



<b>Course:</b> M.Sc.	<b>Name of Faculty:</b> Arun A. Balakrishnan
<b>Topic:</b> ELE 2202 – Control Systems	<b>Semester:</b> II
<b>Lecture Hall:</b> 116	<b>Timings:</b> Slot C= C1+B2'

<b>Week and date</b>	<b>Lecture topics</b>	<b>Assignments</b>	<b>Remarks</b>
Week 1: Jan 3-6	open loop and closed loop systems – concept of feedback - modeling of continuous time systems – Review of Laplace transform - transfer function - block diagrams		
Week 2: Jan 9-13	signal flow graph - mason's gain formula - block diagram reduction using direct techniques and signal flow graphs	<i>Assignment-1</i>	
Week 3: Jan 16-20	- examples - derivation of transfer function of simple systems from physical relations - low pass RC filter - RLC series network - spring mass damper		
Week 4: Jan 23 - 28	time domain solution of first order systems – time constant - time domain solution of second order systems - determination of response for standard inputs using transfer functions - steady state error	<i>Assignment-1 submission</i>	
Week 5:Jan 30 – Feb 3	concept of stability - Routh-Hurwitz techniques - construction of bode diagrams		
Week 6: Feb 6 - 10	First Internals		
Week 7: Feb 13 - 18	- phase margin -gain margin - construction of root locus - polar plots and theory of Nyquist criterion - theory of lag, lead and lag-lead compensators	<i>Assignment-2</i>	
Week 8: Feb 20 - 24	sampling - sample and hold - Examples of sampled data systems		
Week 9: Feb 27 – Mar 3	pulse transfer function - Review of Z-transforms - system function - mapping between s plane and z plane		
Week 10: Mar 6 - 10	Analysis of discrete time systems – examples - stability - Jury's criterion bilinear transformation – stability analysis after	<i>Assignment-2 submission</i>	

	bilinear transformation - Routh-Hurwitz techniques		
Week 11: Mar 13 - 17	construction of bode diagrams - phase margin - gain margin - digital redesign of continuous time systems		
Week 12: Mar 20 - 24	state space models		
Week 13: Mar 27 - 31	Second Internals		
Week 14: Apr 3 - 7	phase variable and diagonal forms from time domain		
Week 15: Apr 10 - 14	- diagonalization - solution of state equations		