MTH 321: Introductory Applications of Mathematical Software

Catalog Description: An introduction to select mathematical software packages to support problem solving and applications. Topics include using computational resources to solve basic numerical and symbolic problems in mathematics, visualization and presentation of data, creation of simple programming scripts, and applications of basic programming techniques to promote mathematical understanding. The scientific typesetting language LaTeX will also be covered. All courses used to satisfy MTH prerequisites must be completed with a C- or better.

Credits: 3

Meets: Two 80 minute classes meeting weekly for 10 weeks in a computer lab.

Terms offered: F,S

Enforced Prerequisites: MTH 252 and either MTH 341 or MTH 306.

Course Content: This course is designed to familiarize students with the use of software resources commonly utilized in the mathematical sciences. Students will learn how to use modern computing environments such as MATLAB and Mathematica for the purpose of symbolic and numerical problem solving and visualization. Students will become acquainted with the syntax and usage of each system through computer-aided lectures as well as through projects. The relative merits and disadvantages of each system will also be discussed. Basic programming paradigms and concepts will be introduced where appropriate. This course will also introduce LaTeX, the de facto standard for the communication and publication of mathematical and scientific documents.

Learning Resources: In lieu of a text, relevant information will be posted on canvas.

Learning Outcomes for MTH 321: A successful student in MTH 321 will be able to use MATLAB and Mathematica to:

1. Solve basic numerical and symbolic mathematics problems.
2. Visualize and present data.
3. Create simple programming scripts and functions.
4. Understand and apply basic programming techniques and paradigms.

In addition, a successful student will be able to typeset and communicate mathematical results using LaTeX.

Evaluation of Student Learning: The grading of the course is on a points-based system:

- Homework: 300 points
- Project: 100 points
- Total: 400 points
Students with Disabilities: Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 541-737-4098. Consult http://ds.oregonstate.edu/home.

Student Conduct: All students are expected to obey OSU’s student conduct regulations. In particular, students are expected to be honest and ethical in their academic work. Academic dishonesty is defined as an intentional act of deception in one of the following areas:
Cheating - use or attempted use of unauthorized materials, information or study aids;
Fabrication - falsification or invention of any information;
Assisting - helping another commit an act of academic dishonesty;
Tampering - altering or interfering with evaluation instruments and documents;
Plagiarism - representing the words or ideas of another person as one’s own.
If evidence of academic dishonesty is found, OSU procedures will be followed, including the potential assignment of a grade of ”F” for the guilty parties. For more information about academic integrity and the University’s policies and procedures in this area, visit the Student Conduct web site at http://studentlife.oregonstate.edu/studentconduct/offenses-0