

The Analog Layout Techniques course provides an introduction to the area of full custom analog layout. Focusing primarily on mixed mode CMOS processes, the course teaches the techniques used in producing high quality layouts of base band analog designs.

COURSE CODE: ANLT01

COURSE PRE-REQUISITE: None

LEARNING OUTCOMES:

- Familiarity with mixed mode CMOS and BiCMOS processes
- Understand the composition and layout techniques for passive devices used in analog design.
- Explore the techniques used in floorplanning complex analog designs
- Ability to layout complex analog designs on a mixed mode CMOS process

SYLLABUS CONTENT:

- Introduction to CMOS processes
 - Basic processing steps (doping, photolithography, etching, deposition)
 - Electrical interaction of layers
 - Fabrication of an inverter
- Introduction to BiCMOS processes
 - Fabrication of an NPN bipolar transistor
- MOS Transistor layout
 - Basic parameters (channel width & length)
 - Folding transistors / unit fingers
- Layout considerations for bipolar transistors
 - Device composition, orientation, emitter area
- Substrate & Wells
 - Substrate model
 - Noise isolation techniques
 - Latch-up
- CMOS Components
 - Physical composition of capacitors, resistors and diodes
- Matching In Analog Layout
 - Discussed the layout techniques applied to circuits requiring matching
- Floorplanning
 - Supply considerations, pin positions/layer, signal flow, isolation

Course Delivery:
Lecture and practical labs with example circuits