

MA 579- Modern Control Systems

Course Code:	MA-579
UTAA Credit (Theoretical-Laboratory hours/week):	3(3-0)
ECTS Credit:	6.0
Department:	Mechanical and Aeronautical Engineering
Language of Instruction:	English
Level of Study:	Graduate
Offered Semester:	Fall and Spring Semesters.

Course Objectives

A brief history of automatic control, Review of matrix algebra, Modeling and linearization, State-space representation of linear systems, State transition matrix, State transformations, Modal analysis, Controllability, observability, Observer design, Pole placement, State feedback and output feedback, Linear quadratic control, Introduction to optimal control, Lyapunov stability criteria.

Course Content

State-space representation of linear systems and Dynamic analysis

Observer design

Feedback control

Linear quadratic control

Fundamentals of optimal control.

Course Learning Outcomes

1-State-space representation of linear systems

2-Dynamic analysis

3-Modal analysis

4-Controllability and observability analysis

5-Observer design

6-Feedback controller design

7-Linear quadratic controller design

8-Lyapunov stability