MA 26600: Ordinary Differential Equations
Section 901 & 902 — Spring 2022

Instructor Information

- **Name:** Ying Liang
- **Office:** MATH 403 (Office Hours: Tue 9:00 am - 12:00 pm)
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Course Information

- **Time:** Section 901: Tue Thur 1:30 pm - 2:45 pm
- Section 902: Tue Thur 3:00 pm - 4:15 pm
- **Classroom:** UNIV 303
- Department Coursepage and Class Webpage

Course Description

Credit Hours: 3.00. First order equations, second and n th order linear equations, series solutions, solution by Laplace transform, systems of linear equations. It is preferable but not required to take MA 265 either first or concurrently. Not open to students with credit in MA 262, 272, 360, 361, or 366. Typically offered Fall Spring Summer.

Learning Resources

Textbook: Differential Equations and Boundary Value Problems, 5th edition, by Edwards, Penney, and Calvis.

Brightspace: The Brightspace course page will be a source of communication to you aside from class. There, you will find notes, supplemental studying material and some important announcements.

Exams

All examinations are close book and note.

Two Midterm Exams
EXAM 1 Tuesday, February 22 at 8:00 pm
EXAM 2 Tuesday, April 5 at 8:00 pm
More information will be announced closer to each exam, including the location.

Final Exam

There will be a two-hour comprehensive common final exam given during final exam week.

Homework

Online homework: There are 36 online homework assignments from MyLab Math that are accessed through Brightspace. Quick Student Guide to MyLabMath

Handwritten homework: There are also some handwritten problems will be collected electronically through Gradescope.

Submit PDF homework in Gradescope Details of homework can be found on the schedule table.

Grading Scale

Please check MA26600 course ground rules for the grading scale.

Course Schedule (tentative)

Week	date	section	Handwritten HW	Online HW
1	11-Jan	1.1		HW 01
		1.2	35, 37	HW 02
	13-Jan	1.3	27, 30	HW 03
2	18-Jan	1.4	29, 49	HW 04
		1.5	27	HW 05
	20-Jan	1.5	37	HW 06
3	25-Jan	1.6		HW 07
		1.6	56, 59	HW 08
	27-Jan	2.1	30, 31	HW 09
4	1-Feb	2.2	17, 19	HW 10
		2.3		HW 11
	3-Feb	2.4, 2.5	2.5: 28	HW 12
5	8-Feb	3.1	51, 52, 54	HW 13
		3.2	19, 41	HW 14
	10-Feb	3.3		HW 15
6	15-Feb	3.3	58	HW 16
		3.4	35	HW 17

	17-Feb	Review		
7	22-Feb	3.5	21, 22, 24, 29	HW 18
	22-Feb	Midterm 1		
	24-Feb	Discussion		
8	1-Mar	3.5	54, 61	HW 19
		3.6	11, 12	HW 20
	3-Mar	3.6		HW 21
9	8-Mar	4.1		HW 22
		4.1, 4.2	4.1: 27, 30	HW 23
	10-Mar	5.1	23, 32	HW 24
10	15-Mar	Spring Vacation		
	17-Mar	Spring Vacation		
11	22-Mar	5.2	29	HW 25
		5.2	8, 11, 24	HW 26
	24-Mar	5.5	2, 3, 4	HW 27
12	29-Mar	5.3	19, 20, 27	HW 28
		5.6	22, 26	HW 29
	31-Mar	5.7	25	HW 30
13	5-Apr	Review		
	5-Apr	Midterm 2		
	7-Apr	Discussion		
14	12-Apr	7.1	19, 29	HW 31
		7.2	19, 20, 23	HW 32
	14-Apr	7.3	31	HW 33
15	19-Apr	7.4	8, 17, 19, 37	HW 34
		7.5	17, 21	HW 35
	21-Apr	7.6	7, 11	HW 36
16	26-Apr			
		Review		
	28-Apr			

Attendance Policy

This course is designed in a hybrid model, with some face-to-face meetings and others completed remotely. University policy states that students are expected to be present for every meeting of the classes in which they are enrolled. For the purposes of this course, being “present” means attending all face-to-face meetings unless you are ill or need to be absent for one of four “excused” reasons: grief/bereavement, military service, jury

duty, or parenting leave (go to the Office of the Dean of Students website for details on how to submit those requests).

Being “present” also means participating remotely and completing work assigned for days when we do not meet face-to-face. This work is required to help you meet the course learning outcomes. These times count toward the course contact hours and your course grade.

Guidance on class attendance related to COVID-19 are outlined in the Protect Purdue Pledge on the Protect Purdue website.

Learning outcomes

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

- Use differential equations to model mechanical and electrical systems.
- Solve basic first order differential equations and initial-value problems.
- Understand the conditions required for a first order differential equation to have a unique solution.
- Find the equilibrium points of an autonomous differential equation and determine their stability.
- Solve homogenous second order linear differential equations and initial value problems with constant coefficients.
- Use the methods of Undetermined Coefficients and Variation of Parameters to find solutions to non-homogenous second order linear differential equations and initial value problems with constant coefficients.
- Use Laplace Transforms to solve basic initial value problems.
- Determine the mathematical and practical effect of step functions and impulse functions on second order linear initial value problems with constant coefficients.
- Use Power Series to solve second order linear differential equations.
- Write a higher order differential equation as a system of first order differential equations.
- Solve homogenous systems of first order linear differential equations.
- Conduct qualitative analysis of 2 by 2 systems of linear first order differential equations with constant coefficients.

Academic Guidance in the Event a Student is Quarantined/Isolated

Whether you have tested positive for COVID-19 or are quarantining because of COVID-19 exposure, a nurse case manager from the Protect Purdue Health Center will

provide guidance and help you make arrangements at every step of the way. The PPHC will provide you with medical clearance to return to campus activity once your quarantine or isolation period is complete. You may call PPHC at 765-496-INFO (4636) or toll-free at 833-571-1043 at any time 24/7 for assistance.

Academic case managers are assigned to undergraduate and Pharmacy professional students who test positive or have to quarantine due to exposure to COVID-19. The role of the academic case manager is to help students as they navigate academic concerns, communication with faculty, as well as providing various resources and strategies to be successful during their time away from in-person course attendance. For more information about academic case managers, contact: acmq@purdue.edu.

For more information about quarantine and isolation, please see Protect Purdue website.

Classroom Guidance Regarding Protect Purdue

Any student who has substantial reason to believe that another person is threatening the safety of others by not complying with Protect Purdue protocols is encouraged to report the behavior to and discuss the next steps with their instructor. Students also have the option of reporting the behavior to the Office of the Student Rights and Responsibilities. See also Purdue University Bill of Student Rights and the Violent Behavior Policy under University Resources in Brightspace.

Academic Integrity

Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." [Part 5, Section III- -B- -2- -a, Student Regulations] Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest." [University Senate Document 72- -18, December 15, 1972] Please refer to Purdue's student guide for academic integrity (https://www.purdue.edu/odos/osrr/academic-integrity/index.html).

Students with disabilities

Purdue University strives to make learning experiences accessible to all participants. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone at 765-494-1247.
If you have been certified by the Disability Resource Center (DRC) as eligible for accommodations, you should contact your instructor to discuss your accommodations as soon as possible. Here are instructions for sending your Course Accessibility Letter to your instructor: https://www.purdue.edu/drc/students/course-accessibility-letter.php

Use of Copyrighted Materials

Students are expected, within the context of the Regulations Governing Student Conduct and other applicable University policies, to act responsibly and ethically by applying the appropriate exception under the Copyright Act to the use of copyrighted works in their activities and studies. The University does not assume legal responsibility for violations of copyright law by students who are not employees of the University.

A Copyrightable Work created by any person subject to this policy primarily to express and preserve scholarship as evidence of academic advancement or academic accomplishment. Such works may include, but are not limited to, scholarly publications, journal articles, research bulletins, monographs, books, plays, poems, musical compositions and other works of artistic imagination, and works of students created in the course of their education, such as exams, projects, theses or dissertations, papers and articles. Please refer to the University Regulations on policies (https://catalog.purdue.edu/content.php?catoid=13&navoid=16335).

Missed or Late Work

Late work (for which you do not have a University approved excused absence) will NOT be accepted.

Nondiscrimination Statement

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates

creativity, promotes the exchange of ideas, and enriches campus life. A hyperlink to Purdue's full Nondiscrimination Policy Statement is included in our course Brightspace under University Policies.

Basic Needs Security

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. There is no appointment needed and Student Support Services is available to serve students 8 a.m.-5 p.m. Monday through Friday. Considering the significant disruptions caused by the current global crisis as it related to COVID-19, students may submit requests for emergency assistance from the Critical Needs Fund

Emergency Preparation

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis.