



QUIZ STUDY GUIDE

StellarXplorers National Finals Competition (NFC)

For National Finals Quiz will be an individual 10-question quiz taken by all team members. This quiz will be a **CLOSED-BOOK QUIZ**, administered using ClassMarker (web-based testing site). Each student will have 10 minutes to complete the quiz. The team score will be the average score of all team members. Study topics come from the *Understanding Space* textbook.

CHAPTER 1

Section 1.1

- Know the mission(s) of the following spacecraft: Pioneer, Mariner, Viking, and Magellan.

CHAPTER 2

Section 2.1

Know the key contributions of the Renaissance astronomers Nicholas Copernicus, Tycho Brahe, and Johannes Kepler.

CHAPTER 4

Section 4.3

- Know how the Total Mechanical Energy, Kinetic Energy, and Potential Energy of a person changes when a person is riding on a playground swing.

CHAPTER 5

Section 5.1

- Know how each of the following six Classical Orbital Elements (COE) describe an orbit and a spacecraft's location within the orbit: Semi-major Axis (a), Eccentricity (e), Inclination (i), Right Ascension of the Ascending Node (RAAN) (Ω), Argument of Perigee (ϵ), True Anomaly (v)
- Know the relationship between an orbit's shape and the orbit's eccentricity.

Section 5.2

- Know the characteristics of the following types of orbits:
 - Geostationary
 - Geosynchronous
 - Semi-synchronous
 - Sun-synchronous
 - Molniya

Section 5.3

- Know the relationship between the inclination of an orbit and its ground track.

CHAPTER 9

Section 9.2

- Understand how the orbit inclination determines the number of launch windows per day from a specified launch site, using the textbook definition of Launch Window.

CHAPTER 14

Section 14.1

- Know the definitions of the following terms: effective exhaust velocity, impulse, total impulse, specific impulse.

Section 14.2

- Know how the Hall Effect Thruster and Pulsed Plasma Thruster work.