MATH 2142Q-001: Advanced Calculus II
Spring 2015

Reed Solomon
Office: 214 MSB, 486-2341.
Email: david.solomon@uconn.edu
Web Page: www.math.uconn.edu/_solomon
Office Hours: TBA.

Grading:
You will be graded on homework (40%), two midterm exams (20% each) and a final exam (20%).

Homework:
There will be regular homework assignments collected for this course. Many of the problems assigned will involve proving why something is true. It is important that you express your mathematical thoughts in clear and complete sentences. Of course, you will make mathematical calculations and use mathematical notation, but often the sentences explaining the reasoning connecting the steps in your proof are the most important. You should write your explanations as though they were for another student in the class. You should also work through your mathematical thoughts on scratch paper first and rewrite the results in a clean and concise way when you hand it in. You will be graded both on the correctness of your solution and on your mathematical writing.

Textbook:
The textbook for this course is the same as last semester, Calculus, Volume I, second edition, by Thomas M. Apostol. Because this course moves very quickly and approaches mathematics from a more sophisticated perspective than you are probably used to, it is extremely important that you read the textbook as we go along. Many of the ideas in this course require time and e_ort to grapple with before they really sink in. Just listening passively to the lectures will not be enough to master this material.

Midterm Exams and Quiz:
The first midterm exam is on Friday February 20 and the second midterm exam is on Wednesday April 1. When we get close to the time of each exam, I will try to be very clear about what material is covered and what types of problems you can expect to see on the exam.

Calculators:
You are welcome to use a calculator for this course, including on the exams. However, I think it is unlikely that a calculator will be of much help in this course.

Office Hours and Additional Help:
This course moves quickly and it is extremely important that you don't get behind. I strongly recommend visiting me in office hours if you find yourself having difficulties with the material. It is much easier for us to discuss a section of the textbook to keep you caught up that to try to discuss an entire chapter.

Academic Integrity:
Instances of academic dishonesty are taken very seriously at UConn. Please read www.community.uconn.edu/student code appendixa.html. If you ever have a question about whether certain behavior constitutes academic dishonesty, you should ask!

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Outline:

Date	Section
Wed 1/21	Taylor polynomials, 7.1-7.4
Fri 1/23	Remainders in Taylor polynomials, 7.5-7.8
Mon 1/26	L'Hopital's Rule, limits at in_nity and in_nite limits, 7.12-7.17
Wed 1/28	Complex numbers, 9.1-9.6
Fri 1/30	Complex exponential, 9.7-9.10
Mon 2/2	Introduction to di_erential equations, separable equations, 8.1-8.3 and 8.23
Wed 2/4	First order linear equations, 8.4-8.7
Fri 2/6	Homogeneous constant coe_cient 2nd order equations, 8.8-8.14
Mon 2/9	Nonhomogeneous constant coe_cient 2nd order equations, 8.15-8.17
Wed 2/11	Applications of di_erential equations, 8.18-8.19
Fri 2/13	Phase lines and qualitative analysis
Mon 2/16	Catch up
Wed 2/18	Sequences, 10.1-10.4
Fri 2/20	Midterm exam
Mon 2/23	Series, 10.5-10.9
Wed 2/25	Comparison and integral tests, 10.11-10.14
Fri 2/27	Ratio and root tests, 10.15-10.16
Mon 3/2	Alternating series and absolute convergence, 10.17-10.18
Wed 3/4	Improper integrals and catch up, 10.23
Fri 3/6	Pointwise and uniform convergence, 11.1-11.3
Mon 3/9	Uniform convergence, continuity and integration, 11.3-11.5
Wed 3/11	Power series, 11.6-11.8
Fri 3/13	Taylor series, 11.9-11.11
Mon 3/23	Power series and di_erential equations, 11.14
Wed 3/25	Catch up
Fri 3/27	Vectors and dot products, 12.1-12.5
Mon 3/30	Norms, orthogonality and projections, 12.6-12.10
Wed 4/1	Midterm Exam
Fri 4/3	Linear span and independence, 12.12-12.13
Mon 4/6	Bases, 12.14-12.15
Wed 4/8	Lines, 13.1-13.5
Fri 4/10	Planes, 13.6-13.8
Mon 4/13	Cross product, 13.9-13.11
Wed 4/15	Triple product and Cramer's Rule, 13.12-

	13.14
Fri 4/17	Normal vectors, 13.15-13.16
Mon 4/20	Vector valued functions, 14.1-14.4
Wed 4/22	Tangents, velocity and acceleration, 14.5-14.7
Fri 4/24	Unit tangent and principal normal vectors, 14.8-14.9
Mon 4/27	Arclength, 14.10-14.13
Wed 4/29	Curvature, 14.14-14.15
Fri 5/1	Alternate coordinates, 14.16-14.18