

PROGRAMMING WITH *MATHEMATICA*

EGN 180: Fall 2010

Instructor : Dr. Mariusz Jankowski
Office : 127 JMC
Office Hours : Th 2 – 2 : 50 PM
Contact : mjankowski@usm.maine.edu
207.7805580

■ Course Description

Introduction to the *Mathematica* computing environment: basic symbolic and numerical calculations, programming language and technical document publishing features. Applications in data acquisition, visualization and processing. Development of application specific packages. Prerequisites: none.

■ Course Objectives:

Students who successfully complete this course will have demonstrated that they:

1. Are able to use all the basic features of *Mathematica*.
2. Are familiar with *Mathematica*'s programming styles and capabilities.
3. Are able to develop their own programs to extend *Mathematica*'s capabilities.

■ ABET EC2000 Program outcomes achieved:

- (a). Ability to apply knowledge of mathematics, science and engineering fundamentals to the solution of electrical engineering problems.
- (e). Ability to identify, formulate and solve electrical engineering problems.
- (g). Ability to communicate effectively in oral, written, graphical and visual ways.
- (k). Ability use the techniques, skills, and modern engineering tools, such as computer languages, instrumentation, engineering and business applications and electronic media, necessary for electrical engineering practice.

■ Textbook

Paul Wellin, Richard Gaylord and Samuel Kamin, "An Introduction to Programming with *Mathematica* ®," 3rd Edition, Cambridge University Press, 2005.

■ References:

Stephen Wolfram, "The *Mathematica*® Book," 2nd Edition, Addison-Wesley, 1991. (For the online version of the book click [here](#)).

Thomas B. Bahder, "*Mathematica*® for Scientists and Engineers," Addison Wesley, 1995

Roman Maeder, "Programming in *Mathematica*®," 3rd Edition, Addison-Wesley, 1997.

■ Topics

Lecture	Topics	Reading
1 – 2	Starting <i>Mathematica</i> :	
	Starting <i>Mathematica</i>	online, 1
	Getting Help!	
3 – 4	Basics :	
	<i>Mathematica</i> language	2
	Lists	3
5 – 8	Programming language :	
	Elementary programming	online
	Styles and constructs : functional programming	4
	Styles and constructs : procedural programming	5
9	Graphics programming	9
10	Writing packages	12
11	<i>Mathematica</i> in the classroom and laboratory : Reading/writing data	11
12	Demonstrations	online

■ Grading

The final grade will be based on a cumulative total of approximately 5 programming assignments. Each assignment will require a written report and the grade will be based on the quality of the presentation as well as the degree to which the desired task was accomplished. There will be no mid-semester or final exams.

■ Academic Support for Students with Disabilities:

Students who may need assistance due to a disability are encouraged to contact the Office of Academic Support for Students with Disabilities, located in Luther Bonney 242, phone number 780-4076, TTY 780-4395, ossd@usm.maine.edu.