

ENGINEERING MATH II
MATH:1560
SPRING 2024
The University of Iowa
The College of Liberal Arts and Sciences
Department of Mathematics

This syllabus contains the policies and expectations for this course. This course is offered by the [Department of Mathematics](#).

Course ICON Site

To access the course site, log into [Iowa Courses Online \(ICON\)](https://icon.uiowa.edu/index.shtml) (<https://icon.uiowa.edu/index.shtml>) using your Hawk ID and password. **Regardless of the lecture or discussion section you are enrolled in, you will be using the ICON course for MATH:1560.** Assignments, handouts, announcements, and grades will be posted on ICON. It is important that you check ICON regularly.

Course Home

The College of Liberal Arts and Sciences (CLAS) is the home of this course, and CLAS governs the add and drop deadlines, the “second-grade only” option (SGO), academic misconduct policies, and other undergraduate policies and procedures. Other UI colleges may have different policies.

Course Instructor:

Dr. Olga Sokratova

Office hours: MWF 10:30-11:30 am, and by appointment

Office location: 225 K MLH

Phone: 319-335-3873

E-mail: olga-sokratova@uiowa.edu

Course E-mail: *All course related email should be sent to:* math-1560@uiowa.edu.

Lecture Information

Each student is enrolled in one of the following lecture:

Lecture 000A: 12:30 – 1:20 pm, MWF, W290 CB

Lecture 000B: 1:30 – 2:20 pm, MWF, W290 CB

Discussion Section Information

Each student is also enrolled in one discussion section. These discussion sections are taught by instructors who are graduate students in the Department of Mathematics.

The meeting time, classroom information, and instructor information for each section follows. Instructor office hours and Math Lab hours will be posted on ICON.

Section 0001: 8:30 – 9:20 am TTh, 117 MLH TA: Kevin Wang TA Email: Office Hours: Math Lab Hours:	Section 0002: 9:30 – 10:20 am TTh, 117 MLH TA: Kerry Tarrant TA Email: Office Hours: Math Lab Hours:
Section 0003: 10:30 – 11:20 am TTh, 117 MLH TA: Kerry Tarrant TA Email: Office Hours: Math Lab Hours:	Section 0004: 3:30 – 4:20 pm TTh, 117 MLH TA: Alex Korotkov TA Email: Office Hours: Math Lab Hours:
Section 0005: 12:30 – 1:20 pm TTh, 117 MLH TA: Ian Ramsey TA Email: Office Hours: Math Lab Hours:	Section 0006: 1:30 – 2:20 pm TTh, 117 MLH TA: Kevin Wang TA Email: Office Hours: Math Lab Hours:
Section 0007: 2:30 – 3:20 pm TTh, 117 MLH TA: Zhihua Li TA Email: Office Hours: Math Lab Hours:	Section 0008: 11:30 am – 12:20 pm TTh, 117 MLH TA: Kevin Ramos TA Email: Office Hours: Math Lab Hours:
Section 0009: 4:30 – 5:20 pm TTh, 117 MLH TA: George Kennedy TA Email: Office Hours: Math Lab Hours:	Section 0010: 5:30 – 6:20 pm TTh, 117 MLH TA: Ashwin Kutteri TA Email: Office Hours: Math Lab Hours:

DEO Contact Information: Ryan Kinser 14 MLH, ryan-kinser@uiowa.edu

Course Description

This is the second semester of a five-semester mathematics sequence for engineering students. Topics include parametric equations for curves, vector geometry, functions of several variables, partial derivatives, tangent planes, maxima and minima, multiple integrals, vector fields, Green's Theorem, and Power Series. The course does not cover three-dimensional surfaces. Computers are used to visualize functions and to operate on these functions.

Course Prerequisites

MATH:1550 with a minimum grade of C- OR MATH:1850 with a minimum grade of C- OR Advance Math Placement Test (AMPT) score of 15 or higher.

Objectives and Goals of the Course

Students who master the core course concepts will be able to:

- Define explicit, implicit, and parametric representations of curves and surfaces.
- Find the line tangent to a curve when it is defined explicitly, implicitly, or parametrically.
- Calculate partial derivatives of functions in 2 variables.
- Find the plane tangent to a surface when it is defined explicitly.

- Define what it means for a function to be “smooth.”
- Determine when a function is “smooth.”
- Calculate the area of a region in the plane or the volume of a surface in space using iterated definite integrals.
- Calculate the arc length of a curve.
- Calculate the flow out of a vector field along the boundary of a compact region in the plane.
- Calculate the swirl (i.e. the two-dimensional curl) of a vector field in the plane.
- Determine when an infinite series is convergent.
- Use Taylor series to approximate, integrate, and differentiate functions.

In the bigger picture, this course will help you develop mathematical reasoning skills beyond symbol manipulation. A successful student will also develop professional skills such as the ability to read and understand technical material independently.

Each week, smaller learning objectives will be listed for each module. These smaller learning objectives will help you identify the key concepts you need to master and the types of problems you will be expected to complete on quizzes and exams. The smaller learning objectives will fall into one of the broader course objectives listed above.

Course Format

This course meets in lecture three days per week and in a discussion section two days per week. Our goal is to use active learning techniques to help you master the material. During the lecture periods, we will be discussing new material and exploring examples. You will work in groups and discuss ideas with your peers. In addition, you will be answering questions using Top Hat, a classroom response system (sometimes called “clickers”), that will help you assess your learning immediately. During discussion sections, you will be working together with your classmates to complete activities and clarify important points made during the previous one or two lecture periods. The lectures and discussion sections are designed to complement each other. Therefore, it is expected that you attend and participate fully in both.

Role of Teaching Assistants

Your teaching assistant (TA) will lead your discussion sections and will be your first point of contact for most course questions. Your TA will hold weekly office hours during the week and will be available for you to ask questions about the homework or go over quizzes and exams. You can visit your TA without an appointment during office hours although your TA may ask you to reserve a time slot. TAs will also work several hours in the Math Tutorial Lab, and you are welcome to drop in there without an appointment too. Office hours and times in the Math Tutorial Lab will be announced in your discussion section.

Required Course Materials

For this course, you are required to have:

1. Textbook: *Advanced Calculus Using Mathematica*, .nb Edition, by Keith Stroyan, ISBN: 097877638
 - Students are able to install the student version of Mathematica free of charge using the University of Iowa’s site license for Mathematica.
 - Complete instructions for accessing the textbook will be provided on the course ICON page.
2. Access to a Top Hat account for responding to questions during class meetings. (Billed to UBill and available through ICON.)
 - Directions for setting up and accessing your Top Hat account are available in the “Getting Started” Module in ICON.
3. Gradescope Account. Available to you through ICON. You will not need to pay for this access.

If you have any trouble gaining access to these materials please inform Dr. Farthing, Dr. Mitchell, or your TA as soon as possible. It is important to have access to the course material from the first day of class, and we can help you solve any problems.

Technology Requirements

1. A reliable Internet connection.
2. Access to the University of Iowa computer system and your Learning Management System, ICON.
3. A scanner or scanning app that will allow you to scan multiple pages into a single pdf document. Microsoft OneDrive has a scanning feature and is available to all UI students through Office 365. (Feel free to use other apps or programs.)

Course Material

Most of Chapters 1 through 4, chapters 8 through 13, and chapter 21 will be covered in this class.

Additional Resources

- The **Math Tutorial Lab** in 125 MacLean Hall offers free, drop-in tutoring for students enrolled in this class. Schedule and information about the Math Tutorial Lab is available at <https://math.uiowa.edu/math-tutorial-lab>.
- **Engineering Tutoring** provides group tutoring and tutor-led exam review sessions to students taking this course. Tutoring is available Sunday – Thursday, 6:00pm – 9:00pm, in 3612 SC. It is a free, drop-in service, so you do not need to schedule an appointment; they show up, sign-in, and receive the assistance they need. Additional information is available at <https://engineering.uiowa.edu/current-students/academic-support-and-tutoring/engineering-tutoring>.
- There are a variety of other places on campus where you can go for help with this course. Visit <http://tutor.uiowa.edu> for more information.

Exam Dates

To be announced	Exam 1
To be announced	Exam 2
Week of May 6	Exam 3 (Date and time will be announced in September.)

Grading Policy

This course uses criterion-reference grading. This means that your grade is determined by how well you demonstrate that you have mastered the learning objectives of the course – not on how well you do in relation to your peers. With criterion-reference grading, it is possible for everyone to get an A in the course! Your grade will be determined by 2 midterm exams, a final exam, midpoint quizzes, weekly homework assignments, Top Hat (clicker questions), Discussion Activities and Labs. The following weights will be given to these items.

Exam 1	50 points
Exam 2	60 points
Exam 3 (Final)	70 points
Quizzes (3 @20 points each)	60 points
Homework (12 @10 pts each, drop 1)	110 points
Top Hat Questions	30 points
Discussion Section Activities (15@2 points each)	30 points
<u>Labs (9 @ 5 points each, drop 1)</u>	<u>40 points</u>
TOTAL	450 points

Grading Scale

The following grading scale will be used to determine grades.

Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
Minimum Percentage	93	90	87	83	80	77	73	70	67	63	60	0
Minimum Points	418	405	391	373	360	346	328	315	301	283	270	0

Absence Notification Policy

If you must be absent from a lecture or a discussion section for any reason, it is your responsibility to check ICON to get the notes, watch recordings from the class, and complete Top Hat questions.

If your absence will require you to make up a quiz or test or request an assignment due date change because of an extended illness please do the following:

1. Complete the Student Absence Form in [ICON](#).
2. Email math-1560@uiowa.edu about the absence and arrange to make up any missed assignments. Whenever possible, please inform your instructors before the assignment is missed, and please try to arrange the time to make up the assignment within 24 hours of the absence. In general, you'll need to complete the make-up within a week.

If your absence will require you to make up an activity or a lab please do the following:

1. Complete the Student Absence Form in [ICON](#).
2. Email your TA to arrange to make up any missed assignments.

The Student Absence Form and additional attendance policies (including what to do if you need to miss five or more consecutive days of class) is available at <https://registrar.uiowa.edu/absence-class>.

Grade Components

Exams

There will be three exams throughout the semester; the last exam will be during Exam Week. Exam 1 will be worth 50 points; Exam 2 will be worth 60 points, and Exam 3 will be worth 70 points.

Exams 1 and 2 in the middle of the semester will be in the evening outside of normal class times. You should try to arrange work and extra-curricular activities around these exam times. Alternate arrangements will be made for students who have a class scheduled during exam time or another approved reason for rescheduling the evening exam. The final exam will be given during the two-hour exam period for this course announced during the fifth week of the semester. Make-up exams will only be given for excused absences.

For each exam, you will be able to prepare and bring with you a reference sheet to use during the exam. You may use both sides of an 8.5 in x 11 in sheet of paper for the reference sheet. You may put whatever information you would like on the reference sheet, and it may be typed or handwritten.

Quizzes

Three quizzes will be given throughout the semester during discussion sections on Thursdays. Each quiz will be worth 20 points. There will be one quiz before exam 1, one quiz between exam 1 and exam 2, one quiz between exam 2 and exam 3. Make-up quizzes will only be given for excused absences.

Homework

Homework assignments will be given each week and due every week except when there is a course exam. There will be 12 assignments during the semester. The problems assigned represent the minimum number of exercises you should complete. While homework will not be collected daily, you will get more out of it if you attempt problems related to new material soon after it is originally presented in class. Homework will help you practice problems and reinforce course content, but a deeper understanding of the material will be required to do well on quizzes and exams.

Each homework assignment will be worth 10 points and will consist of problems to be worked out on paper or on a tablet. You will upload your completed homework assignments into Gradescope. Homework from the previous week will be due by 11:59 p.m. on Mondays. Each week, we will grade a few questions for a total of 6 points toward your homework score. The remaining 4 points will be determined by the percentage of the problems you completed. Late homework assignments will be accepted for up to two weeks after the due date, but a 10% penalty will be assessed to the missing assignment. At the end of the semester, your lowest homework score will be dropped. This dropped score may include unsubmitted homework.

You are permitted and encouraged to work with others, but you are required to write your own solutions with your own words and notation. You must also acknowledge any help you receive.

Top Hat Questions

During the lectures, you will be using your Top Hat account to indicate you are attending lecture and to answer questions over the lecture material. There will be at least one question during each lecture, and one point will be counted toward your final grade for most class periods. You will earn 0.5 points for each question you answer, and 0.5 points for each question you answer correctly. Top Hat questions will be available until 11:59 p.m. on the Sunday following the class during which they were discussed. You do have the option to change your response.

Discussion Section Activities

During some discussion sections, you will be working in groups to solve problems related to the course material covered in lecture. You will scan your completed activity and upload it to Gradescope. You will be graded on your good-faith effort to complete the activity. You are responsible for ensuring the work on the activity is correct. Activities are due by 11:59 pm on the day of the discussion section. If you need to miss a discussion section, you should talk with your TA for permission to turn in the activity late. During the semester, 15 discussion section activities will be assigned. Each activity is worth 2 points.

Mathematica Labs

During some discussion sections, you will be working in groups to complete activities in *Mathematica* related to the course material covered in lecture. The purpose of these activities is to help you understand the course material and to help you understand how *Mathematica* can perform calculations and help you solve problems. You will upload the completed *Mathematica* file to Gradescope. These labs will be graded on the correctness of the *Mathematica* code and the mathematics involved. There will be 9 labs assigned throughout the semester; each lab is worth 5 points, and at the end of the semester, the lowest lab score will be dropped.

Date and Time of the Final Exam

The date and time of every final examination is announced by the Registrar generally by the fifth week of classes. All students should plan on being at the UI through the final examination period, which is May 6 to 10, 2024. Once the Registrar has announced the date, time, and location of each final exam, the complete schedule will be published on the Registrar's web site and will be shared with instructors and students. It is the student's responsibility to know the date, time, and place of the final exam.

Technology

This course uses *Mathematica* extensively, and it will be a great tool to help you understand the material in the course. Other tools like graphing calculators or other mathematics software such as *Desmos* or *Maple* or *Mathematica* can also be excellent tools and resources. **However, only scientific calculators are allowed on exams.** Please check the Acceptable Calculator list in ICON to make sure your scientific calculator You may use your own scientific or graphing calculator on quizzes. If you choose to use a graphing calculator for homework, please keep in mind that you should not use the graphing capabilities to solve homework problems so that you can learn to solve the problems without the tools of the graphing calculator for exams.

Cell phones may not be on desks or tables during quizzes or exams. You may not use a cell phone as a calculator during a quiz or exam.

Collaboration

You are encouraged to work with others on homework and all in-class activities unless you are specifically instructed not to do so. You may also visit the Math Tutorial Lab or consult online resources. Please be aware that to master the skills needed for this class, a lot of practice is required. To do well on quizzes and exams you will need to work many of these problems multiple times without help. Be sure to test your knowledge by doing much of the homework on your own.

Academic Honesty and Misconduct

We trust you to do your own work, and cheating on exams and quizzes will not be tolerated. Your grade should reflect your level of understanding of the material in this class. By asking others to do work for you, you are only cheating yourself of an opportunity to learn and receive feedback.

All students in CLAS courses are expected to abide by the [CLAS Code of Academic Honesty](#). Undergraduate academic misconduct must be reported by instructors to CLAS according to [these procedures](#).

Student Complaints

Students with a complaint about a grade or a related matter should first discuss the situation with the instructor and/or the course supervisor (if applicable), and finally with the Director or Chair of the school, department, or program offering the course.

Undergraduate students should contact [CLAS Undergraduate Programs](#) for support when the matter is not resolved at the previous level. Graduate students should contact the CLAS [Associate Dean for Graduate Education and Outreach and Engagement](#) when additional support is needed.

Drop Deadline for this Course

You may drop an individual course before the deadline; after this deadline you will need collegiate approval. You can look up the [drop deadline for this course](#) here. When you drop a course, a "W" will appear on your transcript. **The mark of "W" is a neutral mark that does not affect your GPA.** Directions for adding or dropping a course and other registration changes can be found on the [Registrar's website](#). Undergraduate students can find policies on dropping and withdrawing [here](#).

Other Student Expectations

- **Workload:** Expect to spend at least 8 to 10 hours weekly outside of the classroom doing the assignments. More time may be needed to prepare for exams.
- **Classroom Behavior:** I expect that you will treat the others in the class and your instructors with respect.
- **Participation and Preparation:** Please come prepared for class and ready to participate each day. If you must miss a class, it is your responsibility to determine what you missed and what you need to turn in. Students learn in different ways, so it is natural that you may feel like you benefit from certain parts of

the course more than others. However, it is expected that you participate in lecture, discussion sections, and out of class activities (homework, concepts quizzes) equally. The course is designed so that these components complement – not duplicate – each other.

- **Personal Devices:** You will need to bring a smart phone, tablet, or laptop to lecture each day in order to answer Top Hat questions. Therefore, it is expected that you will be using these devices in class. You should bring them charged and ready to use! You will get the most out of lecture and discussion section if you give it your full attention. It is your choice how you want to divide your attention between classroom activities and devices. However, please avoid using these devices with sounds, and refrain from using them in a way that might distract other students. (i.e. watching videos or looking at webpages not related to the course in the line of sight of other students).
- **Technical Difficulties:** You are responsible for starting problems far enough in advance in order to complete the assignment by the due take. Computer problems and other technical difficulties are not a valid excuse for missing a due date. You are also responsible for remembering to bring your computer or phone charged and ready to use in class to answer Top Hat questions.

Changes to the Syllabus

We reserve the right to make adjustments to the syllabus. Any changes will be announced in class and posted on ICON.

Course Schedule

The following schedule is the *approximate* schedule for the course. The exam dates will not change, and we will do our best to stay on schedule. Any changes or updates will be posted on ICON.

	Lecture 1	Discussion 1	Lecture 2	Discussion 2	Lecture 3
Week	Monday	Tuesday	Wednesday	Thursday	Friday
1	1/15/2024	1/16/2024	1/17/2024	1/18/2024	1/19/2024
	No CLASS	Chapter 1 Activity 1	Sections 1.1-1.2	Chapter 1 Activity 2	Section 1.3-1.4
2	1/22/2024	1/23/2024	1/24/2024	1/25/2024	1/26/2024
	Section 1.6 HW 1 Due	Chapter 1 Lab 1	Sections 2.1-2.2	Chapter 1 Lab 2	Section 2.3-2.4
3	1/29/2024	1/30/2024	1/31/2024	2/1/2024	2/2/2024
	Section 2.5 HW 2 Due	Chapter 2 Activity 1	Section 2.6	Quiz 1	Sections 2.7-2.8
4	2/5/2024	2/6/2024	2/7/2024	2/8/2024	2/9/2024
	Section 3.1 HW 3 Due	Chapter 3 Activity 1	Section 3.3	Chapter 3 Activity 2	Section 3.4
5	2/12/2024	2/13/2024	2/14/2024	2/15/2024	2/16/2024
	Section 3.5 HW 4 Due	Chapter 3 Lab 2	Chapters 1-3 Wrap-up	Chapter 3 Activity 3	Section 4.1
6	2/19/2024	2/20/2024	2/21/2024	2/22/2024	2/23/2024
	Review	Exam 1 6:30 to 8:30 pm	Section 4.2	Chapter 4 Lab 2 Chapter 4 Activity 2	Chapter 4 Lab 3 Section 8.1
7	2/26/2024	2/27/2024	2/28/2024	2/29/2024	3/1/2024

	Section 8.3 HW 5 Due	Chapter 8 Activity 1	Section 8.3	Chapter 8 Activity 2	Section 13.2
8	3/4/2024	3/5/2024	3/6/2024	3/7/2024	3/8/2024
	Section 13.2 HW 6 Due	Chapter 8 Activity 3	Chapter 8 Lab 3 Chapters 4,8,13 Wrap-up	Chapter 8 Lab 2	Section 9.1
	3/11/2024	3/12/2024	3/13/2024	3/14/2024	3/15/2024
	NO CLASS SPRING BREAK	NO CLASS SPRING BREAK	NO CLASS SPRING BREAK	NO CLASS SPRING BREAK	NO CLASS SPRING BREAK
9	3/18/2024	3/19/2024	3/20/2024	3/21/2024	3/22/2024
	Section 9.2 HW 7 Due	Chapter 9 Activity 1	Sections 9.4, 9.6	Quiz 2	Section 9.7
10	3/25/2024	3/26/2024	3/27/2024	3/28/2024	3/29/2024
	Section 9.8 HW 8 Due	Chapter 9 Lab 2	Chapter 9 Wrap-up	Chapter 9 Activity 3	Section 10.1 Chapter 10 Lab1
11	4/1/2024	4/2/2024	4/3/2024	4/4/2024	4/5/2024
	Review	Review Exam 2 6:30 to 8:30 pm	Section 11.1	Chapter 11 Lab 1	Section 11.4
12	4/8/2024	4/9/2024	4/10/2024	4/11/2024	4/12/2024
	Section 11.5 HW 9 Due	Chapter 11 Activity 1	Ch11 Wrap Up	Chapter 11 Lab 2	Section 12.1
13	4/15/2024	4/16/2024	4/17/2024	4/18/2024	4/19/2024
	Section 12.3 HW 10 Due	Chapter 12 Activity 1	Section 12.3	Chapter 12 Lab 1	Ch12 Wrap up
14	4/22/2024	4/23/2024	4/24/2024	4/25/2024	4/26/2024
	Section 21.1 HW 11 Due	Chapter 21 Activity 1	Section 21.3	Quiz 3	Section 21.4
15	4/29/2024	4/30/2024	5/1/2024	5/2/2024	5/3/2024
	Section 21.5 HW 12 Due	Taylor Series Practice	Chapter 21 Lab 1 Chapter 21 Wrap-up	Review	Review LAST DAY OF CLASSES
16	5/6/2024	5/7/2024	5/8/2024	5/9/2024	5/10/2024
	EXAM WEEK	EXAM WEEK	EXAM WEEK	EXAM WEEK	EXAM WEEK

College of Liberal Arts and Sciences (CLAS) Course Policies

Attendance and Absences

You are expected to attend all lectures. Lectures will occasionally contain material not covered in the textbook. If you miss a class, you are still responsible for all material discussed and announcements made in class. Attendance will be taken regularly. If you are between two grades at the end of the semester, your attendance record will be used to determine which grade you get.

Exam Policies

University regulations require that students be allowed to make up examinations that have been missed due to illness, religious holy days, military service obligations (including service-related medical appointments), or other unavoidable circumstances or University-sponsored activities. Students with UI-authorized activities must discuss their absences with the instructor as soon as possible. Religious obligations must be communicated within the first three weeks of classes.

Other Expectations of Student Performance: Expect to spend at least 6 hours weekly outside of the classroom doing the assignments. More time may be needed to prepare for exams.

Communication: UI Email

Students are responsible for all official correspondence sent to their UI email address (uiowa.edu) and must use this address for any communication with instructors or staff in the UI community.

Mental Health Resources and Student Support

Students are encouraged to be mindful of their mental health and seek help as a preventive measure or if feeling overwhelmed and/or struggling to meet course expectations. Students are encouraged to talk to their instructor for assistance with specific class-related concerns. For additional support and counseling, students are encouraged to contact University Counseling Service (UCS). Information about UCS, including resources and how to schedule an appointment, can be found at counseling.uiowa.edu. Find out more about UI mental health services at mentalhealth.uiowa.edu.

Student Care and Assistance provides assistance to University of Iowa students who are experiencing a variety of crisis and emergency situations, including but not limited to medical issues, family emergencies, unexpected challenges, and sourcing basic needs such as food and shelter. More information on the resources related to basic needs can be found at basicneeds.uiowa.edu/resources/. Students are encouraged to contact Student Care & Assistance in the Office of the Dean of Students (Room 135 IMU, dos-assistance@uiowa.edu, or 319-335-1162) for support and assistance with resources.

University Policies

Accommodations for Students with Disabilities

The University is committed to providing an educational experience that is accessible to all. If a student has a diagnosed disability or other disabling condition that may impact the student's ability to complete the course requirements as stated in the syllabus, the student may seek accommodations through [Student Disability Services](#) (SDS). SDS is responsible for making Letters of Accommodation (LOA) available. **The student must provide an LOA to the instructor as early in the semester as possible, but requests not made at least two weeks prior to the scheduled activity for which an accommodation is sought may not be accommodated.** The LOA will specify what reasonable course accommodations the student is eligible for and those the instructor should provide. Additional information can be found on the [SDS website](#).

Free Speech and Expression

Absences for Religious Holy Days

[Classroom Expectations](#)

[Non-discrimination](#)

[Sexual Harassment/Misconduct and Supportive Measures](#)