

Fundamentals of GNSS

- 1.1 I introductions to GNSS: *Conventional navigation, background, concepts and evolutions of global navigation satellite systems (GPS, GLONASS, Galileo, BeiDou/ COMPASS) and regional navigations satellite systems (IRNSS, QZSS). Comparison of GNSS with other navigation systems;*
9 hrs (**Dr Najam Abbas Naqvi**)
- 1.2 Reference systems: *Terrestrial, celestial and orbit coordinate reference system. Height Systems. Geoid. Time systems, synchronization and data conversion. Transformations between coordinate reference systems. Contribution of the International GNSS Service (IGS) to providing access to the International Terrestrial Reference Frame (ITRF);*
6 hrs (**Dr Hamid Mehmood**)
- 1.3 Satellite orbits: *Orbital parameters. Orbital motion, representation (Keplerian elements, etc.) Determination of satellite position, visibility and ground tracks;*
9 hrs (**Ms Zainab Saleem**)
- 1.4 Basic techniques of communications: *Propagation of electromagnetic waves. Antennas and propagation channels. Signal modulation and multiple accesses. Signal processing.*
18 hrs (**Dr Moazam Maqsood**)
- 1.5 Signal Modulation techniques: *Spread Spectrum, BPSK, QPSK, BOC, MBOC CBOC, AltBOC* (**Ms. Salma Zainab Farooq / Dr Moazam**)
6 hrs