

Course Title	Course Code	Credit Hours
Control Systems	AE- 353	2-1

Textbook:

- Norman S. Nise, “Control Systems Engineering”, Wiley

Reference Books/Materials:

- Katsuhiko Ogata, “Modern Control Engineering”, Pearson
- EASA Part-66 Category B1 Maintenance License Module 4, “Electronic Fundamentals”

Course Objective:

This course aims the students understanding of Control Systems for Aerospace applications, covering design, analysis, and implementation of control strategies, including System Modelling, Stability, and Feedback Control.

Course Outline:

- Introduction to Control System Terminology and Examples
- Understanding Open-Loop Control Systems
- Understanding Closed-Loop Control Systems
- Introduction to Various Test Signals in Control Systems
- Fundamentals of Control System Design
- Graphical Mathematical Modeling of Systems
- Mathematical Modeling of Translational and Rotational Engineering Systems
- Modeling of Electrical and Electromechanical Systems
- Analysis of Servomechanism Defects, Reversal of Synchro Leads, and Hunting
- Concepts of Laplace and Inverse Laplace Transforms in Control Systems
- Nonlinearity and Linearization in Control Systems
- Time Response Analysis of First and Second-Order Systems
- Transient Response and Routh’s Stability
- Root Locus Analysis: General Rules and Plot Construction

- PID Design Principles, Including Lead and Lag Compensation (PD, PI, PID)
- Transfer Functions and Their Application to Aircraft Systems
- Pitch and Altitude Control of Aircraft