Calculus II Syllabus

Math 125, Kowalski

Essentials

- Math 125, Calculus II
  SDSMT, Spring 2009, 4 credits
- Section 1 meets Monday, Tuesday, Wednesday, and Friday from 3:00–3:50 AM in McLaury 205.
  Section 6 meets Monday, Wednesday, Thursday, and Friday from 12:00–12:50 PM in McLaury 310.
- The course text is Calculus (eighth edition), by Larson, Hostetler, and Edwards. We will cover Chapters 5, 8, 9, and 10.
- 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: Official hours are available at the website above. I have an open-door policy, however: if
  my door is open, you may come in and ask me anything. You can also always make an appointment
  with me individually; just contact me by email or after class.

Course objective and description. Calculus II is a continuation of the study of calculus, including the
study of sequences, series, polar coordinates, parametric equations, techniques of integration, applications
of integration, indeterminate forms, and improper integrals.

Prerequisites. There are two:

1. Trigonometry: A Math 120 grade of “C-” or better, or an acceptable score on the COMPASS test.
2. Calculus I: A Math 123 grade of “C-” or better.

In general, you cannot dual-enroll in both Math 125 (Calculus II) and Math 120 (Trigonometry) simulta-
neously.

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, Jing, and 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 if you wish
to stay enrolled in Dr. Kowalski’s sections.

Grading. The grading is based on the following:

  - Homework quizzes: 100 points
  - Maple labs: 75 points
  - Class participation: 25 points
  - 3 midterm exams: 100 points (each)
  - 1 final exam: 200 points

The final is on Thursday, May 7, 7:00-8:50 AM. This is non-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.
About the class

Instruction and attendance. Class will mostly take the form of lecture and discussion. Your daily attendance is expected, though not required. I will not take role, nor will I note frequent absences: I'm not your mother. However, many days there will be an in-class activity for which no make-up will be allowed, as outlined below. I work strictly on the “you snooze, you lose” policy.

Moreover, as you attend class, be sure you are on-time and ready to participate for the duration of class. I work hard to make 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. Moreover, it is expected that you should spend at least 2 hours of study for every hour in class. 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. These will include individual single-problems from the homework, or in-class group problems/worksheets. 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 quizzes.** 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 Tuesday I will post a 4-problem “homework quiz,” which will be available online from 7:00 AM until midnight. These problems are to be written up using Windows Journal and submitted via Desire2Learn no later than midnight of the day assigned. I will drop the lowest quiz score from the grading.

- **Maple labs.** During the semester you will have 3 computer labs assignments, designed specifically to give you exposure to working with the calculus concepts from class dealing with more real-world based applications using the computer algebra system Maple. These projects will be announced in class well ahead of their due dates, and will be submitted via WebCT.

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 for each date late.

Examinations. There will be three hour-long examinations over the semester (about every four weeks or so) that will test your mastery of the course material. My exams have a reputation for being difficult, since they are designed to test not only your ability to efficiently solve standard problems (such as basic homework problems), but also your ability to synthesize new ideas and use your calculus skills in novel 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. Departmental policy prohibits final exams be given early, so plan your summer vacation 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.

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 PC policies

**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, and I recommend it as a note-taking and homework-organizing tool.

- **DyKnow.** DyKnow will be used for in-class presentations, to submit in-class work, and for monitoring/application blocking purposes.

- **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.

- **Jing.** Jing is a free podcasting and screenshot software we will use to make podcasts for assignments. You can download it from [www.jingproject.com](http://www.jingproject.com).

**In-class policies.** I expect you to bring your Tablet PC to class each day. You should immediately (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.

I may run DyKnow Monitor during class to keep you from temptation. Monitor is a program to monitor student activities and to block applications 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 forfeiture of all Daily Participation points.

I will try and work around the occasional Tablet PC problem. However, I will expect everyone to bring their Tablets to class on any day I specify (I will give you at least one lecture’s notice ahead of time).

**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 the appropriate MATH 125 KOWALSKI section 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: if you need help (technical or software) with your tablet PC, go to Tablet Central in the Devereaux Library. The number 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.

**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. **Standard interface.** 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 125)

2. **Basic functionality.** Students will be able to use the Worksheet Mode to enter and evaluate arithmetic or algebraic expressions.

3. **Plotting.** Students will be able to do a 2D plot of a function, parametric curve, or polar curve in Maple.

4. **Solving.** Students will be able to solve an equation (using both solve and fsolve).

5. **Functions and expressions.** Students will be able to name an expression, define a function, and explain the difference between expressions and functions.

6. **Calculus.** Students will be able to use the calculus operations of limits, differentiation, and integration in Maple.
Classroom policies Math 125, Kowalski

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.

- **Electronic disruptions.** The use of cell phones, pagers, PDAs, non-SDSMT laptop computers, or any other associated electronics in class in 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 for electronic device disruption is the purchase of cookies and/or donuts 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. (2) I am your professor, not your BFF LOL ZOMG!!!1! Emails written without a salutation, reasonable grammar, and respectful tone of voice will be promptly ignored.

Harmful side-effects. Potential side-effects of Calc II include irritability, insomnia, apathy, internal bleeding, ulcers, chronic muscle pain, Type II diabetes, heart arrhythmia, ocular explosion, death, and in extreme cases, zombification. Talk to your doctor to see if Calc II is right for you. Actually, I’m just pulling your leg, but if you did read all this silliness, send me an email with the subject line “I’m not a zombie yet” and I’ll throw 3 extra credit points your way. Offer expires January 23.

Academic dishonesty. If you cheat on a test or assignment, you will receive a 0 and intense scrutiny for a first offense, and you will fail the course for a second offense. At the very least, you will get a negative score on that test or assignment since cheating is worse than doing nothing. 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

Outcomes and assessment

**Student learning outcomes.** This course is intended for students majoring in mathematics, physics, chemistry, engineering and related fields. It has three main objectives:

1. The student will continue to learn differentiation and integration techniques, building on the skills learned in Calculus I,
2. The student will learn basic concepts dealing with infinite sequences and series, and
3. The student will learn how to work with parametric equations and polar coordinates.

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 identify, interpret, and correctly apply standard mathematics symbols to solve problems requiring differentiation and integration techniques. 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 quizzes, labs, homework, and/or exams.

- Demonstrate the correct use of quantifiable measurements of real world situations.
  
  **Assessment.** Students will apply their knowledge of calculus in one-variable, infinite sequences and series, and parametric equations and polar equations in applications such as area computation, function approximation, and arc-length computation. This will be demonstrated on quizzes, labs, homework, and/or exams.

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

1. differentiate exponential and logarithmic functions and integrate the corresponding functions
2. differentiate inverse trigonometric functions and integrate the corresponding functions
3. appropriately use various integration techniques, including integration by parts and partial fractions
4. evaluate limits of infinite sequences, including how and when to use L'Hôpital’s Rule
5. evaluate improper integrals
6. recognize common infinite series, including the geometric and harmonic series
7. appropriately use various tests for convergence of infinite series, including the Ratio Test, the Alternating Series Test, and Comparison Tests
8. determine the interval of convergence for a power series
9. use infinite series such as the Taylor Series or Fourier Series to approximate functions
10. convert between rectangular and parametric form, graph parametric curves, find derivatives, and do other calculus applications using parametric equations
11. convert between rectangular and polar coordinates, graph polar curves, and do calculus applications using polar coordinates

**Official outcomes.** Visit