VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY
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DEPARTMENT OF ELECTRICAL ENGINEERING & E.E.E.

2016-17 LESSON PLAN OF NONLINEAR CONTROL(3-1-0)

FACULTY: SASMITA BEHERA **SEMESTER-EVEN(2nd) M. Tech (C & I)**

PERIOD	MODULE NO.& TOPIC TO BE COVERED	REMARKS
	MODULE-I	
1	Introduction, Syllabus and revision of background	
2	Phase plane analysis: Concepts of phase plane analysis	
3	Phase portraits- singular points	
4	Symmetry in phase plane portraits-Constructing Phase Portraits	
5	Phase plane Analysis of Linear and Nonlinear Systems-	
6	Existence of Limit Cycles.	
7	Describing function: fundamentals,	
8	computing describing functions, common nonlinearities and its describing functions,	
9	Nyquist criterion and its extension, existence of limit cycles, stability of limit cycles.	
10	Tutorial	
	MODULE-II	
11	Nonlinear Systems and Equilibrium Points,	
12	Concepts of Stability,	
13	Linearization and Local Stability,	
14	Lyapunov's Direct Method-Positive definite Functions and Lyapunov Functions,	
15	Equilibrium Point Theorems-Invariant Set Theorems-	
16	LTI System Analysis based on Lyapunov's Direct Method,	
17	Krasovski's Method,	
18	Variable Gradient Method,	
19	Control Design based on Lyapunov's Direct Method.	
20	Tutorial	
	MODULE-III	
21	Feedback linearization: Feedback Linearization and the Canonical Form,	
22	Mathematical Tools,	
23	Input-State, Linearization of SISO Systems,	
24	input-Output Linearization of SISO Systems,	
25	Generating a Linear Input-Output Relation, Normal Forms,	
26	The Zero-Dynamics, Stabilization and Tracking,	
27	Inverse Dynamics	
28	Non-Minimum-Phase Systems,	
29	Feedback effect	
30	Tutorial	
	MODULE-IV	
31	Feedback Linearization of MIMO system	
32	Zero Dynamics	
33	Control Design of MIMO system	
34	Sliding mode control: Basics	
35	Sliding Surfaces,	
36	Continuous approximations of Switching Control laws,	
37	The Modeling/Performance Trade-Offs-MIMO Systems.	
38	The Modeling/Performance Trade-Offs-MIMO Systems.	
39	MIMO systems	
40	Tutorial	