

COMMUNICATION ENGINEERING AND ELECTRONIC TECHNOLOGIES

(Lecce - Università degli Studi)

Insegnamento RF MICROELECTRONICS C.I.

GenCod A005770

Docente titolare RICCARDO COLELLA

Insegnamento RF MICROELECTRONICS C.I. **Anno di corso** 2

Insegnamento in inglese RF MICROELECTRONICS C.I.

Lingua

Settore disciplinare ING-INF/01

Percorso PERCORSO COMUNE

Corso di studi di riferimento
COMMUNICATION ENGINEERING AND

Tipo corso di studi Laurea Magistrale

Sede Lecce

Crediti 6.0

Periodo Secondo Semestre

Ripartizione oraria Ore Attività frontale:
54.0

Tipo esame Orale

Per immatricolati nel 2020/2021

Valutazione

Erogato nel 2021/2022

Orario dell'insegnamento
<https://easyroom.unisalento.it/Orario>

BREVE DESCRIZIONE DEL CORSO

The course of RF Microelectronics aims at providing principles and tools to analyze and design RF analog circuits.

PREREQUISITI

Basic skills of Analog Electronics

OBIETTIVI FORMATIVI

After the course the student should be able to:

- 1) Describe the basic RF analog circuits (LNA, Mixer, etc...) and wireless transceiver architectures.
- 2) Evaluate the performance parameters and discuss complexity issues associated with different basic RF analog circuits and wireless transceiver architectures.
- 3) Understand the technology limits in circuit design.
- 4) Use the simulator to analyse performance of RF analog circuits.
- 5) Correctly expose a RF circuit study or a wireless transceiver architecture description

METODI DIDATTICI

Frontal lessons, practical exercises, laboratory activities.

MODALITA' D'ESAME

Oral exam. Two open questions on the course topics, including the possibility of commenting laboratory experiences and solving quick exercises on RF circuits. The oral exam is aimed at verifying the knowledge of the course topics acquired by the student.

ALTRE INFORMAZIONI UTILI

- Office hours: - Friday h. 11:30 - 13:30 (La Stecca, Second floor)
- Everyday, by appointment, if needed (via Teams, or other telematic instrument)

PROGRAMMA ESTESO

- 1.Introduction to the Course
 - 2.Overview of wireless communication systems, current trends, quick focus on modern RF communication systems and IoT, analog and digital modulations (recall), Basic receiver architectures.
 - 3.Basic concepts in RF: linearity and time variance, distortion and intermodulation, intercept points, compression point, sensitivity and dynamic range, link budget
 - 4.Noise at RF: noise figure definition.
 - 5.Passive RF Design, Matching Networks, transmission lines, passive components design.
 - 6.Front-end circuits: Low-Noise Amplifiers (LNAs)
 - 7.Front-end circuits: Mixers
 - 8.Oscillators: basic tuned oscillators
 - 9.Phase-locked loops (PPLs)
- Hints: RF Power Amplifiers schemes: class A, B, AB, power amplifiers (if room)
- Laboratory: Software to Design and Simulate RF circuits
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TESTI DI RIFERIMENTO

Behzad Razavi "RF Microelectronics" Ed. I or II