Syllabus / Course Outline

Instructor: Dr. Miriam Castillo-Gil – Office: Carver 386 – Phone: 294-8184
   e-mail: miriamc@iastate.edu
   Website: http://orion.math.iastate.edu/miriamc/

Office Hours: M,F, 9:00-9:50 am in (Group Office Hours) Also T, 10:00-10:50 am and W, 1:10-2:00 pm (Regular Office Hours).
   In the event you absolutely can not make it to any of my office hours I am available by appointment. The purpose of the office hour is to go over problems you have trouble with, clarify concepts covered in class and discussing grades.

Lectures: Lecture will be on MWF @ 8:00-8:50 am in Bessey 0210.

Recitation Sections:
With Miss Anna Seitz:
   • Section 1: meets Tuesday at 8:00-8:50 am in Carver 0282
   • Section 2: meets Tuesday at 9:00-9:50 am in Pearson 3143
   • Section 3: meets Tuesday at 10:00-10:50 am in Carver 0196

Anna’s Office Hours: Tuesday 12:10-1:00 pm and 2:10-5:00 pm
   Office: Carver 419
   Anna’s e-mail: acseitz@iastate.edu


Course Objectives
   Also found at: http://orion.math.iastate.edu/dept/CoursePages/266-7/.

   Be able to identify types of differential equations and use appropriate methods to solve them.
   • Be able to use the method of integrating factors to solve first order linear equations.
   • Be able to separate variables and compute integrals in solving first order separable equations.
   • Know how to find a general solution of a linear second order constant coefficient homogeneous differential equation by seeking exponential solutions.

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1This document is subject to adjustment by the instructors, with notice given to the students.
- Be able to use the method of undetermined coefficients to find a particular solution of a linear second order constant coefficient nonhomogeneous differential equation.

- Be able to find a general solution of a linear second order constant coefficient nonhomogeneous equation.

- Be able to solve an initial value problem associated with a linear second order constant coefficient homogeneous or nonhomogeneous equation.

- Be able to extend the methods used for linear second order constant coefficient equations to higher order linear constant coefficient equations, both homogeneous and non-homogeneous.

- Be able to use the eigenvalue-eigenvector method to find general solutions of linear first order constant coefficient systems of differential equations of size 2 or 3.

- Be able to find a fundamental matrix for linear first order constant coefficient system of differential equations of size 2 or 3.

- Be able to use the method of variation of parameters to find a particular solution of a nonhomogeneous linear first order constant coefficient system of size 2.

Learn how differential equations are used to model physical systems and other applied problems. These could include the following types of problems.

- Be able to formulate and use elementary models for population dynamics, such as the logistic equation, to describe transient and steady state behavior.

- Be able to work with models for the linear motion of objects using assumptions on the velocity and acceleration of the object.

- Be able to set up and solve a problem involving stirred tank reactor dynamics.

- Be able to use Newton’s second law to set up a model for a simple spring-mass system; and use appropriate methods to obtain the solution of the model problem.

- Be able to use models for continuous compounding of interest to describe elementary savings and loan problems.

Gain an elementary understanding of the theory of ordinary differential equations.

- Understand statements on existence and uniqueness of solutions.

- Understand the role of linear independence of solutions in finding general solutions of differential equations.

- Understand what constitutes a general solution of a differential equation.

- Understand the concept of stability as it relates to equilibrium solutions.

- Be able to use the method of Laplace transforms to solve linear second order constant coefficient homogeneous and nonhomogeneous equations.
• Be able to use series methods to find a power series solution of a linear second order variable coefficient homogeneous equation about an ordinary point.

**Homework:** Homework will be done online with Enhanced Webassign, you will be able to login directly from the Blackboard platform, more information can be found in Blackboard itself.

Homework assignments will be due on Fridays before midnight beginning the second week, and including the last week (Dead Week), that is the last assignment will be due on Friday December 11, 2015.

Students should first attempt to complete the homework by themselves before seeking outside help, such as other students and the professor. There is, however, no penalty for students working together. Each part of each question is allowed 5 submissions only.

**Quizzes:** Fourteen quizzes will be given during recitation sessions on Tuesdays, including the last Tuesday of classes during Dead Week, that is, Quiz 14 will take place on Tuesday December 8, 2015. The four lowest quiz scores will be dropped.

**Exams:** There will be four in-class partial exams and a final exam for the course. All exams are closed books and closed notes. Exams must be taken during the scheduled times. The lowest exam grade will be dropped. The final exam is cumulative and will take place at the time and place assigned by the registrar. (The final exam can not be dropped). The dates for our in-class exams are as follows:

- Exam 1 - Wednesday September 16, 2015
- Exam 2 - Wednesday October 14, 2015
- Exam 3 - Friday November 6, 2015
- Exam 4 - Friday December 4, 2015.

**Make up Policies:** There will be NO make up quizzes as there are 4 drops. As for exams, there will be opportunity to make up up to two exams of the 4 in class exams, given that the reason to miss the exam is due to a legitimate excuse as sated by university policies, and is well documented. A request must be made in advance to make up the exam to be missed, unless of course, the reason is a last minute emergency (such as an illness, dead in the family, accident, etc.). If a third exam is missed, it shall count as a drop. If any of the exams is missed for a reason other than the listed as legitimate excuses (as per university policies), such as personal trips, job interviews, sleeping-in, etc., there will be no make up allowed.

Students will **NOT** be given the opportunity to complete old assignments at the end of the semester to improve their grades.

**Grading Policy:** Your grade will be computed as follows:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Component</th>
</tr>
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<tbody>
<tr>
<td>30%</td>
<td>Quizzes (Best 10 Quizzes)</td>
</tr>
<tr>
<td>40%</td>
<td>Exams (Best 3 Exams)</td>
</tr>
<tr>
<td>20%</td>
<td>Final Exam</td>
</tr>
<tr>
<td>10%</td>
<td>Online Homework</td>
</tr>
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Letter grades will be assigned as follows (plus and minus grades will be assigned according to the instructors’ discretion):
<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent Earned</td>
<td>≥ 90%</td>
<td>≥ 80%</td>
<td>≥ 70%</td>
<td>≥ 60%</td>
<td>&lt; 60%</td>
</tr>
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**Calculators and Other Electronic Devices:** You may use any calculator that does not have wireless communication features. Calculators are permitted on all exams; however, *the TA’s reserve the right to allow calculators during quizzes, depending on its true need during such.* Also, whether calculator is allowed or not *answers without procedure will result in considerable loss of points.* Other electronic devices, such as laptops, iDevices, etc., may be used during lecture for *educational purposes only.*

**SI:** Supplemental Instruction (SI) will be available for this course. This is one option to develop learning and is not meant to replace attending class, reading the book, or other course assignments. More information is available online: [http://www.asc.dso.iastate.edu/supplemental/](http://www.asc.dso.iastate.edu/supplemental/)

**Accommodations:** If you have a documented disability that requires assistance, you will need to go to the Disability Resource (DR) Office for coordination of your academic accommodations. The DR is located in the Student Services Building, Room 1076. Their phone number is 515-294-6624. *No retroactive accommodations will be provided in this class.*

**Conduct and Academic Dishonesty:** We expect all students to behave in a respectful manner during lecture, and *you will be asked to leave the lecture if you are being inappropriate and/or disruptive.* For more information, including [make up policies](#), see the *Class Policies* provided by the Department of Mathematics.

**Extra Credit:** Occasionally there might be a possibility to earn extra credit on the exams and/or quizzes. Extra credit will not be assigned on an individual basis; and most importantly, no extra credit assignments will be available at the end of the semester to improve grades.