Math 4540: Introduction to Differential Geometry

Time and Place: 10:10 – 11:25 AM on Tuesdays and Thursdays in 224 Malott.

Instructor: Justin Moore
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phone: 255 4185
e-mail: justin@math.cornell.edu
office hours: Monday, Wednesday 11:15-12:15, and by appointment.

Teaching assistant: Wai-kit (Mathew) Yeung
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TA office hours: Mondays 4:30-6:30pm in 218 Malott


This course offers a rigorous and systematic study of the geometry of lines and curves in three dimensional Euclidean space and lays the framework for a more advanced study of differential geometry. The topics will include: curvature of space curves, regular surfaces and their parameterizations, the first and second fundamental forms, the Gauss map, Gaussian and mean curvature of surfaces, orientability of surfaces, conformal maps and isometries. Specifically, we will cover sections 1.1-1.5, 1.7 (partially), 2.1-2.5, 3.1-3.3, 4.1-4.5 and, time permitting, some of 4.6, 5.1-5.4, 5.10. Students will be evaluated both on their ability to do computations related to the material and to construct proofs relating to the concepts being studied.

Grading: You will need at least 60% to guaranteed a D, 70% for a C, 80% for a B and 90% for an A. The weighting of the grades will be:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>homework</td>
<td>30%</td>
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<tr>
<td>2 midterm examinations</td>
<td>40%</td>
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<tr>
<td>final examination</td>
<td>30%</td>
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<tr>
<td><strong>total</strong></td>
<td><strong>100%</strong></td>
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Each student is expected to abide by the Cornell University Code for academic integrity.

Homework: Homework will be assigned in class once a week (tentatively on a Thursday). Unless otherwise specified, homework assignments will be due one week from the day they are assigned at the beginning of class. Late assignments will generally not be accepted except as required by university policy. Your name and the page number must appear at the top of each sheet of paper handed in unless the assignment is stapled. Stapling is STRONGLY encouraged. The instructor and grader reserve the right to deduct points from and/or refuse to grade illegible homework.

Makeup work: Generally a student will only be allowed to make up work when it is required by university policy. See the instructor in advance if you need to make up work in order to make arrangements.
Exams: there will be two inclass preliminary exams for the course on 2/21 and 4/2. (Note: the last day to drop this course is 3/8.) The final exam will take place on ??.

All exams may have a takehome component to be handed in at the time of the exam (this will be announced at a later date).