

## Computational and Applied Mathematics 1351 – Mathematical Technology

### Student Learning Outcomes

1. **The students will demonstrate factual knowledge.** Students will utilize the specific functions and commands for producing mathematical documents. Students will also utilize specific functions and commands from the program MATLAB.
2. **The students will apply the fundamental aspects of mathematical technology.** Students will use contemporary software to study a variety of mathematical problems such as those involving algebraic equations, probability simulations, curve fitting, iteration and recursion, area and volume computations, and matrix applications. Students will also represent data and functions using visual aids such as two-dimensional plots with linear and logarithmic scales, scatter plots, histograms, three-dimensional surface plots, contour plots, and animations.
3. **The students will apply course material to solve problems.** Students will implement algorithms for analyzing and solving mathematical problems, using an appropriate high-level programming language.
4. **The students will develop specific skills, competencies, and thought processes sufficient to support further use of mathematical technology.** Students will prepare mathematical documents and presentations of professional quality incorporating text, mathematical notation, and graphics. Students will also solve problems, represent solutions, and develop algorithms using software.

### Course Content

1. Use of Microsoft Equation Editor for mathematical documents
2. Use of Microsoft Excel for mathematical applications
3. Use of MATLAB for solving problems numerically, graphically, and symbolically, for representing solutions and data graphically, and for developing and implementing algorithms
4. Use of LaTeX and/or LyX for producing mathematical documents and presentations

### Textbook

*Learning LaTeX*, by David F. Griffiths and Desmond J. Higham, Society for Industrial and Applied Mathematics, 1997, ISBN: 978-0-898713-83-1