

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

	Lab 7				Construct counter circuit			
10		M	11		SPRING BREAK			
		W	13		SPRING BREAK			
		F	15		SPRING BREAK			
11	26	M	18		Filters and frequency-response plots	2.33		
	27	W	20		Exam 3			
	28	F	22		M1: Overview of Sounds and Speech; Matlab® Intro; Starting and quitting; Matlab® Primer book, Desktop; Matlab® as powerful graphics calculator		Lect_M1	
	Lab 8				Build and test audio circuit.			
12	29	M	25		M2: Variables, Arrays, Matrices: entering, addition, transpose, inverses, products, element-by-element operations, Concatenation, Complex Numbers		Lect_M2	
	30	W	27		M3: Script files, Array indexing, Colon operator, Indexing using arrays, Sum function, Functions operating on columns, Generating matrices		Lect_M3 , Advanced Indexing	
	31	F	29		M4: Operators, Identity matrix (eye), min, max, size, character strings, Advanced indexing		Lect_M4	
	Lab M1				Experiment with sound files using simple script functions (provided).			
13	32	M	1	Apr	M5: Advanced indexing continued, Writing script files, Clearing functions		Lect_M5 , my_script.m	
	33	W	3		M6: 3-D plots using meshgrid and surf, Array processing, Fourier theory, Creating 3-D surfaces		Lect_M6 , bumps.m	
	34	F	5		M7: Solving simultaneous equations, Fitting lines or other functions to data, Comparison operators: ==, >=, ~=, >, <, Any and All functions		Lect_M7	
	Lab M2				Alter sound waveform (apply functions [= distort], add noise, delete parts, etc.).			
14	35	M	8		M8: 3-D plot example with array processing, And and Or operators, Any and All operators, If else control flow		Lect_M8	
	36	W	10		Exam 4			
	37	F	12		M9: Digital Signal Processing, Fast Fourier Transform, Spectrum		Lect_M9 , chop_spec.m , real_fft.m , butter_filter.m	
	Lab M3				Process and plot sound waveforms: spectrogram, sound effects, filtering, plots.			
15	38	M	15		M10: Control flow: if, else, elseif, end; switch; for loops; while loops		Lect_M10 , R_code.m , rand_int.m	
	39	W	17		M11: Writing Matlab® functions		Lect_M11 , parallel_R.m , standard_R.m , vibrato.m	
	40	F	19		M12: Writing Matlab® functions, Digital filter function		Lect_M12 , dig_filter.m , r2_p.m	
	Lab M4				Create a sound effect: write functions, plot waveforms, create sound effect.			
16	41	M	22		M13: Matlab® input/output to and from files, dlmread, wavread, imread		Lect_M13 , wr_str_file.m , rd_str_file.m , image_proc.m	
	42	W	24		Solution of Practice Final Exam			
		W	1	May	Final Exam 8:00-10:00 a.m. (regular classroom)			