















Systems Signal Abstractions	•	Frequency Response	•	Symmetric matrices, quadratic forms, matrix norm, and SVD
Signals as Vectors / Systems as Maps	:	Discrete Time Continuous Time	:	Controllability and state transfer Observability and state estimation
Linear Systems and Their Properties LTI Systems Autonomous Linear Dynamical Syste	• ms •	Laplace Transformation Feedback and Control Additional Applications	•	And that, of course, Linear Systems are Cool!
Convolution FIR & IIR Systems	•	Linear Functions		
Frequency domain Fourier Transform (CT) Fourier Transform (DT)	•	Linear Algebra Review Least Squares Least Squares Problems		
Even and Odd Signals Likelihood Causality		Least Squares Applications Matrix Decomposition and Linear Algebra Regularized Least Squares		
Impulse Response Root Locus Bode Functions	•	Least-squares Least-squares applications Orthonormal sets of vectors		
Left-hand Plane	•	Linear dynamical systems with inputs and outputs		



What I expect from you

- Lectures:
 - Participate ask questions
 - Turn up (hence the attendance marks)
 - Take an interest in the material being presented

• Tutorials:

- Work on questions before tutorials
- Use tutorials to clarify and enhance
- Assignments to be submitted on time

ELEC 3004: Systems

Welcome to ELEC 3004!				
Schedule of Events:				
	Week	Date	Lecture Title	
	1	27-Feb	Introduction	
	-	1-Mar	Systems Overview	
	2	6-Mar	Signals & Signal Models	
	_	8-Mar	System Models	
	3	13-Mar	Linear Dynamical Systems	
		15-Mar	Sampling & Data Acquisition	
	4	20-Mar	Time Domain Analysis of Continuous Time Systems	
	-	22-Mar	System Behaviour & Stability	
	5	27-Mar	Signal Representation	
	5	29-Mar	Holiday	
		10-Apr	Frequency Response	
	0	12-Apr	Analog Filters	
	7	17-Apr	FIR & IIR Systems	
		19-Apr	Multirate Filters	
		24-Apr	Discrete-Time Signals	
	8	26-Apr	Discrete-Time Systems	
		1-May	z-Transform	
	9 [3-May	Discrete Time Analysis Using the z-Transform	
		8-May	Introduction to Digital Control	
	10	10-May	Stability of Digital Systems	
		15-May	Digital Filters	
		17-Mav	Information Theory & Communications	
		22-May	State-Space	
	12	24-May	Controllability & Observability	
		29-May	Applications in Industry	
	13	31-May	Summary and Course Review	
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Schedules and Locations: Lectures: Wednesday from 1:00--3:00 pm in Hawken -- T103 Friday from 10:00--11:00 am in the Prentice -- 216 Tutorials: Odd Weeks Starting on Week 3 (3, 5, 7, etc.) in Hawken -- S202 Sessions are: (1) Monday 9:00a--9:50, (2) Monday 12:00p--12:50, (3) Tuesday 10:00a--10:50, and (4) Thursday 3:00p--3:50 Prac Sessions: Even Weeks

- Starting Week 4 (4, 6, 8, etc.) in <u>Hawken</u> -- S202
- Sessions are: (1) Monday 4:00p--5:50, (2) Thursday 11:00a--12:50, (3) Thursday 4:00p-5:50, and (4) Friday 4:00p--5:50

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Reference Texts:							
LINEAR SYSTEMS SIGNALS	B. P. Lathi, <i>Linear Systems and Signals</i> , 2 nd ed, 2005 TK5102.5.L298 2005	 Yes! You may use the Internet!! – Khan Academy 					
Soleno	(I find the 1 st ed better and cheaper!!)	 Wikipedia YouTube & Google Scholar Too! 					
	João Hespanha, Linear Systems Theory, 2009 [UQ Ebooks]	• This field is vast & there are countless references present					
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Contact Lecturer	
 Surya Singh: – Office: Room 531, <u>GP-South (Bldg 78)</u> 	
 Office Hours: After lectures Wednesday and Friday Fridays 3:00-7:00pm 	
 Make an appointment: – E-mail: elec3004@itee.uq.edu.au 	
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