

## **A Practical Review of Math and Coding (GT EAS)**

(2021 pilot: open to current and incoming grad students, not for credit)

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### **Syllabus**

(3 sessions per week during September 2021)

**8/30 Class 1:** MATLAB Basics: installation, basic commands, vector matrix manipulation, indexing, function definitions, loops, Booleans, data types

**9/1 Class 2:** Python basics

**9/3 Class 3:** Data I/O, plotting

**9/8 Class 4:** Linear algebra: dot product, matrix multiplication, norm, determinant

**9/10 Class 5:** Interpolation, smoothing

**9/13 Class 6:** Statistics: regression, model fitting, distributions, histograms

**9/15 Class 7:** Coordinate systems: cartesian vs. spherical, lat/lon coordinates, projections, transformations, operations on mapped data

**9/17 Class 8:** Derivative: concept, numerical calculation, space vs. time

**9/20 Class 9:** Integral: concept, numerical calculation

**9/22 Class 10:** Ordinary differential equations: concept, numerical methods, initial values, examples

**9/24 Class 11:** PDEs: concept, types, boundary conditions, common use in Earth science: diffusion, advection, waves

**9/27 Class 12:** Fourier transform: concept, numerical calculation, interpretation of PSD