Math 3140-01: Vector Calculus & Partial Differential Equations
Summer 2016

Time & Location   10:00-11:00 AM, MTWHF in WBB (William Browning Building) 617

Instructor   Chris Miles

Contact   Office hours: **11-12 AM Monday, 9-10 AM Tuesday** or **always available by appointment**
Office location: LCB (LeRoy Coles Building, on President's Circle) 326
Email: miles@math.utah.edu
Website: www.math.utah.edu/~miles

Textbook   Both textbooks are **required** but hopefully you should already own them:

Calculus: Concepts and Contexts, 4th ed. by James Stewart ISBN: 9780495557425. This is the same textbook used for Math 1310, 1320. You can also buy just the second half of the book *Multivariable Calculus: Concepts and Contexts* ISBN: 9780495560548 in lieu of the full text.

Linear Algebra & Differential Equations, by Edwards & Penney, ISBN: 9781269425575. This is a custom edition printed for the University of Utah and (unfortunately) can seemingly only be found at the bookstore as a result.

Course website   Canvas will be used regularly for this course. Checking the site often for updates is strongly recommended. It can be access via my website or at:

http://utah.instructure.com/courses/386763.

Technology   **Calculators will not be allowed on quizzes or exams**, but the use of technology is strongly encouraged otherwise. You are *not* expected to have prior programming experience, but will be encouraged to run snippets of code that will be provided in lecture and lab. These snippets will often provide an aid to the theory either through easing computation or visualization.

Grading   The grade for each student will be calculated by the following breakdown:

homework (10%) + lab (12.5%) + quizzes (12.5%) + project (10%) + exams (2x15=30%) + final (25%).

Lab   Although there is no structured lab time for this class, we will use Thursdays as though it were a lab period. During this time, the students will discuss worksheets that focus on applications of the theory currently discussed and the worksheet will be due the week after. **Attendance to the lab section is required**.

Homework   Homework assignments will be given either at the end of class or on Canvas. A subset of the problems will be selected to be turned in weekly (likely every Wednesdays) and will be **graded for both completeness and correctness**, but all of the problems assigned are recommended to the student to attempt and are considered "fair game" for material on exams and quizzes. Questions about homework can be asked in lecture *prior* to the homework being due. **Late homework will not be accepted.**

Quizzes   Quizzes will be every Friday unless noted otherwise. They will be approximately 15-20 minutes in length and given at the beginning of class. They will cover the material discussed in class since the previous quiz. **There will be no make-up quizzes but the lowest quiz grade will be dropped from every student's score.**

Project	Early in the semester, students will receive a list of possible projects dealing with various applications of PDEs, including chemical reactions, traffic, and beam deflections. These problems will be very difficult and involved to solve, but will be broken down into steps to allow the student to develop and utilize their knowledge from this course and previous. A week before the end of the semester, a full-writeup will be required. **Students must turn in something for the project to pass the course.**
Exams	There will be two in-class mid-term exams. They are **tentatively** scheduled for the **weeks of June 6ᵗʰ and July 5ᵗʰ**. Exact dates will be announced closer to the exam and will be determined based on the pace of the course. **There will be no make-up exams unless the student has a Dean's note.**
Final exam	All students are expected to take the **comprehensive** final exam and **cannot** pass the course without taking it. The room will be the usual meeting place (WBB 617). **Students with conflicts should speak to the instructor as soon as possible but unless it is an absolute emergency no student will be allowed to take the final exam early.**

<div align="center">

FINAL EXAM: FRIDAY, AUGUST 5, 2016 10:00 − 12:00 PM

</div>

Resources	The math department offers free drop-in tutoring for students. The center is located underneath the walkway between LCB and JWB and can be accessed by entering either building. They are open M-Th 8:00 AM-8:00 PM and F 8:00 AM-6:00 PM.
	The math department offers relevant videos lectures which can be found at:
	http://www.math.utah.edu/lectures/ http://www.youtube.com/playlist?list=PLkfmuPOLLnthHE9ICNdGgdgIi16-M80ZS
Cheating	If a student is caught cheating on any homework, quiz, or exam, they will automatically receive a 0 for that assignment. **Depending on the severity of the cheating, the student may immediately fail the class.**
ADA statement	The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If a student needs accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with the student and the instructor to make arrangements for accommodations. All information in this course can be made available in alternative format with prior notification to the Center for Disability Services.
Schedule	The following schedule is **tentative** and very likely to change with the pace of the course. Students will be alerted of any changes. **key:** S = Stewart, E&P = Edward and Penney.

Week 1: S12.1 - S12.5 – double integrals, iterated integrals, general regions
Week 2: S12.6 - S12.9 – surface area, triple integrals, coordinate changes
Week 3: S13.1 - S13.4 – vector fields, line integrals, Green's theorem
Week 4: S13.5 - S13.8 – curl & divergence, surface integrals, Stokes', Divergence Theorem
Week 5: E&P 12.1 - E&P 12.3 – heat equation, transport in 1D   **(exam 1)**
Week 6: E&P 12.4 - E&P 12.5, E&P 4.6, E&P 4.10 – boundaries, orthogonality, inner products
Week 7: E&P 13.1 - E&P 13.5 – heat equation with boundaries, Laplace's equation on rectangle
Week 8: E&P 14.1 - E&P 14.4 – Fourier series, sine and cosine series   **(exam 2)**
Week 9: E&P 15.1 - E&P 15.5 – 1D wave equation, vibrating membrane
Week 10: E&P 16.1 - E&P 16.4 – Fourier transform, heat equation on infinite domain

Note: This syllabus is **not** a binding legal contract. It may be modified at the instructor's discretion at any time with appropriate notice given to the students.