No	Information of subject	
1	Unit name:	Modern Control System
2	Code:	McE 51017
3	Classification:	Engineering subject
4	Credit value:	2.5
5	Semester/ Year Offered:	1/5
6	Pre-requisite:	Modeling & Control
7	Mode of delivery:	Lecture, Presentation, Discussion
8	Assessment system and breakdown of marks:	Assignment , Tutorial, Practical
	Mid-term/ final Examination	70%
	Assignment/Home work /Practical	30%
9	Academic staff teaching unit:	Department of Mechatronic engineering
10	Course outcome of unit: In this course, students will be able (a) To explain the relative stability of a system utilizing the root locus graphical method. (b) To analyze the frequency response of a system by using the polar plot and logarithmic plots (Bode plot). (c) To determine the stability of a feedback control system in the frequency domain by utilizing Nyquist's criterion. (d) To sketch the important concepts of gain margin, phase margin and bandwidth are developed in the context of Bode plot and Nyquist diagrams.	
11	Synopsis of unit: The course introduces students to the study of Modern Control System, its principles and techniques. Course covers the root locus method, a graphical technique, can be used to obtain an approximate sketch in order to analyze the initial design of a system and determine suitable alternations of the system structure and the parameters values. A computer is commonly used to calculate several accurate roots at important points on the locus. Furthermore we have considered the representation of a feedback control system by its frequency response characteristics. And also the stability of feedback control system can be determined in the frequency domain by utilizing Nyquist's criterion. Nyquist's criterion provides us with two relative stability	

	measures: (1) gain margin and (2) phase margin. Modern Control System subject is a comprehensive course in Mechatronic engineering and can be applied in the control field and any other various applications.
12	Topic: **1 The Root Locus Method** 1.1 Introduction 1.2 The Root Locus Concept 1.3 The Root Locus Procedure 1.4 An example of a Control System Analysis and Design Utilizing the Root Locus Method 1.5 Design Example Problems and Exercises **2 Frequency Response Methods** 2.1 Introduction 2.2 Frequency Response Plots 2.3 An example of Drawing the Bode Diagram 2.4 Frequency Response Measurements 2.5 Performance Specifications in the Frequency Domain 2.6 Log Magnitude and Phase Diagrams 2.7 Design Example Problems and Exercises **3 Stability in the Frequency Domain** 3.1 Introduction 3.2 Mapping Contours in the s-Plane 3.3 The Nyquist Criterion 3.4 Relative Stability and the Nyquist Criterion 3.5 Time-Domain Performance Criteria Specified in the Frequency Domain 3.6 System Bandwidth 3.7 The Stability of Control System with Time Delays 3.8 Design Example Problems and Exercises
13	Main references: A Textbook of Modern Control System , Twelfth Edition, Robert H, Bishop
14	Additional references: