Math 314: Calculus of Several Variables

Winter 2021 – Section 2

Instructor: Tuan Pham
Course Credits: 3
Class meetings: 5:00 - 6:15 PM on Tuesday and Thursday at JKB 3108. Those who are unable to attend the class in person can join online at

https://byu.zoom.us/j/94971333489?pwd=MElLWGZ4dkhYQVhnajJ5UDhkc2RQZz09

Email: tuan.pham@mathematics.byu.edu

Couse website:
http://math.byu.edu/~tpham/Courses/W21-Math-314-Sec2/W21-Math-314-Sec2.html

Learning Suite:
https://learningsuite.byu.edu/.gsaY/cid-H3F4ctn7wZqi/home

Office: TMCB 306, **phone:** 801-422-7873

Office Hours: held on Zoom on MWF 4:00 - 5:00 PM and TTh 3:30 - 4:45 PM with the link as follows (different from the class-meeting link above):

https://byu.zoom.us/j/4429506864?pwd=bXAwWUVIWFlzSzdzdVVMSG9QTHYxdz09

Textbook: "*Multivariable Calculus*", 9th Edition by Stewart, Clegg, and Watson.
DO NOT BUY THE TEXTBOOK. Our department has negotiated access to the textbook online as well as the online assignments for a basic tuition fee. This is done through the program Webassign. Your BYU student financial account will be directly charged $25 later in the semester, which covers full access to all of the required materials. This is very cheap compared to the $125 students used to pay for the book and online homework. Your account will not be charged if you drop the course before the add/drop deadline. You need to get registered into Webassign by go to webassign.net, then click on 'Enter class key', then enter the following code:

byu 8237 5546

Course Description: This course is analogous to Math 112 except that you will learn about functions of more than one variable. Thus comes the name of the course. You

will learn how to do calculations on functions of several variables, for example: take derivatives, integral, and find local minimum, maximum, and so on. You will learn very interesting applications in real life, for example: computing the length, area, volume of a general object, or finding the total flux of water coming out of a surface. This course is highly suitable for all who are interested in (but not limited to) science and engineering. The prerequisite is Math 113.

Other Learning Resources:

1. The last section of the textbook (the ebook version in WebAssign) has detail solutions to all the odd problems. You can read them if you get stuck.

2. From time to time, we will use a mathematical software called Mathematica to visualize multivariable functions. You can also use it to double check your answers in homework problems. The instruction to install Mathematica will be given on Page 4 of this syllabus.

3. Math Lab is open for online and in-person service. That is a great place for you to ask questions besides office hours. Please check out this website to know how: https://math.byu.edu/?page_id=193.

4. If you would like to discuss with other students in the class, you can post your questions using the Digital Dialog tab in Learning Suite.

Learning Outcomes: Upon completion, a successful student will be able to:

1. Understand conceptually the limit, partial derivatives, double integral, triple integral of a multivariable function.
2. Know the basic techniques to compute partial derivatives, especially the Chain Rule.
3. Know the basic techniques to compute double/triple integrals: change of variables, Jacobian matrix, Riemann sum, etc.
4. Know how to apply to certain real-life problems: expressing the length of a curve, area of a surface, volume of a shape as an integral, or finding local extrema of a function using Lagrange multiplier method.

Grading:
Written homework: 25%
Online homework (optional): 6%
Midterm 1: 25%
Midterm 2: 25%
Final Exam: 25%

Written homework: submitted on Learning Suite. A schedule of written homework assignments was posted on the course website and Learning Suite.
Policy: you work on your own paper, then take a picture (please make sure that it is clear enough to read) and upload it on Learning Suite. Typing would be great, but not

required. You are encouraged to work together. However, homework must be written individually in your own words and reflect your own understanding.

Each homework set is worth 20 points. The lowest 4 scores will be dropped. Only a few selected problems will be graded in detail. The rest will be given credit based on completion.

If you experience extended illness, injury, hospitalization, or other major disruption during the semester and cannot complete your work, please speak to your instructor. Special accommodations may be able to be arranged on a case by case basis.

Online homework: this is for extra credit. A schedule of online assignments was posted on Learning Suite and WebAssign. You will need to enroll yourself to WebAssign to be able to see those assignments. See the instruction above to know how to enroll yourself. **Policy:** These assignments are strictly multiple choice or fill-in-the-blank. For each assignment, you can submit up to 50 times. There are 3 'batches' of online assignments. The first batch is due on the last day of the first midterm. The second batch is due on the last day of the second midterm. The third batch is due on the last day of the semester. *Doing those online assignments will not only prepare you for the exam but also help you earn extra credits.* You don't need to do *all* the online assignments to receive extra credits. The more assignments you do, the more extra credits you get (up to 6%).

Midterm Exam: there will be two midterm exams submitted online. More detail instructions will be given later during the course.

- Midterm 1: Feb 10 – 12
- Midterm 2: Mar 16 – 18

Policy: No note cards or calculators allowed. The first midterm covers the material from the beginning to Section 14.1. The second midterm covers the material from Section 14.2 to Section 15.7.

Final exam: Apr 16 – 21 submitted online. More detail instructions will be given later during the course.
Policy: No note cards or calculators allowed. The Final exam covers the material from Section 15.8 to Section 16.9.

Grade lines: the course grades will not be harder than: A 93%, A- 90%, B+ 87%, B 83%, B- 80%, C+ 77%, C 73%, C- 70%, D+ 67%, D 63%, D- 60%.

Preventing Sexual Harassment: Title IX of the Education Amendments of 1972 prohibits sex discrimination against any participant in an educational program or activity that receives federal funds. The act is intended to eliminate sex discrimination in education and pertains to admissions, academic and athletic programs, and university-sponsored activities. Title IX also prohibits sexual harassment of students by university

employees, other students, and visitors to campus. If you encounter sexual harassment or gender-based discrimination, please talk to your professor; contact the Equal Employment Office at 801-422-5895 or 1-888-238-1062 (24-hours), or http://www.ethicspoint.com; or contact the Honor Code office at 801-422-2847.

Students with Disabilities: BYU is committed to providing reasonable accommodation to qualified persons with disabilities. If you have any disability that may adversely affect your success in this course, please contact the University Accessibility Center at 422-2767. Services deemed appropriate will be coordinated with the student and instructor by that office.

Get access to Mathematica

There are two methods to get access to Mathematica.

Method 1: (cloud based, no installation required)

- Go to https://byuapps.cloud.com/
- Sign in with your Net ID. Make sure to include '@byu.edu' at the end.
- On the left panel, click on Apps, then All Apps. Scroll down to locate Wolfram Mathematica.

Method 2: (installation on your own computer)

- Go to https://software.byu.edu/mathematica
- Click on platform (Window or Mac) that is compatible with your computer. The download will start.
- Meanwhile, click on the link 'Product Key'. It will takes you to the Sign-in/ Sign-up page. Create a Wolfram Alpha account if you haven't had one. Make sure to use your NetId@byu.edu email to sign up.
- Check your BYU email. You should receive an activation code from Wolfram Customer Support.