

Course Type	Course Code	Name of Course	L	T	P	Credit
DC	EEC206	Control System Engineering	3	0	0	9

<b>Course Objective</b>
The objective of the course is to provide basic concept of automatic feedback control systems principles and analysis.
<b>Learning Outcomes</b>
Upon successful completion of the course the students will acquire knowledge of feedback control principles.

Unit No.	Topics to be covered	Lecture Hours	Learning Outcome
1	Introduction: open-loop and feedback control systems Mathematical modelling of physical systems through differential equations, Linearization, Transfer function, block diagram, signal flow graph. Examples from electrical, mechanical and thermal systems. Control systems components – potentiometer, differential amplifier, synchro, tacho-generator, servomotor, stepper motor, hydraulic valve.	12	Understanding of physical properties and developing of mathematical models for control system components.
2	Time response of first and second order systems, steady state errors and error constants, performance specification in time domain. Frequency response of control systems – Bode plot and Nyquist plot, performance specification in frequency domain.	14	Knowledge on analyzing control system properties and performances.
3	Concept of stability, Routh stability criterion, Root locus technique, Nyquist criterion, gain margin and phase margin. Compensation technique: lead-lag compensators, PID controllers.	16	Knowledge on stability and acquaintance with designing control systems

**Text Books:**

1. K. Ogata – Modern Control Engineering.

**Reference Books:**

1. B. C. Kuo – Automatic Control Systems.
2. N. S. Nise – Control Systems Engineering.
3. I. J. Nagrath and M. Gopal – Control Systems Engineering.