Population Dynamics
SP TP in Applied Analysis
MA 792-00A, Fall 2017

Instructor: Dr. Y. Zeng, CH 496A, 934-2154

Time & Location: Friday, 10am-12pm, HHB221

Office Hours: Monday and Wednesday, 10:15am – 11:15am (or by appointment)

Text: Course materials and assignments are posted on Canvas.

Important dates:
- First day of classes: August 28, 2017
- Labor Day Holiday: Monday, September 4, 2017
- Fall/Thanksgiving Break: November 20–26, 2017
- Last day of class: December 8, 2017

Grading Policy:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance</td>
<td>20 %</td>
</tr>
<tr>
<td>Assignments</td>
<td>40 %</td>
</tr>
<tr>
<td>Term project or presentation</td>
<td>40 %</td>
</tr>
</tbody>
</table>

Contents:

- Heat equation and diffusion equation
- Vibrating membranes and simulation with COMSOL Multiphysics
- Population dynamics and simulation with COMSOL Multiphysics
- Chemotaxis and Keller-Segel equation
- ODE phase plane analysis, Poincare-Bendixson theorem
- Traveling wave solutions of Keller-Segel equation (migration fronts in chemotaxis)
- Stability and simulation for traveling waves in chemotaxis
- Predator-prey models (if time permits)
- Student presentations