Information Sheet for Math 207   Winter 2011

Class Meets: MTRF   1:00 - 1:50 pm in BH 215
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Goals: In this course students will be introduced to the computer program *Mathematica*. Such programs are known as computer algebra systems (CAS). The goal of the course is to get students to use this program for numerical, symbolic and graphical computations and simulations, and to teach students the basics of *Mathematica* programming. We believe that these goals are best achieved when *Mathematica* is used to explore some interesting mathematics.

Organization: The class meets in the computer lab and requires intensive computer use both during class times and independently. Assignments will be distributed and collected weekly. The notebooks with the assignment problems can be found in

<div align="center">

`K:\Math\Curgus\207\Problems\`

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Your homework should be deposited in

<div align="center">

`K:\Math\Curgus\207\Assignments\`

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The file (notebook) with your homework should be named using your last name, the capital letter **A** and the assignment number. For example my first homework should be named `CurgusA1.nb` Once deposited the homework files cannot be changed. If you have improved your homework after submitting it, then submit the improved version adding **a** at the end of the name. For example `CurgusA1a.nb` would be an improved version of my first homework assignment.

Material: Information about the software and relevant mathematical background is in the following two files: `Primer201010.nb` and `Programing2010.nb`, both located in the directory `K:\Math\Curgus\207\2010\`. This and other directories contain several illustrative *Mathematica* notebooks. Several books devoted to *Mathematica* are available in the Western Library.

Homework: This is a heavy homework load class. Expect to spend many hours per week working on the assigned problems. This is not just about learning a programming language. In fact, I consider *Mathematica* to be a tool that enables you to work on meaningful mathematical problems. The nature of any meaningful problem is that it encompasses certain level of uncertainty. And the beauty of it is that with certain amount effort this uncertainty can be overcome. This takes time, but without the effort one can not develop higher-order thinking skills: critical and creative thinking, ability to analyze, conjecture, synthesize, evaluate, ...

Your work outside of class should consist of reading the provided materials and working on the homework problems. Some of the class time will be devoted to the discussion of the homework problems, but the most of the work on these problems will be done outside of the class time. Discussions with classmates are encouraged. However, the

work that is submitted must be done individually. In particular, the final write up of your homework assignments should be done without any collaboration with classmates. If several students submit identical code for a particular problem, then all students with that code will receive only partial credit.

Assignments: There will be four assignments; approximately one assignment per week. Instead of the final exam there will be a final assignment which will be due either the last day of classes or the day of the final exam.

Homework notebooks: Your homework notebooks should be organized neatly. A notebook should start with a title cell. Individual assigned problems should be presented as sections. Each problem should contain sufficient amount of text, so that I can make sense of what is being presented. If I ask a specific question in a problem, then that question should be answered by a complete sentence. The notebooks should be saved with all output deleted (click Kernel, then Delete All Output). You should make sure that all the calculations evaluate properly. A good way to test this is to open your notebook and evaluate entire notebook by clicking Evaluate Notebook in the Evaluation submenu of the Kernel menu.

Here is a list of common mistakes in homework notebooks:

- Text in input cells. (Text should be put in special "text" cells. Or if text is included in input cells then it should be commented out in (* *), that is, stared-parenthesis .)

- *Mathematica* reports Null in Graphics output. (This error occurs when an empty space is included in a list of graphics objects.)

- If several students submit identical code for a particular problem, then all students with that code will receive partial credit.

- Homework includes material which is not directly related to your solutions (but, your explorations related to assigned problems are welcome). There is no need to repeat the statements of the problems in your notebook. Answer all the questions and present your solutions in a "teacher friendly" way.

- Claims not justified by mathematical arguments and/or *Mathematica* calculations and/or pictures.

- Answers to specific questions are not sufficiently specific.

- The names of the functions and the variables not cleared before the definition.

You: The work that you submit in your assignments must be your own. You should put a special effort in making your assignments truly your own. The best way to do this is to have your original solution that will differ from the solutions of others. If you have gotten a significant help from another student, or if a solution is a result of collaboration, then you can find your own way of presenting and illustrating that solution. No two illustrations that a certain command does what it is expected to do should be the same. In fact, the presentation of solutions in your homework should be your own and it should differ from other presentations.

If you end up using a formula or a piece of particularly original code written by another student, acknowledge that by including the name of the student preceding her or his work. Have in mind that formulas and code can always be improved or modified; you can individualize them.

A homework without original individual contribution will receive only partial credit.

Assessment: Students will be assessed on the quality of the assignments submitted. Each assignments will be graded by an integer between 0 and 100. This number will reflect

- mathematical accuracy and completeness of your work,
- accuracy, efficiency and completeness of your *Mathematica* code,
- organization of your homework notebook and your original contribution.

Your final grade will be the average of the assignments grades. Your letter grade for the Mathematica part will be assigned according to the following table.

| F : 0 - 49 | D : 50 - 54 | C−: 55 - 59 | C : 60 - 64 | C+: 65 - 69 |
| B−: 70 - 74 | B : 75 - 79 | B+: 80 - 84 | A−: 85 - 89 | A : 90 - 100 |

The final grade for the class is the average of the grades for the first and the second part.