# COM 337 Computer Graphics

# Project 1 (27/09/2016)

Your task is to develop and display a terrain model from a given digital elevation model (DEM) data given in `data.txt` along with this script. The file consists of height values of a terrain sampled at 20m intervals. You will notice that the data is in a 2D array form where the values of the array store heights in 3D.

You are going to build a terrain model using these height values by drawing triangles as shown in the laboratories. Your program must have the following features:

1. The camera should be placed so that the entire terrain is visible by the user.
2. The terrain should be rotated around the `y` direction (up, according to the right-hand coordinate system, in the same direction where you will use your height values) using the left and right arrow keys.
3. The application should allow the user to switch between different viewing options. If the user presses 'h' or 'H' the heights points on the terrain should be displayed in colour according to the height of the terrain such that (assuming h is the elevation of a 3D point):
    a. Green, 0 < h < 50
    b. Yellow, 50 <= h < 80
    c. Red, 80 <=h

    Pressing the same button will disable this feature.
4. A moving light should be added to the scene and the motion should be animated in order to give a day/night effect in the scene. A fairly quick motion would be enough. You will need to remember how we used the `idle`callback for such tasks.

**Additional notes:**

- In addition to basic features asked above, your code should be well-structured and well-documented. A submitted junk of code with no readability(meaningless variable names, no indentation, *etc.*) and documentation(comments, top header, *etc.*) is unlikely to receive a high mark though the application has all the specified features.
- You will need to explain parts of your code to the lab demonstrator, and this will be arranged.
- This is an individual project and collaboration is not allowed. The university policy for plagiarism will strictly apply for both parties (source and receiver). A zero mark will be given in suchcases.

**Deadline: 30 November, 17:30**, Late submissions without any advance notice and a valid excuse will automatically receive a zero.

**Submission:** Send your source code only(without any executable or project files) to the email address that will be given by the instructor. You will also present a demo of your application.