NPTEL Video Course - Electrical Engineering - NOC:Design and Simulation of Power Conversion using Open Source

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Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Getting started with NgSpice
Lecture 2 - Refractoring the .cir
Lecture 3 - Sub-circuits
Lecture 4 - gschem and netlist generation
Lecture 5 - Setting up for simulation with Octave
Lecture 6 - Getting started with equation based simulation
Lecture 7 - Resuming a simulation in Octave
Lecture 8 - PV cell model - review
Lecture 9 - PV cell characteristic - review
Lecture 10 - PV cell - symbol and subcircuit
Lecture 11 - Rectifier-capacitor filter - operation review
Lecture 12 - Rectifier-capacitor filter - NgSpice simulation
Lecture 13 - Rectifier-capacitor filter with non-idealities
Lecture 14 - 3 phase Rectifier-capacitor filter
Lecture 15 - Equation based simulation in Octave
Lecture 16 - Passive power factor improvement - review
Lecture 17 - Passive power factor circuit in NgSpice
Lecture 18 - Buck converter - review
Lecture 19 - Buck converter - NgSpice
Lecture 20 - Boost converter - review
Lecture 21 - Boost converter - NgSpice
Lecture 22 - Buck-boost converter - review
Lecture 23 - Buck-boost converter - NgSpice
Lecture 24 - Equation based simulation of converters
Lecture 25 - Forward Converter - review
Lecture 26 - Forward Converter simulation
Lecture 27 - Understanding Core flux reset
Lecture 28 - Core flux reset - simulation
Lecture 29 - Flyback converter - review

Lecture 30 - Flyback converter - simulation
Lecture 31 - Pushpull converter - review
Lecture 32 - Pushpull converter - simulation
Lecture 33 - Half bridge converter - review
Lecture 34 - Half bridge converter - simulation
Lecture 35 - Full bridge converter - review
Lecture 36 - Full bridge converter - simulation
Lecture 37 - Close loop operation
Lecture 38 - Close loop with feed forward control
Lecture 39 - NgSpice simulation of close loop control
Lecture 40 - Battery charging with current control
Lecture 41 - Slope compensation for current control
Lecture 42 - NgSpice simulation of battery charging
Lecture 43 - Single phase PWM for single phase inverter
Lecture 44 - NgSpice simulation of single phase PWM
Lecture 45 - 2-axes theory for 3-phase systems
Lecture 46 - Transformations for 2 and 3 axes systems
Lecture 47 - Maximum power point tracking - NgSpice
Lecture 48 - Space vector PWM - digital
Lecture 49 - Space vector PWM - analog
Lecture 50 - SVPWM analog - NgSpice simulation
Lecture 51 - Induction motor model
Lecture 52 - Induction motor simulation in Octave
Lecture 53 - V/F control of induction motor - NgSpice