

Wk	#	Date	Lecture Topic	Reading	Lecture/Notes	CTools	
1	1	M 14	May	Introduction, Systems in radio-controlled car.	Ch. 1, 2.1-3	Sources, Passive Sign, K's Laws Ohms Law V I Dividers	
	2	W 16		Basic electrical units & symbols, Kirchhoff's laws.	2.5-7, 17		
	3	H 17		Resistance, Ohm's law, Power, Resistors in parallel & series.	2.11-12, 3.5		
	4	F 18		Nodes, Grounds, Branches, Meters, Voltage and current dividers.	2.10, 2.13-16		
2	5	M 21		I vs V curves of, sources, resistors, bulbs, and diodes. Thevenin. Max pwr xfer	3.2, 2.19	Lect 5 and 6	Thevenin Equiv, Max Power Xfer
	6	W 23		Thevenin examples			
	7	H 24		Intro to AC and time-varying v(t) & i(t). Concept of signal. Sinusoids. Fourier.	2.20, 3.8	Lect 7	Fourier Series
	8	F 25		Power transmission, Transformer.		Lect 8	
	Lab 1			Introduction to lab, procedures, basic equipment. Measure I-V curves of devices.			
	Lab 2			Measurements of I and V for RC car battery. Create model of the car's battery.			
	3	M 28		MEMORIAL DAY			
	9	W 30		PWM duty cycle and power, AM, FM	2.23, C.8, C.9		A/D Converters
3	10	H 31		A/D conversion, Capacitors	2.34	Lect 9	RLC Circuits
		F 1	Jun	Exam 1			
	Lab 2			cont.			
4	Lab 3			Learn about oscilloscope. Motor drive control RC car. PWM circ. with func gen.			
	11	M 4		RC Circuits. First-order transients.	Ch 6		
	12	W 6		Op amps	Ch 7	Notes: Op Amps	Op-Amps
	13	H 7		Op amps and the PWM circuit			
	14	F 8		Op amps			
	Lab 4a			Make PWM circuit with op-amps.			
5	Lab 4b			Model PWM circuit in PSpice			
	15	M 11		Introduction to block diagrams, feedback	13.1-4	Notes: Systems	
	16	W 13		Feedback control, esp. as it relates to steering position control of the car.			
	17	H 14		Stability and Performance of Control Systems.	Ch 12		
		F 15		Exam 2			
	Lab 4b			cont.			
6	Lab 5			Steering position control. Pots as sensors. Measure system response of servo.			
	18	M 18		Introduction to digital circuits, esp. related to encoding and decoding RC signals	Ch 12	Notes: Digital	
	19	W 20		Boolean algebra, Digital gates	Ch 12		
	20	H 21		Flip-flops			
	21	F 22		State machines			
	Lab 6			Construct digital adder circuit			
7	Lab 7			Construct counter circuit			
	22	M 25		Steady-state sinusoids, Phasors, & Complex numbers.	2.34	Notes: Phasors Intro	Complex #'s
	23	W 27		Phasors, Impedance, and AC circuits	2.27		Phasors
	24	H 28		AC circuit examples	2.29-30	Notes: Phasors Ex	Impedance
	25	F 29		Filters and frequency-response plots	2.33		
	Lab 7			cont.			
							Build and test audio circuit.

8		M 2	Exam 3			
		W 4	<u>4TH of JULY</u>			
	26	H 5	M1: Overview of Sounds and Speech; Matlab® Intro; Starting and quitting; Matlab® Primer book, Desktop; Matlab® as powerful graphics calculator		Lect M1	
	27	F 6	M2: Variables, Arrays, Matrices: entering, addition, transpose, inverses, products, element-by-element operations, Concatenation, Complex Numbers		Lect M2	
	Lab M1		Experiment with sound files using simple script functions (provided).			
9	28	M 9	M3: Script files, Array indexing, Colon operator, Indexing using arrays, Sum function, Functions operating on columns, Generating matrices		Lect M3, Advanced Indexing	
	29	W 11	M4: Operators, Identity matrix (eye), min, max, size, character strings, Advanced indexing		Lect M4	
	30	H 12	M5: Advanced indexing continued, Writing script files, Clearing functions		Lect M5, my_script.m	
	31	F 13	M6: 3-D plots using meshgrid and surf, Array processing, Fourier theory, Creating 3-D surfaces		Lect M6, bumps.m	
	Lab M2 Lab M3		Alter sound waveform (apply functions [= distort], add noise, delete parts, etc.). Process and plot sound waveforms: spectrogram, sound effects, filtering, plots.			
10	32	M 16	M7: Solving simultaneous equations, Fitting lines or other functions to data, Comparison operators: ==, >=, ~=, >, <, Any and All functions		Lect M7	
	33	W 18	M8: 3-D plot example with array processing, And and Or operators, Any and All operators, If else control flow		Lect M8	
		H 19	Exam 4			
	34	F 20	M9: Digital Signal Processing, Fast Fourier Transform, Spectrum		Lect M9, chop_spec.m, real_fft.m	
	Lab M3 Lab M4		Process and plot sound waveforms: spectrogram, sound effects, filtering, plots. Create a sound effect: write functions, plot waveforms, create sound effect.			
11	35	M 23	M10: Control flow: switch, for loops		Lect M10, parallel.m, standard_R.m, vibrato.m, butter_filter.m	
	36	W 25	M11: Writing Matlab® functions		Lect M11, dig_filter.m	
	37	H 26	M12: Writing Matlab® functions		Lect M12	
	38	F 27	M13: Examples of writing functions, Digital filter function		Lect M13	
	Lab M4		Create a sound effect: write functions, plot waveforms, create your sound effect.			
12	39	M 30	M14: Matlab® input/output to and from files, dlmread, wavread, imread		Lect M14	
	40	W 1 Aug	Review for final			
		F 3	Final Exam 10:00-12:00 a.m. (regular classroom)			