Read this document carefully!
All of the rules, regulations and student expectations for this course are here.

Course Identifiers

<table>
<thead>
<tr>
<th>Item #</th>
<th>Section</th>
<th>Days</th>
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<tr>
<td>1345</td>
<td>02</td>
<td>M–F</td>
<td>10:00–10:50AM</td>
<td>SAM 102</td>
<td>5</td>
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<td>1346</td>
<td>03</td>
<td>M–F</td>
<td>11:00–11:50AM</td>
<td>SAM 102</td>
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</tbody>
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Contact Information

Instructor  A. Gregg Harbaugh, Ph.C.
Office       Science & Math Building (SAM), room 219
Phone / Fax  (206) 587.6912 / (206) 587.3837
Email        agh_teach@earthlink.net or GHarbaugh@sccd.ctc.edu
Homepage     http://home.earthlink.net/~agh_teach
Course Blog  http://sccc-math152.blogspot.com

The best way to contact me is via e-mail. If you do not hear back from me within 48 hours, please resend your message. During regular business hours (Mondays–Fridays), I check my email on a regular basis.

Office Hours
Remember, I am your best tutor and best resource for help. Office Hours for this class are:

- Mon – Thurs 9:10–9:50AM and
- Mon & Wed 12:00–12:25PM and
- by appointment (schedule via email)

If I am not in my office, please check to see if I am helping students in our classroom.

Community Code of Conduct
Every member of this community (both the students and the instructor) shall treat every other member, including—and especially—themselves, with a generous level of courtesy, respect and integrity. We will all act professionally during the class and actively participate. This means:

- there will be no side talking during class;
- no cell phone use or text messaging; no non-class use of the computers;
- attending all classes; being on time; staying for the entire class;
- completing all required assignments on time;
- participating actively to the best of your ability;
- treating different opinions respectfully; and giving others room to speak during discussions.

Keep self disclosure at a safe level to prevent feelings of vulnerability, harm, or lack of safety for you and your classmates. Respect the opinions of others, even if different than your own. You might be surprised to learn that even in math class, two truths in seeming opposition can exist side by side—and both may be correct. Students who demonstrate a repeated inability or unwillingness to abide by this code will be reported to the Dean of Students.

Disability Services
If you need course adaptations because of a disability; if you have medical information that needs to be shared with me in the event that the building needs to be evacuated; if you use an alternate medium for communication; or if you feel you need special accommodations in order to effectively take an in-class assessment, see me at the beginning of the quarter so arrangements can be made. Waiting until the day of the quiz or exam to inform me of such situations is strongly discouraged. More information is available from the Disability Support Services office (206.587.4183) located in room BE 1140 of the Broadway Edison building (http://seattlecentral.edu/disability-support/index.php).
Required Text & Materials
- MATH 152 Course packet on Taylor Series; available at the SCCC Copy Center (3rd floor BE) for $\approx 4 (also available on-line).
- You must have an active email account that you check on a regular—i.e., semi-daily—basis and a USB Flash drive (a.k.a. thumb drive) to store computer files.
- *Mathematica* and TI-84 graphing calculator (or equivalent). Students using other models will have to read their manual to figure out their calculator. Some calculator models (TI-89 or 92) may not be allowed in this class because they are too powerful. Check with me ASAP! Cell phones and other mobile communication devices may not be used as calculators in this class on exams.
- At least one composition book, graph paper (engineer’s computation pad preferred), loose-leaf paper and a 3-ring binder. *NOTE: Paper ripped out of a spiral notebook or composition book will not be accepted.*
- Stapler, ruler, (mechanical) pencil(s), eraser, small package of colored pencils, and at least one colored highlighter (used to highlight answers on homework assignments and tests).

Important Dates & Deadlines
If you drop this class by Apr 10th, you may obtain a 100% refund (less $5). If you drop this class by Apr 17th, nothing will show on your student record. If you withdraw from this class between Apr 18th and May 29th, a “W” will show on your student record. After May 29th, you cannot withdraw from the class. If you encounter a hardship after this date, I will consider assigning an incomplete grade if—and only if—you are in good academic standing in the course to date (which means 2.0 or higher) and have attended regularly and done all the assignments to date. If you vanish and do not contact me in a reasonable amount of time, I will assign a 0.0 grade. I no longer assign grades of NC under any circumstances. Do not ask for an NC! For more information on the college’s registration deadlines, please visit http://seattlecentral.edu/cal/0809cal.php. There is one scheduled holiday (no class on this day) during the Spring 2009 quarter: Memorial Day (Mon May 25th).

Type of Instruction
This class is a quasi-hybrid course. That is to say, it incorporates technological components similar to an online course along with more traditional components of a course of lectures. You will receive most of the course content from attending lectures, studying the textbook and working in groups with your classmates. I will—as needed—use the traditional lecture format to clarify select concepts. Most in-class activities will involve cooperative learning and collaborative assessments. *If you are unwilling to work in groups, please drop this course and find another instructor who does not use groups on a regular basis.* Because collaborative learning strategies are used in this class, I must stress that it is vital you prepare for and attend all lectures if you intend to pass this class. The textbook and homework are essential to my teaching strategy. In preparation for class activities, reading assignments should be done prior to attending class. Homework assignments should be done after class.

Research & Professional Development
I want you to be aware that I may conduct research on my teaching practices, which means collecting student assignments, recording classroom activities, and the like. The purpose may be for professional development, for institutional research or for publication in a professional journal. Please be aware that I am doing nothing in this class that I would not do in any other educational setting; if I change something, the primary reason is because I believe it is the best for the class (and not for research purposes). If I intend to use any of your data in a published study, I will seek your signed consent at the end of the quarter (after grades have been submitted). More information will be provided at the end of the quarter (if the need arises).
Course Content & Schedule

Course Description (formerly MAT 125)
“The definite integral and its applications; antiderivatives and the fundamental theorem; basic
techniques of integration; numerical integration methods, Taylor Series, and an introduction to
differential equations,” description for MAT 152 from the Seattle Central Community College
Spring 2009 Class Schedule (http://www.seattlecentral.org/course/class-schedule.php). For more information,
please visit the SCCC Mathematics website (http://seattlecentral.edu/learn/math) or the Seattle Community

Prerequisites
This course has a prerequisite of MAT 151 (Calculus I or a differential calculus equivalent—formerly
MAT 124) with a minimum grade of 2.0, or an appropriate placement test score within the last three
years. (For information on the placement test, please visit http://seattlecentral.edu/testing/index.php.)
Computers in Math CSC 102Q is a prerequisite or a corequisite. I will not sign anyone into this class
without evidence that the prerequisites have been satisfied. Prerequisites/Corequisites will not be
waived except under the most extreme circumstances; at a minimum a request to waive the prerequisite
must be accompanied by a letter (or email) from your last math instructor.

Published Course Content
1. The definite integral: Riemann sums, total change, area, average, properties, improper.
2. Integration techniques: substitution, integration by parts, tables, approximation methods.
3. The Fundamental Theorem of Calculus
4. Applications: area, volume, probability, arc length, work.
5. Differential equations: slope fields, Euler’s method, separation of variables, applications.
6. Taylor series and polynomials

Chapters from the Textbook
We will cover §4.9 and nearly all of the sections in chapters 5 through 7 of the textbook. We will also
cover the Taylor Series course packet.

Evolving Schedule of Topics
A current schedule will be maintained on the course blog and on the WAMAP homework system. As
such, it is expected that you will regularly visit the course blog for important information regarding the
class. The schedule will be regularly updated during class. Regardless of whether you are present or
not, you are responsible for all announcements and course adjustments presented in class—this also
means you are responsible for all in-class announcements whether they are recorded on the blog or not.
The blog and/or WAMAP may include links to lecture notes and handouts (if you do not see a link for
something you need, email me and I will get it up there for you).

Schedule for Assignments & Tests
In general, most homework assignments are due the day new material will be covered in class. All in-
class tests—except the final—are on the last class of the week, but I reserve the right to change this with
relatively short notice. The days of the (full class) exams are Fri May 1st, Fri May 29th, and the final is
on either Wed Jun 17th from 10:30AM–12:30PM or Fri Jun 19th from 8–10AM.
Assignments & Grading Policy
Three primary strategies are used for grading in this class: (1) out-of-class practice (homework); (2) in-class demonstration (testing); and (3) in-class participation (group work & class preparation). The complete set of assignments for this class is listed below along with associated percentage values and instructions. Grade-point calculations generally follow the following scale: a 93% is a 4.0, a 75% is a 2.0 (the prerequisite grade to enroll in MATH 153), and the lowest 0.7 grade is 50%.

Out-of-Class Practice: Online Homework
Homework for this class consists of online homework problems worth 20% of the final grade.

Online Homework Most homework (not all) in this class is submitted and graded using WAMAP (http://www.wamap.org). Instructions on how to navigate the WAMAP system are available on the blog or online at http://staff.washington.edu/agreggh/courses/SCCC/Accessing_WAMAP_152.pdf.

- Online homework assignments are due at start of class on days when new material will be introduced;
- You will have 10 free late passes; late passes add 1 week to the due date;
- Late passes must be used BEFORE the due date;
- If you need additional extensions on these assignments, you must request them via email before the due date passes;
- Extensions are granted for the remaining of the quarter, however you are strongly discouraged from delaying completing the assignment; and
- Opening an assignment after the due date has passed may affect your ability to “fix” specific problems on that assignment if you are granted an extension.

There is no “penalty” for late passes and extensions, but they come at a cost: only students who completed the online homework (85% or more) are considered prepared for a test. Only prepared students are eligible for a curve, if it is applied to a test.

Questions in Class  If you are unable to complete a problem, write down as much as you can, and make notes on your ideas, concerns, questions, points of confusion, etc. The first part of each class will be devoted to discussing the previous night’s assignment. I am happy to answer questions about homework in class provided that the students help out with the process. Questions about the previous night’s homework will be answered during the first 10–15 minutes of class if students take the initiative and responsibility to do the following:

- Arrive to class early to clearly write the basics of the problem on the board (include section and problem number);
- Clearly write on the board what progress has been made on the problem so far; and
- Indicate on the board the question or obstacle preventing finishing the problem.

This must be completed by the time the class starts for the instructor to discuss a problem. If more than 10–15 minutes are required to answer all questions, the instructor will try to address questions in the order in which they were written. The instructor always reserves the right to offer to address questions after class or in office hours.

DO NOT start to write questions on the board if you cannot finish them before class starts.

DO NOT ask questions from assignments that were given prior to the previous class.

WAMAP Grades It is expected that you will take advantage of this learning opportunity. If you answer a problem incorrectly, the system can generate a new problem for which you can gain full credit. As such, there is no excuse for all students not to earn 80% or higher on these assignments! Because of this feature, none of these assignments are dropped in calculating the final grade. However, there are always a few extra credit assignments provided on the system. If you find a mistake on the system, email me for a few extra credit points (and so that I can fix the error posthaste).
In-Class Demonstration: Quizzes & Exams

In this class, the word “test” refers to both quizzes and exams. Missing tests in this class is simply unacceptable.

While on-demand testing may not be the most effective measure of a student’s learning, it is the predominant strategy in most math classes in higher education. As such, in this class, the primary purpose of testing is to provide students an opportunity to demonstrate to the instructor that they have learned the rudimentary tools and skills necessary for future mathematical endeavors. Of course, there is a certain level of stress that accompanies these types of testing situations. I am aware of this, and am willing to work with students on this issue.

In combination, all in-class assessments will count for 70% of the final grade.

- Unless announced otherwise, all tests are closed-book and closed-notes.
- You must bring graph paper, pencil, highlighter, ruler and calculator to all tests.
- If you miss a test, I must be informed of the reason via email within 48 hours of the test, else you will score a zero, you will not be eligible for a make-up, and the test will be marked as an unexcused absence.

Make-up tests are available for legitimate excuses and are provided on a very rigid schedule:

- make-up tests are provided on two Friday mornings (5/22 & 6/12) at 8:00AM in SAM 200;
- make-up tests must be scheduled in advance;
- students may make-up one and only one missed test;
- If you miss a test and do not make it up, it will be graded as a zero; and
- If you schedule a make-up test and miss it, you will earn a zero and lose the opportunity to make-up the test.

**Tests**  DO NOT MISS TESTS IN THIS CLASS! DO NOT MISS TESTS IN THIS CLASS! DO NOT MISS TESTS IN THIS CLASS! DO NOT MISS TESTS IN THIS CLASS! Starting on the 2nd week of classes, every other week there will be a test on the last class of the week. Most tests will include a group component, so *if you are unwilling to work in groups, please drop this course and find another instructor who does not use groups on a regular basis.* Tests start at the beginning of class. If you are more than 5 minutes late to a group test, you may have to work alone. No extra time will be provided to students arriving late for a test. There are

- 3  50-point tests (quizzes– 40 min)
- 2  100-point tests (exams– 60 min)
- 5  10-point tests (take-home quizzes – 90 min)
- 1  50-point test (take-home final – 4 hours)
- 1  150-point test (final exam – 120 min)

The full-class exams are currently scheduled for the following Fridays: May 1st and May 29th. The final exam is scheduled for either Wed Jun 17th from 10:30AM–12:30PM or Fri Jun 19th from 8–10AM. The final is scheduled by the college, so adjust all travel plans accordingly. Missing the final for vacation travel is not a valid excuse. (No special arrangements will be made, so please do not ask.) Your lowest 50 point score will be dropped*.

**Extra Time on Tests**  In most cases, it will not be a problem to accommodate students needing a few extra minutes for a test. If more time than this is needed, arrangements can be made. However, such extra time is available only if arrangements have been made in advance! For this class, this will always mean reaching to class a few minutes early. If you arrive late to any test, you will not receive extra time; you must stop working at the same time as the rest of the class.

* A 2nd option is available, and will be mentioned in class
Engaged Participation: Preparatory Work, Classroom Learning & Group Activities
Students must prepare for and actively participate in class to succeed in this course. Prompt, focused and engaged participation is expected on a regular basis. *If you are unwilling to work in groups, please drop this course and find another instructor who does not use groups on a regular basis.* Participation for this class consists of two parts. end-of-class-questions worth 5% and participation activities are worth 5%.

Reading Assignments  Pre-lecture reading assignments are found on WAMAP and are due before the material is discussed in class.
- Assignments are due the day the material will be initially presented in class, and they are due prior to entering the room; due dates will be maintained on the blog;
- Assignments not done on time will be graded as a zero; there are no extensions for Reading Assignments.

These assignments are short activities that take most students 20–45 minutes. Questions are based on the reading and on the examples presented in the text. The purpose is for you to become mildly familiar with the material before we discuss it in class. Because of this, these assignments are graded very liberally.
- None of these grades are dropped, but maximum point value is adjusted down from (approximately) 440 to 400 points; and
- All missing assignments will receive a grade of zero.

Presenting a timely reading assignment also earns you (at least) five participation points for coming to class prepared.

End of Class Questions  At the end of almost every class you will answer a short question about recent topics in the course. These serve as both attendance and a measure of how the class is doing. As such, they are graded rather liberally and are individually only worth a few points. Often, they will be graded over 100%. If you score 90% or better on the test, your EOCQ for that unit will be adjusted to 100%.

Group Work  You will receive 5–50 participation points for participating in group work each day you attend class. You will also receive participation points for any group assignments that are collected in class or assigned as homework.

Miscellaneous Items  You will receive (at least) 5 participation points for any in-class or online surveys. You will receive 5–50 participation points for various class activities, mini-homework assignments, any exam reviews or practice exams, and any pop-quizzes in class.

Small Projects  During class, small homework projects will be assigned. The nature of the WAMAP problems are skill-and-drill. Such problems help you develop the mathematical tools you will use in more challenging situations. Alternatively, the small projects present much more authentic mathematical challenges. These assignments are relatively short, may often be worked in groups, and generally will require both mathematical analysis coupled with computer exploration (*Mathematica*). You will be graded not only on your answers, but also on your work, how you present your work and how effectively you communicate the final conclusions. Homework projects must be neat and professional. At this point, none of these assignments will be dropped, but the grades (in aggregate) may be curved as deemed necessary by your instructor. No late assignments will be accepted.

Alternative Grading Strategy
Some students naturally perform poorly on exams despite spending many hours preparing. As such, if you demonstrate that you have indeed worked diligently toward succeeding in this class yet performed poorly on the in-class tests, the percentage weights can be adjusted so that in-class assessments count for 65% and homework counts for 25%. I must stress that this alternative must be earned! For example, if you do not have an 80% or higher on your (pre-test) WAMAP homework assignments, you should not expect to be a candidate for this alternate grading strategy.
Extra Credit
At this time, there are no formal extra credit assignments. Many tests and assignments will have at least one optional question for extra credit. There are also the opportunities mentioned above related to WAMAP assignments.

Getting Help
Students who score less than 70% on any test should immediately seek help. It is the student’s responsibility to seek out the numerous resources for help available on this campus. First and foremost, remember that I am your best tutor. Take advantage of my office hours, they are scheduled for you. Also, email me when you have a question. You should also make contacts with your classmates (exchange emails and cell numbers, if you wish). They are also an excellent source of help when you encounter homework problems. Also, there is a homework discussion forum on the WAMAP system.

The Student Academic Assistance Center (206.587.3852) offers college-wide tutoring services and a federally funded program called TRIO. These tutors are located in room BE 1102B (on the 2nd floor above the latte stand) and sessions are made by appointment. The Math Tutoring Lab offers drop-in help for currently enrolled math students. It is found in room SAM 106 (206.903.3206) and is open daily. A schedule will be posted shortly after the start of the quarter. Both tutoring services are free!

Returning Graded Assignments
I will commit to returning all assignments within one week, but will try to get them to you sooner. Late assignments will be graded as time permits, but are very low priority.

Academic Integrity
Whenever you submit an assignment to be graded, you are implicitly indicating that you are contributing your own work. You are more than welcome (and encouraged) to discuss assignments with each other. However, under no circumstance should you prepare your final document in the presence of another classmate. Also, it is unacceptable to copy solutions from one collaboratively constructed draft. Proper disciplinary action will be taken if anyone is caught cheating or facilitating academic dishonesty. At a minimum, the first offense will result in a zero for the assignment or exam. At a minimum, the second offense will result in a grade of 0.0 for the class. Please refer to the 2007–2009 Seattle Central Student Handbook or contact Lexie Evans, Dean of Student Leadership (levans@sccd.ctc.edu or 206-587-3890) for a copy of Seattle Central Community College’s policy (and state law) regarding academic dishonesty. Furthermore, any request to change a grade based on a student’s future goals in spite of the student’s performance is considered academic dishonesty and will be reported to the dean. I take this matter very seriously.

Expected Workload
I am going to push you to learn a lot in a short amount of time. You will not be able to succeed in demonstrating the course objectives and learning outcomes for this course without determination, time, discipline and desire. The “unwritten” policy is 1–2 hours per credit outside of class for an undergraduate class; 2–3 hours per credit outside of class for undergraduate level science/math classes. I also tell students that if you have previously had difficulty with mathematics, you should plan on budgeting a few extra hours per week.

You should be aware that there are often constraints imposed on instructors regarding the amount of content to be covered in class. In that this course is a prerequisite for many advanced courses in math and science, this is indeed a class requiring a certain amount of material to be covered. Also, as students, you are aware that all classes are heterogeneous in nature. Some students will be able to master the material with little or no effort. Others will require tremendous effort. You must judge for yourself what is reasonable and what is not.

Finally, I appreciated most those teachers that demanded more of me than I thought capable.
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**Missing Class**

**Vacations**  I am sorry to inform you that vacations are not legitimate excuses for missed quizzes or examinations. While this might seem harsh, if you will not be able to make a scheduled exam because of a vacation, you will need to sign up for this course when you can appropriately prioritize it in your schedule.

**Tardiness**  Because tardiness disrupts the learning environment of your fellow classmates, I strongly discourage it. However, at the start of each quarter I assume a relaxed policy. If this becomes a consistent problem, I will enforce a stricter policy. Of course, I am aware that some circumstances are beyond our control. So, if—once or twice—you arrive within the first five to ten minutes of class, there should not be a problem. However, there is a penalty for arriving late to a group quiz activity.

**Truancy**  I reserve the right to fail any student that attends less than 85% of the scheduled class meeting times based on the premise that they are not participating in nor contributing to the classroom assessment strategies. If you miss six (6) or more classes, I will require you to make an appointment with an academic counselor if you wish to continue attending class.

**More information regarding this course is available on-line:**
Please note that this document is provided as a reference for the quarter. The information in this document—along with clarifications and additional information—will be posted on the website. Much more information regarding this course and your instructor’s pedagogic philosophy is available online. More information will be posted and clarified at the students’ request. For example, if you are interested in additional course readings, I could post these on the website. Just ask.

**Final Comments**
I will not overload this course beyond a reasonable number of students. I will not sign any add forms until I have a sense of how many students are in the class. I will not sign any one into this class after the quarter has started without the course prerequisites (no exceptions). I will not assign grades of NC. I will not tolerate unsubstantiated grade requests. I want you to argue for your points with well thought-out mathematical rationales. Simply asking for a specific grade is an example of academic dishonesty, and I report all such incidents to the Dean immediately.

**Disclaimer**
I reserve the right to reasonably adjust this syllabus if and when deemed necessary. Minor changes (e.g., fixing typos or adding clarifications) will be indicated during class or on the course blog. More substantive changes will result in the distribution of a revised syllabus. Students are responsible for all administrative changes announced during class.

**Administrative Note About Teaching at SCCC**
If you have any concerns about the course or your instructor, please see the instructor about these concerns as soon as possible. If you are not comfortable talking with the instructor or not satisfied with the response that you receive, you may contact the Math Department Coordinator at (206) 587.6919 or scccmath@gmail.com. If you are still not satisfied with the response that you receive, you may contact Dean Hartzler at (206) 587.3858 or RHartzler@sccd.ctc.edu.
Course Objectives & Learning Outcomes

Published Course Objectives

“To introduce students to the use of calculus in context by emphasizing the modeling approach throughout. Students are expected to understand the derivative and definite integral beyond the purely symbolic level. Concepts are presented using the rule of three (numerical, graphical and algebraic representations). The appropriate use of technology (graphing calculators and a symbolic algebra system) is required,” for MAT 125 from the SCCC Mathematics website (http://seattlecentral.edu/learn/math).

Brief Comment on the Differences Between Outcomes & Objectives

Without going into a exhortation about the intricacies between course objectives, learning outcomes, rubrics and demonstrative criteria…learning outcomes are the broadest goals for a discipline—or education in general—and course objectives are the subsidiary goals that will be pursued to achieve the learning outcomes. (A rubric would further elaborate on how those objectives would be assessed; demonstrative criteria are the levels by which achievement of the rubric would be evaluated.)

Learning Outcomes

Problem Solving

- **LO-1a Modeling** Discover how mathematics enables us to impressively model the physical world and efficiently solve authentic problems
- **LO-1b Interconnecting Information** Refine logical manipulation of mathematical objects to further abstract information for use in related but separate disciplines and scenarios [same as LO-2c]
- **LO-1c Problem Solving** Use mathematics to solve problems efficiently by recognizing, formalizing, manipulating & abstracting patterns in science (the observed world), numbers (the theoretic world), & geometry (the prevalent model connecting the two)

Critical Thinking

- **LO-2a External Critical Analysis** Critically analyze mathematical arguments as presented in the media, popular press, and academic reports
- **LO-2b Self Critical Analysis** Assess logical (symbolic) arguments (e.g., the solution to a problem) and mathematical models used to describe the physical world or predict unknown information
- **LO-2c Critical Extension/Synthesis** Refine logical manipulation of mathematical objects to further abstract information for use in related but separate disciplines and scenarios [same as LO-1b]

Communication

- **LO-3a Interpretation** Make connections between information presented verbally (written or oral), graphically (charts or diagrams), algebraically (symbolically or using conventional notation) and/or numerically (tables or enumerations)
- **LO-3b Creative Communication** Communicate using the 5 “C”s of communication: Clear, Concise, Comprehensive, Cogent & Correct (in mathematics, statistics and other technical disciplines, this means communicating with clarity using an appropriate combination of text, symbols and pictures)
- **LO-3c Conventional Communication** Develop and exploit a mathematical symbolism to precisely represent observed patterns in nature and in numeric and graphical applications
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Learning Outcomes (continued)
Engaged Learning

- **LO-4a Access Knowledge**  Develop strategies to extract information from various sources—including technical reports and math/science textbooks; actively engage dense & technical material presented in text or lecture format (more generally construed as the establishment of practices that promote self-instruction and result in lifelong learning)

- **LO-4b Flexible Vocabulary**  Develop strategies to define unfamiliar vocabulary terms using your current understanding of mathematical concepts

- **LO-4c Mathematical Language**  Learn the intricacies of the language of mathematics—the language of precision & abstraction

General Skills

- **LO-5a Technologic Proficiency**  Explore the power, usefulness and limitations of available technology to increase one’s technical literacy

- **LO-5b Lifelong Learning**  Establish practices of self-instruction and lifelong learning

Course Objectives  (I’ll refer to these frequently)

- Use mathematics to solve problems efficiently by recognizing, formalizing, manipulating & abstracting patterns in science (the observed world), numbers (the theoretic world), & geometry (the prevalent model connecting the two)

- Make connections between information presented verbally, graphically, algebraically and/or in tables

- Develop & exploit a mathematical symbolism to precisely represent observed patterns in nature & in numeric & graphical applications (particularly via integration)

- Use the various features of the integral to model authentic situations & solve problems

- Refine logical manipulation of mathematical objects to further abstract information for use in related but separate disciplines & scenarios

- Learn the intricacies of the language of mathematics—the language of precision & abstraction

- Communicate with clarity using an appropriate combination of text, symbols & pictures

- Accurately & efficiently simplify or evaluate definite and indefinite integrals

- Become well acquainted with the geometric origins and interpretation of integrals

- Understand the relationship between integration and differentiation (FTC)

- Use summation notation in various contexts (sequences, series, integration)

- Reinforce geometric concepts such as area, volume, perimeter & surface area

- Explore the power, usefulness & limitations of available technology

- Establish & exercise a wide variety of problem solving skills

- Establish practices of self-instruction & lifelong learning