Math 2110: Calculus III

MTWR 12:45-2:05 in Dunn Hall 123

Instructor:
Conner Griffin
Dunn Hall 143
cgrffn11@memphis.edu

Office Hours: 2:05-3:30 Monday and Wednesday or by appointment. Office hours over zoom are also possible if you prefer.

Course Content: Major topics include three dimensional Euclidean space and it's algebra; curves and surfaces in three dimensional space; the calculus of vector valued functions; the calculus of multivariate real valued functions; arc-length and surface area; optimization problems and Lagrange multipliers; change of variables; vector fields; line and surface integrals; generalizations of the fundamental theorem of calculus.

Prerequisite: Math 1920 with a grade of C or better

Course Objectives: The main objective of this course will be to develop a mastery of the basics of multivariate calculus including practical problems inspired by physics and other subjects. There will also be a focus on improving students' mathematical reading comprehension, logical reasoning, and analytical writing.

Course Materials: Textbook, Calculus, Early Transcendentals Volume I, 8th ed. by James Stewart

Disabilities: Any student who anticipates physical or academic barriers based on the impact of a disability should contact Disability Resources for Students (DRS) at 110 Wilder Tower, 901.678.2880 at the earliest opportunity. DRS coordinates access and accommodations for students with disabilities. You must give your instructor a copy of any accommodation memos provided by the DRS within the first week of class.

Attendance: Attendance is important and is a factor in your participation grade. Every student is required to be in class, on time, and stay for the entire class period for each class session. If you miss class you are responsible for finding out what topics were covered.

Grading Policy: Final grades will be on a 10 point scale: 90-100%, A; 80-89%, B; 70-79%, C; 60-69%, D; and anything lower than 60% is an F. The various graded work will be weighted as follows:

10%   Participation
25%   Homework
15%   Written Project (1)
30%   Exams (2)
20%   Final Exam (comprehensive)

Homework: I will be writing the homework myself meaning that there will be NO online homework. So, don't purchase WebAssign. Homework will be assigned for each section of the text and must be finished before the due date for you to receive credit. As long as we are on schedule, there will be some dedicated class time to working on homework together. All homework will be due in class a week after it is assigned.

Quizzes: For each section there will be a 2 question reading quiz prior to the first lecture of that section. You will have 15 minutes to complete it. The quiz will be based on the course notes which I will distribute at least a week in advance. The questions will be short response (2-3 sentences). Completion of the quiz counts towards your participation grade.

Exams: Each exam is worth 100 pts. The use of a calculator is not permitted for exams. For each exam (except the final) there will be a take home bonus worth 10pts. The bonus will be 5 questions that are 2 pts each. The bonus will be graded based on completion rather than correctness.

Written Project: This project will have a substantial written component. You will also be required to produce some computer calculations and graphics using MatLab or Mathematica, which are available to you through the university. These projects will be quite serious and are intended to prepare students for advanced math classes or careers which rely on mathematical communication. I am available to help with MatLab or Mathematica. The information for the project will be distributed the day of the first exam and will be due two weeks after that.

Make-ups for Exams: If you must miss a test let me know and we can schedule a make-up exam. In extraordinary cases we may agree to re-weight the other work if a make-up exam is not possible.

Final Exam: The comprehensive final is mandatory. You will be allowed a cheat sheet no larger than one side of an 8.5"x11" (standard printer paper size) piece of paper. The use of a calculator is not permitted. There will be no bonus problems for the final exam.

Important dates:
- First Day of class: May 31, 2022
- Break: July 4, 2022
- Last Day of Class: August 4, 2022
- Final Exam: August 5, 2022

Course Schedule: All dates are subject to change. If we deviate from it at all I will let you know.

Monday	Tuesday	Wednesday	Thursday
	May 31 Three dimensional Euclidean space The dot product	June 1 The cross product	June 2 HW 1 assigned Vector-valued functions Curves and surfaces
June 6 Derivatives and integrals of vector-valued functions	June 7 Arc-length and curvature	June 8 HW1 group work	June 9 HW 1 due HW 2 assigned Multivariate real-valued functions
June 13 Partial derivatives	June 14 Tangent planes and linear approximation	June 15 HW2 group work The chain rule	June 16 HW 2 due HW 3 assigned Directional derivatives The gradient vector
June 20 Maximum and Minimum values	June 21 Lagrange Multipliers	June 22 HW3 group work	June 23 HW 3 due HW 4 assigned Exam 1 review
June 27 Exam 1 Written Project assigned	June 28 Double integrals over rectangles (introduction to iterated integrals)	June 29 HW 4 group work Iterated integrals	June 30 HW 4 due HW 5 assigned Double integrals over general regions and in polar coordinates
July 4 No class	July 5 Applications of double integrals	July 6 HW 5 group work Surface area	July 7 HW 5 due HW 6 assigned Triple integrals
July 11 Written Project due Triple integrals in cylindrical coordinates	July 12 Triple integrals in spherical coordinates	July 13 HW 6 group work Change of variables in multiple integrals	July 14 HW 6 due HW 7 assigned Exam 2 review

July 18	July 19	July 20	July 21
Exam 2	Vector fields Line integrals	HW 7 group work The Fundamental Theorem of Line Integrals	HW 7 due HW 8 assigned Green's Theorem
July 25 Curl and Divergence	July 26 Parametric surfaces and their area	July 27 HW 8 group work	July 28 HW 8 due Surface integrals
August 1 Stokes' Theorem	August 2 The Divergence Theorem	August 3 Final Exam review	August 4 Final exam review