Calculus II Syllabus

Essentials

- Math 125, Calculus II
  SDSMT, Summer 2011, 4 credits
- Section 3 meets Monday, Wednesday, Thursday and Friday from 11 – 11:50 AM in EP 208.
  Section 6 meets Tuesday and Thursday from 8 – 9:50 AM in CB 116.
- The course text is Calculus (first edition), by Rogawski. We will cover Chapters 7, 8, 9, 11 and 13
  with a few additions and some omissions.
- A tentative course outline can be found on the class webpage.

Instructor information

- Dr. Travis Kowalski. “Travis,” “Dr. K,” or just “The Doctor” (for you sci-fi fans) are fine.
- Office: McLaury 314D
  Phone: (605) 394-6146
  Email: travis.kowalski@sdsmt.edu
- Webpage: http://www.mcs.sdsmt.edu/tkowalsk/math125/
  You should visit this every day... including today!
- 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, basic matrix concepts, 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 a grade of 65 or better on the COMPASS
   Trigonometry Exam.
2. Calculus I: A Math 123 grade of “C-” or better.

A score of 3 or better on the AP (A/B) Exam will satisfy both requirements. In general, you cannot
enroll in both Math 125 (Calculus II) and Math 120 (Trigonometry) simultaneously.

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, and Jing) as well as an interactive course website; see below for details.

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 Tuesday, December 13, 3–4:50 PM.
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. Extra credit will be offered a few times during the semester; but they will only be added
after a student has earned a passing grade.
About the class Math 125, Kowalski

**Instruction and attendance.** Class will take the form of lecture and discussion. Your daily attendance is expected, though not required. I will not take attendance, nor will I note frequent absences, as I am not your mother. However, you will turn in a quiz problem (almost) every day in class, and make-ups will not be permitted. 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. As a result, I will challenge you with frequent assignments to help you develop skill and proficiency with calculus. Assignments will come in three flavors:

- **Bookwork.** I will assign textbook problems for you to work on every day in class. These problems will give you the best training in the mechanical aspects of the course. However, while I expect you to do these problems, and will be happy to discuss any of them in class, I will not grade any of them. They are for your practice and self-assessment only.

- **Quiz problems.** In addition, each topic I will assign three “quiz problems,” which I expect you to work on in a dedicated homework folder stored on your Tablet PC. These problems will allow me to gauge your understanding of the mechanics of the course, and will provide you with feedback to prepare for the exams. I will grade one problem from each topic, dropping your lowest score for each module. This will total approximately 160 points.

- **Lab assignments.** During the semester you will have four computer projects, typically computer labs designed to give you exposure to working with the calculus concepts 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 using the Submit it! feature of the MCS website. Together, these projects will account for approximately 40 points total.

It is expected that you should spend at least 2 hours of study for every hour in class. Late homework assignments or projects will be subject to a 50% penalty for each day it is submitted 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 long and 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. **The Final Exam is scheduled for Tuesday, December 13, 3–4:50 PM.** Departmental policy prohibits early final exams, so plan your Christmas 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 the following programs:

- **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.

- **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 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 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 payment of The Fine. The Fine is the purchase of cookies, donuts, or other treats for the entire class, or a 10 point deduction of your class grade.

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). Failure of a student to appropriately use their Tablet PC in class will result in forfeiture of all quiz problem points.

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. If you need basic help in using the class software, please come see me and I’d be happy to help. If you need help technical help with your tablet PC (such as dealing with hardware failures or installation problems), go to Tablet Central in the Devereaux Library. The number for the library desk is 394-2418.

Maple outcomes. We will be using Maple in this class. The following are expectations of your Maple usage in Math 125 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.

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, integration and series expansions in Maple.
Classroom policies

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:

- **Disruptive talking in class.** Students who hold conversations with each other in the middle of class disrupt other student’s ability to listen to the lecture. Please be courteous of each other and quiet down at the start of lecture. If I need to specifically quiet a group of students in class, they must pay the Fine.

- **Electronic disruptions.** The use of cell phones, pagers, PDAs, or other associated electronics during class in prohibited. Such devices should be set to vibrate or turned off. If an electronic device disrupts class then the owner must pay The Fine.

The Fine is either a 10-point deduction in your grade, or the purchase of cookies for the entire class.

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.

- If you are writing about issues relating to the class, make sure the subject line reads MATH 125: (subject info) so that my email filter does not junk your email.

- I am your professor, not your BFF LOL ZOMG!!1! Emails written without a salutation, reasonable grammar, your proper name, and respectful tone of voice will be promptly ignored.

Academic dishonesty. All students will be held to the institutional standard for academic honesty and integrity. I have a zero-tolerance policy with cheaters. All assignments and exams will have clear instructions as to permissible behaviors. If you cheat on a test or assignment, you will earn a grade of 0 and I will report you to the Dean of Students. If you cheat a second time, I will fail you outright and will report you to the Dean a second time. 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.

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

Student learning outcomes. This course is intended for students majoring in mathematics, physics, chemistry, engineering and related fields. It has two 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

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 in applications such as area computation, function approximation, and arc-length computation. This will be demonstrated on quizzes, labs, homework, and/or exams.

Ontologicalus argument. Calculus is a subject for which nothing greater can be conceived. Understand what you hear, and what you understand is in your understanding; although you do not understand it to exist. For it is one thing for an object to be in the understanding, another to understand that the object exists. But whatever is understood, exists in the understanding. That for which nothing greater can be conceived cannot exist in the understanding alone: then it can be conceived to exist in reality, which is greater. Therefore, if that for which nothing greater can be conceived exists in the understanding alone, the very being for which nothing greater can be conceived is one for which a greater can be conceived. Oops! This isn’t the syllabus... I’ve copied down Anselm of Canterbury’s philosophy notes instead. But, hey, if you read this, send me an email with the subject line “I Kant believe it’s not butter!” and I’ll throw 5 extra points your way. Offer expires Friday, September 2.

Topic list. 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, such as 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. use the elimination method for solving linear systems
11. perform basic matrix arithmetic, such as addition, multiplication, and inversion

Official outcomes. Visit