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<th>Wk</th>
<th>Lect #</th>
<th>Date</th>
<th>Lecture Topic</th>
<th>Reading</th>
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<td>Introduction, Systems in radio-controlled car.</td>
<td>Ch. 1, 2.1-3</td>
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<td>Basic electrical units &amp; symbols, Kirchhoff's laws.</td>
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<td>Resistance, Ohm's law, Power, Resistors in parallel &amp; series.</td>
<td>2.11-12, 3.5</td>
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<td>Nodes, Grounds, Branches, Meters, Voltage and current dividers.</td>
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<td>I vs V curves of, sources, resistors, bulbs, and diodes. Thevenin. Max pwr xfer</td>
<td>3.2, 2.19</td>
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<td>Thevenin examples</td>
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<td>Introduction to lab, procedures, basic equipment. Measure I-V curves of devices.</td>
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<td>Intro to AC and time-varying v(t) &amp; i(f). Concept of signal. Sinusoids. Fourier.</td>
<td>2.20, 3.8</td>
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<td>Power transmission, Transformer.</td>
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<td>Measurements of I and V for RC car battery. Create model of the car's battery.</td>
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<td>M 28</td>
<td>PWM duty cycle and power, AM, FM</td>
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<td>A/D conversion, Capacitors</td>
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<td>Learn about oscilloscope. Motor drive control RC car. PWM circ. with func gen.</td>
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<td>Ch 6</td>
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<td>Op amps</td>
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<td>Op amps and the PWM circuit</td>
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<td>Make PWM circuit with op-amps</td>
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<td>Introduction to block diagrams, feedback</td>
<td>13.1-4</td>
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<td>Model PWM circuit in PSpice</td>
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<td>M 18</td>
<td>PRESIDENTS' DAY</td>
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<td>Feedback control, esp. as it relates to steering position control of the car.</td>
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<td>Stability and Performance of Control Systems.</td>
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<td>Steering position control. Pots as sensors. Measure system response of servo.</td>
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<td>Introduction to digital circuits, esp. related to encoding and decoding RC signals</td>
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<td>Boolean algebra, Digital gates</td>
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<td>Construct digital adder circuit</td>
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<td>Steady-state sinusoids, Phasors, &amp; Complex numbers.</td>
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<td>Construct counter circuit</td>
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<td>Build and test audio circuit.</td>
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<td>M1: Overview of Sounds and Speech; Matlab® Intro; Starting and quitting; Matlab® Primer book, Desktop; Matlab® as powerful graphics calculator Lect_M1</td>
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<td>29</td>
<td>M 25</td>
<td>M2: Variables, Arrays, Matrices: entering, addition, transpose, inverses, products, element-by-element operations, Concatenation, Complex Numbers Lect_M2</td>
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<td>M5: Advanced indexing continued, Writing script files, Clearing functions Lect_M5, my_script.m</td>
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<td>M6: 3-D plots using meshgrid and surfl, Array processing, Fourier theory, Creating 3-D surfaces Lect_M6, bumps.m</td>
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<td>M 8</td>
<td>M8: 3-D plot example with array processing, And and Or operators, Any and All operators, if else control flow Lect_M8</td>
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<td>Process and plot sound waveforms: spectrogram, sound effects, filtering, plots.</td>
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<td>M 15</td>
<td>M10: Control flow: if, else, elseif, end; switch; for loops; while loops Lect_M10</td>
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<td>M12: Writing Matlab® functions, Digital filter function Lect_M12, dig_filter.m, r2_p.m</td>
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<td>Create a sound effect: write functions, plot waveforms, create sound effect.</td>
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<td>M13: Matlab® input/output to and from files, dlmread, wavread, imread Lect_M13</td>
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<td>W 24</td>
<td>Solution of Practice Final Exam</td>
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