# EE:211

# Computational Techniques in Electrical Engineering

# Lab#1

# Root Finding by Bisection Method

An implementation of the bisection method in Matlab is given in the textbook (page 75) and is made available to you with minor modification as Matlab function **bisect1** saved as file **bisect1.m.** You can download this file from course website.

The following script calls the function **bisect1** for the example 3.1.1 of the textbook (page73), with $f(x) = x^6 - x - 1$ and values of interval as [a , b] = [1 ,2] and the tolerance of 0.001.

```
clear all;
close all;


a0 = 1;
b0 = 2;
ep = 0.001;

root=bisect1(a0,b0,ep)
```

- Type/Download this script in Matlab and save it as a file.
- Run this script and compare your results with Table 3.1 (page 73) of the textbook.
- Verify your results uptil n = 5 by doing the calculations using your calculator as done in class
- Change the error tolerance (ep) to 0.00001, does your answer change, does number of iteration changes?
- From Matlab help command find the use of "eps" function. Change the error tolerance to machine precision (ep = eps) does your answer change?
- Change the error tolerance to 1e-18, does your answer change, if no, why?
- Carefully study the Matlab code bisect1.m and make sure you understand the algorithm and Matlab commands.
- Implement the steps in Lab1HW. You are not supposed to turn in this HW assignment. However, there will be Lab Quiz next week based on this HW assignment.