Spring 2018

MA 36600
ORDINARY DIFFERENTIAL EQUATIONS

Text: *Elementary Differential Equations and Boundary Value Problems*, Boyce & DiPrima, 10^{th} ed.

Instructor Information

Professor: J. Brown
Office : 700 Math Sci Bldg
Phone : 494-1955
Email : *brown00@purdue.edu*
Webpage : **www.math.purdue.edu/∼jeb** (*Click here*)

Office Hours : Monday 1:30 - 2:30 pm
Tuesday 1:00 - 2:00 pm
Wednesday 2:00 - 3:00 pm
(or by appointment)

Course Information

- Department Course Webpage: **www.math.purdue.edu/MA366** (*Click here*)
- Class attendance is expected. Reading the sections ahead of time is *strongly recommended*.
- No calculators are allowed on any exams.
- Grading policy for our particular section of MA 36600:

GRADING POLICY

Homework	20%
(2) Midterm Exams	35%
Computer Labs	15%
FINAL Exam	30%
	100%

- Homework will usually be due once a week. No late homework will be accepted unless there are extenuating circumstances. The list of homework problems and their due dates are posted here:

HOMEWORK SETS (*Click here*)

- There will be two evening midterm exams (dates announced later) and a comprehensive final exam.
- There is a computer lab component to this course which meets each Tuesday (see your schedule). Lab Help Sessions are on Thursday nights 7:00pm - 9:00pm in SC 277. These labs are important for this course. The complete list of labs and the expectations for each lab are available at:

COMPUTER LABS (*Click here*)

- Each student is required to give a **5 minute oral presentation** in the lab. More information will be given by your lab instructor.

Important Dates and Deadlines

Last day to drop a course without it appearing on record: **Monday, January 22 (5:00pm)**
Last day to drop a course with grade of W: **Monday, February 5 (5:00pm)**
Last day to drop a course with grade of W or WF: **Friday, March 9 (5:00pm)**

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Accommodations for Students with Disabilities

In this mathematics course accommodations are managed between the instructor, student, and the Disability Resource Center (DRC) Testing Center. Students should see their instructors outside class hours, before or after class, or during office hours to share your Accommodation Memorandum for the current semester and discuss your accommodations as soon as possible.

Request your exam at **www.purdue.edu/drctesting** a minimum of three (3) business days in advance of the exam date. This will start the registration process with the DRC Testing Center.

Online Course Evaluation System

During the last two weeks of the semester, you will be provided an opportunity to evaluate this course and your instructor(s). To this end, Purdue has transitioned to online course evaluations. On Monday of the fifteenth week of classes, you will receive an official email from evaluation administrators with a link to the online evaluation site. You will have two weeks to complete this evaluation. Your participation in this evaluation is an integral part of this course. Your feedback is vital to improving education at Purdue University. We strongly urge you to participate in the evaluation system.

Campus Emergency Notice

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. Please refer to the course web page **www.math.purdue.edu/MA366** (*Click here*) to get the information about changes in this course.

Academic Dishonesty

The Mathematics Department, following Purdue Policy, prohibits academic dishonesty. For details about the Purdue Policy on academic dishonesty see

http://www.purdue.edu/odos/osrr/academic-integrity/index.html (*Click here*)

Purdue's Honor Pledge: **https://www.purdue.edu/provost/teachinglearning/honor-pledge.html**

Course Syllabus

§1.1 - Basic Mathematical Models; Direction fields
§1.2 - Solutions of Some Differential Equations
§1.3 - Classification of Differential Equations

§2.1 - First Order Linear Equations
§2.2 - Separable Equations
§2.3 - Modeling With First Order Equations
§2.4 - Difference Between Linear and Nonlinear Equations
§2.5 - Autonomous Equations
§2.6 - Exact Equations
§2.7 - Numerical Approximations; Euler (Tangent Line) Method

§3.1 - Homogeneous Equations with Constant Coefficients
§3.2 - Solutions of Linear Homogeneous Equations; the Wronskian
§3.3 - Complex Roots of the Characteristic Equation
§3.4 - Repeated Roots of the Characteristic Equation; Reduction of Order
§3.5 - Nonhomgeneous Equations; Undetermined Coefficients
§3.6 - Variation of Parameters
§3.7 - Mechanical & Electrical Vibrations
§3.8 - Forced Vibrations

§4.1 - n^{th} Order Equations
§4.2 - Homogeneous Equations with Constant Coefficients
§4.3 - Undetermined Coefficients

§7.1 - Introduction to Systems of Differential Equations
§7.3 - Eigenvalues and Eigenvectors
§7.4 - Theory of First Order Linear Systems
§7.5 - Homogeneous Linear Systems with Constant Coefficients
§7.6 - Complex Eigenvalues
§7.7 - Fundamental Matrices
§7.8 - Repeated Eigenvalues
§7.9 - Nonhomogeneous Linear Systems

§9.1 - The Phase Plane
§9.2 - Autonomous Systems and Stability
§9.3 - Locally Linear Systems
§9.4 - Competing Species
§9.5 - Predator-Prey Equations

§2.8* - The Existence & Uniqueness Theorem
§8.5* - Numerical Approximations (Systems of 1^{st} Order Equations)

* provided there is time