Electronic classes

Chapter 1 : Discrete components

- Electricity and wire
  - how work electricity
  - potential difference
  - ground
  - U = RI
- Resistor
  - What is it ?
  - basic formules
  - Simples assembly (dividor bridge, series, parallel)
- Capacitor
  - What is it ?
  - electrical field
  - basic formules
  - simple assembly (series, parallel)
  - RC circuit
- Inductor
  - What is it ?
  - electromagnetic field
  - basic formules
  - Simple assembly (series, parallel)
  - RL circuit
- Transformer, relai & Switch
  - What is a Transformator & how it work ?
  - When using a transformator and how ?
  - What is a relai & how it work ?
  - When using a relai and how ?
  - What is a Switch & how it work ?
  - When using a Switch and how ?
- RLC circuit

Chapter 2 : Semi-conductors

- NP liaisons
  - silicium conduction & dopage
  - N & P polarisation
- Diodes
  - How a diode work ?
  - Diodes basics (voltage drop, use case, limitations)
  - basic assembly
  - Zener diodes
  - Schottky diodes
- Transistors
  - How it works (NPN & PNP)
  - Transistors (BJT) basics
  - Transistors (MOSFET) basics (N-channels & P-channels)

Chapter 3 : Logic gates & digital electronic

- Transistors & logic gates
  - What is a logic gate?
  - Physical example
- Logic gates
  - Buffer
  - Inverter
  - AND
  - NAND
  - OR
  - XOR
- Logic assembly
  - XOR
  - NXOR
  - SR Latch
  - D Latch
  - D flipflop
- Digital Electronic
  - Binaire
  - How a computer do an addition ?

Chapter 4 : Electronic design & manufacturing

- THT (Through Hole Technology) components
  - basics
  - Soldering
  - IC Soldering
  - De-solder
  - Tools maintenance
- SMD (Surface Mount Device) components

    - Basics
    - Stencils
    - Soldering
- Design
    - Softwares
    - Designs basics

Chapter 5 : Microcontrolers and basic register programming

- Architectures
- Memory map
    - Register
    - RAM / EEPORM / Flash
- Hardware modules
    - TIMER
    - External
    - Interuption
- Protocoles (I2S / SPI/ etc)
- programming
    - Bootloader
    - JTAG

Chapter 6 : Filtering & signal conditioning

Chapter 7 : Automatism