



# AUTOMATIC CONTROL

**PROF. ANIL KUMAR**

Department of Mechanical Engineering  
IIT Roorkee

**TYPE OF COURSE** : Rerun | Core | UG/ PG

**COURSE DURATION** : 8 weeks (24 Jan' 22 - 18 Mar' 22)

**EXAM DATE** : 27 Mar 2022

**PRE-REQUISITES** : Completed first year of BE/BTech

**INTENDED AUDIENCE** : UG students of Mechanical, Electrical, Automobile, Production, Aerospace, Civil Engineering and equivalent

**COURSE OUTLINE :**

Automatic Control is the theory used in various applications, for example, manufacturing of a product, refrigeration and air conditioners, aircraft, missile, satellite launching, etc. The study of a dedicated course is required to understand the fundamental and advance concepts of automatic controls for engineers and designers. This course is of basic level. It introduces design and modelling of a control system, theory of transfer functions, poles, zeros, block diagram algebra, transient response analysis of first and second order systems, stability and Routh's criteria, error analysis, PID control, root locus techniques, compensation techniques, introduction to the state space method and application of MATLAB in automatic control.

**ABOUT INSTRUCTOR :**

Prof. Anil Kumar works as an Assistant Professor faculty in the Department of Mechanical and Industrial Engineering at IIT Roorkee for more than four years. He teaches subjects like, Automatic Control, Machine Design, Vibrations and Noise, etc. to UG students. His research area belongs to semi-active rail suspension, modal identification of structures, testing of piping joints, pedestrian-structure interaction modelling.

**COURSE PLAN :**

**Week 1:** Automatic Control System

**Week 2:** Mathematical Modelling

**Week 3:** Transient Response Analysis

**Week 4:** Stability and Steady State Error

**Week 5:** Root Locus Technique

**Week 6:** Design via Root Locus and Compensation Techniques

**Week 7:** State Space Method

**Week 8:** Application of MATLAB in Automatic Control