

## COMPUTER GRAPHICS.

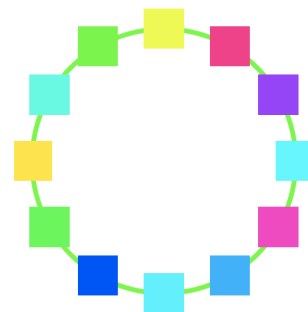
This course will cover some of the basic tools of Computer Graphics Including: Three dimensional viewing. Rotation and scaling. Clipping algorithms. Hidden-Line algorithms. Computer aided design. Computer animation. Your accounts will be in “*insci14*” but you will be able to do your work in any of the labs that will be reserved for us. There are no computer language prerequisites. Lab instruction in the use of the computers and MATHEMATICA will be provided in the first weeks of the course. Students will be given access to the work stations in two Labs in the basement of the AP & M buiding..

### Course Description

All our lab activities will involve the creation of Graphic Images by means of MATHEMATICA or POSTSCRIPT. Our final tasks will involve implementing some of the basic ”Clipping” and ”Hidden line” algorithms which arise in Computer Graphics.

Our first goal is to help you acquire as soon as possible a working knowledge of MATHEMATICA. You will be given a *list of commands* that is sufficiently rich to cover all your needs. You will also get some *sample programs* that make use of these commands. You may use these sample programs as *templates* for the construction of other MATHEMATICA programs.

First of all, as soon as you have access to a PC or a Mac with MATHEMATICA, you should start experimenting with the language by running some test programs of your own. To stimulate you into doing this we shall have a first computer assignment due *Wednesday January 13*. Try to put together a working MATHEMATICA procedure with name “**neckless**” which, upon the input of “*n*”, displays on the screen *n* squares with centers at a set of equidistant successive points on the unit circle. For instance for  $n = 8$  this procedure should display the figure on the right. You may enrich it by having the squares filled with random colors as in the figure on the right as well as adding an additional input parameter which allows you to control the size of the squares as well as the color and thickness of the circle.



Our TA’s is Angela Hicks. You may consult her or me in carrying out the assignments. I will be available after every class or by appointment. I am generally in school every afternoon. During lab hours we will be available for consultation. The class room instruction will be dedicated to the presentation of the theory on which each given assignment is based. After that we move to the lab to carry it out. This often results in a substantial portion of time spend at the lab. As a general rule, unless you are instructed otherwise, on Fridays the class meets in the lab.

There will be a series of (possibly 6 or 7) in lab quizzes on Fridays class time to test your ability to write MATHEMATICA programs and to test how much you are learning from this course. No midterm. There will be a total of eight lab assignments. They are designed to give you a hands-on experience in programming graphic displays on the computer and getting POSTSCRIPT outputs from a Laser printer. They are also to test your understanding of the basic mathematics involved in computer graphics. These assignments can be carried out in *teams* of no more than three students. However, each member of a team must be able to show an understanding of all the programs handed out by the team. The grade will be based 40% on the computer assignments and 60% on the quizzes. Each of the quizzes and the final will have the same weight in your total score. Assignments should to be completed and posted on your website within a week of the day they are assigned.

Our first quiz will be *Friday January 22*, you will be required to write a MATHEMATICA procedure. You may consider the “neckless” assignment given above as a sample quiz.

Download from the class website the Handout “*Sample Mathematica Commands*”. This pdf file contains a set of basic MATHEMATICA commands which is more than you will need to begin programming in MATHEMATICA. Get hold of a MATHEMATICA book and look up these commands to understand how they can be used. You may also to do this at a lab by getting into MATHEMATICA and using the built-in ”Help”. A recommended book is: *The Beginner’s Guide to MATHEMATICA* by Theodore Gray and Jerry Glynn. MATHEMATICA manuals are also available in the lab. Go to some lab and have fun playing with these commands!