Syllabus / Course Outline – Spring 2015

Instructor: Dr. Miriam Castillo-Gil – Office: Carver 386 – Tel: (515) 294-8184
e-mail: miriamc@iastate.edu – Website: http://orion.math.iastate.edu/miriamc/

Office Hours: M, W 11:00-11:50 and W 14:10-15:00. 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 Carver 0001.

Recitation Sections:
With Mr. Christopher Cox:

- Section 1: meets Thursday at 8:00-8:50 am in Carver 0184
- Section 4: meets Thursday at 10:00-10:50 am in Carver 0132
- Section 6: meets Thursday at 11:00-11:50 am in Carver 0274

Christopher’s Office Hours: Monday 1-2 pm and Tuesday 11am-12pm (in Carver 417) and Wednesday 1-3pm (in help room Carver 385)
Christopher’s e-mail: cocox@iastate.edu

With Miss Julia Anderson-Lee:

- Section 2: meets Thursday at 8:00-8:50 pm in Carver 0174
- Section 3: meets Thursday at 10:00-10:50 am in Carver 0174
- Section 5: meets Thursday at 11:00-11:50 am in Morrill 1030

Julia’s Office Hours: Tuesday 9-11am (in Carver 468) and Wednesday 3-5 pm (in help room Carver 385)
Julia’s e-mail: juliaal@iastate.edu


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1This document is subject to adjustment by the instructors, with notice given to the students.
Course Description (from the ISU Catalog):

Learning Outcomes Also found in the webpage:
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.
- 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 non-homogeneous 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, refer to the following document for instructions on how to enroll in WebAssign. (You may also find this document in course content in the Blackboard course.)


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:** Thirteen quizzes will be given in sections on Thursdays as per the course calendar; The three lowest quiz scores will be dropped. Requests for makeup quizzes can be made prior to the date that the quiz will occur; any requests after the quiz has occurred will be turned away, with the exception of medical emergencies in this instance be sure to contact your instructors as soon as possible.

**Exams:** There will be four in-class midterm exams and a final exam for the course. The exams are closed books and closed notes. Tentative dates for the exams are as follows: February 4th, March 4th, April 3rd and April 24th. Exams must be taken during the scheduled times. There will be NO makeup exams with the exception of medical emergencies or university approved absences. The final exam is cumulative and will take place at the time and place assigned by the registrar.

**Other Make up Policies:** The first exam/quiz missed for any reason will count as a drop.

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>
</thead>
<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>
</tbody>
</table>

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>
</tbody>
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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 quizzes and exams; however, *the Instructors reserve the right to inspect calculators during quizzes and exams*. 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: [https://apps-dso.sws.iastate.edu/si/course.php?id=839](https://apps-dso.sws.iastate.edu/si/course.php?id=839)

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.