



Differential Equations
MTH 240-001
Fall 2021
Sugar Grove Campus, BDE 240
TTh 8:00am-9:15am

Instructor Contact Information and Availability

Name and Title:	Dr. Steve Kifowit, Instructor of Mathematics (Pronouns: He/Him/His)
Waubonsee Email:	skifowit@waubonsee.edu
Office Location:	Sugar Grove Campus, BDE 249
Office Hours:	DWNTN 356 -- MW 1pm-2pm or by appt. BDE 249 -- TTh 11:30am-12:30pm or by appt. Zoom -- M 6:30pm-7:30pm or by appt.
Phone Number:	(630) 466-6698
Preferred Contact Method:	Email or in-person
Response Time:	During weekdays, please allow for up to 24 hours for email response.

Course Description

This course is designed to introduce basic theory, techniques, and applications of differential equations. Several types of differential equations will be solved including linear equations of first and second order, exact equations, separable equations, non-linear equations, and partial differential equations. Methods of solution will include variation of parameters, undetermined coefficients, series solutions, numerical solutions, graphical solutions, and the Laplace transform.

Prerequisite(s)

MTH 233 (Calculus III) with a C or better

Illinois Articulation Initiative (IAI) Code

MTH 912

Course Materials

Textbook (required)

Edwards & Penny (2019). *Elementary Differential Equations with Boundary Value Problems* (6th ed.). Pearson, ISBN: 9780134995410

Class Materials and Resources

The TI-83/84 Graphing Calculator is required for the course.

Important Class Notes

Recommended Corequisite: None

Course Delivery Mode: Face-to-face

Credit Hours: 3.0

Course Objectives

Throughout this course, the student will learn to:

1. solve first order and linear differential equations of any degree using the methods of separation of variables, homogeneous equations, exact equations, integrating factors, substitution, auxiliary equations, undetermined coefficients, variation of parameters, Laplace transforms, and power series;
2. apply the theory of differential equations to applications in chemistry, physics, and electricity;
3. solve initial value problems by Laplace transform method;
4. solve partial differential equations by separation of variables;
5. apply partial differential equations to various problems in physics and mathematics.

Student Learning Outcomes

Course Learning Outcomes

Upon successful completion of this course, the student will be able to:

1. classify differential equations and determine appropriate methods of solution;
2. solve linear ordinary equations with constant coefficients; and
3. solve a damping problem via a second order ordinary differential equation.

College Learning Outcomes

This course contributes to the following college learning outcomes:

Critical Thinking

Examine information in order to propose or develop solutions or construct arguments.

- Communication
Use clear language to communicate meaning appropriate to various contexts and audiences.
- Quantitative Literacy
Make judgments or draw appropriate conclusions based on the quantitative analysis of data.
- Global Awareness
Describe the interconnectedness of issues, trends or systems using diverse perspectives.
- Information Literacy
Use technology to ethically research, evaluate or create information.

Methods of Evaluation of Student Learning, Grading Criteria, and Scale

Your performance in this course will be evaluated based on the following components:

Grading Criteria

Total points: 500

Grading Components	Score	Quantity	Subtotal	Percent
Tests	100	3	300 points	60%
Quizzes and Homework	10	10	100 points	20%
Comprehensive Final Exam	100	1	100 points	20%

Grading Scale

A ≥ 89.50% B ≥ 79.50% C ≥ 69.50% D ≥ 59.50% F < 59.50%

You can estimate your current grade at any time during the semester by computing the following percentage: $100\% * (\text{Total points accumulated}) / (\text{Total points possible})$. Please feel free to discuss your grade at any time during the semester. Throughout the semester, current grades will be available in our Canvas course shell.

Attendance, late work, and make-up policy

Regular class attendance is an essential component of successful learning. Students are responsible for prompt attendance and participation in all class meetings. If you miss class, you will not be allowed to make up any tests, quizzes, or assignments that you may have missed (**but you may reschedule a test or quiz, or submit an assignment, in advance of a missed class period**). All material covered in class is the student's responsibility.

Description and Details of Assignments

Homework

Suggested homework problems from the textbook will be assigned daily and posted to the class website. Most of these will not be collected for grading, but they should be considered

mandatory. On five Thursdays during the semester (see course schedule), a subset of five (or fewer) suggested problems will be announced for submission on the following Tuesday. These assignments will be posted on the class website. Each collected homework assignment is worth a possible 10 points. At the end of the semester, a combination of only your top ten (10) homework assignments and quizzes will count toward your overall grade.

Quizzes

Be prepared for a 10-point, in-class quiz on Thursdays, according to the course schedule. No make-up quizzes will be given (unless scheduled prior to the quiz). Quizzes may have take-home portions. At the end of the semester, a combination of only your top ten (10) homework assignments and quizzes will count toward your overall grade.

Tests

Test problems will be similar to class examples, textbook problems, and quiz problems. In addition to computational problems, tests may include multiple choice, true/false, short answer, and/or writing problems. You must show all work (showing how you got your answer) on all tests to receive full credit. **You must work individually on all tests.** No make-up tests will be given (unless scheduled prior to the test). At the end of the semester, your lowest test score will be replaced by your final exam score (if this helps you).

Final Exam

The final exam is comprehensive and will be worth 100 points (20%) toward your final grade. The final exam is scheduled for our last class period.

Calculators

The TI-83/84 graphing calculator is required for this course. There are graphing calculator emulators available for smart phones and tablets--you may use these during class periods, but not during tests. If you would like to use a graphing calculator other than the TI-83/84, please discuss your options with your instructor.

Phones/Tablets/Laptops

Electronic devices may be used for taking notes and computing during lectures, but they may not be used on in-class tests. These devices must be silenced and put away during tests. Students in special circumstances who require their phones to be readily available must discuss their situations with the instructor.

Institutional Policy

Withdrawal

Waubonsee Community College reserves the right to administratively withdraw students who are not actively attending.

Students may withdraw themselves from this course until the date noted on the Tuition Refunds page.

*** Please see the [Student Handbook](#) for other course policies and procedures.

Institutional Statements

Academic Integrity

Waubonsee Community College believes that all members of the community (students, faculty, staff, and administrators) have a responsibility to participate in learning with honesty, respect, and integrity. We must commit to engage in learning both in and out of the classroom, value each member in our learning community, demonstrate original thought, and help foster ethical, open, safe learning environments for all. For more information, please see the Waubonsee Community College Plagiarism Statement section in the [Student Handbook](#).

Accessibility and Disability Statement

Accessibility is a value of our institution. We are committed to creating environments that are welcoming and that support all students' learning. If you experience barriers to your learning in this course please notify the instructor as soon as possible to discuss options. Students who experience barriers due to disability may contact the Access Center for Disability Resources to begin this conversation or establish accommodations.

Plagiarism

Waubonsee firmly upholds sound principles of academic integrity and responsibility. Plagiarism and cheating are serious infractions of academic integrity, and, as such, are considered breaches of the Code of Student Conduct. If a student has violated this policy, I will report the infraction to the Dean for Student Success and Retention and the student may fail the assignment or the course, depending on the severity or the number of infractions.

Student Support Services and Resources

Waubonsee Community College is committed to your success, and has many free supports, services, and resources available to you. Please visit the [Waubonsee Cares](#) page for links to basic needs (food, shelter, safety, etc.) support and resources both on campus and in the community. Please see the [Student Experience](#) page for more information and to get connected with Academic Support, Career Development, Counseling and Advising, Disability Resources, Student Life, Student Services, Technical Assistance Center, the Veterans Program, and many more! If you're not sure what type of assistance you need, please talk to me and I will help get you connected.

Course Schedule

Week (Date)	Sections	Topics & Assignments
Week 1 Aug 24 & Aug 26	Course Information, Sections 1.1 & 1.2	Intro to differential eqn's (Quiz on 8/26)
Week 2 Oct 31 & Sep 2	Sections 1.3, 1.4, & 1.5	Slope fields, Separable eqn's, 1st-order linear eqn's (Quiz on 9/2)
Week 3 Sep 7 & Sep 9	Sections 1.5 & 1.6	1st-order linear eqn's, Exact eqn's, Substitution (HW assigned 9/9)
Week 4 Sep 14 & Sep 16	Sections 1.7 & 1.8, Test 1	Applications, Test 1 covers sections 1.1-1.8.
Week 5 Sep 21 & Sep 23	Sections 2.1 & 2.2	General linear eqn's (Quiz on 9/23)
Week 6 Sep 28 & Sep 30	Sections 2.3 & 2.4	Homogeneous, constant coefficient, linear eqn's and applications (Quiz on 9/30)
Week 7 Oct 5 & Oct 7	Section 2.5	Nonhomogeneous eqn's, Undetermined coeffs, Variation of parameters (HW assigned 10/7)
Week 8 Oct 12 & Oct 14	Section 2.6 & 2.7, Test 2	Applications, Test 2 covers sections 2.1-2.7.
Week 9 Oct 19 & Oct 21	Sections 3.1 & 3.2	Series solutions near ordinary points (Quiz on 10/21)
Week 10 Oct 26 & Oct 28	Sections 3.3 & 4.1	Regular singular points, Intro to Laplace transforms (HW assigned 10/28)
Week 11 Nov 2 & Nov 4	Sections 4.1, 4.2, & 4.3	Intro to Laplace transforms, Translation. (Quiz on 11/4)
Week 12 Nov 9 & Nov 11	Section 4.4, Test 3	Test 3 covers sections 3.1-3.3 & 4.1-4.3.
Week 13 Nov 16 & Nov 18	Sections 4.4, 4.5, & 4.6	Properties of Laplace transforms, Piecewise cont. and step functions (Quiz on 11/18)
Fall Break Nov 23 & Nov 25	Thanksgiving Break	No class
Week 14 Nov 30 & Dec 2	Sections 8.1, 8.2, & 8.3	Fourier series (HW assigned 12/2)
Week 15 Dec 7 & Dec 9	Sections 8.5 & 8.6	Separation of variables, Heat and wave equations (HW assigned 12/9)
Week 16 Dec 14 & Dec 16	Review, Final Exam	Final exam is comprehensive with emphasis on course learning outcomes.

November 12 is the last day for students to withdraw themselves. Please check the current Waubonsee [Academic Calendar](#) for important dates.

Class Website

Course information, including tests, quizzes, answer keys, and homework problems, can be found on the class website at <http://stevekifowit.com/classes/m240.htm>.



Grades, announcements, and Zoom meeting information will be posted in our Canvas course shell. Other course information will be available on the class website.

Change of Delivery Mode

In the event that we must discontinue our face-to-face class meetings, we will automatically transition to synchronous Zoom meetings at our scheduled days and times.