Short Guide to APPM 2350 Calculus 3 Section 110

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1   Introduction

This course is about multivariable calculus. Other names associated with the content are vector calculus and calculus of functions of several variables. The course website (for all sections of the class) where the homework, syllabus, and official policies are posted is at: `http://amath.colorado.edu/content/appm-2350-calculus-3-engineers-fall-2014`. The course website serves as the official information page for the course. I do not guarantee the correctness of policy information I summarize here. The purpose of this pdf is to give you a rough overview of the course and offer some suggestions which you may find useful.

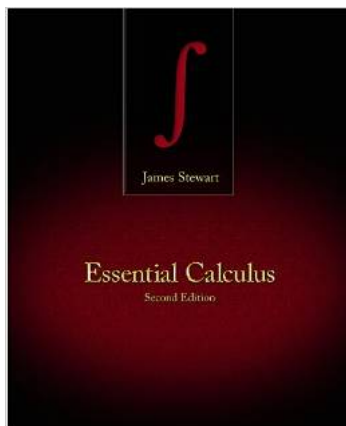The textbook is Essential Calculus by James Stewart, 2nd edition.

Figure 1: `http://www.amazon.com/Essential-Calculus-James-Stewart/dp/1133112293/`

Homework assignments will consist of online problems (due before every lecture), written home-work, and 3 projects. For online homework you need to have a webassign account: `http://www.webassign.net/`. Webassign also offers an e-book version of the tetbook with solution videos for some exercises. Another feature of webassign is the Personal Study Plan. This is a good source of short videos with examples and solutions for every section of the book. I encourage you to use this

resource. Note that for webassign, you sign up with your identikey username and password. Look for class APPM2350 - all sections; this is where the webassign homework is posted. Starting week 2 of lecture, webassign problems are assigned every week and due 2-3 days after they are posted, as marked.

Your grade will be based on homeworks, recitation assignments/quizzes, 3 computer projects, and exams. Each component has a sizeable contribution to your final grade. However, the exams weigh the most. It is important that you are aware of the following course grading policy that all instructors have to adhere to: if you do not get a sufficiently high average exam score (regardless of your scores on other components) you will not be able to pass the class. Thus, it is crucial that you properly prepare for the exams. The best way to do this is to do the homework, review and understand solved examples given in class and in the book and work through old posted exams. If you can, I encourage you to also look at additional solved problems from other sources.

The three computer projects involve programming. You are highly encouraged to sign up for the APPM2450 course which reviews programming concepts (Mathematica). It is a simple 1 credit pass/fail course. It teaches you some essential programming and modeling skills with Mathematica which you need for the projects and is useful for the future.

2 Solved Problems

I encourage you to review and understand as many solved problems as possible. This greatly improves your chances of doing well in this class. One big source of solved problems is the class session and the textbook! Please go over the solved problems given in the textbook and those presented in class. My aim is not to show you the exact same solved problems in class as the examples worked already in the textbook; I will instead try to supplement those with other problems so you get exposed to even more solved problems. Recitation is a good opportunity to ask about material you do not understand and the TAs will review more problems with you at these times. Keep in mind that there are other resources besides the course textbook you can use to study. You may find it helpful to look at examples and explanations from this free online Vector Calculus textbook by Michael Corral: `http://www.mecmath.net/`. Paul's Online Notes are also a good source: `http://tutorial.math.lamar.edu/Classes/CalcIII/CalcIII.aspx`. There are also open access mit ocw courses on various subjects, including multivariable calculus, with lecture videos and exams with solutions. For example, see: `http://ocw.mit.edu/courses/mathematics/18-02sc-multivariable-calculus-fall-2010/`. You may also purchase (not expensive) some Schaum's Outline books, which have many solved problems and may help preparing for the tests and with homework. In particular, two books with some relevant problems are Schaum's Outline of Advanced Calculus and Schaum's Outline of Vector Analysis. Other possibly helpful books are Advanced Calculus Demystified and Vector Calculus by Springer Undergraduate Mathematics Series. See the details below. Previous year exams are available online and are a good study resource.
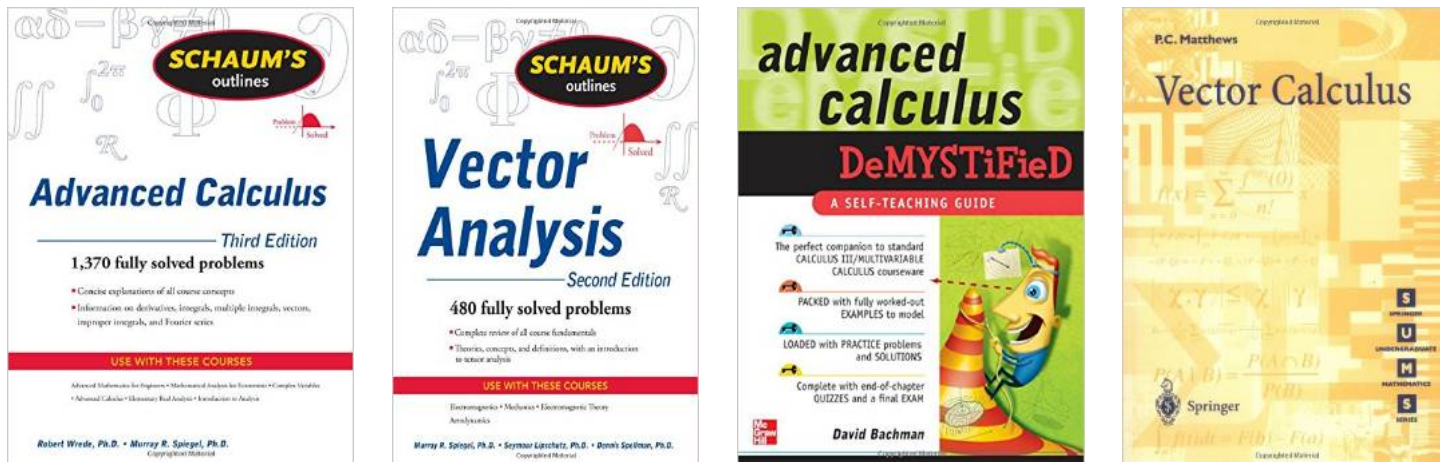
Figure 2: Book 1: `http://www.amazon.com/Schaums-Outline-Advanced-Calculus-Third/dp/0071623663/`, book 2: `http://www.amazon.com/Vector-Analysis-Edition-Murray-Spiegel/dp/0071615458/ref=pd_cp_b_3`
, book 3: `http://www.amazon.com/Advanced-Calculus-Demystified-David-Bachman/dp/0071481214/`, and book 4: `http://www.amazon.com/Vector-Calculus-Paul-C-Matthews/dp/3540761802/`

3   Recitation, Help Room, and Office Hours

Find out and make use of the resources available to you. Recitation is a good opportunity to see more solved problems and ask questions. There are also Office Hours for each instructor as well as the math help room (located at the stadium). University tutoring is also available.

4   Things to Keep in Mind

Homework posted on week n is due on Friday of week $n + 1$. You have one week to contest grades (with a clear, written explanation) after the date a homework is returned. Late homework is generally not accepted. For exams (which are on Wednesdays), you can petition for regrades the following Monday, if you have a clear reason to believe the exam was marked incorrectly. Keep in mind the policy regarding cheating on homework, projects, or exams. The policy set by the University is very strict. See info sheet for details. This course requires a significant time commitment to do well. Keep in mind that the internet has a lot of information on all topics covered in this course, use it to your advantage to look up extra examples and explanations. Good luck with the course!

5 Software

You will be using Mathematica for the projects and it's a good idea to download and play with this software from the beginning. It has easy visualization routines which can help you visualize 3D functions and vector operations. Mathematica is available for free for personal use from the University.
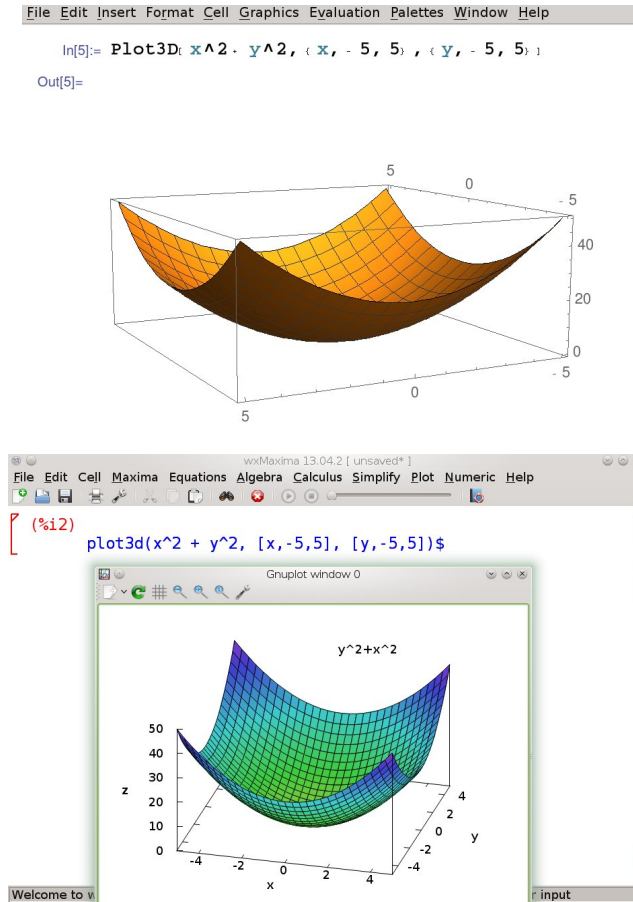

Figure 3: Screenshots of Mathematica and Maxima plotting $z = f(x,y) = x^2 + y^2$.

Matlab is also useful for visualization. A software package called Maxima http://maxima.sourceforge.net/ is an open source completely free computer algebra / plotting system which can be quickly installed on various operating systems and has syntax similar to Mathematica. It uses the package gnuplot for plotting. You can install the wxMaxima package on some systems which provides a nice GUI interface http://andrejv.github.io/wxmaxima/. You may also find these CAS systems useful for evaluating complicated integrals and for solving nonlinear equations.