Math 4610 Table of Contents for Lectures by Topic:

The topics listed below form the content for lectues in the class. The course will start with the first topic and will move through each topic in order. The idea is to go through as many topics as possible. If a topic is not needed, it can be skipped or maybe come back during a leter lecture. The topics are self-contained. There is no set number of topics that can/will be covered in a single lecture. For example, during the first class it is likely that three or four topics will be covered based on the instructor and how many questions are being asked.
The contents will likely change from semester to semester. So, the guide for this course is the table of contents listed here.

19. The Intermediate Value Theorem for Continuous Functions:
20. The Bisection Method: A simple application of the Intermediate Value Theorem results in a root finding method.
21. A Recursive Definition for the Bisection Method:
22. Rewriting the Bisection Method for Efficiency:
23. Truncation Error: A definition of truncation error is ....
24. Roundoff Error:
25. Absolute and Relative Error:
26. Examples of Roundoff Error in Real Life: Roundoff error can accumulate in computationally intensive algorithms.
27. Solving a linear system using Gaussian Elimination and Roundoff Error:
28. Truncation Error vs. Roundoff Error in the Finite Difference Approximation:
29. Bounds on Error: Interval Analysis and Accumulation of Roundoff Error:
30. Stable Algorithms and Computation: related topic involves selecting "stable"algorithms for solution of real problems. Stable algorithms are less sensitive to accumulation of errors.
31. FLOPS:
32. Efficiency of an Algotihm: Counting the number of computations in the execution of an algorithm.
33. Tradeoffs between Accuracy and Efficiency:
34. Number of Operations for Bisection:
35. Newton's Method for Finding Roots:
36. The Secant Method:
37. Review of Linear Systems: Gaussian Elimination:
38. Review of Linear Systems: Back Substitution:
39. Direct Methods versus Iterative Methods for Solving Linear Systems:
