

MTH 357-01 (12772): Advanced Calculus

Fall 2021; TR, 11:00 – 12:30; Room: 416 MSB

Instructor: Dr. Daniel Coffield, Email: dcoffiel@umich.edu, Office: 403C MSB

Office Hours: MW 11:00 am – 12:30 pm or by appointment (in-person or Zoom)

Administrative Support: Room 196 MSB expansion, phone: 810-766-6735

1 Topics

- *Vector Calculus*: gradient, divergence, curl, line and surface integrals, Green's Theorem, Stokes' Theorem, Gauss Divergence Theorem, applications.
- *Fourier Analysis*: Fourier Series, Fourier Integrals, Fourier Transforms, applications.
- *Partial Differential Equations*: Wave equation, Heat Equation, Laplace equation, solution techniques.

2 Prerequisites

MTH 222 with a grade of C (2.0) or better; MTH 305 with a grade of C (2.0) or better or concurrent election of MTH 305.

3 Textbook

Advanced Engineering Mathematics by Erwin Kreyszig. I will use the 10th edition, but you may use any version. We will cover parts chapter 9-12.

4 Class meetings & Attendance

Our class will meet at the scheduled times, in person, following all university guidelines. I will not take attendance, but expect you to attend every class. It is nearly impossible to succeed in this class without regular attendance. The classroom will be my primary mode of communication and you are responsible for all information given in class.

5 Office Hours & Contacting Me

Email is the best way to contact me. My office hours are listed at the top of this document. This means I will be in my office at the posted times, or you can email me to make an appointment for an in-person or Zoom meeting.

6 Homework

Homework will be assigned through WeBWork for the first few weeks and after that it will be posted as a pdf on Canvas. Homework must be submitted before the deadline and there is no make-up homework or extra credit.

7 Exams

There will be two in-class exams and a final exam. The tentative dates for the in-class exams are shown in the course schedule. These dates may change and it is your responsibility to find out the actual date of all exams. Make-up exams will only be given in extreme circumstances with a valid excuse. If you do not have a valid excuse, as determined by me, you forfeit those points and receive a 0. A valid excuse almost always requires documentation and communication sent to me before the exam begins.

8 Evaluation

Your final grade will be determined as follows: 55% for homework, 12.5% for each in-class exam, and 20% for the final exam. I will use the following grading scale: $A : 93 - 100$; $A^- : 89 - 92$; $B^+ : 85 - 88$; $B : 81 - 84$; $B^- : 77 - 80$; $C^+ : 73 - 76$; $C : 69 - 72$; $C^- : 65 - 68$; $D^+ : 61 - 64$; $D : 57 - 60$; $D^- : 53 - 56$; $E : < 53$.

9 Technology

You will probably need a calculator. You also need to have internet access and should check WebWork, your UM-Flint email, and Canvas regularly. Mathematica is a useful tool that we will use throughout the course so you should familiarize yourself with it as soon as possible. Mathematica is available in the campus labs and through labanywhere.umflint.edu.

10 Your Responsibilities

- Attend every class, do all the homework, and don't get behind.
- Get your questions answered, in class and/or in office hours.
- If you are struggling, get help as soon as possible. Come talk to me!
- Participate in class and ask questions.

11 Classroom Policies

- All university COVID-related guidelines must be followed at all times.
- I expect you to be on time ready to begin at the appropriate time. Tardiness is disruptive to the class. I understand that sometimes unforeseen circumstances can cause you to be late. If that is the case, please be as respectful and non-disruptive as possible when entering the classroom. The same is true for leaving class early. If you must leave early, please let me know before class.
- Laptops/tablets may be used for classwork only; cell phones off and put away; no eating (a beverage is fine).
- No chatting during the lecture. However, participation will be encouraged on a daily basis.
- Please respect me and your classmates and we will respect you.

12 Academic Integrity Policy

Please familiarize yourself with the university's academic integrity policies, which can be found here: catalog.umflint.edu/content.php?catoid=31&navoid=3475#Student_Rights_and_Responsibilities

13 Disability and Accessibility Support Services (DASS)

The University of Michigan–Flint strives to make learning experiences as accessible as possible and complies with Section 504 of the Rehabilitation Act of 1973 and the American with Disabilities Act. The university provides individuals with disabilities reasonable accommodations to participate in educational programs, activities, and services. Students with disabilities requiring accommodations to participate in class activities or meet course requirements must self-identify with Disability and Accessibility Support Services as early as possible at (810) 762-3456 or dassflint@umich.edu. The office is located in 264 University Center, inside the CAPS Office. Once your eligibility for an accommodation has been determined you will be issued an Accommodation Letter. Please present this letter to each faculty member in each class at the beginning of the term, or at least two weeks prior to the need for the accommodation (test, project, etc.).

14 Catalog Description

MTH 357 - Advanced Calculus

MTH 222 with a grade of C (2.0) or better; prior or concurrent election of MTH 303 or MTH 305. (3)

Intended for science concentrators. Fourier series, differential and integral vector calculus. Additional topics chosen from orthogonal functions and partial differential equations. Not offered every semester; see www.umflint.edu/math. Graded ABCDE

15 Schedule

The following schedule is tentative and subject to change. Make sure you are aware of all changes announced in class.

Week of:	Tuesday	Thursday
8/30	Intro	9.7-9.9
9/6	10.1-10.4	10.4-10.6
9/13	10.7, 10.9	10.8
9/20	11.1	11.2
9/27	11.3	11.4
10/4	11.5	Exam 1
10/11	No class	11.6
10/18	11.7	11.8
10/25	11.8	12.1-12.2
11/1	12.3	12.3
11/8	12.4	12.5
11/15	12.6	Exam 2
11/22	12.7	No class
11/29	12.8	12.9
12/6	12.10	Review
12/13	No class	Final Exam

Final Exam: Thursday, 12/16/21, 10:30 AM - 1:00 PM