

SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Electronics)
Semester: III
Syllabus with Effect from: June - 2014

Paper Code: PS03CELE01	Total Credit: 4
Title Of Paper: Principles of Control Systems	

Unit	Description in detail	Weightage (%)
I	Definition, Classification and Characteristics of Control Systems, Open and closed loop Systems, Transfer Function and Impulse Response, Block Diagram Representation, Signal Flow graph, Modeling of Systems. Control Action & Controllers, ON/OFF, Proportional, Integral, Derivative and PID Controllers.	25%
II	Time Domain Analysis, Standard test Signals, Steady state error, Analysis of type 0,1,and 2 Systems, Time Response of higher order Systems, Frequency Domain Analysis, Conceptual Approach to Frequency Response, Relation between Transfer Function and Frequency Response, Co-relation between Time and Frequency Response Specifications.	25%
III	Concept of Root Locus, Angle and Magnitude Condition, Construction of Root Locus, Inverse Root Locus, Addition of Poles and Zeros on Root Locus, Stability of Control Systems, Routh-Hurwitz Criterion, Bode Plots and Stability Analysis of Systems,	25%
IV	Polar Plots, Stability on Polar Plots, Nyquist Analysis, Stability from Nyquist Plot, Constant gain and Phase Loci, M and N Circles, Nichols Chart. Compensation of Control Systems, Types of Compensation, Phase-Lead, Phase-Lag, Phase-Lag-Lead Compensation, Feedback Compensation.	25%

Basic Text & Reference Books:-

- **Principles of Control Systems**
S.C.Goyal and V.A.Bakshi Technical Publications, Pune (INDIA)
- **Feedback Control Systems**
S.D.Bhide, S.Satyanarayan & N.A. Jalgaonkar, Technova Publications, Pune (INDIA)
- **Control Engineering: Theory and Practice**
M.N.Bandyopadhyay
Prentice Hall of India Private Limited, New Delhi (INDIA)
- **Automatic Control Systems**
Benjamin C. Kuo, Prentice Hall of India Pvt. Ltd., New Delhi (INDIA)
- **Modern Control Engineering**
Katsuhiko Ogata, Prentice Hall of India Pvt. Ltd., New Delhi (INDIA)
- **Control Systems Engineering**
I.J.Nagrath & M. Gopal, Wiley Eastern, New Delhi (INDIA)

