Math 153  
Calculus III

Course: Calculus III (5 credits), Math& 153, 6147/6148, Section A/B, Winter 2015
Instructor: Gregory Ferencko, Science and Engineering Building, Office # 239, Phone: 253-566-5305
E-Mail: gferencko@tacomacc.edu
Web-Page: http://www.tacomacc.edu/home/gferencko

Class Time and Location:
- Section A: M-F, 8:30 – 9:20 am, Bldg. 15, Room 202
- Section B: M – F, 12:30 – 1:20 pm, Bldg. 17, Room 1

Office Hours: M-F, 9:30 – 10:20 am, and by appointment.

Prerequisites: MATH&-152 with a "C" or better or CL2 MATH placement and instructor permission; ENGL/ 095 with a "C" or better or assessment above ENGL/ 095.

Course Description: Topics of calculus are presented geometrically, numerically, and symbolically. MATH&-153 topics include sequences, infinite series, Taylor series, Taylor polynomials, vectors, and functions of several variables. Graphing calculator required.

The course objectives listed below make reference to the following Math Department Program Learning Outcomes:

1. Create, interpret, and analyze graphs and charts that communicate quantitative or relational information.
2. Determine, create, and use appropriate and reasonable mathematical constructs to model, understand, and explain phenomena encountered in the world.
3. Determine and carry out an appropriate algorithm to solve problems that are amenable to mathematical solutions.
4. Communicate mathematical information formally, using appropriate math notation and terminology, and informally by using everyday language to express ideas.
5. Use technology to analyze and solve mathematical problems and to effectively communicate solutions to problems, particularly those that cannot be solved efficiently by other means.

Course Objectives: Upon successful completion of this course, the student should be able to:

1. Determine the convergence/divergence of both sequences and series. (3)
2. Use Taylor series as a means to define functions. (3, 4)
3. Use substitution, differentiation, and integration to find a Taylor series. (3, 4)
4. Approximate functions with Taylor polynomials and find error bounds. (3, 4)
5. Use contour maps, cross-sections, and computer-generated graphs of surfaces to describe and analyze functions of two variables. (1, 2, 4, 5)
6. Demonstrate an understanding of vectors and vector operations, including the scalar product, dot product, vector product, and the projection of one vector onto another. (3, 4)
7. Use vector valued functions to describe the motion of an object and solve related application problems. (2, 3, 4)
8. Write clear and complete solutions to mathematical problems, including correct notation and written explanations when appropriate. (4)
9. Use a graphing calculator and/or computer software as appropriate. (5)
Course Materials:


Supplies\Tools:  In addition to the text, the following items will be needed by you throughout the quarter:

- **Pencil, paper, graph paper, straight edge.**
- **Graphing Calculator.** I will be using the TI-84 Plus Silver Edition for all in class demonstrations. This is the recommended calculator for this course. The use of graphing calculators is an integral part of the course and will be used regularly in class and on exams. On all in-class exams and quizzes, the TI-83 or TI-84 are the ONLY calculators that may be used.
- **Internet access and e-mail.** If you don't have internet access at home, there are many places on campus where you can use a computer, most notably the Math Center (bldg. 19, room 22), the library (bldg. 7), and the Information Commons (bldg. 16). You should also set up your TCC e-mail account. I will expect that you check your TCC e-mail at least once each weekday. If you have not yet set up your campus computer account, go to building 16 for details about how to do so.
- **WAMAP Account.** I will be using WAMAP to post class documents, including problem sets and answer keys. Details about WAMAP are provided on my website and will also be discussed in class.
- **Maple.** Maple is a computer algebra system. It is available on most campus computers. Details about using Maple will be given during class.

Course Activities, Grades, and Policies:

Your course grade will be based upon your performance on various course activities. These activities include study problems, problem sets, in-class work, unit exams, and a final exam. Each of these activities is described below along with information about how the activity will count toward your final grade.

**Study Problems:** Working on study problems every day is critical to your success in this class. Study problems will be assigned for each section that we cover in the text (posted in WAMAP). It is my expectation that you will take responsibility for your own learning, so I will not be collecting or grading daily study problems. There will often be some time in class to discuss study problems, but not enough time to discuss all problems. If there is not enough time to discuss a problem on which you need help, I expect that you'll either see me during office hours and/or seek help at the Math Advising and Resource Center. **Study problems are NOT collected and do NOT count towards your grade. Study problems will help you prepare for quizzes and exams.**

**Problem Sets:** In order to check your understanding, correct use of notation, and clarify my expectations regarding the quality of written work, selected problems will be assigned approximately 2 - 4 times during the quarter. Problem sets will consist of 3 - 5 problems and should be demonstrative of your best work. I will give zero points to messy, hastily written problems without adequate work and/or explanation. The problems are generally of medium to high difficulty, so it is my expectation that you will have done the assigned odd problems in the section before attempting these problems. I encourage you to work together on these problems and am also happy to provide some guidance during office hours, however I will want to see the work you've been doing before providing such guidance. I will not discuss these problems in class until after the assignment is turned in. I will post solutions to the problem sets after the due date. The points earned on a problem set will count towards your Activity Grade.

**Problem sets that don't meet the following criteria will be penalized:**

1. **Neat and orderly.** Each problem should be clearly numbered. Problems should be done using vertical format whenever appropriate (e.g. solving equations, simplifying expressions, etc.). The answer to the question should be clearly identifiable. Justification for your answer should be clear and easy to understand.
2. **Done in pencil.** (Use your eraser! There should be no cross-outs.)
3. On 8.5" x 11" lined or graph paper. **Stapled if there are multiple pages.**
4. For all graphs, axes should be clearly labeled, with some indication of the scale. Rough sketches of graphs should be careful enough so that important information is correctly and accurately conveyed to the reader of the graph. Typically, important features include local extrema, concavity, asymptotes, holes, and correct implications.
about the behavior of the graph beyond the graphing window. Certain graphs will have to be done on graph paper. I will specify this when it is required. See the graphing guidelines for more information.

5. All answers should be accompanied with a justification. Justification usually take the form of (1) algebra shown, (2) a graph, (3) a short written explanation, or (4) some combination of items 1 - 3. Any answer given with no justification will receive no credit.

6. For all word problems, variables should be clearly defined. This means a precise definition (including units) of what each variable represents.

7. All written explanations should be written in clear and coherent English. Do not assume that I will know what you mean - I won't!

Quizzes: Friday will be quiz day. On many Fridays, a short quiz will be given either in-class or as a take-home. If a quiz is given in-class, you must take it during class-time – no make-up quizzes will be given. At the end of the quarter, your lowest quiz score will be dropped. Each quiz will count 10 points toward your activity grade.

Activity Grade: The points you earn on class activities (i.e. quizzes and problem sets, etc.) will be summed to form your activity grade. Since late work is not accepted, I will divide by 95% of the total activity points available to compute your activity grade. This grade will count 20% toward your final grade.

Unit Exams: There will be three unit exams during the quarter. Each unit exam will count 15% toward your final grade.

Final Exam: There will be a cumulative final exam. The final exam will count 35% toward your final grade.

Final Grades:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A:</td>
<td>92% - 100%</td>
</tr>
<tr>
<td>A-:</td>
<td>90% - 91.9%</td>
</tr>
<tr>
<td>B+:</td>
<td>88% - 89.9%</td>
</tr>
<tr>
<td>B:</td>
<td>82% - 87.9%</td>
</tr>
<tr>
<td>B-:</td>
<td>80% - 81.9%</td>
</tr>
<tr>
<td>C+:</td>
<td>78% - 79.9%</td>
</tr>
<tr>
<td>C:</td>
<td>72% - 77.9%</td>
</tr>
<tr>
<td>C-:</td>
<td>70% - 71.9%</td>
</tr>
<tr>
<td>D:</td>
<td>60% - 69.9%</td>
</tr>
<tr>
<td>E:</td>
<td>Below 60%</td>
</tr>
</tbody>
</table>

Attendance: It is expected that you will attend class every day. If you are absent, it is your responsibility to submit any assignments due on that day and to learn about any announcements. Furthermore, it is expected that you will arrive to class on time each day. Showing up late to class on a consistent basis is rude to both me as well as to your classmates. Don't be rude!

Graded Work: Work that is graded will be handed back during class time. It is your responsibility to be present during class to pick-up your graded assignments. Work that is not collected during class may be picked up at my office during office hours. Work that is not collected within a week of me handing it back may be disposed of at my discretion (i.e. I'm going to throw it out if you don't come and get it).

Late Work: Take-home assignments are due at the beginning of class on the due date. Assignments turned in after I collect them are considered late. I will accept late assignments until 2:00 pm on the due-date. Late assignments (even 1 minute late) will receive an automatic 2-point penalty. Late assignments can be turned in to the front desk of building 15 – ask the receptionist to time-stamp the assignment and have it put in my mailbox.

Missed Exams: Exams can be taken at an alternate time only in cases of emergency and if I am contacted BEFORE the exam is given. If the nature of the emergency is such that you cannot contact me beforehand, contact me as soon as possible, and I might be willing to make an exception. Please be prepared to provide documentation of your emergency (e.g., police report, note from doctor, etc.).

Dropping This Class: If you drop the class by January 16th, no grade will be reported. You may drop the class with a grade of 'W' through February 27th. After this date, you will not be allowed to drop the class.

Incompletes: After February 27th, an incomplete may be arranged in the case of an emergency. An incomplete will only be granted if the student is performing satisfactorily (C or better). You will need to meet with me so that an Incomplete Contract can be written.
Etiquette for Classroom Dispute Resolution: If you have questions or concerns about this class or me, please come to talk with me first. If we are unable to resolve your concerns, you may talk next with Carol Avery, the Chair of the Mathematics Department.

Cheating: Cheating (as defined by TCC's Academic Dishonesty Policy) on an exam or quiz will result in a grade of zero for that piece of work. A second occurrence will result in a grade of E for the course. The complete Administrative Process for Academic Dishonesty is available on the TCC website.

Accommodations: If you need specific auxiliary aids or services due to a disability, please contact the Access Services office in Building 7 (253-566-5328). They will require you to present formal, written documentation of your disability from an appropriate professional. When this step has been completed, arrangements can be made for you to receive reasonable auxiliary aids or services. Once you have received the disability accommodation documentation prepared by Access Services, you must make an appointment with me so that appropriate arrangements can be made.

Caveats: This syllabus is subject to change in the event of extenuating circumstances. If changes are necessary, an addendum to the syllabus will be distributed via e-mail.