

Aerospace Engineering

Level 3

(Principles of Aerospace – EGG 1025)

Covers the field of aerospace engineering and how engineers use math, science, and technology to solve problems. The course also includes how the problem-solving process is applied to satellite subsystem designs and implemented practically, and an examination of the social and political implications of technology.

REQUIRED LEARNING OUTCOMES:

1. Explain the principles of aerospace engineering.
2. Apply engineering principles to a variety of aerospace related project-based experiences and applications.
3. Apply critical thinking skills when solving problems.
4. Participate in team projects and contribute equitably to foster teamwork.
5. Apply technical writing to develop quality reports.
6. Show professional communication through oral presentations.
7. Explain social and political implications of aerospace technology.

REQUIRED TOPICAL OUTLINE:

- I. Aeronautical engineering topics
 - A. Glider stability and control
 - B. Trim speed
 - C. Incompressible flow introduction
 - D. Supersonic flow and shock waves
 - E. Aircraft propulsion
- II. Rocketry
 - A. Rocket engine types
 - B. Ideal rocket equation
 - C. Rocket stability and control
 - D. Launch vehicles
- III. Space systems introduction
 - A. Basics of orbital mechanics
 - B. Orbital mechanics and maneuvering
 - C. Satellite subsystems

- 1. Power
- 2. Thermal control
- 3. Structures
- 4. Communication
- D. Space weather
- E. Satellite applications
- F. CubeSats
- IV. Engineering professional skills
 - A. Teamwork
 - B. Time management
 - C. Ethics
 - D. Safety
 - E. Sustainability
- V. Engineering design process methodologies
 - A. Newton's Laws
 - B. Dimensional
 - C. Presentation applications
 - D. Mathematical
 - E. Software applications
 - F. Manufacturing
 - G. Testing environments

