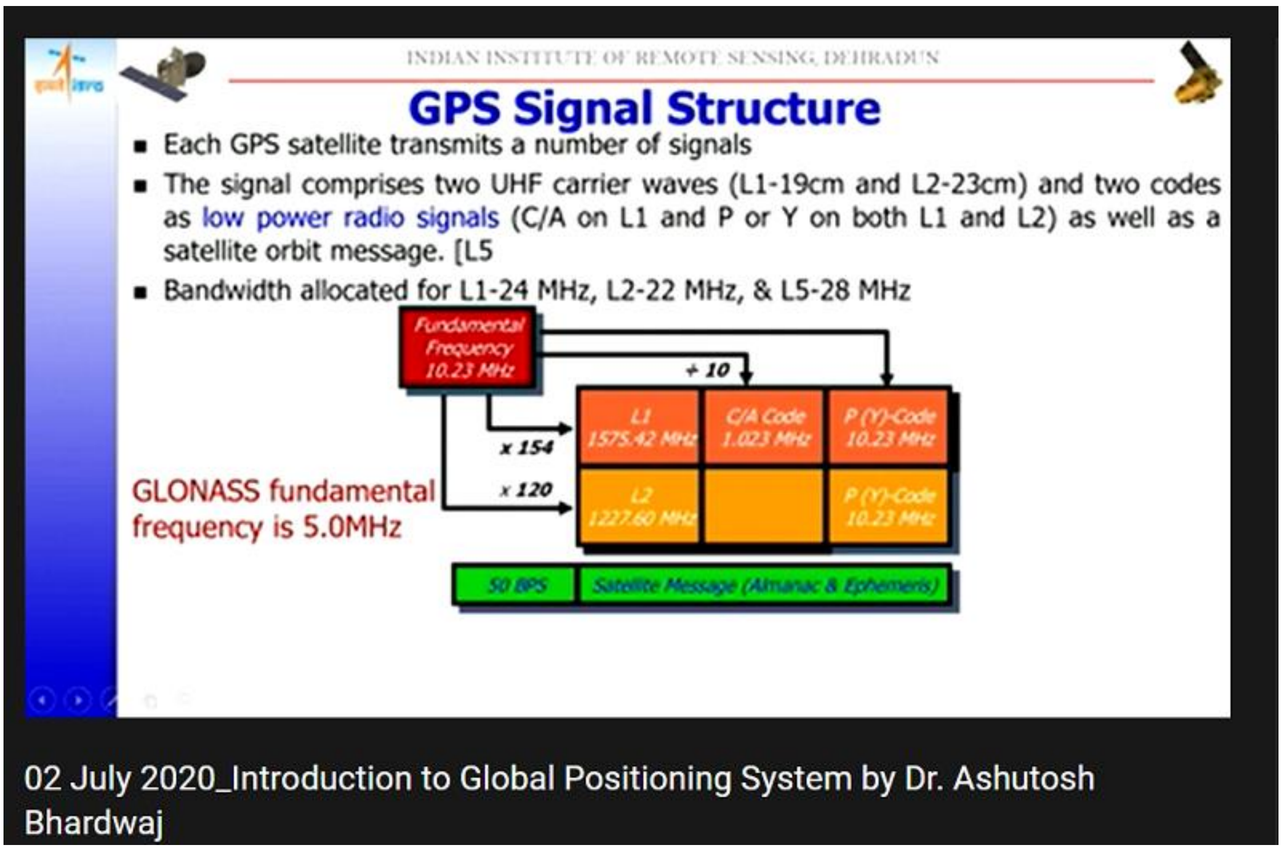
DAILY ASSESSMENT FORMAT

Date:	02-07-2020	Name:	M V Ramya
Course:	Satellite photogrammetry and its applications	USN:	4al17ec045
Topic:	Introduction to Global Positioning System	Semester & Section:	6th & A
GitHub Repository:	MV-Ramya-045		

SESSION DETAILS
Image of session



Introduction to Global Positioning Systems:

Globe within Satellite Network:

The Global Positioning System (GPS) is a satellite-based navigation system made up of a network of 24 satellites placed into orbit by the U.S. Department of Defense. GPS was originally intended for military applications, but in the 1980's, the government made the system available for civilian use. GPS works in any weather conditions, anywhere in the world, 24 hours a day, 365 days a year. The 24 satellites that make up the GPS space segment are orbiting the earth about 12,000 miles above us. These satellites are travelling at speeds of roughly 7,000 miles an hour. GPS satellites are powered by solar energy. They have backup batteries onboard to keep them running in the event of a solar eclipse, when there's no solar power. Small rocket boosters on each satellite keep them flying in the correct path. Each satellite weighs about 2,000 pounds and is built to last about ten years.

How Does GPS Work?

GPS satellites circle the earth twice a day in a very precise orbit and transmit signal information to earth. GPS receivers take this information and use triangulation to calculate the user's exact location. Essentially, the GPS receiver compares the time a signal was transmitted by a satellite with the time it was received. The time difference tells the GPS reciever how far away the satellite is. Now, with distance measurements from a few more satellites, the reciever can determine the user's position and display it on the user's electronic map. A GPS reciever must be locked on to the signal of at least three satellites to calculate a 2D position (latitude and longitude) and track movement. With four more satellites in view, the reciever can determine the user's 3D position (latitude, longitude and altitude). Once the user's position has been determined, the GPS unit can calculate other information, such as speed, bearing, track, trip distance, distance to destination, sunrise and sunset time and more.

What is WASS?

Wide Area Augmentation System (WAAS) is a system of satellites and ground stations that provide GPS signal corrections, giving you even better position accuracy. How much better? Try an average of up to five times better. A WAAS-capable reciever can give you a position accuracy of better than three meters, 95 percent of the time. As long as your GPS system is WAAS enabled you do not need any additional equipment or pay any service fees.

Precise Point Positioning:

Precise point positioning (PPP) stands out as an optimal approach for providing standalone static and kinematic geodetic point positioning solutions using all the available GNSS constellations. Combining precise satellite orbits and clocks with un-differenced, dual-frequency, pseudo-range and carrier-phase observables, PPP is able to provide position solutions at centimeter-level precision. PPP offers an attractive alternative to Differential Global Navigation Satellite System (DGNSS), with the advantage that it does not require simultaneous observations from multiple stations, i.e., it only needs a single geodetic receiver. In practice, PPP makes use of a network of reference stations in order to compute precise estimates of GNSS satellites orbits and clock errors. Nevertheless, it requires fewer reference stations globally distributed as compared with classic differential approaches (e.g. Real Time Kinematics, RTK), and one set of precise orbit and clock data (computed by a processing center) is valid for all users everywhere. Furthermore, as the precise orbits and clocks are calculated from a global network of reference stations, the same set of satellites is simultaneously observed by multiple stations, which enables PPP to provide position solutions rather robust to individual reference station failures.