

Index of Multisim Simulations  
BMEn 2151 *Introductory Medical Device Prototyping*  
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**Analog Circuits Part 1 – Circuit Theory**

Ohms law  
Kirchoff's Voltage law  
Parallel Resister Current  
Series vs. Parallel Resistors  
Current Limiting an LED  
RC Charging of a Capacitor  
RC Discharging of a Capacitor

**Analog Circuits Part 2 – Semiconductors**

Zener Diode  
Transistor Switch  
Saturation Voltage  
Linear Region  
Amplifier

**Analog Circuits Part 3 – Operational Amplifiers**

Inverting Amplifier  
Inverting Amplifier – Changing R2  
Non-Inverting Amplifier, Gain of 11  
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Voltage Follower  
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Differentiator  
Integrator  
Current Controlled Power Supply 1-10ma  
Power Supply Lower Section with V and A Probes  
Monostable Mode or "One Shot"  
Astable Multivibrator

**Digital Circuits Part 1 – Logic Gates**

Inverter – 74HC04  
NAND – 74HC00  
Flip Flop – 74HC74  
4-Bit Binary Counter with Buffer Drivers  
Tri-State Logic – 74HC126

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Schmitt Trigger – 74C14  
Switch Contact Noise  
Contact Debouncer  
Creating Noise with Voltage Summing  
Noise Eliminator – Schmitt Trigger 4093B  
Leading Edge Detector – Schmitt Trigger  
One-and-Only One Synchronized Pulse  
Driving LEDs – 4049B  
Decade Stepper – 4518B and 4511B  
Lamp Driver with Transistor – 2N2222  
MOSFET Relay Driver with Transient Suppression – IRF510

### **Lab 3: Analog Circuits**

Exercise 3-6: Series and Parallel Resistance  
Exercise 3-7: Properly Turning on a Light Emitting Diode  
Exercise 3-8: Full-Wave Bridge Rectifier  
Exercise 3-9: Zener Diode  
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Exercise 3-10: The 7800/7900 Series Voltage Regulators  
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Exercise 3-12: Operational Amplifier – Non-Inverting Amplifier  
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### **Lab 4: Digital Circuits**

Exercise 4-2: The 74HC00 NAND gate & 2N3904 for LED Driving  
Exercise 4-3: Four Bit Binary Counter with Buffer Drivers  
Exercise 4-4: One-and-Only One Synchronized Pulse  
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Exercise 4-6: Design a Circuit Board from the 4-Bit Binary Counter