



GEL 2530 - Introduction to Geologic Field Work

FIELD DAY 4 (200 pts)

LOCATION:	Dinosaur Ridge 16831 W Alameda Pkwy, Morrison, CO 80465	GPS: 39.68922261249904, -105.19057684617296
TIME:	Start 9:30 AM: Meet at Dinosaur Ridge Visitor Center indicated by the GPS coordinates <i>(Leave "home" at appropriate time to arrive BEFORE start time)</i>	



["V True Thickness of Dipping Strata" Video Lecture \(click here\)](#)

GENERAL INFO

- This is an Educational Park - **NO ROCK COLLECTING ALLOWED** -
- This section of W Alameda Pkwy IS the trail. There are NO cars allowed.
- You may gather in larger groups. You can also explore the hiking trails branching off Alameda Pkwy.
- Bring a Sack Lunch
- Bring ALL your Course Equipment including writing utensils
- Bring any personal item you deem necessary for the day (e.g. sunscreen, hat, jacket, etc.)
- Hike to measuring location is about 1 mile from the parking lot along the gently sloping, paved Alameda Pkwy to the road bend on ridge top at GPS location 39.67576393843463, -105.19249730782761
- "Facilities" are available at Visitor Center Parking Lot.

FIELD OBJECTIVES:	<ol style="list-style-type: none"> 1. Measuring TRUE THICKNESS of a tilted outcrop parallel to dip direction using the Brunton - Eye Height Method 2. Create a Stratigraphic Section of your Rock layers showing the TRUE THICKNESS measured 3. Notebook descriptions of rocks present
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GRADING:	<p>- All exercises to be answered / documented in Field Notebook -</p> <p>Field Notebook Due on CANVAS by 6:00 PM</p> <p><i>Use your cell phone (PDF creator app?) to make quality copies of today's notebook entries & exercises for upload</i></p> <p>You will lose 10% per hour late with a minimum of 10% score after that</p> <p>You may work in groups of up to 3 people. However, each individual must turn in their individual notebook with ALL notes and data by the end of the day</p>
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General Grading Rubric:

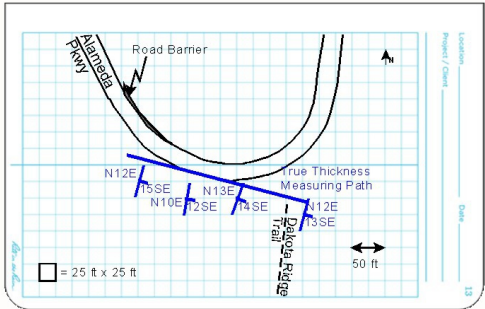
Generally my grading is pretty much straight forward. I will deduct points from each exercise below for errors, falsehoods, idiosyncrasies, omissions, non-legibilities, computation discrepancies, missing data, calculation mistakes, etc. etc. Percentages of total points may be deducted for repeated errors or larger omissions. This includes missing (forgotten) essential field equipment.

Measurement Path Map with feature sketch and 4 placed Strike & Dip Symbols, their alphanumeric transcription, and AVERAGE Strike & Dip Computation - see below -	50 points
Stratigraphic Section - Drawing & Labels - see below	50 points
Stratigraphic Section - Rock Observations & Description - see below	50 points
<u>Self-Selection</u> : Pick one of the features on the Dinosaur Ridge Trail (Dino Bones? Foot Prints? Ripple Marks?, whatever interests YOU). Identify location in notes. Then Describe / Sketch (to scale)!	50 points

Field Reconnaissance Exercises

Strike & Dip Measurements	Measure the Strike & Dip at 4 places along your measurement trail, which should be parallel to the dip of the strata. Then compute an S&D average.
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Method
<p>Field Work Handbook, p.32, Formations: Measuring Strike & Dip</p> <ul style="list-style-type: none"> <input type="checkbox"/> Create a path and sketch map similar to the ones done in previous exercises. <input type="checkbox"/> To make this exercise a little easier, an ACTUAL example to scale is shown. However, the indicated S&D symbols with their transcriptions are fictional. <input type="checkbox"/> Don't forget North arrow & map scale. <input type="checkbox"/> Then take the average STRIKE. In the pictured example: N12E, N10E, N13E, N12E = N12E average, rounded to sig.digs!! Show computation and results in notebook! <input type="checkbox"/> Compute the average DIP. In the pictured example: 15SE, 12SE, 14SE, 13SE = 14SE average, rounded to sig.digs!! Show computation and results in notebook!



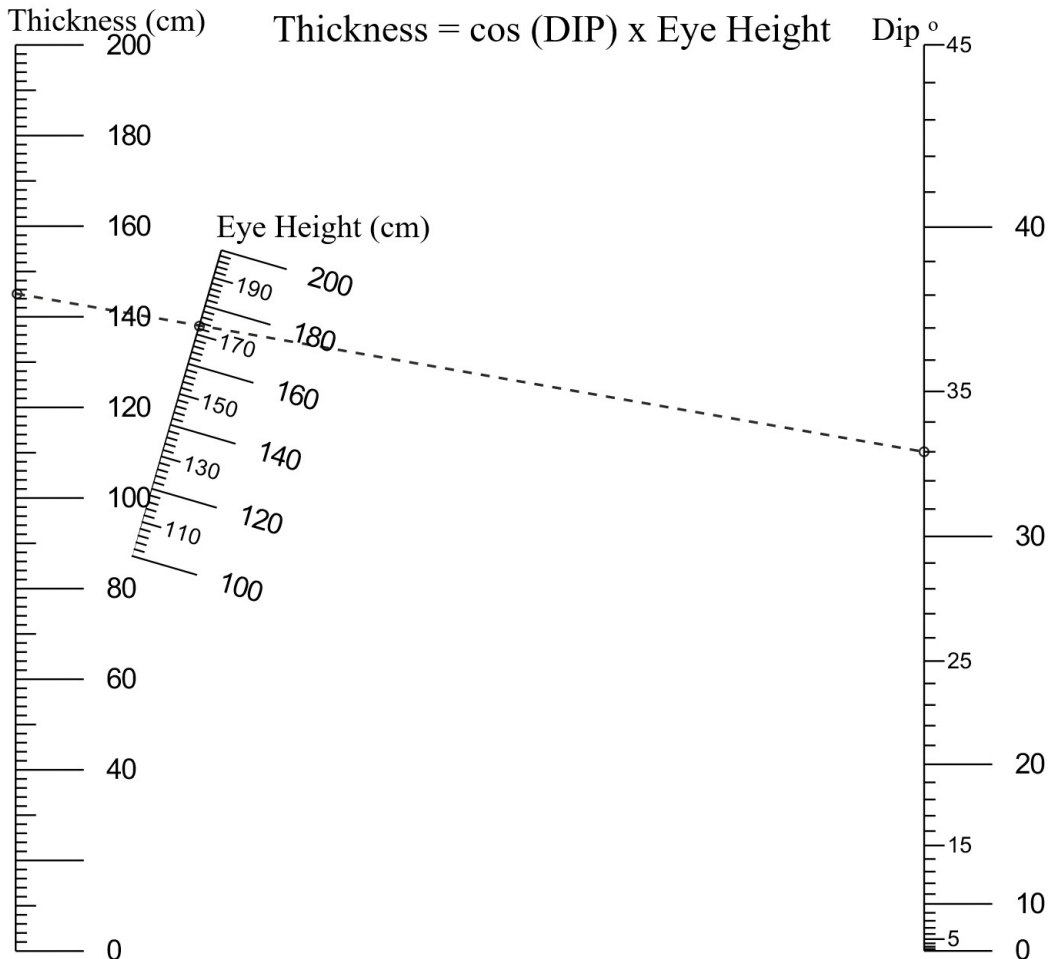
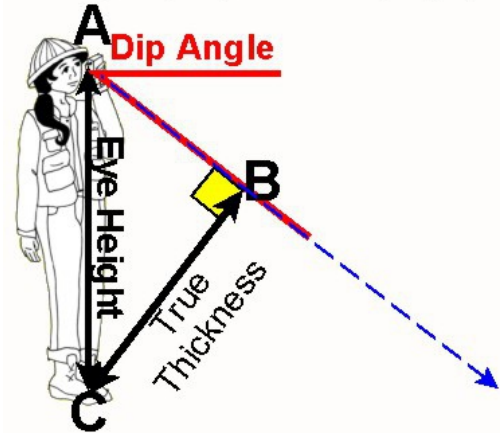
Method

Measuring the TRUE stratigraphic thickness of rock layers using the Brunton Method

- Make sure you measure parallel to DIP and perpendicular to STRIKE -

- Explain the general measurement approach in your field notebook. Include calculations if necessary.
- Start drawing your stratigraphic section **TO SCALE** as you do your Brunton - Eye Height true thickness measurements.
- Draw the profile of your stratigraphic section as you measure, including graphic display of lithology and weathering characteristics.
- You should have a minimum of 3 different rock units detailed. Show smaller beds or layers in your stratigraphic section **TO SCALE**.
- Remember, oldest rocks are on the bottom, the youngest on top!

True thickness (BC) = Eye Height (AB) x COS (Dip °)



Stratigraphic Section -
Rock Observations &
Description

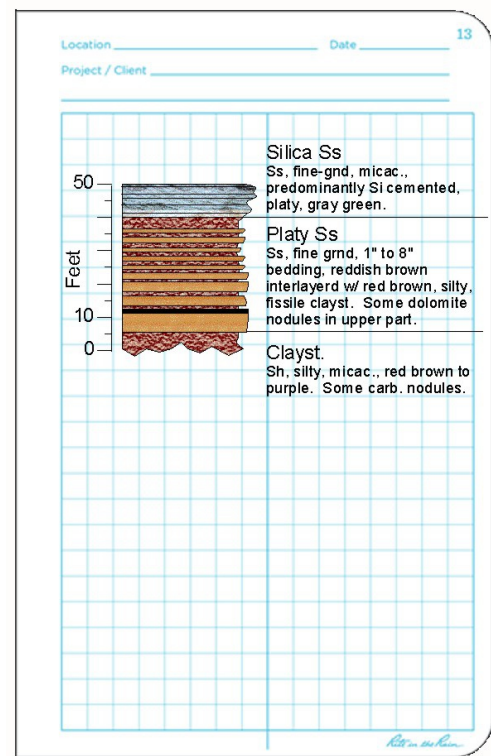
For each rock unit and smaller beds identified and drawn in your stratigraphic section, give a geologic description, following the points as outlined.

Method

Detailed description of Lithologies

As with previous field assignments, give a detailed description of the lithologies observed covering the following points:

- Assumed rock type / age (any RockD data marked as such)
- Weathering patterns (Cliff former? Dissolution cavities? Etc.)
- Color (fresh & weathered)
- Assessment of cement and / or any observable mineralogy
- Grain size (numeric if at all possible)
- Roundness / Sorting observation for sedimentary rocks
- Porosity (Does your acid drop soak in?) Size of drop soak analogous to porosity
- Fossils, Trace fossils, and other features (e.g. ripple marks, cross bedding, bioturbation?) Be detailed, give sizes and density of occurrence



Self - Selection:

Pick one of the features on the Dinosaur Ridge Trail (Dino Bones? Foot Prints? Ripple Marks?, whatever interests YOU). Identify location in notes. Then Describe / Sketch (to scale)!

Applying what you have learned so far. You pick whatever feature interests you along the Dinosaur Ridge trail or Alameda Pkwy. Then you complete a notebook entry with measurements concerning this feature. Your notebook entry should include:

- A detailed notebook entry describing the feature including the lithology.
- Your notebook entry should include at least ONE quantitative measurement (S&D, Size, Height, etc.) about the feature
- You should have at least ONE sketch of the feature drawn to scale.