Syllabus for MTH 254H Honors Multivariable Calculus
Spring 2012

Course: MTH 254H Honors Multivariable Calculus

Instructor: Robert Bell

Lectures: MWF 11:30 a.m. - 12:20 p.m. in C-210 Wells Hall

Required Textbook:

Multivariable Mathematics: linear algebra, multivariable caluclus, and manifolds by Theodore Shifrin, ISBN: 0-471-52638-X, John Wiley & Sons, 2005.

Instructor's Office Hours:

Tuesday 5:30 - 7:30 p.m. in W-32 Holmes Hall,
Thursday 1:00 - 3:00 p.m. in A-305 Wells Hall,
and by appointment (please send an e-mail).

E-mail: rbell@math.msu.edu (best way to contact me)

Course Web Page:
`http://www.math.msu.edu/~robertbe/MTH254HSP12.html`

Topics: This is a course in the calculus of several variables including differential forms and topics from advanced calculus. The major topics include derivatives of functions of several variables, the gradient, Lagrange multipliers, the Hessian, the inverse and implicit function theorems, multiple integrals, change of coordinates, Jacobian determinants, differential forms, line and surface integrals, and various forms of Stokes' Theorem.

Grading Criteria. In general, your work in the course will be graded according to three criteria: the **clarity** of your explanation, the **completeness** of the steps taken to arrive at a solution, and the **accuracy** of the answer. Solutions which are incomplete, unclear, illegible, or contain errors may not receive full credit.

Graded Components	
Midterm Exams (2)	30%
Homework	30%
Quizzes	10%
Final Exam	30%

	Grading Scale
4.0	$90 \leq x$
3.5	$84 \leq x < 90$
3.0	$78 \leq x < 84$
2.5	$72 \leq x < 78$
2.0	$66 \leq x < 72$
1.5	$60 \leq x < 66$
1.0	$55 \leq x < 60$
0.0	$x < 55$

A detailed description of the graded components follows.

Midterm Exams: There will be two midterm exams during the semester. These are tentatively scheduled as follows:

Midterm I	Wednesday, February 15
Midterm II	Wednesday, April 11

Exams are written and completed in class without the aid of the textbook, notes, calculators, or similar materials. Exams last for the entire class period (50 minutes). Each exam is worth 15% of your final grade.

Homework: Written homework will be assigned and collected regularly. Homework is due at the start of the lecture (typically due on a Friday). Homework may be turned in late up until the start of the subsequent lecture; however, a late penalty of 20% will be assessed. The lowest two homework scores will not count towards your final grade.

Some assigned problems may require significantly more time to complete than the questions and problems which will typically appear on quizzes or exams. However, reading through your homework gives the instructor an excellent opportunity to assess your overall understanding of the course material as well as your progress towards developing strong analytical problem solving skills. Please do all of the homework assignments: it is the best way to succeed in this course.

Please feel welcome to ask questions about the homework assignments during lecture, during office hours, via e-mail, or via our discussion group. We can discuss solutions to the homework during lecture as needed.

A score will be assigned to each homework assignment using the criteria below. Problems for which a serious attempt at a solution is not given will count against the completeness. All but the most minor of errors will count against the accuracy. Problems which are not clearly stated, illegible, or disorganized will count against the clarity.

completeness	40%
accuracy	40% (from among graded problems)
clarity	20% (clearly explaining the problem and its solution)

Do not forget to state the problem clearly. Often the most difficult aspect of a mathematical problem is understanding what is being asked. If you do not know how to solve a problem, then at least try to write down the ideas or questions you have so that I can read these.

Collaboration is encouraged on homework assignments, however each student must submit his or her own written solutions to the homework assignments.

Quizzes: Quizzes will be administered occassionally during the lecture to give you an opportunity to practice solving problems under time constraints. You should think of quizzes as practice for the midterm exams. The lowest two quiz scores will not count towards your final grade. You may make up a missed quiz only if you have missed class due to highly specialized reason (e.g. you are in the hospital or it is a religious holiday). You must contact the instructor in advance and ask permission if it is a planned event, or you must contact the instructor within 24 hours if it is an unplanned event (health emergency).

Final Exam: The final exam is comprehensive. The date and time of the final exam is set by the university. You must take the final exam on the scheduled day at the scheduled time.

The final exam is on Monday, April 30 from 10:00 a.m. until noon in C-210 Wells Hall.

Student Responsibilities

Attendance & Preparation:

- Regular attendance is required.
- Before attending the lecture, read the current sections, or read about the current topics from other available sources (e.g. try a Google search).
- At minimum, attempt to work through the first few examples in each current section, and write down any questions you have.

How to read mathematics. You should always have paper and pencil (and eraser!) readily available when reading mathematics. Work through the

examples by writing the steps out yourself until it is clear to you that the solution is correct. Once a topic has been introduced in lecture, you should re-read the corresponding sections from the text. You should work on the exercises at the end of these sections until you are proficient.

Participation:

- Be attentive and stay alert.
- Work effectively with your classmates.
- Take careful notes.
- Ask questions! Don't be shy: we (yes, me too) are all here to learn!

Homework:

- Start homework assignments early and discuss these with your classmates.
- Write your attempts on scratch paper. Write solutions that you will submit for a grade carefully and neatly.
- When your homework is returned with a grade, compare your solutions to the posted answers and solutions; you might learn a new technique or a more appealing way to think about a topic.

Utilizing Office Hours: Please consider bringing your questions to office hours. Office hours are times set aside specifically as an opportunity for you to get additional help. If your schedule conflicts with the scheduled office hours, please make an appointment.

Please do not think of this as an inconvenience to your instructor; additional help is available if you seek it out. However, it is your responsibility to come to office hours only after first making a sincere effort to answer questions on your own. Learning is difficult: work hard, try new ideas, and ask questions. If you do this, you will see definite progress.

E-mail: E-mail can be an effective way to obtain more immediate help. When e-mailing your instructors, be sure to state your question clearly. If you are asking about a specific exercise or example in the text, be sure to restate the problem in its entirety since, while it is quite possible that your instructors are awake and online at 10 p.m., it is unlikely that he or she keeps a copy of the text under his pillow!

When addressing e-mail, please include a greeting and sign your e-mail with your first and last name, at least until you are certain the instructor has learned your name.

Online Discussion Forum: There is an online discussion group for this course. The details of how to participate will be discussed in lecture. Please feel welcome to discuss problems from the course online. The instructor will also participate and help to facilitate discussions.

Calculators: The use of calculators is not be permitted on any of the exams or quizzes. Approximate answers will be penalized when an exact answer can be obtained. However, you are welcome to use your calculator or to write computer programs to test your understanding while studying.

Students with Disabilities: MSU provides the Resource Center For Persons with Disabilities (RCPD); URL: http://www.rcpd.msu.edu/ Please contact the RCPD if you require special accommodations, and then schedule an appointment to meet with the instructor.

Academic Honesty: Cheating in any form will not be tolerated and will be reported to the Department Chair. You will receive a zero on any assignment in which their is a case of cheating. This includes, but is not limited to, plagiarism, failure to give proper citations, and copying another's work. If you are preparing an assignment and have a question about whether you are adhering to this policy, please ask your instructor.

Advice: The best way to learn mathematics is to write down solutions to specific mathematical problems. If you are able to solve most of the assigned problems, then I am confident that you will do very well in the course. But don't limit yourself to the assigned problems; the textbook offers a variety of interesting problems. Challenge yourself! Try working out problems that sound interesting to you. If you want more practice or want more challenging problems, please drop by my office during office hours or make an appointment to meet with me.

If you are falling behind in the course, please seek help ASAP. There is help available during office hours, from your classmates (just ask them!).

I want you to succeed in this course, and I'm here to facilitate this goal. But the burden is upon you to work hard, to set aside realistic amounts of time for study and to seek out help when you need it.

Some final advice: read the book. Then work some problems and read the book again. I cannot emphasize this enough. Read the book.