Introduction to Surveying and Geomatics

1st stage – Fall semester – 1st Lecture

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OUTLINE

- What is surveying?
- What is geomatics?
- Tasks of Geomatics Engineer
WHAT IS SURVEYING?

- **Surveying** is the art and science of taking field measurements on or near the surface of the Earth.
- Surveying may be defined as the science of determining the position, in three dimensions, of natural and man-made features on or near the surface of the Earth.
• Survey field measurements include:
  • horizontal and slope distances, vertical distances,
  • horizontal and vertical angles.
• Surveyors can measure position as given by the northing, easting, and elevation of a survey station by using some techniques.

• The surveyor can derive related distances and directions through geometric and trigonometric analysis.
GEOMATICS

• **Geomatics** (*geos*: Earth, *matics*: informatics) is a term used to describe the science and technology of dealing with Earth measurement data.

• It includes selecting the instruments and the appropriate techniques for **collecting**, **storing**, **integrating**, **modeling**, **analyzing**, retrieving at will, **transforming**, displaying and distributing spatially georeferenced data.

• It has applications in all disciplines and professions that use Earth-related spatial data.

• Geomatics includes traditional surveying as its basic.
Moving from Surveying to Geomatics:

- The term *geomatics* was created at Laval University in Canada in the early 1980s.

- The principal reason cited for making the name change is that the manner and scope of practice in surveying have changed dramatically in recent years.

- Many college and university programs in the United States that were formerly identified as “Surveying” or “Surveying Engineering” are now called “Geomatics” or “Geomatics Engineering.”
TASKS OF GEOMATICS ENGINEER:

1. The determination of the size and shape of the earth by:
   - The measurements of all data needed to define the size, position, shape and contour of any part of the earth and monitoring any change within.
2. The development, testing and calibration of sensors, instruments.

3. The acquisition and use of spatial information from close range, aerial and satellite imagery.
4. Monitoring of physical features, structures and engineering works on, above or below the surface of the earth.
5. The determination of the position of the boundaries of public or private land, including national and international boundaries.

6. The design, establishment and administration of geographic information systems (GIS) and the collection, storage, analysis, management, display and distribution of data.

8. Execution of as-built surveys and preparation of related maps, plans, and profiles upon completion of the project.

9. Analysis of errors and tolerances associated with the measurement, field layout, and mapping or other.
QUESTION