MATLAB Learning Modules

MATLAB TUTORIALS FROM CORNELL UNIVERSITY

MATLAB from The MathWorks is a high-level language and interactive environment for numerical computation and data visualization. If you have never used MATLAB before, we recommend going through the free MATLAB Onramp course provided by MathWorks. The following are some modules developed for Mechanical and Aerospace Engineering courses at Cornell University.

Spring-Mass Harmonic Oscillator From MAE 2030. Covers implementation of the Euler's method for numerical integration, pre-allocation, plotting, function creation and structure creation. Contains numerous embedded YouTube videos.

Introductory MATLAB Learning Module From MAE 2120. An extended introduction that discusses important MATLAB basics such as functions and vectorization. It shows how you can figure out most things yourself by properly navigating the online documentation. It emphasizes developing code incrementally, testing obsessively at each stage.

Structures and Handles From MAE 3250. An intermediate-level tutorial on structured programming in MATLAB using structures and handles in the context of finite-element analysis. It shows how you can figure out most things yourself by properly navigating the online documentation. It emphasizes developing code incrementally, testing obsessively at each stage.

redAnTS TUTORIAL #1 From MAE 3250. *redAnTS* is a free MATLAB toolbox developed at Cornell University for performing 2D finite-element analysis. This introductory redAnTS tutorial takes you through the steps used for solving a simple solid mechanics problem: a humble rectangular block in uniaxial tension. The computational results are validated by comparing with the solution from elementary theory. Tutorial contains a link to download redAnTS.

redAnTS TUTORIAL #2 From MAE 3250. This *redAnTS* tutorial solves a beam bending problem and in the process shows you how to generate a mesh using the *CSG Mesh Tool*. It also shows you how to set boundary conditions at a *point* in *redAnTS*. You need a license to the *PDE* Toolbox to run the *CSG Mesh Tool*. Also, this mesher was developed in MATLAB version 7.0. We haven't had the time to upgrade it to later MATLAB versions. This means that in MATLAB version 7.4 or later, you'll get warnings about obsolete functions while running this mesher. We know it's ugly and not a good practice but you can ignore these warnings for now.