

UNIVERSITY OF IDAHO
Department of Mechanical Engineering

ME 541, Mechanical Engineering Analysis
Fall 2015

1. Meets: Tue & Thu 08:00am - 9:15am, EP 203 (Moscow)
 Instructor: Tao Xing, Ph.D., P.E., Assistant Professor of Mechanical Engineering
 Room EP 324F, Phone: (208) 885-9032, e-mail: xing@uidaho.edu,
 Web: <http://www.taoxing.net>
 Office Hours: Tue & Thu, 9:30-10:30am or by appointment.
 Required Text: *Advanced Engineering Mathematics*, Kreyszig, Wiley, 10th ed., 2011

2. Prerequisite: ME 345 Heat Transfer & ENGR 350 Engineering Mechanics of Materials

3. Assignments: (All homework problems are subject to change)

Session	Date	Subject	Reading	Problems
1	Aug 25	Introduction, First Order ODEs	1.1-1.3, 1.4	1.3: 5, 12, 21; 1.4: 9
2	Aug 27		1.4-1.7	1.4: 16d; 1.5: 4,9,35
3	Sept 1	Second Order ODEs	2.1-2.4	2.2: 1, 5, 21, 37; 2.4: 3
4	Sept 3		2.4-2.7	2.4: 14; 2.5: 3,12; 2.7: 1,4,6,14
5	Sept 8		2.8-2.10; 3.1	2.8: 4, 9
6	Sept 10	Higher Order Linear ODEs	3.2-3.3	3.2: 1, 3, 12; 3.3: 4, 12
7	Sept 15	Systems of Differential Equations	4.0-4.2	4.1: 4, 10
8	Sept 17		4.3-4.4	4.3: 1, 10, 18; 4.4: 5, 12
9	Sept 22		4.5-4.6	4.5: 8; 5.1: 3, 4
10	Sept 24	Series Solutions of Differential Eqns.	5.1-5.2	5.1: 7, 14; 5.2: 4,5
11	Sept 29		5.3	5.3: 6, 13; 6.1: 16, 28
12	Oct 1	Laplace Transforms	6.1-6.2	6.1: 42; 6.2: 6, 15, 28
13	Oct 6		6.3-6.4	6.3: 2,24; 6.4: 10
14	Oct 8		6.5-6.9	6.5: 8,24; 6.6: 4,20; 6.7: 8
15	Oct 13	Fourier Series	11.1	11.1: 4,16; 11.2: 10
16	Oct 15	Forced oscillation; Fourier Integrals	11.2-11.7	11.2: 24; 11.3: 11; 11.7: 6,12,16
17	Oct 20	Midterm Exam Review		
18	Oct 22	Take home Midterm	11.8-11.9	11.8: 9,10; 11.9: 8
19	Oct 27	Midterm due before class; PDE (SOV)	11.10;12.1-12.3	11.9: 12; 12.1: 20; 12.3: 12,16
20	Oct 29	Heat Equation (SOV)	12.4-12.6	12.4: 12,13; 12.6: 7,16
21	Nov 3	2D Wave Equation	12.9	12.9: 8,12
22	Nov 5	Vector Differential Calculus	9.1	9.1: 2,8,17,22,34; 9.2: 10, 19
23	Nov 10		9.2-9.3	9.2: 28,32,36; 9.3: 8,22,28,30
24	Nov 12		9.4-9.5	9.4: 12, 20,24; 9.5: 5, 18
25	Nov 17		9.5-9.7	9.5: 26,32,38; 9.7: 6,16, 22,28
26	Nov 19		9.8-9.9	9.8: 2,18; 9.9: 8,12,20
	Nov 24	Fall Break		
	Nov 26	Fall Break		

27	Dec 1	Vector Integral Calculus	10.1-10.3	10.1:6,10,18;10.2:3,16,18;10.3:4,10,14
28	Dec 3		10.4-10.6	10.4: 3,8,16; 10.5:6,14; 10.6: 2, 10
29	Dec 8		10.6-10.9	10.6: 16; 10.7:9,18,P1; 10.9:6,18
30	Dec 10			Review for Final Exam

Final Exam: Take home exam, due Dec. 16th, 9:30am

4. Grading: Homework, 30%; Midterm Exam, 30%; Final Exam, 40%
5. Homework: **Homework is due on Tuesday before class begins.** I believe that working problems is critical in understanding engineering principles, so be sure and do them. Partial credit is given when homework problems are graded, so give it your best shot. We may discuss homework in class, so be prepared with questions. No late homework will be accepted without prior arrangements made with me.

6. Learning Outcomes

Upon successful completion of the course, students will have the tools necessary to solve:

- Second-order and higher differential equations using a number of techniques including the method of characteristics, series solutions and Laplace transforms
- Differential equations using Fourier series, integrals and transforms
- Partial differential equations using separation of variables
- Vector differential and integral calculus problems

6. Honesty: I believe that the vast majority of UI students are honest. Students in this class will be expected to conduct themselves in accordance with the Student Code of Conduct in the UI Faculty-Staff Handbook, Chapter Two: 2300 Article II. No plagiarism is allowed. Presenting someone else's work as your own, or allowing your work to be presented as someone else's will be considered dishonest, and the students involved will receive an F for the class.

You may work on homework problems together, but each student is responsible for turning in their own work and their own assignment. In general helping each other understand the material by discussion or other means and in particular sharing information in the solution of the problems is encouraged.

The midterm and final exams, and other individual assignments are expected to be your work and your work alone. You may not copy any others work. No cheating is allowed. If you are caught cheating, you will receive an F in the class.

7. Disability Support Services Reasonable Accommodations Statement:

Reasonable accommodations are available for students who have documented temporary or permanent disabilities. All accommodations must be approved through Disability Support Services located in the Idaho Commons Building, Room 306 in order to notify your instructor(s) as soon as possible regarding accommodation(s) needed for the course.

- 885-6307
- email at <dss@uidaho.edu>

- website at www.uidaho.edu/dss

8. UI Classroom Learning Civility Clause

In any environment in which people gather to learn, it is essential that all members feel as free and safe as possible in their participation. To this end, it is expected that everyone in this course will be treated with mutual respect and civility, with an understanding that all of us (students, instructors, professors, guests, and teaching assistants) will be respectful and civil to one another in discussion, in action, in teaching, and in learning.

Should you feel our classroom interactions do not reflect an environment of civility and respect, you are encouraged to meet with your instructor during office hours to discuss your concern. Additional resources for expression of concern or requesting support include the Dean of Students office and staff (5-6757), the UI Counseling & Testing Center's confidential services (5-6716), or the UI Office of Human Rights, Access, & Inclusion (5-4285).

9. Firearms Policy

The University of Idaho bans firearms from its property with only limited exceptions. One exception applies to persons who hold a valid Idaho enhanced concealed carry license, provided those firearms remain concealed at all times. If an enhanced concealed carry license holder's firearm is displayed, other than in necessary self-defense, it is a violation of University policy. Please contact local law enforcement (call 911) to report firearms on University property.