Instructor: Dr. Menassie Ephrem  Office: Wall 124G
Phone: 349-2436  E-mail: menassie@coastal.edu
URL: ww2.coastal.edu/menassie

Office Hours: MWF 10:00-10:50, MF 1:00 – 1:50, Th 11:15-12:15, and by appointment.

Text: *Elementary Differential Equations by William F. Trench*  
http://ramanujan.math.trinity.edu/wtrench/texts/index.shtml


Prerequisite: Math 161 with a minimum grade of “C” or equivalent.

Course Objectives: This course represents a systematic introduction to ordinary differential equations. Topics will include first order equations, linear equations with constant coefficients, Laplace transforms or series solutions, variation of parameters, systems of equations, and numerical solutions.

Exams: There will be three exams and a cumulative final exam. The exams will be on the following dates:

- Exam 1–Wednesday, February 10
- Exam 2–Friday, March 18
- Exam 3–Friday, April 15
- Final Exam–TBA.

Exam dates are subject to change. Make-up exams will be made solely at my discretion. If you know ahead of time that you must miss an exam, you must let me know at least two class periods in advance. If you miss an exam due to some unexpected reason and fail to let me know in advance either via email, in person, or by phone, then you will not be allowed to make up the exam.

Quizzes: I will give short quizzes as frequently as time permits throughout the semester. Quizzes will be based on class discussions and assigned homework. At the end of the semester, I will drop your lowest quiz grade. There will be absolutely no make-up quizzes.

Homework: Doing all of the homework assignments is absolutely necessary for you to pass. A selection of homework problems will be collected once a week. You are encouraged to discuss homework problems with classmates. However, you are expected to individually write up your solutions, and you are responsible for your own understanding of the material. At the end
of the semester, I will drop one homework grade. There will be absolutely no late homework accepted. All graded assignments must meet the following standards:

- your solutions are neat and easy to read,
- your name and the assignment number is written on the first page,
- the problems are written in order,
- multiple pages are stapled together,
- spiral notebook edges are neatly torn off.

In addition, be sure to copy down each problem and show supporting work for your solutions to receive full credit. All word problems must be answered in the form of a complete sentence.

**Grade Policy:** Your course grade will be weighted as follows.

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>Exams</td>
<td>51%</td>
</tr>
<tr>
<td>Homework</td>
<td>10%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>7%</td>
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<tr>
<td>Final Exam</td>
<td>32%</td>
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</tbody>
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**Grade Scale:**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90–100</td>
</tr>
<tr>
<td>B+</td>
<td>87–89</td>
</tr>
<tr>
<td>B</td>
<td>80–86</td>
</tr>
<tr>
<td>C+</td>
<td>77–79</td>
</tr>
<tr>
<td>C</td>
<td>70–76</td>
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<tr>
<td>D+</td>
<td>67–69</td>
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<tr>
<td>D</td>
<td>60–66</td>
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<tr>
<td>F</td>
<td>below 60</td>
</tr>
</tbody>
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**Class Attendance:** As stated in the University catalog, students are expected to attend every class session. For this class, more than seven (7) absences (excused or unexcused) will result in your final grade being lowered–one letter grade for each excessive absence. Please do not put me in the position that I have to do this.

Absences, whether excused or not, do not absolve you from your responsibility to keep informed concerning all assignments made. Please get the notes from any class missed from another student. All assignments will be posted on the course web page.

**Important Dates:**

- **Monday, January 18**  
  Martin Luther King, Jr. holiday
- **March 7 – 12**  
  Spring Break
- **Friday, March 25**  
  Student holiday – no classes
- **Thursday, March 23**  
  Last day to drop with grade of “W”
- **Wednesday, April 27**  
  Last day of classes.

**Student Code of Conduct:** Coastal Carolina University is an academic community that expects the highest standards of honesty, integrity and personal responsibility. Members of this community
are accountable for their actions and reporting the inappropriate action of others and are committed to creating an atmosphere of mutual respect and trust.

**Cheating:** You are referred to the University policy on plagiarism and cheating. I have zero tolerance for cheating. If you are caught violating the policies on original work, you could receive an F on the assignment(s) in question, and/or an F in the course, and/or may be referred to the Vice-chancellor of Academic Affairs for possible suspension. If there is any possible ambiguity or question, please talk to me, and make an appointment if necessary.

**Students with Disabilities:** Any student with a documented disability needing academic adjustments or accommodations is requested to speak with me during the first week of class. All discussions will remain confidential.

**Student Learning Outcomes:** After finishing the course, students will:

- Know how to solve first order differential equations for the following types and by the following methods:
  - Separable equations, separation of variables
  - Homogeneous equations
  - Exact equations
  - Linear equations by integration factor

- Know how to solve the following applications of first order ODEs
  - Population Growth and Decay
    - bacteria growth/decay
    - population growth/decay
    - radioactive substance decay (half-life)
  - Newton’s Law of Cooling
  - Free-Falling Bodies

- Know how to solve \( n^{th} \)-order linear homogeneous differential equations with constant coefficients by the following methods:
  - Method of Undetermined Coefficients
  - Variation of Parameters
  - Laplace Transforms
  - Series Solutions

- Be able to set up, read, and solve Mass-Spring System problems. Additionally, know how to categorize a system as harmonic, under damped, critically damped, over damped or none of the above.