Course Code	ECE 570
Course Name	Control Theory
Credits	4
Course Offered to	UG/PG
Course Description	The goal of this course is to provide introductory knowledge in control systems. This course covers modelling a system, analysing the response of the system in time and frequency domain, and designing a feedback controller to control the system. The course will have an equal weightage on theoretical foundations and simulation based implementation.

Pre-requisites		
Pre-requisite (Mandatory)	Pre-requisite (Desirable)	Pre-requisite(other)

*Please insert more rows if required

Post Conditions*(For suggestions on verbs please refer the second sheet)			
CO1	**CO2**	**CO3**	**CO4**
Students are able to develop mathematical model of systems using differential equations and analyse its dynamical behaviour	Students are able to characterize the stability of a control system using time domain, frequency domain and state space approaches	Students are able to synthesize a controller satisfying the performance specifications in time domain, frequency domain and state space approaches.	

Weekly Lecture Plan

Week Number	**Lecture Topic**	**COs Met**	**Assignment/Labs/ Tutorial**
1	Introduction and Modelling a dynamical system with differential equations	CO1	Assignment
2,3	Behavior of dynamical systems - equilibrium points, stability, limit cycles and other key concepts of dynamical systems	CO1	Assignment
4	Linear systems - input/output behavior for linear systems and linearization	CO1	Assignment
5,6	Time-domain response	CO2	Assignment
7	Root locus	CO2	Assignment
8,9	Frequency domain analysis	CO2	Assignment
10,11	State-space modeling, Controllability and Observability	CO2	Assignment
12	Controller and observer synthesis	CO3	Assignment
13	PID Controller	CO3	Assignment

*Please insert more rows if required

Weekly Lab Plan

Week Number	**Laboratory Exercise**	**COs Met**	**Platform (Hardware/Software**
	NA		

*Please insert more rows if required

Assessment Plan	
Type of Evaluation	% Contribution in Grade
Homework	20
Mid-sem	30
Quiz	20
End-sem	30

*Please insert more row for other type of Evaluation

Resource Material	
Type	**Title**
Textbook	Modern Control Engineering, Katsuhiko Ogata, 5th edition
Reference	Feedback Systems: An Introduction for Scientists and Engineers by Karl J. strm and Richard M. Murray, Princeton University http://www.cds.caltech.edu/~murray/amwiki/index.php/Second_Edition [Chapters 4 and 5] Automatic control systems, Benjamin. C. kuo Control systems and engineering, I. J. Nagrath, M. Gopal