COMMUNICATION ENGINEERING AND ELECTRONIC TECHNOLOGIES

(Lecce - Università degli Studi)

Insegnamento MICROWAVES

GenCod A003099

Docente titolare Luca CATARINUCCI

Insegnamento MICROWAVES

Insegnamento in inglese MICROWAVES

Settore disciplinare ING-INF/02

Corso di studi di riferimento COMMUNICATION ENGINEERING AND

Tipo corso di studi Laurea Magistrale

Crediti 9.0

Ripartizione oraria Ore Attività frontale: 81.0

Per immatricolati nel 2018/2019

Erogato nel 2018/2019

Anno di corso 1

Lingua ITALIANO

Percorso PERCORSO COMUNE

Sede Lecce

Periodo Secondo Semestre

Tipo esame Orale

Valutazione Voto Finale

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

BREVE DESCRIZIONE DEL CORSO	Microwave course is aimed at providing both theoretical and practical knowledge on the main aspects of microwave engineering. It also serves as the necessary prerequisite for more advanced courses in communication engineering.
PREREQUISITI	Electromagnetic Fields
OBIETTIVI FORMATIVI	After the course the student should be able to * Apply microwave analysis methods to determine the main properties of high-frequency circuits. * Apply knowledge on transmission lines and waveguides particularly for their use as elements in impedance matching and filter circuits. * Design an impedance matching network with either distributed or lumped elements through the Smith Chart. * Evaluate both analytically and experimentally the scattering parameters of N-Port microwave devices * Illustrate the main aspects of N-Port networks, microwave filters and resonant cavities
MODALITA' D'ESAME	An oral exame is foreseen. It is aimed at verifying the knowledge and understanding of the course topics acquired by the student (maximum overall duration: 45 minutes).
ALTRE INFORMAZIONI UTILI	**Office Hours:** By appointment; contact the professor by email or at the end of class meetings. Official office hours will be defined once the course agenda will be definited.

PROGRAMMA ESTESO	Introduction: the main differences between low-frequency and hi-frequency circuits (2 hours). Transmission lines and waveguides: transmission lines theory. Smith chart. Line-Load matching through single and double stub techniques using the Smith chart. Quarter-wave matching. Properties of the most common transmission lines: coaxial cable, microstrip line, coplanar stripline. Properties of the most common waveguides: rectangular, circular, and "ridge" (20 hours). Solutions of assigned exercises and practical examples of use of the Smith Chart. (12 hours). Microwave junctions. N-port junctions. Scattering matrix. 2-port, 3-port and 4-port cases. (8 hours) Microwave devices: functional description of the main passive components used in microwave circuits. Attenuators. Circulators. Dividers and combiners (Resistive, T-junction, Wilkinson). Directional couplers theory. Two-hole couplers. Branch-Line. Rat-Race. Magic-T. (12 hours) Resonant cavities: brief overview on resonant cavities. Rectangular and circular resonant cavities. Application as filters and frequency meters. (4 hours) Microwave filters: general information on Microwave filters. Main design techniques for a microwave filter. (6 hours) Passive RFID technology : overview on passive RFID technology. The conjugate matching techniques in the design of RFID tags. (4 hours) CAD of microwve circuits (Laboratory Activity): Introduction to microwave CAD programs; analysis of microwave circuits. Examples of design of simple microwave circuits. (7 hours) S-Parameter evaluation (Laboratory Activity): Vector Network Analizer description. Laboratory measurement of the scattering parameters of various microwave devices (rat race, wilkinson divider, etc.). (6 hours)