**ES302 Reading Review Questions Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Introduction to Geologic Maps**

Read the introductory chapter on introduction to maps used to study the Earth, located for download at the following URL on the class web site:

<https://people.wou.edu/~taylors/g302/Ch1_Intro_Geo_Maps.pdf>

Using the reading resource and ancillary internet search tools (google, Wikipedia, etc.), answer the following questions.

1. List and briefly describe 6 of the primary sources of map and imagery information for use in interpretation of the Earth’s surface features and geologic structures.
2. List and describe the primary information provided by Topographic Maps.
3. List and describe the primary information provided by standard Geologic Maps.
4. Describe the difference between oblique aerial photographs and vertical aerial photographs. Provide a sketch or image showing the difference to illustrate your answer.
5. What is an “orthophotograph” and describe the process used in its creation.
6. Provide a definition of “remote sensing” and a brief discussion of the types of images that fall into this category.
7. List the range of the electromagnetic spectrum that is used for remote sensing of the Earth’s surface.
8. True or False: reflected electromagnetic energy from the sun is commonly used in the development of remote sensing imagery of the Earth’s Surface.
9. What is infrared radiation commonly used to detect with remote sensing technology of the Earth’s surface?
10. Examine Figure 1-2 in the reading. Of the three rock unit types provided in the example, which lithology (rock type) is most durable, resistant to erosion, and forms hard cap rock forming the canyon rim at Book Cliffs, Utah? Which rock material appears to be the weakest and most erodible, forming the valley floor below?
11. Briefly describe the “Landsat” program and the types of products that are derived from this remote sensing technology.
12. True or False: Google Earth is highly useful tool for examining the Earth’s surface.
13. Examine Figure 1-3. Describe the types of river drainage patterns exemplified in this set of images.
14. What is “SLAR” and how is it used in the study of the Earth’s Surface.
15. On geologic maps, what define and discuss the difference between “rock units”, “formations”, and “members”. What is the primary information about the rock materials that are used to distinguish between map units.
16. What is a “control point” on a geologic map and how are they used in the mapping process. What types of features are commonly used as control points on geologic maps.
17. Examine Figure 1-4, image of the Valley and Ridge province of Pennsylvania. What types of rock units are resistant to erosion and tend to hold up the mountain ridges. What types of rock units are less-resistant to erosion and tend for line the eroded valley bottoms. Describe the difference between the topography of the Appalachian Plateau province in the northwest (upper left) corner of the image, compared to the Valley and Ridge Province located in the lower 2/3’s of the image. What types of rock materials underlie the Appalachian Plateau.
18. Examine Figure 1-5 part 1 on p. 9 and Figure 1-5 part 2 on p. 10. Compare the aerial photograph, to the topographic map base, to the resulting Geologic sketch map. Answer the following questions:
    1. What two geologic time periods are represented by the rock record in this part of Utah?
    2. True or False: given the time period represented by the rock record at this location, compared to known evolutionary time scales based on the fossil record, it is highly possible that dinosaur bone fossils could be contained in the rock strata outcrops in the field.
    3. True or False: given the time period represented by the rock record at this location, compared to known evolutionary time scales based on the fossil record, it is highly possible that Neanderthal humanoid fossils could be contained in the rock strata outcrops in the field.
    4. Which formation is located at the highest elevation points along the Mesa top and what is Its geologic age?
    5. Which formation is located at the lowest elevation points in the northwest corner of the map area (upper left) and what is its geologic age?
    6. True or False: based on the geologic map patterns, the oldest age rocks are located at the highest elevation points on the map area, and the oldest age rocks are located at the youngest age rocks are located at the lowest elevation points on the map area.
    7. Describe the difference between a Geologic Cross Section and a Geologic Block Diagram. Provide a sketch or image capture to support / illustrate your answer.
    8. What is “LiDar” imagery, how is it collected and what is it used for?
    9. What types of surface features can be mapped using LiDAR Bare Earth terrain models.
19. Examine Figure 1-7 and read the related text. What is a structure contour map, what types of features are modeled?
    1. True or False: the Michigan Basin is characterized by over 12,000 feet of sedimentary rock accumulated in the center of the basin.
20. In summary, provide four examples of how geologic maps are used by natural resource professionals as part of land development activities.
21. True or False: Geologic Maps are an important information resource for sustainable management of planet Earth resources.