

**SYLLABUS Spring 2024 e**  
The University of Iowa  
The College of Liberal Arts and Sciences  
**Department of Mathematics**

Course Title is

**Intro to Ordinary Differential Equations**

**MATH:3600:0001** *Prerequisites:* (MATH:1560 or MATH:1860) and (MATH:2550 or MATH:2700) [more](#)

Start and end times: 3:30P - 4:20P MWF 118 [MLH](#).

Instructor. Palle Jorgensen (Primary Instructor).

**Course ICON site:** To access the course site, log into [Iowa Courses Online \(ICON\)](#) <https://icon.uiowa.edu/index.shtml> using your Hawk ID and password. ICON includes an announcement explaining how students can activate WileyPlus, and *the ICON Direct program*.

The class is by **Palle Jorgensen**, in-person 3:30P - 4:20P MWF in 118 [MLH](#).

**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.

**Instructor: Palle Jorgensen** <https://uiowa.instructure.com/courses/226909>

Office location, and office hours:

**In Person: 2:20 PM – 3:20 PM W, Office Location 25B MLH: 1:00 PM – 2:00 PM, MF, Zoom ID 564 972 4313.**

**And by appointment.**

Phone and E-mail: 335-0782(Office), [palle-jorgensen@uiowa.edu](mailto:palle-jorgensen@uiowa.edu)

**DEO Contact Information:** Ryan Kinser, 14 MLH, [ryan-kinser@uiowa.edu](mailto:ryan-kinser@uiowa.edu)

*Course details: Prerequisites:* [\(MATH:1560 or MATH:1860\)](#) and [\(MATH:2700 or MATH:2550\)](#). [Talk to me if you have concerns.](#)

**CLAS fyi. Some of the policies relating to this course (such as the drop deadline) are governed by its administrative home, the College of Liberal Arts and Sciences, 120 Schaeffer Hall.**

**Description of Course:** We cover Ordinary differential equations and applications. This includes first-order equations; higher order linear equations; systems of linear equations, Laplace transforms, numerical methods. Applications include non-linear, phase plane, stability.

**Objectives and Goals of the Course:** Be able to identify and solve the following types of differential equations:

1. First order linear equations including the method of integrating factors; Nonlinear equations, in particular separable equations.
2. Second order linear constant coefficient equations, both homogeneous and non-homogeneous. This includes methods of characteristic equations, undetermined coefficients, and variation of parameters.

3. Generalization of the techniques for second order to higher order linear constant coefficient equations, both homogeneous and non-homogeneous.
4. Laplace transform method, including solutions of second order problems with discontinuous forcing terms and impulse responses.
5. Systems of first order linear constant coefficient equations, both homogeneous and non-homogeneous. This includes solutions of homogeneous problems using eigenvalues.
6. Phase plane, stability.

*This course makes use of course materials via ICON homework assignments in ICON. See below.*

**TEXTBOOK:** *The ICON Direct program will be used to provide required course materials via your ICON course site.*

*Your U-Bill will be charged automatically after your course has started, unless you opt out prior to the last day for tuition and fee reduction [course deadline](#). Specific opt out information will be provided in the course syllabus and in the opt out tool.*

**Elementary Differential Equations And Boundary Value Problems Wileyplus Ecommerce Single Term Required**

ISBN: 978EEGRP44029

Author: William E. Boyce Richard C. DiPrima Douglas B. Meade

Publisher: Wiley ©2022

Approximately \$57.24 will be billed to your U-Bill

**MATERIAL TO BE COVERED:** *Boyce and DiPrima. Elementary Differential Equations and Boundary Value Problems. 12<sup>th</sup> Edition. Chapters 1-9, and 10 (partially covered).*

- Chapter1: (1.1-1.3) Introduction to differential equation: examples and basic concepts.
- Chapter2: (2.1-2.5, 2.7-2.8) First order equations and method of integrating factors for linear equations; Separable equations; Applications (in particular population dynamics). Existence and uniqueness theorems; autonomous equations, equilibrium and stability.
- Chapter3: (3.1-3.8) Theory of second order linear constant coefficient equations and applications. Characteristic equations; Existence and uniqueness theorems; Principle of superposition; linear dependence and independence; Wronskian; Reduction of orders; Undetermined coefficients and variation of parameters.
- Chapter4: (4.1-4.4) Higher order equations are covered briefly to extend the theory and methods of second order equations.
- Chapter 5: Solutions of ODEs with power series 5.1-5.7.
- Chapter6: (6.1-6.6) Laplace transform, and the Laplace transform-method for solving linear initial value problems (IVPs) (in particular for IVP with discontinuous forcing terms and impulse responses.
- Chapter7: (7.1, 4, 5, 6, 7) Theory of first order linear systems with constant coefficients including real and complex eigenvalues.
- *Chapter9: (9.1-9.3) Phase plane, stability, and if time permits, we cover 9.3 for nonlinear theory.*
- *Chapter 10, sections 10.1-10.5. Fourier methods and applications.*

Fyi. *WileyPlus via ICON:* Per department policy, I will be teaching this class with electronic content using *Wiley Plus*. So your course material is available in your ICON course site. **Tips. Wiley Plus via ICON:** Use only access to Wiley Plus from the ICON site. If instead you click on links from Google searches, you may be asked to pay for the content, that you already paid for. If you have any problems accessing Wiley Plus from the ICON site, contact the Help Desk, or if it's a whole class thing/issue, let me or Holly M Soboroff, [holly-soboroff@uiowa.edu](mailto:holly-soboroff@uiowa.edu) know, and they can pass it along to the ICON team.

While you may [opt out](#) of this content, the consequences of doing so may affect your outcomes in the course. Specifics on this issue:

- Opting out, you will lose access to any additional content your instructor might add to the eTextbook, such as links to other content, additional supplemental resources, highlights, annotations, and any study tips your instructor may add to guide your engagement and learning in the course.
- You risk falling behind in the course if you have not acquired alternate versions of the same materials prior to the first day of the class.
- Faculty cannot be responsible for providing you with alternative materials, or being able to waiving course/class requirements.

**Grading System: Plus/minus grading will be used.**

40%	2 midterms.
25%	Final exam.
10%	Attendance. Participation. Quizzes, bi-weekly.
25%	Homework (weekly, due on Wednesdays.)

**ALL EXAMS ARE COMPREHENSIVE unless specified otherwise.**

**Grade cuts and Grade Distribution:**

90% <= A- < 92% <= A
80% <= B- < 82% <= B < 88% <= B+ < 90%
60% <= C- < 62% <= C < 78% <= C+ < 80%
50% <= D- < 52% <= D < 58% <= D+ < 60%
F < 50%

The grade of A+ will be considered for truly exceptional performance.

***Closed book. Calculators and other electronic devices are not allowed during the exams.***

**Midterm Exam dates:** 2/28 MT1. 4/10 MT2, in class.

**MIDTERM 1:** 2/28 at 3:30 PM - 4:20 PM 118 MLH.

**MIDTERM 2:** 4/10 at 3:30 PM - 4:20 PM 118 MLH.

**Date and Time of the Final Exam TBA. Set by the University.**

The final examination date and time will be announced by the Registrar generally by the fifth week of classes and it will be announced on the course ICON site once it is known. **Do not plan your end of the semester travel plans until the final exam schedule is made public. It is your responsibility to know the date, time, and place of the final exam.** According to Registrar's final exam policy, students **have a maximum of two weeks after the announced final exam schedule** to request a change if an exam conflict exists or if a student has more than two exams in one day (see the [policy](#) here). It is the student's responsibility to know the date, time, and place of the final exam.

**During the semester**, students are encouraged to check often in the two ICON-slots, (a) *Announcements*, and (b) *Assignments* (including weekly HW).

PS. Note that math2560 is an engineering version of 3600. But there are important differences, for example, the number of chapters covered in 2560 is smaller than that of 3600. Therefore, the math2560 ICON course material is good for the first part of math3600, and we will make use of stuff from math2560. Math3600 goes beyond 2560. Both courses now use WileyPlus.

**TIMETABLE First class on Jan 17. A week is MWF:** book, Boyce, DiPrima, Meade, 12<sup>th</sup> Edition/WileyPlus.  
**January 17- 19:** sections 1.1 - 1.3.

**Week 2 Jan 22-26**, sections 2.1 -2.3.

Week 3: Jan/Feb; sections 2.4 -2.7.

Week 4: 2.8 -2.9, and 3.1-3.3.

Week 5: 3.4-3.8.

Week 6: Chapter 4.

Week 7, 5.1-5.4 & Review. Midterm #1.

Week 8: sections 5.5-5.7, 6.1-6.2.

The week of **spring break** March 10 - 17.

Week 9: sections 6.3-6.6.

Week 10: sections 7.1 -7.4.

Week 11: sections 7.5-7.9 & Review, Midterm #2.

**Week 12:** chapter 8.

**Week 13:** sections 9.1-9.5.

Week 14: sections 10.1-10.5. Review & practice exam.

**Final exam will be comprehensive. Time& place TBA.**

**Homework schedule:**

\_\_This course will have most information for students under *Announcements* in ICON, and assignments under *Assignments*. Assignments for that week of the semester will always be due on Wednesdays before class; HW 1 due on the Wednesday of week 1, etc.

### **University calendar.**

January 15     Martin Luther King, Jr. Convocation--All Classes Suspended; Offices Closed

January 16     **Opening of Classes**

March 10 - 17 Spring Break.

March 18     Classes resume

May 3         Close of Classes

May 6 - 10    Final Examination Week

May 9 - 12    Commencement ceremonies. Visit the [Commencement website](#) for more information.

### **Course Policies:**

#### **ATTENDANCE AND CLASSROOM EXPECTATIONS**

**Students are expected to attend every class. Absences may affect your grade.**

All students are expected to attend class and to contribute to its learning environment in part by complying with University policies and directives regarding appropriate classroom behavior or other matters.

### **Academic Honesty and Misconduct**

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](#). Graduate academic misconduct must be reported to the Graduate College according to Section F of the [Graduate College Manual](#).

### **Rules on Student Collaboration:**

In this class, students are allowed to talk with others about homework. However, do not share your written work with others or ask others to see their completed assignments since both are considered academic misconduct. In other words, you can discuss a problem with other students, but you write your solution alone. If you worked/discussed a problem with others, you must state their names on your homework before the beginning of that problem, even if you wrote the solution yourself. HWs showing duplication will be considered as the result of academic dishonesty. If you need help, please stop by during my office hours. Students are responsible for understanding this policy; if you have questions, ask for clarification.

### **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](#). Graduate students should adhere to the [academic deadlines](#) and policies set by the Graduate College.**

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## **College of Liberal Arts and Sciences (CLAS) Course Policies**

### **[Attendance and Absences](#)**

*University regulations require that students be allowed to make up examinations which have been missed due to illness or other unavoidable circumstances. Students with mandatory religious obligations or UI authorized activities must discuss their absences with me as soon as possible. Religious obligations must be communicated within the first three weeks of classes.*

### **[Exam Policies](#)**

### **Communication: UI Email**

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

### **University Policies**

### **[Accommodations for Students with Disabilities](#)**

**Basic Needs and Support for Students**  
**Classroom Expectations**  
**Exam Make-up Owing to Absence**  
**Free Speech and Expression**  
**Mental Health**  
**Military Service Obligations**  
**Non-discrimination**  
**Religious Holy Days**  
**Sexual Harassment/Misconduct and Supportive Measures**  
**Sharing of Class Recordings**

**Where to Get Help (in addition to office hours):**

- Math Tutorial Lab: <https://math.uiowa.edu/math-tutorial-lab>
- Engineering Tutoring: <https://engineering.uiowa.edu/current-students/academic-support-and-tutoring/engineering-tutoring>
- Tutor Iowa: <https://tutor.uiowa.edu/>
- Math Platoon (for military-connected students): <https://math.uiowa.edu/diversity-and-outreach/math-platoon>
- Other tutoring resources: <https://math.uiowa.edu/math-tutorial-lab/other-tutoring-resources>