

No	Course Information (2019-2020)	
1	Unit name:	Modern Control System
2	Code:	EcE – 41003
3	Classification:	Engineering subject
4	Credit value:	3 (2-1-1)
5	Semester/ Year Offered:	1/4
6	Pre-requisite:	Fundamental of Electronic Circuits, Electronic Engineering Circuits, Microelectronics, Digital Electronics, Modeling and Control, Integrated Electronics
7	Mode of delivery:	Lecture, Practical, tutorial
8	Assessment system and breakdown of marks:	
	Tutorial	10%
	Practical	20%
	Mid-term/ final Examination	70%
9	Academic staff teaching unit:	Electronic Engineering
10	<p>Course outcome of unit:</p> <p>In this course students will be able</p> <ul style="list-style-type: none"> ➤ To identify powerful basic concepts of modern control system ➤ To design controllers to meet desired specifications using root locus method, frequency response method ➤ To simulate performance of feedback control system by using MATLAB and simulation of PID control by using Simulink software 	
11	<p>Synopsis of unit:</p> <p>The course covers the techniques of analysis of linear control system and control design. The course introduces students to apply the root locus method. In addition, the locus of roots in the s-plane can be determined by a graphical method, the roots of the characteristics equation move around the s-plane by changing one parameter. Frequency response method, the polar plot of the frequency response of a system, stability in the frequency domain, stability considerations using Nyquist diagram, design using compensation networks and optimization, the bode diagram of a transfer function, the design of feedback control systems, and the design of state</p>	

	variable feedback systems will be learned.																																																
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14	<p>Main references:</p> <p>Modern Control Systems, 12th Edition, Richard C. Dorf, Robert H. Bishop</p>																																																
15	<p>Additional references:</p> <p>Note by Modern Control Systems, 11st Edition, Richard C. Dorf, Robert H. Bishop, Prentice-Hall, Upper Saddle....,</p> <p>(http://www.Mypearsonstore.com>bookstore)</p> <p>Modern Control Engineering,5th edition 2010, Ogata, Katsuhiko, by Prentice-Hall, Inc</p>																																																

Information on Lab Practical (EcE-41003 Modern Control System)

Lab	Activities
1	<p>Experiment I: The Root Locus using Control Design Software</p> <p>Objectives:</p> <ul style="list-style-type: none">• To design controllers to meet desired specifications using root locus method, frequency response method• To simulate performance of feedback control system and simulation of PID control by using MATLAB/Simulink software <p>Equipment required:</p> <ul style="list-style-type: none">▪ MATLAB software, Personal computer
2	<p>Experiment II: PID Control System for a DC Motor</p> <p>Objectives:</p> <ul style="list-style-type: none">• To simulate performance of feedback control system and simulation of PID control by using MATLAB/Simulink software <p>Equipment required:</p> <ul style="list-style-type: none">• MATLAB software, Personal computer
3	<p>Experiment III: Polar Plot by using MATLAB</p> <p>Objectives:</p> <ul style="list-style-type: none">• To design controllers to meet desired specifications using root locus method, frequency response method• To simulate performance of feedback control system and simulation of PID control by using MATLAB/Simulink software <p>Equipment required:</p> <ul style="list-style-type: none">• MATLAB software, Personal computer

4	<p>Experiment IV: Stability analysis with Polar Plot using MATLAB</p> <p>Objectives:</p> <ul style="list-style-type: none"> • To design controllers to meet desired specifications using root locus method, frequency response method • To simulate performance of feedback control system and simulation of PID control by using MATLAB/Simulink software <p>Equipment required:</p> <ul style="list-style-type: none"> • MATLAB Software, Personal computer
5	<p>Experiment V: Stability analysis with bode diagram by using MATLAB</p> <p>Objectives:</p> <ul style="list-style-type: none"> • To design controllers to meet desired specifications using root locus method, frequency response method • To simulate performance of feedback control system and simulation of PID control by using MATLAB/Simulink software <p>Equipment required:</p> <ul style="list-style-type: none"> • MATLAB software, Personal computer