ENAE 441 Notes

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Contents

1 Definitions

Details can be found in the appendix of the book.

- **Datetime** : 2021-09-02 09:45:23 [04:00] (the latter part is the timezone). Time zone is generally not used because we'll be using UTC.
- $\mathbf{r}_\bullet$: Location at Epoch
- J2000 Timekeeping system : Terrestrial time (approximately UTC)
- Julia date number of days from an epoch Jan 1 4713 BC @ noon
- MID Modified Julia Date JD - 2400000 epoch in 1858
- Angles
  - Radians : whenever an angle appears as a polynomial
  - **Degrees** : Divides into **minutes** and **seconds**
  - **Degree** (in decimal) : divides into **arcminutes** (1/60 degree) **arcseconds** (1/60 arcminute) 45 12' 30"
  - Revolutions
  - Hours : 24 hours = 1 revolution
- Three properties characterize a coordinate system
  - center
  - orientation alignment of the axes
  - type: cartesian or spherical polar
  - principal axis is the first axis (x)
  - perifocal plane is plane of orbit
  - Compass heading measured clockwise from North
  - Earth coordinates measure radial distance form urface of the earth rather than the center

Definition 1.1 (Hill Clohssey Wiltshire Equations (HCW))**.**

$$\ddot{x} - 2x\dot{y} - 3n^2x = f_x$$

$$\ddot{y} + 2n\dot{x} = f_y$$

$$\ddot{z} - n^2z = f_z$$