projects will be announced in class well ahead of their due dates, and will be submitted via *D2L*.

Since work submission will be handled on-line or in-class, late homework assignments or projects *will not be accepted*. I may accept late homework on an individual basis, but it will be penalized by a 50% reduction of points.

Examinations. There will be three hour-long examinations over the semester which will test your mastery of the course material. These exams are designed to test not only your proficiency with mechanical skills and standard problems (such as basic homework problems), but also your ability to synthesize ideas and use your calculus skills in novel or extended ways. Examinations will be announced at least one week prior to the exam. Details regarding the exams will be made available as they approach.

Make-up exams. It is the *your* responsibility to check about missed class or examinations, especially when the problem is known previous to the absence. If you have an excused absence to an exam, then the final will be weighted more heavily to make up for the missed exam. **The final is on Thursday, December 18, from 4:00–5:50 PM. This is not negotiable, so plan your holiday travel accordingly.**

Getting help. There are many resources available should you like or need additional help with calculus. Among the three most important resources are:

- *My office hours.* Make use of them. I'm more than happy to work with you on a more personal basis during office hours – heck, it's my job! Check my webpage for my office hours this semester.
- *The Tech Learning Center.* Located in the basement of the Devereaux Library, fellow Tech students are willing and able to help you with basic math and calculus problems. You can make an appointment or just drop in when you have questions.
- *Math department tutors.* The Math Department keeps a list of SDSMT students willing to tutor students privately. You can contact these tutors and find a schedule that suits you best. Go to the department office in McLaury 308 to see this semester's tutor list.

Special needs. Students with special needs or requiring special accommodations should contact the instructor and/or the campus ADA coordinator, Dr. Jolie McCoy, at 394-1924 at the earliest opportunity.

Tablet PCs. The use of the Tablet PC program in this class is meant to provide a tool that will enhance student learning. It is expected that you will make appropriate in class use of the Tablet PC, which means the Tablet PC should be used on tasks relevant to the current classroom activities, such as taking notes, participating in DyKnow sessions, and using other software as called for in class by the instructor. In particular, we will use

- *Journal.* Windows Journal is a tablet-based, note-taking program. We will be using it to write up homework assignments.
- *DyKnow.* DyKnow Vision allows for interactive class-presentations and submission of in-class student work
- *Maple.* Maple is a powerful mathematical program that combines the functionality of a graphing calculator with a symbolic “computer algebra system” for solving complicated equations.

In-class policies. When you bring your Tablet PC to class, I expect you to (1) log into DyKnow Vision and (2) lock your monitor in Tablet Mode *before* the start of the lecture. When the lecture starts up, the screens go down! Failure to comply will result in the sacrifice of your highest homework score for each offense, or payment of **The Fine**. The Fine is the purchase of cookies, donuts, or other treats for the entire class. This happens to be similar to a policy used at the state legislature.

I might also run DyKnow Monitor during class to keep you from temptation. Monitor is a program to block software use and monitor student activities during scheduled class times. For my part, Monitor will only be used during time when classes are in session and will not be intentionally used outside of class time or during any class time where the class has been canceled. Failure of a student to appropriately use their Tablet PC in class will result in suspension of Tablet PC usage during class.

I realize that while we are in the transition process to becoming a Tablet PC campus, not all returning students in the class are enrolled in the Tablet program, and I will try to work around this. However, I will expect *everyone* to bring their Tablets to class every Wednesday, as well as on any other day I specify (I will give you at least one lecture’s notice ahead of time). It is the obligation of students not enrolled in the Tablet program to check out a Tablet prior to class on such days.

Official SDSMT Tablet policy. This is a Tablet PC class, so you are required to bring your tablet to class each time we meet, fully charged. You will also be required to download DyKnow software and then join MATH 123 KOWALSKI to activate. Any attempt to circumvent the DyKnow monitoring system will be considered a form of cheating and a breach of academic integrity. Note that according to “Policy Governing Academic Integrity” in the SDSMT Undergraduate Catalog, the instructor of record for this course has discretion of how acts of academic dishonesty are penalized, subject to the appeal process, and that “Penalties may range from requiring the student to repeat the work in question to failure in the course” (72-73). No other use of any other electronic or computer media is allowed during class time.

Tablet PC Help. The Associate Vice President for Academic Affairs suggests the following when you are in need of assistance. The first and best place to go if you need help (technical or software) with your tablet PC is the Circulation Desk of the Devereaux Library. The number at for the library desk is 394-2418. The friendly folks at the library will answer questions, checkout rental tablets, and do whatever it takes to get you the help you need. The Tablet PC repair shop is on the lower level of the library. You may be sent down there by the folks at the front desk.

Maple outcomes. We will be using Maple in this class. The following are expectations of your Maple usage in Math 123 and they will likely be useful in Math 125.

1. Every student will have the defaults for Maple to be set in worksheet mode, with Maple input, and rollover highlight in plots (applied globally during Math 123)
2. Students will be able to use the Worksheet Mode to enter and evaluate arithmetic or algebraic expressions.
3. Students will be able to do a 2D plot of a function in Maple.
4. Students will be able to solve an equation (using both `solve` and `fsolve`).
5. Students will be able to name an expression, define a function, and explain the difference between expressions and functions.
6. Students will be able to use the calculus operations of limits, differentiation, and integration in Maple.

Most of these policies are common sense and are associated with being a responsible adult at an institution of higher learning.

Classroom behavior. The Student Handbook prohibits the disruption or obstruction of teaching. Activities that are disruptive and/or obstructive to teaching will include, but are not limited to, the following:

- *Showing up late to class.* While it is understandable that you might be a few minutes late to class there is a limit to how late one can be. As a general rule, it is acceptable for a person that is less than 5 minutes late to enter class. I ask that if you are more than 5 minutes late to class to refrain from entering class. You can always catch me after class if they need to see me.
- *Eating in class.* Your schedule may have classes that overlap your lunch hour, or don't leave you time to eat during the day. Nevertheless, refrain from eating during class. Those with medical conditions that require special accommodations are certainly welcome to speak with me.
- *Electronic disruptions.* The use of cell phones, pagers, PDAs, non-SDSMT laptop computers, or any other associated electronics in class is prohibited. The best advice is to simply leave your electronic noisemakers at home or in your car. However, if there is some compelling reason why you require such a device then make sure your device is (at the very least) set to vibrate or (preferably) turned off. If an electronic device disrupts class then the owner will sacrifice their highest homework score for each offense, or pay **The Fine**. The Fine is the purchase of cookies, donuts, or other snacks for the entire class. This happens to be similar to a policy used at the state legislature.

Email etiquette. I am more than happy to take questions or suggestions by email, and email is one of the best ways to contact me. However, keep in mind the following. (1) If you are writing about issues relating to the class, please use your *D2L email account* rather than campus mail; doing so ensures that I will respond to you in some fashion within 24 hours. (2) I am your professor, not your BFF LOL ZOMG!!! Emails written without a salutation, reasonable grammar, and respectful tone of voice will be promptly ignored.

Academic dishonesty. If you cheat on a test or assignment, you *will* receive a 0 on the work, and you *may* fail the course out right. Discussing a problem with other students is a valuable learning tool; copying someone else's work is not. All students will be held to the institutional standard for academic honesty and integrity. The following are the relevant sections taken from the student handbook (SD BOR policy), which states that acts of academic dishonesty will include, but are not limited to, the following:

- *Cheating*, which is defined as, but not limited to, the following: (1) the use or giving of any unauthorized assistance in taking quizzes, tests, or examinations; (2) the use of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; or (3) the acquisition, without permission, of tests or other academic material belonging to a member of the institutional faculty or staff.
- *Plagiarism*, which is defined as, but is not limited to, the following: (1) the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgement consistent with accepted practices of the discipline; (2) the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.
- *Dishonesty* relating to academic achievement, research results or academically related public service.
- *Furnishing false information* to any institutional official, faculty member or office.
- *Forgery, fabrication, alteration, misrepresentation or misuse* of any document, record, or instrument of identification, including misrepresentations of degrees awarded or honors received.

State Policy on "Freedom in Learning." Students are responsible for learning the content of any course of study in which they are enrolled. Under Board of Regents and University policy, student academic performance shall be evaluated solely on an academic basis and students should be free to take reasoned exception to the data or views offered in any course of study. Students who believe that an academic evaluation is unrelated to academic standards but is related instead to judgment of their personal opinion or conduct should contact the dean of the college which offers the class to initiate a review of the evaluation.

Official policies. You can read the official Board of Regents student policies at

- http://www.sdbor.edu/policy/3-Student_Affairs/documents/3-4.pdf.

Student learning outcomes. This course meets GenEd Goal #5: Students will understand and apply fundamental mathematical processes and reasoning. As a result of taking a course meeting this goal, students will:

- Use mathematical symbols and mathematical structure to model and solve real world problems.

Assessment. Students will

1. identify, interpret, and correctly apply standard mathematics symbols to solve problems requiring the derivative. This will be demonstrated on quizzes, labs, homework, and/or exams.
2. identify, interpret, and correctly apply standard mathematics symbols to solve problems requiring the integral. This will be demonstrated on quizzes, labs, homework, and/or exams.

- Demonstrate appropriate communication skills related to mathematical terms.

Assessment. Students will correctly use functional notation of algebra, trigonometry, and calculus. This will be demonstrated on in-class problems, labs, homework, quizzes and/or exams.

- Demonstrate the correct use of quantifiable measurements of real world situations.

Assessment. Students will

1. apply their knowledge of the derivative in applications such as related rates, linear approximations, Newtons Method, curve sketching, optimization, velocity, and acceleration. This will be demonstrated on quizzes, labs, homework, and/or exams.
2. apply their knowledge of the integral in applications such as area, volume, moments, work, arc length, and surface area. This will be demonstrated on quizzes, labs, homework, and/or exams.

In Hawaiian, “mahalo” means “thank you.” Why am I telling you this? No point, really, except to say *Mahalo* for reading all these rules and regulations. (That, and I have an excessively large wardrobe of Hawaiian-print tee-shirts.) Don't worry – class will be fun and beneficial if you're willing to pay attention. Heck, if you've paid attention this long, why don't you send me an email with your name and a picture of an Aloha shirt, and I'll give you 5 points of extra credit *right now!* Hurry... off expires September 10.

Course outcomes. A student who successfully completes this course should, at a minimum, be able to:

1. understand functions
2. use functional notation in manipulating mathematical expressions
3. understand the concept of a limit and how it applies to calculus
4. compute limits using various methods
5. determine where a function is continuous
6. understand the concept of the derivative
7. compute derivatives using the power, product, quotient and chain rules
8. use the concept of the derivatives in applications such as related rates, linear approximations, Newtons Method, curve sketching, optimization,
9. velocity and acceleration
10. understand the concept of an antiderivative
11. manipulate expressions using sigma notation
12. integrate using substitution and the power rule
13. understand and be able to apply the Fundamental Theorem of Calculus
14. use the concept of the integral in applications such as area, volume, velocity and acceleration
15. understand the use of numerical integration techniques (e.g. Trapezoidal and Simpsons rules)

Official outcomes. Visit

- http://www.hpcnet.org/math_assessment/course_objectives