

## **G302 – Final Take-Home Quiz / Project (50 pts)**

Go to the G302 class web site via [www.wou.edu/~taylors](http://www.wou.edu/~taylors). The following data files are located in the lab data section under the “Final Project” heading:

app_morph.xls	Microsoft Excel Spreadsheet with Appalachian Drainage Basin data
fracture.xls	Microsoft Excel Spreadsheet with Fracture Orientation Data (strike/dip)
bachpt.dat	A comma-delimited text file with x,y,z elevation data for Mt. Bachelor

Note: Compile your take-home quiz products in a nice, neat, well-organized, professional-looking folder. Place your products (see below) in the order listed. Clearly label and organize all of your work.

### **Task 1 – Digital Mapping with Surfer**

Using surfer and the Mt. Bachelor elevation data (elevation in meters, Eastings and Northings in meters), create and print the following maps (include your name, a title, and make them look nice with labels and lines):

- A. Contour Map with Contour Interval of 10 meters
- B. Contour Map with Contour Interval of 20 meters
- C. Shaded Relief Map with Sun Azimuth of 335 and inclination of 45
- D. Shaded Relief Map with Sun Azimuth of 200 and inclination of 30
- E. A wireframe model
- F. Create a vector map and overlay in on the 10 m contour map

### **Task 2 – Plotting Stereonets with Rockworks**

Using the fracture data from the web site, plot a stereonet with poles to bedding (show all of the fractures on one stereonet).

### **Task 3 – Rose Diagrams with Grapher**

Using the fracture data from the web site, plot a rose diagram of the fracture data (show all of the fractures on one graph)

### **Task 4 – Rose Diagrams with Rockworks**

Using the fracture data from the web site, plot a rose diagram of the fracture data (show all of the fractures on one graph).

### **Task 4 – Morphometric Analysis Using Grapher and Excel**

The Appalachian morphometric data was collected from three watersheds (Fernow, Little River, and North Fork). Data on the app\_morph.xls workbook is organized into three worksheets, these include: Channel Slope (channel slopes of channel segments, drainage area upstream, locality), Channel Width (valley width, distance from drainage divide, locality), and Hillslopes (slope length, slope angle, aspect (azimuth direction that the hillslopes face), and locality).

Your job is to use a combination of Excel and Grapher to produce the following graphs / analytical products:

X-Y Plot of Drainage Area (y axis) vs. Slope (x axis) Fernow Area (with linear regression)  
 X-Y Plot of Drainage Area (y axis) vs. Slope (x axis) North Fork Area (with linear regression)  
 X-Y Plot of Drainage Area (y axis) vs. Slope (x axis) Little River Area (with linear regression)  
 X-Y Plot of Valley Width (y axis) vs. Distance from Divide (x axis) Fernow Area (with linear regression)  
 X-Y Plot of Valley Width (y axis) vs. Dist. From Divide (x axis) North Fork Area (with linear regression)  
 X-Y Plot of Valley Width (y axis) vs. Dist. From Divide (x axis) Little River Area (with linear regression)

Rose Diagram of Hillslope Aspect Fernow Area  
 Rose Diagram of Hillslope Aspect North Fork Area  
 Rose Diagram of Hillslope Aspect Little River Area

Polar Plot of Slope Gradient vs. Aspect Fernow Area  
 Polar Plot of Slope Gradient vs. Aspect North Fork Area  
 Polar Plot of Slope Gradient vs. Aspect Little River Area

X-Y Plot of Slope Length (y axis) vs. Hillslope Gradient (x axis) Fernow Area (with linear regression)  
 X-Y Plot of Slope Length (y axis) vs. Hillslope Gradient (x axis) North Fork Area (with linear regression)  
 X-Y Plot of Slope Length (y axis) vs. Hillslope Gradient (x axis) Little River Area (with linear regression)

### Statistical Summary – Filling in the Table Below

	Hillslope Length Fern, Nfork, Lriv	Hillslope Gradient Fern, Nfork, Lriv	Valley Width Fern, Nfork, Lriv
Minimum Value	____, ____, ____	____, ____, ____	____, ____, ____
Maximum Value	____, ____, ____	____, ____, ____	____, ____, ____
Range	____, ____, ____	____, ____, ____	____, ____, ____
Standard Deviation	____, ____, ____	____, ____, ____	____, ____, ____
Variance	____, ____, ____	____, ____, ____	____, ____, ____
Mean	____, ____, ____	____, ____, ____	____, ____, ____
Median	____, ____, ____	____, ____, ____	____, ____, ____
25 <sup>th</sup> percentile	____, ____, ____	____, ____, ____	____, ____, ____
Number of Obs.	____, ____, ____	____, ____, ____	____, ____, ____