MAT-303 Calculus IV with Applications
Monday, Wednesday, Thursday 6:00pm-9:05pm
Kirill Lazebnik
Kirill.Lazebnik@stonybrook.edu
Office Hours (in MLC): Monday 5-6pm, Tuesday 3-4pm, Wednesday 5-6pm

**Course Description:** This course discusses the basic methods for solving ordinary differential equations.

**Course Policies:** We will have a quiz at the end of weeks 1, 2, 4, and 5. At the end of week 3 we will have our midterm. At the end of week 6 we will have our final exam. For any exam you will be responsible for all of the material covered up to, but not including, the day of the exam. **Missed exams will only be excused in documented, extenuating circumstances.** All missed exams will need to be made up.

**Text:** *Differential Equations with Boundary Value Problems: Computing and Modeling* (Fourth Edition)

**Grade Distribution:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>40%</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>35%</td>
</tr>
</tbody>
</table>

**Miscellaneous Remarks:** This course relies heavily on material covered in single-variable calculus courses. You need to make sure you are comfortable with the material from these courses. Attendance is not mandatory, but please do not disrupt class by leaving early. (I.e. if you show up plan to stay the entire class). Our course outline is tentative and will be updated as we move along.
Tentative Course Outline:

<table>
<thead>
<tr>
<th>Week</th>
<th>Content</th>
</tr>
</thead>
</table>
| Week 1 | • 1.1 Mathematical Models  
   • 1.2 General and Particular Solutions  
   • 1.3 Direction Fields  
   • 1.4 Separable Equations |
| Week 2 | • 1.5 Linear First Order Equations  
   • 1.6 Substitution/Exact Models  
   • 2.1 Population Models  
   • 2.2 Equilibrium Solutions |
| Week 3 | • 3.1 Second Order Linear Equations  
   • 3.2 General Solutions of Linear Equations  
   • 3.3 Homogeneous Constant Coefficient Equations  
   • 3.4 Mechanical Vibrations |
| Week 4 | • 3.5 Non-Homogeneous Equations  
   • 4.1 First Order Systems  
   • 5.1 Matrices and Linear Systems  
   • 5.2 Eigenvalue Method; Homogeneous systems. |
| Week 5 | • 5.4 Multiple Eigenvalues  
   • 5.5 Matrix Exponentials  
   • 5.6 Nonhomogenous Systems |
| Week 6 | • 6.1 Nonlinear Systems and Phenomena |