ColoState Fall 2025 MATH 340
"Introduction to Ordinary Differential Equations"

Textbook: William E. Boyce, Richard C. DiPrima, Douglas B. Meade, Elementary Differential Equations and Boundary Value Problems, Wiley,**11th ed.,** ***ISBN-13: 978-1-119-25600-7 (or ISBN-10: 1119256003)***

List of Topics for Study (or A Tentative Weekly Schedule)

Classes start on Mon.Aug.25 and end on Fri.Dec.12;
Fall Break November 22-30 (Sat.-Sun.) for Thanksgiving

Week 1
Ch.1. Introduction
-- Modeling (Falling object, Predator-prey system, Newton's cooling law);
-- Direction fields;
-- Solutions and classification of ODEs.

Week 2 & 3
Ch.2. First-Order ODEs (Sec.1,2,3,5,6)
-- 1st order linear ODEs (Integrating factor);
-- Separable ODEs;
-- Exact ODEs (~~Integrating factor~~);
-- Modelling by 1st order ODEs (**Mixing, Newton's cooling law**);
-- Autonomous ODEs, population model;
-- Use of **dfield** (Java or Matlab)

Week 4 & 5
Ch.3. Second-Order Linear ODEs
-- Solutions of 2nd linear homo. ODEs w/ const. coeff. **(Sec.1,3,4)**
-- Solutions of 2nd linear ***NonHomo.*** ODEs w/ const. coeff. **(Sec.5)**
-- Method of undetermined coefficients
-- Mechanical vibrations (undamped/damped free vibrations) **(Sec.7)**
-- Forced periodic vibrations (beat, resonance) **(Sec.8)**
-- Wronskian, Linear combinations, Superposition principle **(Sec.2)**
-- ~~Method of variation of parameters **(Sec.6)**~~

Week 6
Ch.4. Higher-Order Linear ODEs, Review, Midterm#1
-- Study Ch.4, Sec.2,3 (but not Sec.1)
-- Review (Up to Ch.4 Sec.3)
-- Midterm#1 on topics up to Ch.4 Sec.3
-- Thu. Oct. 2nd, 5pm, Midterm#1, Location TBD.
-- No class on Fri. Oct.3rd

Week 7,8,9,10
Ch.7. Systems of 1st order ODEs
-- Study/Review Linear Algebra (Sec.2,3) for about 1-1.5 weeks
-- Sec.5,6,8 for about 2 weeks
-- Sec.1,4,7 for about 1 week
-- `pplane` software, recognizing planar phase portrait types

Week 11
Ch.7 Sec.9, Catch-up, Review, Midterm#2
-- ~~Ch.7 Sec.9 and~~ Catch-up
-- Review for Ch.7 Sec.1-8
-- Midterm#2 on topics in Ch.7 Sec.1-8
-- Thu. Nov. 6th, 5pm, Midterm #2, Location TBD
-- No class on Fri. Nov. 7th

Week 12 & 13
Ch.6 Laplace transforms and their use for ODE IVPs
(Mainly Sec. 1 & 2)
-- Review of improper integrals
-- Definition & examples of Laplace transforms
-- Properties of Laplace transform
-- Inverse Laplace transforms
-- A table of direct & inv. Laplace trans. of common functions
-- Solving 1st order ODE IVPs by direct & inv. Laplace trans.
-- Solving 2nd order ODE IVPs by direct & inv. Laplace trans.
Topics we have to skip due to constraints
** Laplace transform of step/discontinuous/impulse functions;*
** ODEs with discontinuous forcing terms*

Fall Break for Thanksgiving (Nov. 22-30)

Week 14
Ch.9.
-- Planar linear systems and classification **(Sec.1)**
-- Autonomous systems and stability **(Sec.2)**
-- Locally linear systems **(Sec.3)**

Week 15
Optional topics & suggestions for further study
-- Predator-prey systems (Ch.9 Sec.5)
-- SIR model for infectious disease
-- Explicit and implicit Euler methods (Ch.8 Sec.1&2)
Review for Final Exam

Final Exam (Accumulative)
Wednesday Dec. 17th, 7:30--9:30am, Location TBD

Last modified by James Liu on Wed.2025/09/10

ColoState Fall 2025 MATH 340 *"Intro. Diff. Eqs."*

(Course Registration Number varies by Section)
This webpage is for course coordination

Textbook: William E. Boyce, Richard C. Diprima, Douglas B. Meade,
Elementary Differential Equations and Boundary Value Problems,
Wiley, **11th ed.,** ***ISBN-13: 978-1-119-25600-7 (or ISBN-10: 1119256003)***

Suggested Weekly Schedule
Suggested Examples & Problems

Time(MTWF), Rooms, CRN, Section, and Instructor *(Email through CANVAS preferred)*

9am	Engrg.E103	()	76288	#8	Oleg Emanouilov
10am	Weber.223	()	76282	#2	Iuliana Oprea
11am	Engrg.E105	()	76283	#3	Jacob Cleveland
11am	Walnt.110	()	76289	#9	Amaury Minino
1pm	Weber.202	()	76284	#4	Andrew Reimer-Berg
2pm	Clark.C363	()	76285	#5	Kelsey Brown
3pm	NATRS.109	()	76286	#6	Trent Osland
4pm	Engrg.B2	()	76287	#7	Yingli Li

Coordinator: Weber 116, Jiangguo "James" Liu (Email through CANVAS)
-- Classes start on Mon.Aug.25, end on Fri.Dec.12;
-- Fall (Thanksgiving) Break: Nov.22-30 (Sat.-Sun.)

Office Hours

Each instructor will hold two 1-hr office hours in Calculus Center (TILT Great Hall now).
Note that Dr. Oprea will hold office hours in her office Weber 123.
There is also free tutoring for MATH 340 and other subjects over there.
Tutoring is also offered in TILT

Common Exams (Fall 2025)

SDC students please contact SDC at least 1 week ahead to schedule your exams.
All exams will be "closed book/notes",
No calculators/computers/Pads/phones are allowed.

Midterm #1: Thu. Oct.02, 5pm-6:50pm (6th week) and
Midterm #2: Thu. Nov.06, 5pm-6:50pm (11th week)
One letter-size double-sided cheat sheet is allowed for each Midterm.
Room assignments:
- ***Last Name A-D(72#/142) in PATH.101***
- ***Last Name E-K(51#/120) in BIO.136***
- ***Last Name L-Z(132#/258) in CHEM.A103***

Final Exam: Wed. Dec.17th, 07:30am--09:30am

Two letter-size double-sided cheat sheets are allowed for the Final.
Last Name A-?(?#/) in Where.CSU **(Where at CSU?)**
Last Name ?-Z(?#/) in Where.CSU **(Where at CSU?)**

Grading

Quizzes/Homework: 25%; Midterm#1: 25%; Midterm#2: 25%; Final Exam 25%
In-class quizzes will be handled by each instructor;
(Usually the problems will be similar to those in "Suggested Problems")

Course Letter Grades

A (100-90) B (89-80) C (79-70) D (69-60) F (<60)
Plus/minus grades may be assigned at the margins.

Makeups

We follow university policies but require legitimate excuses and documents.
-- For quizzes, please contact your instructor;
-- For Midterm & Final exams, please contact Prof. Jiangguo "James" Liu (thru CANVAS email).
Usually before or within 24-hours after the exam/quiz.

Last modified by James Liu on Mon.2025/09/15