SYLLABUS:
MATH 226 (CALCULUS III), FALL 2018

Disclaimer: This syllabus does not constitute a contract. The instructor reserves the right to make changes at his discretion throughout the semester.

General information:

- **Instructor:** Dr. Guillaume Dreyer
  Office: Across the Math Center (KAP 263)
  Email: gdreyer@usc.edu
  Lectures: 10:00–10:50 am MWF in SOS B44
  Office hours: 11:00–12:00 am MW in KAP 263 or in my office right across.

- **Teaching Assistant:** Wei Wang
  Office: TBA
  Email: wang890@usc.edu
  Discussions: 10:00–10:50 am and 11:00–11:50 am TTh in THH 217
  Office hours: TBA

- **Textbook:** James Stewart, *Essential Calculus, Second Edition*, ISBN: 9781133112297

- **Prerequisite:** Math 126

Course content: space curve, surface, curvature, function of several variables, partial derivatives, multiple integral, line integral, surface integral, Stokes' Theorem and its applications.

Learning objectives: By the end of the semester, you will be familiar with the fundamentals of multivariable calculus: vector formalism, vector function, partial derivative, gradient vector of a function, geometry of curves and surfaces. You will be able to apply these skills to a variety of applications – electromagnetism, classical and fluid mechanics, thermodynamics –. In particular, you will learn how to apply Green's Theorem, Divergence Theorem and Stokes' Theorem. (These 3 theorems are actually the very same theorem stated in different contexts.)

We will cover Chapters 10–13 of Stewart. Caution: while covering the material included in those chapters, we will not be following the textbook line-by-line.

Blackboard: Weekly homework assignments as well as **grades** will be posted on **Blackboard** http://blackboard.usc.edu. It is everyone's responsibility to visit the website on a regular basis.

Grading breakdown: Homework 10%, Quiz 13%, 2 Midterms 21% each, Final 35%.

Quizzes: There will be a weekly 20 min quiz during Tuesday's discussion, every week except midterm weeks. **No make-ups under any circumstances**. You are allowed to drop one quiz score. (Keep that one-time deal for that day you find yourself sick.)

Homework: Weekly homework will be posted on BB every Monday. Assignment are due a week later and **must be submitted in class at the beginning of your Tuesday's discussion section**. Late and electronically submitted homework will not be accepted, no exceptions.

While assigned exercise must be treated, only 4 picked at random questions will be graded. (Completion will be part of the grading rubric.) You are allowed to drop one HW score. (Keep that one-time deal for that day you find yourself sick.)

You are strongly encouraged to discuss homework problems with your peers and to work in groups. This is the most efficient and rewarding way to learn and work. However, you must write your own solutions. **Homework which is simply copied from another source (friend, another textbook, internet, etc.) will be considered as plagiarism which is a serious offense to USC Student Code of Conduct.**

Exams: There will be two midterms and a final.
- **Midterm 1:** Wednesday, September 26th, in class.
- **Midterm 2:** Wednesday, October 31st, in class.
- **Final:** Wednesday, December 5th, 2:00–4:00 pm. **You must take the final exam at the scheduled time.**

If there is a scheduling conflict for an exam, **you must let ME know (NOT the TA) at least 2 weeks before the examination**. A scheduling conflict must involve an activity sponsored and approved by USC (marching band, athlete event, etc.). In particular, the university club or organization in question must send an official request, with the Dean's approval, to all faculty. Personal activities do not qualify. **FAILURE TO ATTEND AN EXAMINATION WILL NOT BE EXCUSED UNDER ANY CIRCUMSTANCES.**

No cheat sheet, no formula sheet, no calculator, no cell/smart phone or other electronic device will be allowed during examinations.

I am your point of reference. Above all, what is covered during <u>lectures</u> – topics, methodology, examples, exercises and methods to solve them – are your points of reference. Failure to attend lectures will extremely impact your performance in this course.

Resources: The Math Center is located in KAP 263 and is open weekdays from 8 am to 7 pm (it closes earlier at 5 pm on Fridays). For up-to-date information on the consulting hours, visit the Math Center homepage `http://dornsife.usc.edu/mathcenter`. The purpose of the Math Center is to provide an environment where students can stop by to get help on their math classes. Math TAs at USC hold their office hours there. It is probably better to attend office hours of TAs who are teaching Math 126 this term. However, you are welcome to stop by the Math Center at any time and seek for help from any of the Instructors or TAs who are present at that time.

Students with disabilities: Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester and a letter of verification detailing approved accommodations must be delivered to your Instructor as early in the semester as possible. DSP is located in STU 301 and is open 8:30–5:00 pm, Monday through Friday. The phone number for the DSP office is (213) 740–0776.

Course standards and good practice:

Work habits:

- Preparing for lectures: I usually announce at the end of each lecture what will be covered next. Taking 10 min before lecture to skim and get familiar with the content of a section–topics, definitions, theorems–is very profitable.
- Daily training: You must work on your math every day, ideally 60 min in average. Daily training is the only way to properly learn and memorize the material, develop your mathematical skills and style. Exams and quizzes are fast-paced and require adequate preparation. Train yourself to complete as much work as possible within a given time-frame. Also, bear in mind that College-level calculus courses are very fast-paced and demanding. It is easy to fall behind and surprising difficult to catch up. Only daily practice can prevent this.
- Evaluations standards: Exams, quizzes, and homework assignments are partial credits. The quality of your answers is a main component of the evaluation process. Your answers must be neat, organized, unambiguous. You must show mastery of mathematical terminology and notations–e.g. equations neatly organized; knowing definitions, theorems and conditions under which results apply–. Keep in mind that it is in no way the job of the person evaluating your work to guess and piece together chaotic or illegible arguments. Developing a top-notch "style" comes with (a lot of) practice. It is also by following such standards you'll achieve mastery of the material. Indeed, writing neat complete but concise solutions forces you to organize your thoughts and identify the key arguments that must be part of your solution. It is by pushing yourself to delivering a work of high quality that will make real progress, in mathematics as in as in other areas.

Course policies:

- Course attendance: I do not enforce attendance. However, based on past experiences, all students who decide not to daily attend lectures and discussions end up performing extremely poorly in the class, which typically result in either dropping, barely passing, very often failing the course. Be aware that key examples and methods are discussed during lectures, and some are not covered in the book. You may be asked to solve an exercise following a specific method discussed during class.
- Accountability: Rules are clearly stated in the syllabus and are strictly enforced. By enrolling in this course, you pledge to abide by them. You determine what the learning experience will be through the standards you set for yourself. You take full responsibility for the quality of the work you deliver.

It hurst but it's inspiring: Being in a selective institution such as USC, we assume knowledge of concepts and methods covered in course prerequisites. In theory, you all have the same mathematical background. Reality however proves otherwise. While the majority of you may have achieved high grades in the past, those grades do not necessarily reflect actual mastery. Some have set higher standards in the way they've been learning mathematics (and other topics), training and timing themselves on a regular basis, dissecting arguments, pushing themselves to write clear articulate solutions. Others may have not imposed such standards on themselves while still getting by. (Grade inflation in high-school can be very deceptive.)

So here is likely the first major challenge you'll face in College. Within days, you'll come to the realization that you're surrounded by high-achieving fellows, among themselves some who are extremely competitive.

- First step is to humbly acknowledge it.

- <u>Second step</u> is to acknowledge their qualities. These persons are very good for very good reasons: they've held themselves to high learning standards, they've worked harder, they're attentive, better organized, articulate, they deliver a work of high quality.
- <u>Third step</u> is our own introspection. While there are things we're good at, there are plenty of skills we've overlooked, often very conveniently, and thus never developed. It takes years to correct some of our bad work habits and perfect them. What matters is not where you as an individual start, it is how dedicated you are at shaping your intelligence and abilities, especially the ones you're not good at. All of this comes with one and only thing: hard work and perseverance.

Something to cheer you up: we've all been there.