# GEO111 – NUMERICAL SKILLS IN GEOSCIENCE

### week #04a: Loops, conditionals, and algorithms

### Friday 22nd April 2016

**Work plan**

Use this session to make sure you know what you are doing so far. Use the opportunity of having a different person with a different perspective of programming and different way of explaining MATLAB, to ask for clarifications of MATLAB or basic programming, or work though existing or new examples and coding illustrations.

Specifically: work though the new examples surrounding a global bathymetry dataset:

1. Pages 41-42, and very simple 2D plotting using the `image` function.

2. Pages 60-63, and the creation of fa function to calculate the area of a cell on the Earth surface, and application in calculating e.g. global land (and future sea-level change venerable) area.

3. If time ... (otherwise we can work through this on Monday) – pages 63 onwards, and creating an algorithm to count and label (number) all the sperate land masses on Earth (but initially taking a simple low resolution model grid to work with).

If you have not already glanced though the following sections of the 2 background reading texts, do so:

- **MATLAB®7 – Getting Started Guide**

    - *Programming – Scripts and Functions* – pages 4-20 through 4-23

- **MATLAB – A Practical Introduction to Programming and Problem Solving**

    - *Nested for loops* – pages 155-162

**Learning goals (aka: 'what specifically should I have got to grips with?')**

Topics and methodologies you should be familiar with:
- functions (a 'special' case of an **m-file**)
- nested loops
- partial sums and counting variables