MTH 253: Differential Equations (4)
MWF 2-3pm H257
Westminster College, Spring 2019

Instructor:
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Prerequisite: MTH 251

Text:

Web page: http://learn.westminster.edu/

Content: Upon completion of the course you will:

- Be able to identify a differential equation and classify it by partial/ordinary, order, linearity and describe the constraints on solutions (initial value problem vs boundary value problem, for example).
- You will understand the questions of uniqueness and existence of solutions to a differential equation and be able to apply fundamental existence and uniqueness theorems for the type of differential equations covered in this class.
- You will be able to characterize stability of solutions to differential equations.
- You will be able to apply symbolic mathematics packages (we will use Sage) to solve or aid in understanding and solving differential equations. In particular you will be able to generate slope fields and use a slope field to characterize solutions.
- You will be able to verify (or reject) a proposed solution or family of solutions to a differential equation, even relations given that only implicitly express the dependency.
- Know and be able to employ several methods of solving differential equations including direct integration, separation, integral transformations including the Laplace transform.
- Be able to determine the correct solution method (or most reasonable approach) based on characteristics of the equation.
- You will be able to generalize techniques used on first order equations to second and higher order linear equations.
- You will be able to apply simple linear algebra techniques to solving systems of first order linear equations.
- You will be able to identify autonomous (systems of) differential equations and solve them
- You may be able to solve some limited forms of partial differential equations and use Fourier series techniques
- You may be able to solve some limited forms of boundary value problems and be well-versed in the Sturm–Liouville Theory

Your responsibilities:

- Read ahead and understand text material.
- Complete/master the text, homeworks, and projects.
- Seek help immediately if you are struggling.
- Learn the material (sometimes in spite of presentation format).
- Substantial work outside of class.

**Attendance:** You are expected to attend all classes. Attendance will not constitute part of your grade but failure to attend will result in no credit for missed assignments, tests, quizzes etc. Additionally, failure to attend will probably result in poorer performance on exams. **I do not provide class notes to students who miss class, excused or unexcused.**

**Grading:**
Letter grades are assigned based on the percentage of the available points that you receive. The grading scale is fixed and based on the percentage of points you scored rounded to the nearest integer. **I do not curve.** The grading scale is as follows:

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<thead>
<tr>
<th>Letter</th>
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<tr>
<td>A</td>
<td>[93,100]</td>
<td>A-</td>
<td>[90,92]</td>
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<tr>
<td>B+</td>
<td>[87,89]</td>
<td>B</td>
<td>[83,87]</td>
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<tr>
<td>B-</td>
<td>[80,82]</td>
<td>C+</td>
<td>[77,79]</td>
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<tr>
<td>C</td>
<td>[73,77]</td>
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<td>[70,72]</td>
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<td>D</td>
<td>[60,69]</td>
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**Academic policies:**
Students are encouraged to work together on homework exercises. Projects, quizzes and exams must be individual work and any cooperation will result in, at a minimum, a zero grade for this item and reporting of this action to the dean of academic affairs. See the college catalog and student handbook for more detailed discussions of academic honesty policies.

**Disabilities and special needs:** I will make any necessary, reasonable accommodations for students with disabilities. If you have a disability which requires accommodations, it is your responsibility to indicate to me that you have a disability and to discuss with me what special needs you might have regarding this class. In addition to notifying me, if you have a disability which requires class accommodations, you must make it known to Westminster College’s student affairs office so that they can send me the proper paperwork.