Welcome and Course Information

Welcome to the Course *Numerical Methods for Engineers!*

Most real world problems cannot be solved with pen and paper. A course on numerical methods teaches the computational algorithms that engineers need to solve real world problems. Success in this course requires some knowledge of single variable and vector calculus, differential equations, and matrix algebra. Some knowledge of computer programming is also required, though the basics of the MATLAB programming language will be taught in the first week.

To see if numerical methods interests you, watch the Promotional Video. To get a brief overview of the course, watch the Course Overview video. If you are considering taking this course and want to assess your math skills, take the Diagnostic Quiz. If you pass the quiz and have some computer programming skills, then you should have no problem succeeding in the course. If you struggle with the quiz, then you may need to brush up on your foundational math skills. For instance, you might consider taking my courses *Matrix Algebra for Engineers*, *Differential Equations for Engineers*, and *Vector Calculus for Engineers*.

Course Materials

This course is divided into six weeks, each week focusing on a specific subject. The first week is about **MATLAB**, the second week is about **root-finding algorithms**, the third week is about **numerical linear algebra**, the fourth week is about **quadrature and interpolation**, and the fifth and sixth weeks are about **ordinary and partial differential equations**.

After each video, I post some suggested analytical math problems or MATLAB computations. Within each week, the videos and problems are divided into sections corresponding to specific topics. At the end of each week, there is both a graded quiz and an assessed programming exercise.

Textbook

My lecture notes for this course can be downloaded is a pdf format at the link

https://www.math.hkust.edu.hk/~machas/numerical-methods-for-engineers.pdf

A paperback edition of my lecture notes may also be purchased from amazon.com at the link