Application Project Description

Math 20

Fall 2004

The linear algebra and multivariable calculus ideas we are studying this semester have applications in a variety of fields. Learning about the ways in which mathematical ideas are applied to problems from other disciplines in one of the goals of this course. To that end, you will be required to complete an application project.

The application project should demonstrate your understanding of a particular problem from the social sciences or other discipline, the mathematical concepts and techniques that can be used to solve the problem, and the ways in which the mathematical modes of thought are brought to bear on the problem. The project should be an extension of mathematical ideas or applications seen in this course.

The project will take the form of a properly formatted paper of an appropriate length. Most papers should be between five and 10 pages, double-spaced, but the amount of mathematical notation may result in some longer papers. Several software packages enable one to include mathematical notation in a document, including Microsoft Word (through its Equation Editor tool), Mathematica, and various implementations of T_EX. Please ask if you need help using one of these software packages.

The paper should be written as if to a fellow student in Math 20. Thus you may assume that your audience is familiar with the material we have covered together as a class this semester. You will be graded not only on the depth of your understanding of the application you choose, but also on the clarity of your explanations and creativity of your choice of subject. Adherence to the standard rules of written English (grammar, usage, spelling, punctuation) is as important as in any paper for a humanities course.

You must include at least three references in your project. At least two of your references must be print media (i.e., *not* from the Internet). Your textbook does not count as one of these references. A list of references must appear at the end of your paper, formatted properly.

You might find a computer algebra system such as Mathematica or Maple helpful in solving the problem you choose for your project, especially if your problem involves real data. Please ask if you need help using one of these packages.

Plagiarism is a serious offense and is punishable by expulsion from the University.

In order to assist you in choosing a reasonable scope for your project, the topic and outline of your project must be submitted by **Monday, November 22**. Failure to submit a proposal on time will result in a letter grade deduction. We strongly suggest that you

submit a rough draft of your paper on December 6. The rough draft will be returned by December 10.

The final draft is due **Monday, December 20**, at 4:30pm. Late projects will not be accepted.

There is a large list of applications on the front endpapers of the textbook. You may choose one of the applications we've done in class (e.g., Leontief input-output, traffic flow, game theory), or choose another that we did not cover (computer graphics, digital sound sampling, airline route maps…). Feel free to consult the text's companion web site http://www.laylinalgebra.com/ as well. Google is another great resource.