

Faculty of Engineering & Technology

Integrated Circuit Applications

Information :

Course Code : ELE 564

Level : Undergraduate

Course Hours : 3.00- Hours

Department : Specialization of Electronics & Communication

Area Of Study :

- Build analytical skills needed for the field of radio frequency design.
- Build analytical skills needed for analyzing basic radio frequency performance parameters.
- Enrich students knowledge in the field of transceivers system and circuit design.

Description :

Amplifiers: RF IF and video, Oscillators: tuned and untuned oscillators stability, VCO, phase locked loop, Modulators: AM, SSB balanced FM, PM, pulse modulators, digital modulators, Demodulators: AM, FM and PM detectors, Transmitter and receiver circuits, Circuit simulators, Digital, Analog and mixed mode.

Course outcomes :

a. Knowledge and Understanding: :

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| 1 - | a1- List the operation of common transceiver architectures for high-frequency applications. |
| 2 - | a2- Explain the concept of noise figure, non-linearity, and sensitivity in transceivers |
| 3 - | a3- Discuss the performance requirements of different building blocks such as noise figure, gain and non-linearity. |
| 4 - | a4- Describe the concept of impedance matching and impedance transformation in high-frequency circuits |
| 5 - | a5- Recognize the usage of low noise amplifiers, mixers, voltage controlled oscillators, power amplifiers, and phase locked loops. |

b. Intellectual Skills: :

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| 1 - | b1- Assess intuitively about communication transceivers and its building blocks. |
| 2 - | b2- Analyze system requirements of communication transceivers. |

c. Professional and Practical Skills: :

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| 1 - | c1- Simulate communication transceivers and its building blocks. |
| 2 - | c2- Use software tool to build the different building blocks. |
| 3 - | c3- Prepare and technical report. |

d. General and Transferable Skills: :

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| 1 - | d1- Work in teams. |
| 2 - | d2- Propose and formulate new ideas in communication transceivers. |

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Amplifiers: RF IF and video,	10	6	4
Oscillators: tuned and untuned oscillators stability, VCO	10	6	4
phase locked loop	10	6	4
Modulators: AM, SSB balanced FM, PM, pulse modulators, digital modulators, Demodulators: AM, FM and PM detectors,	20	12	8
Transmitter and receiver circuits,	10	6	4
Circuit simulators	5	3	2
Digital, Analog and mixed mode.	10	6	4

Teaching And Learning Methodologies :

Interactive Lecturing

Problem Solving

Discussion

Experiential Learning

Project

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Final exam	40.00		
o Assignments	5.00		
o In Class Quizzes	10.00		
o Mid-Term exams	30.00		
o Project/Lab	15.00		

Recommended books :

a. Course notes

- Taken by the student inside classroom

b. Essential books (text books)

- P.R. Gray and R.G. Meyer, Analysis and Design of Analog Integrated Circuits, 5th Edition, John Wiley, 2009.

- D. O. Pederson, K. Mayaram, Analog Integrated Circuits for Communication, Springer. 2nd Ed., 2009

c. Periodicals, Web sites, etc

- IEEE periodicals