Summary
The course is covering following aspects: Fundamentals of Analog PLLs, Interference Effects, Deadzone and Phase Noise, VCO Design, All-Digital PLL Architecture and Implementation, Digitally-Controlled Oscillator, Time-to-Digital Converter, RC-Oscillators, Designing XTAL and MEMS Oscillator.

Content
Day 1:
- Fundamentals of Analog PLLs
- Interference Effects in PLLs
- Spiral Inductor Interference, Deadzone and Phase Noise
Day 2:
- VCO Design
- Jitter and Phase Noise in PLLs
Day 3:
- All-Digital PLL Architecture and Implementation
- Digitally-Controlled Oscillator (DCO)
- Time-to-Digital Converter (TDC)
Day 4:
- Oscillator Basics: Feedback and Power Consumption
- RC-Oscillators
- Designing XTAL and MEMS Oscillator from MHz to GHz
- Low Phase Noise and Low Jitter 0.1-10GHz VCO
Day 5:
- Fractional-N PLLs for Frequency Synthesis
- FDC-Based Digital PLLs

Note
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Keywords
Clock Recovery, PLL, VCO Circuits, Oscillators, Transceivers

Learning Prerequisites
Recommended courses
Analog IC Design

Resources

Ressources en bibliothèque

- Analog-to-Digital Conversion / Pelgrom
- Structured Analog CMOS Design / Kayal
- Understanding delta-sigma data converters / Schreier
- Understanding Delta-Sigma Data Converters / Pavan
- RF analog impairments modeling for communication systems simulation: application to OFDM-based transceivers / Smaini
- All-Digital Frequency Synthesizer in Deep-Submicron CMOS / Staszewski
- Charge-Based MOS Transistor Modeling: The EKV Model for Low-Power and RF IC Design / Enz
- Analog Design Essentials / Sansen
- Methodology for the Digital Calibration of Analog Circuits & Systems / Kayal