Analog Electronics   Spring 2016

The following table lists topics covered in analog electronics. The topics are divided into different columns that roughly reflect an evaluative score. Hence you must master the topics in the "C" column to obtain the corresponding course grade. Each subsequent column assumes mastery of the previous columns topics.

C	B	A
Circuit Analysis		
• V=IR • Reactance – X_C and X_L • Impedance • DC circuits • AC circuits	• Loop current circuit analysis • Thevin equivalent circuits • Norton equivalent circuits • Decibel • AC ripple • Negative feedback	• Diode theory (exponential fit) • Eber-Molls theory transistor • Positive feedback and hysteresis
Parts		
• Resistors • Capacitors • Inductors • Switches • Diodes: Signal and Power	• Diodes: LED and Zener • Transformers • Bipolar transistors • Operational Amplifiers • Relays • Transducers (basic: light, temp etc.)	• JFETs (MOSFETs) • SCR • 555 Timer ICs • Transducers (advanced: electrolet, strain gauges etc.) • Motors (DC and/or AC)
Equipment		
• DMM [measuring resistance, current, voltage and diodes] • Oscilloscope [functions: basic V(t) use] • Proto-board connections	• Oscilloscope [functions: trigger, measure, average, cursor, DC vs AC coupling] • Function Generator • Solder Iron	• Circuit board design and fabrication (Fritzing or EagleCAD) • Oscilloscope [functions: FFT, phase measurement]
Circuits		
• Voltage divider	• Filters (RC and RL Circuits) • Rectifiers • Regulators • Push Pull amplifier • Inverting/Non-inverting Amp • Comparitor	• LCR Circuits • H-Bridge • Line filters • Differentiators • Integrators • Oscillators
Microcontroller – Arduino		
• Pin-out Diagram • Power Requirements • TTL Logic • Base 2: Hexadecimal • Basic Program (blink LED)	• Current Limits • Motors with transistor control • ADC (transducers)	• Servos • PWM • Serial Communication