Fundamentals of Geometry, MATH-4120-01, Spring 2012

Instructor: Bruce Piper (Prof. Piper), piperb@rpi.edu, 276-6892, Office: Amos Eaton 309

Textbooks:

- Required: *Pressley, Introduction to Differential Geometry*
- Recommended: *A Calculus Book* Especially the sections on vectors, lines, planes, parametric equations, space curves, tangent planes, multi-variable chain rule.

Course Web Page: http://www.rpi.edu/~piperb/geometry Visit this page several times a week throughout the course to check the daily schedule, office hours, study guides, homework, and for any updates.

Student Learning Outcomes: Upon successfully completing this course, students will be able to demonstrate that they can

- apply properties involving tangents, curvatures and techniques of parametrization to various examples of curves and surfaces.
- state definitions, prove basic theorems and derive various formula involving transformations and parametrized curves and surfaces.
- create written descriptions of visual implications of equations involving transformations and curve and surface properties.
- choose appropriate mathematical models and equations to represent descriptions of pictures and animations involving transformations, and tangents and curvatures of curves and surfaces.
- make computer animations that demonstrate or apply the mathematical properties of transformations and curve and surface properties.

Homework: There will be 8 homework assignments. Some of the homework assignments will have a Maple component; for these parts, you will need to hand in the Maple code (or code in another approved language) and an explanation of what it does. Before students work together on the homework, they must first individually read the problem, collect relevant definitions, formulas and theorems and think of at least one or two possible approaches to a solution. After this, students may work together, but they must separate and write their solutions individually, without copying from a shared set of notes. This entire process may be iterated on a given homework assignment.

Exams: There are 2 in-class exams as listed on the calendar on the course web page. Note that the second exam is on the last day of class. Study guides for the exams will be posted on the course web page.

Maple Projects: There will be two Maple projects. You can work alone or in groups of two on the Maple projects. When working in groups of two, you may freely share Maple files, but both partners must contribute. You can use a language other than Maple for the projects provided it is first approved by the instructor.

Final: There will be a final exam scheduled, but the final exam time slot will be used for submission and presentation of the second Maple Project.

Grades: The homework, Maple Projects, and exams will be weighted as follows:

8 Homework Assignments	40%
First Maple Project	10%
Second Maple Project	20%
2 In-class Exams	30% (15% each)

Using these weights and the percentages for each item, the final course score will be computed and then based on this score, letter grades will be assigned as follow: 93% + is an A; 90%-92% is an A-; 87%-89% is a B+; 83%-86% is a B; 80%-82% is a B-; 77%-79% is a C+; 73%-76% is a C; 70%-72% is a C-; 65%-69% is a D+; 60%-64% is a D; 0%-59% is a F.

Appeals: Changes to exam grades will be made only if something has been overlooked. All appeals must be made within 1 week of the time the exam is returned to the class. Please pick up your exams and homework on a timely basis.

Attendance: Students are responsible for knowing all the material covered in class. Some of the material covered in class may not be in the textbook or otherwise supplied by the instructor. Missing lectures has a negative impact on student exam scores based on past statistics.

Missing an exam or a recitation without a valid excuse results in a grade of zero and cannot be made up. Late homework or projects are generally not allowed.

For excused absences, please contact or visit the office of Student Experience. The web page for this is at http://se.rpi.edu/policies/ea/
This page outlines some sample cases of what does and does not qualify as an excuse.

Academic Integrity: Student-teacher relationships are built on trust. Acts which violate this trust undermine the educational process. The Rensselaer Handbook of Student Rights and Responsibilities defines various forms of Academic Dishonesty and you should make yourself familiar with these. Students are encouraged to work together outside of class provided they follow the guidelines on Maple Projects and homework. Exams must be done individually and cheating will result in a grade of zero and a report to the Dean of Students. Changing an answer on any submitted work after it has been graded will result in a zero on the assignment and a report to the Dean of Students. Repeat offenders will fail the class.