

Analog Electronics & Design

MODULE 1:

1. Circuit Theory
 - Kirchhoff's Laws
 - Network Theorems
 - Passive Elements
 - Analysis of Nonlinear Circuits
2. Semiconductor Devices
 - Diode
 - BJT
 - MOSFET
 - Firing Techniques and Pulse Generation
3. Operational Amplifiers
 - Op-Amp Comparator .
 - Buffer
 - The Non-Inverting Amplifier
 - The Inverting Amplifier
 - Instrumentation Amplifier
 - Differentiator
 - Schmitt Trigger
4. Power supplies and Rectifiers
 - Voltage Regulators
 - Switching Regulator
 - Charge Pump
 - Half-Wave Rectifier .
 - Full-Wave Rectifier .
 - Sample-Hold Circuit

MODULE 2:

1. Semiconductor Device Selection
 - Voltage and current ratings
 - Power-loss calculations
 - Integrated structures
2. Passive Element selection
 - Resistor selection calculations
 - Capacitor selection calculations
 - Inductor selection calculations
3. Signal conditioning circuits
 - Filters (Low pass, High Pass and Band Pass 1st and 2nd order)
 - Resonant circuits
 - Buffers
 - Gain Amplifier
 - Current Mirrors
4. Active Device selection
 - Diode calculations
 - BJT calculations
 - MOSFET calculations

MODULE 3:

1. Power Supplies Design
 - Buck converter
 - Boost Converter
 - Buck-boost Converter
 - Transformer and Inductor Design
 - Analysis of parasitics effect in the design
 - Active Rectifier topologies
2. Oscillators and Clock Generation circuits
3. Feedback circuits & Phase locked loops
4. Non ideal considerations for OP-AMP
 - Gain Limitations
 - Common Mode rejection Ratio
 - Slew rate
 - Input and output impedance
5. Data converters
 - Analog to Digital Conversion
 - Digital to Analog conversion
6. Opto coupler & Isolators