Essential information

- Math 115, Precalculus
  SDSMT, Fall 2007, 5 credits
- Course meetings: Monday through Friday from 2:00-2:50 PM in EP 251B.
- The course text is *Precalculus: Graphical, Numerical, Algebraic* by Demana, Waits, Foley, and Kennedy. We will cover Chapters 1 through 7, and portions of 8 and 10 if time and/or interest permit.

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/](http://www.mcs.sdsmt.edu/tkowalsk/)
  We will be using WebCT; we’ll talk about this more later in class.
- Office hours: See the webpage above for tentative office hours. Of course, you can always make an appointment with me; just contact me before or after class.

Course objective and description. This is a preparatory course for the calculus sequence. The objective of Math 115 is to prepare students for higher-level math courses (most immediately, calculus) by developing conceptual understanding and problem-solving skills. Topics include: polynomial, rational, exponential, logarithmic, and trigonometric functions and their graphs; solving systems of equations, inequalities, and complex numbers. Math 115 may not be used for credit towards an engineering or science degree (except for interdisciplinary science, chemistry, and associate of arts).

Prerequisites. Math 101 or appropriate mathematics placement.

Technology. Access to the SDSMT’s Tablet PC program ([http://sdmines.sdsmt.edu/tabletprogram](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.

Grading. The grading is based on the following:

Assignments: 200 points
3 midterm exams: 100 points (each)
1 final exam (**December 21, 2:00–3:50 PM**): 200 points

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 mostly 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 assignments or activities for which no make-up will be allowed, as outlined below. I work strictly on the “you snooze, you lose” policy.

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 precalculus, 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 all of these problems. Instead, we will spend each Friday in class going over these homework problems. At the end of class, I will post a 4-problem quiz based on the homework problems. These problems are to be written up using Windows Journal and submitted via WebCT no later than MIDNIGHT that Friday. I will drop the lowest homework 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 precalculus 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 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.

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 ability to solve standard problems (such as basic homework problems), but also your ability to synthesize ideas and use your precalculus 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. Departmental policy prohibits final exams be given early, 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 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.

- **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!

I will also be running 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.

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.
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 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.

**Academic dishonesty.** If you cheat on a test or assignment, you may fail the course. At the very least, you will get a negative score on that test or assignment since cheating is worse than doing nothing. 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.

**In the event of a sudden loss of cabin pressure,** oxygen masks will fall from panels in the ceiling. Please place the mask over your nose and mouth and breath regularly. While the bag may not appear to inflate, oxygen will be passing through it. I have no idea why I included this, but if you read it, thanks for looking through this syllabus. Send me an email through WebCT with the subject line “I read the syllabus!” and I’ll throw 5 extra credit points your way. Offer expires September 9, 2007.

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

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 correctly write and use polynomial, rational, exponential, logarithmic, radical, and trigonometric expressions to solve real world problems. This will be demonstrated on in-class problems, labs, homework, quizzes and/or exams.

- Demonstrate appropriate communication skills related to mathematical terms.
  
  **Assessment.** Students will identify, interpret, and use algebraic and transcendental expressions and functional notation to solve real world problems. 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 evaluate functions involving polynomial, rational, exponential, logarithmic, radical, and trigonometric expressions. This will be demonstrated on in-class problems, labs, homework, quizzes and/or exams.

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

1. simplify radicals
2. apply the rules of exponents to add, multiply and divide radical expressions
3. add, subtract and multiply polynomials
4. factor polynomials
5. add, subtract, multiply and divide rational expressions
6. sketch lines, ellipses and parabolas, given equations describing the functions
7. solve linear and quadratic equations
8. create mathematical models to solve real-life problems
9. evaluate functions, find composites and inverses
10. divide polynomials using long division and synthetic division
11. write models involving variation and proportion
12. evaluate exponential and log functions and solve equations involving such functions
13. solve systems of equations using the substitution, elimination, and row-echelon methods
14. perform the basic matrix operations of addition and multiplication
15. define radian and degree measures and be able to convert between the two
16. list the features of the unit circle and state the definitions of sine and cosine
17. state the definitions of the trigonometric functions tangent, secant, cosecant and cotangent
18. recall or derive the values of all six trigonometric functions at all standard angles without use of reference material or calculator
19. state the right triangle definitions for sine, cosine, tangent, cosecant, secant and cotangent functions
20. identify and draw the basic graphs of $A \sin (bx - c)$, $A \cos (bx - c)$ and $\tan (bx)$
21. evaluate inverse sine, inverse cosine and inverse tangent functions by memorization (standard angles) or by calculator (nonstandard angles)
22. state the domain and range of the sine, cosine and tangent functions
23. describe the relationship between the domain of a function and the range of its inverse
24. use trigonometric identities to simplify expressions and solve equations
25. identify the type of a conic section and sketch it given a conic equation
26. identify a conic equation, given the sketch of a conic and its identifying features
27. numerically approximate a limit of a function
28. know by heart the **DEADLY SINS OF PRECALCULUS**, that he or she may be forever wise in Math 123 and beyond