MA1024 - C Term - 2022

Lecture (CL06): MTRF, 11-11:50pm, GH227

Conference(CD06): F, 2-2:50pm, SH304

Lab: Individual Lab Section CX*

Instructor:	Dr. William C. Sanguinet
Email:	wcsanguinet@wpi.edu
Physical Office:	SL405D
Virtual Office (Zoom):	`https://wpi.zoom.us/j/7387271648`
Office Hours:	12-12:50pm MR (In Person), or by appointment 12-12:50pm TF (In Zoom Office), or by appointment

Peer Learning Assistant (PLA AD01):	Dhruv Cheda
Email:	dmchheda@wpi.edu
Virtual Office Hours Time:	TBA
Virtual Office Hours Location:	TBA
Tutoring Center Hours:	TBA

The information in this syllabus is subject to change as the course progresses. Please keep up to date regarding any changes.

Course Logistics: Course content will be organized and posted to Canvas under the **Pages** and the **Modules** tabs. The course content will consist of lecture videos, notes, and/or slides as well as assigned reading material. The lecture videos and other material is created by me and will be posted before the assigned course lecture sessions. This course will be taught in a reverse or "flipped" classroom model. This means that students are responsible for watching the lecture videos and completing the reading assignments (posted on the Canvas Calendar) before their assigned lecture session. During our lecture sessions, I will be reinforcing and expanding upon the material in the lecture videos/reading. During these sessions you will have the opportunity to ask me questions regarding the material so that you get a better and deeper understanding of the material and its value to solving problems in applied mathematics/engineering. As the course progresses we will cover various subsections and topics in chapters 11, 12, 13, 14, 15, and 16 from the course textbook.

Please make sure to check the Calendar on Canvas multiple times each day to follow the assigned material and to stay informed about any updates with regards to scheduling.

Severe Weather/ General Absence Accommodation Plan: Upon declaration of a "Severe Weather Impact" situation or a situation where I cannot personally make it to WPI (for example, due to sickness, etc.) we will have a Virtual Zoom Lecture at the normal class time in my Zoom Office unless you are otherwise notified. In the event that you cannot make it to class please let me know and we can discuss any missed work that you may have to make-up.

Course Description: Calculus is essential for majors in biology, chemistry, computer science, mathematics, physics, engineering, and environmental science and policy.

This course provides an introduction to multivariable calculus. Topics covered include but are not limited to: vector functions (Ch13, Ch14), partial derivatives (Ch14) and the gradient vector field (Ch14), multivariable optimization methods including Lagrange Multipliers (Ch14), double and triple integrals (Ch15), integration with polar coordinates (Ch15), integrating with other coordinate systems and applications (Ch15), line integrals of scalar functions (Ch16), vector fields and line integrals (Ch16).

Recommended background: MA1021-MA1023. I will post links to review material on the Course Canvas Page. It is your responsibility to review and practice this material. Please reach out to me if you need help understanding it. The course will make use of computers, however, no prior programming experience is assumed. For more information on what mathematics you should know before taking this course contact the instructor.

Text: *Thomas' Calculus, Early Transcendentals*, Hass, Heil, Weir (14th edition) published by Pearson
Author(s): J. Hass, C. Heil, M. Weir; **ISBN-10:** 0134439023

About Text: Our text for MA1024 is Thomas' Calculus, Early Transcendentals, by Hass, Heil, and Weir. This is the text that is officially recommended in the mathematics departments calculus syllabi, however, there are many other good resources. Speak to the instructor if you are interested in learning more.

About Text: This is an excellent text. It includes a good amount of extra material that you will find useful in your further studies. Keep it after the course as a good reference book.

Course Objectives:

- To provide students with a good understanding of the concepts and methods used in Multivariable Calculus.
- To develop formal methods of logical reasoning and problem solving by studying how calculus extends to multidimensional Euclidean spaces.
- To introduce and expand upon how to solve real-world multidimensional mathematical modeling problems found in Physics and Engineering (ME, AE, EE, CE, CS) using tools developed from Multivariable Calculus in a multidimensional setting.

Time and study: Besides the time for classes, you will spend time on reading the text, doing the assignments, and studying for quizzes and tests. That comes to about five to nine hours outside of class on average per week, the actual amount varying from week to week. Below is a summary of the typical semesters work:

- Watching lecture video material and reading the relevant book material to prepare for class
- Attending regular class Active Learning Activity sessions (ALAs)
- Doing daily homework assignments
- Meeting with Professor and TA/PLA team for office hours
- Meeting with tutors or in student study groups
- Reviewing for midterm and final
- Midterm and final exam

WebWork Homework: There will be weekly online homework assignments using the WebWork system. This is free of charge, and is a great method of practicing the concepts introduced in the reading, lectures, and ALAs because it gives you instant feedback on how you are doing. Please make sure to **only** access the WebWork through the Canvas page when the assignments are posted, this will ensure that you get registered properly.

Written Homework: There will also be written homework assignments that will be assigned and collected via Canvas. It is your responsibility to submit these assignments on Canvas by the time they are due. The **only** proper submission format is a scanned pdf or Microsoft word document. Do not submit a collection of individual image files, this will not be graded and will receive **zero** credit.

Randomly selected problems from these homeworks will be graded and returned to you afterword. If your work is messy, incomplete, or is generally disorganized, it may not be graded.

Computer Labs: There will be two computer labs posted throughout the term. Lab #1 will be posted in Week 2 and Lab #2 will be posted in Week 4 of the course.

Midterm and Final Exam: There will be one Midterm during the term and one Final Examination during the last week. The exams will be virtual and proctored in Zoom. You will need to have a camera that fully shows your workspace and your person that is connected for the duration of the exam and submission period. The Final is cumulative, but post-midterm material will be emphasized. The tests are closed book, no calculators, and 1 notesheet is allowed. You can leave your answers in terms of algebraic expressions on tests.

- Midterm will be on **Friday, February 4th, 7-8:30pm**, Location: TBA
- Final Exam will be on **Friday, March 4th, 7-8:30pm**, Location: TBA

Grade Distribution:

The course grade will be based on 10% for the computer labs, 20% for hand-written homework assignments, 20% for online homework (WebWork), 24% for the midterm, and 26% for the final.

Course Policies:

- **Accessibility Services:** The University is committed to providing students with documented accommodations equal access to all university programs and facilities. If you require academic accommodations, you must register with The Office of Accessibility Services (OAS). If you are registered with OAS, and qualify for accommodations that you would like to utilize in this course, please request those accommodations through OAS in a timely manner. For information, please contact the director of OAS at WPI.

- **Grades**

  - Grades in the **C** range represent performance that **meets or is below expectations**, on a standard curve this is typically 70%-79%; Grades in the **B** range represent performance that is **meets or is better** than expectations, on a standard curve this is typically 80%-89%; Grades in the **A** range represent work that is **better than or substantially exceeds** expectations, on a standard curve this is typically 90%-100%.

- **Assignments**

  - Students are expected to work independently. **Offering** and **accepting** solutions from others is an act of **plagiarism**, which is a serious offense and **all involved parties will be penalized according to the Academic Honesty Policy**. Discussion among students is encouraged, but when in doubt, direct your questions to the professor or teaching assistant.

- **Attendance and Absences**

  - Students are responsible for all missed work, regardless of the reason for absence. It is also the absentee's responsibility to get all missing notes or materials.

Academic Honesty Policy Summary:

Introduction

In addition to skills and knowledge, The University aims to teach students appropriate Ethical and Professional Standards of Conduct. The Academic Honesty Policy exists to inform students and Faculty of their obligations in upholding the highest standards of professional and ethical integrity. All student work is subject to the Academic Honesty Policy. Professional and Academic practice provides guidance about how to properly cite, reference, and attribute the intellectual property of others. Any attempt to deceive a faculty member or to help another student to do so will be considered a violation of this standard.

Instructor's Intended Purpose

The student's work must match the instructor's intended purpose for an assignment. While the instructor will establish the intent of an assignment, each student must clarify outstanding questions of that intent for a given assignment.

Unauthorized/Excessive Assistance

The student may not give or get any unauthorized or excessive assistance in the preparation of any work.

Authorship

The student must clearly establish authorship of a work. Referenced work must be clearly documented, cited, and attributed, regardless of media or distribution. Even in the case of work licensed as public domain or Copyleft, (See: http://creativecommons.org/) the student must provide attribution of that work in order to uphold the standards of intent and authorship.

Declaration

Online submission of, or placing one's name on an exam, assignment, or any course document is a statement of academic honor that the student has not received or given inappropriate assistance in completing it and that the student has complied with the Academic Honesty Policy in that work.

Consequences

An instructor may impose a sanction on the student that varies depending upon the instructor's evaluation of the nature and gravity of the offense. Possible sanctions include but are not limited to, the following: (1) Require the student to redo the assignment; (2) Require the student to complete another assignment; (3) Assign a grade of zero to the assignment; (4) Assign a final grade of "NR" for the course. A student may appeal these decisions according to the Academic Grievance Procedure. (See the relevant section in the Student Handbook.) Multiple violations of this policy will result in a referral to the Conduct Review Board for possible additional sanctions.

The full text of the Academic Honesty Policy is in the *Student Handbook*.

Data for Research Disclosure: Any and all results of in-class and out-of-class assignments and examinations are data sources for research and may be used in published research. All such use will always be anonymous.