
Microwaves

Finalità

The course aims to provide the basic theoretical knowledge, analysis tools and application examples of microwave components.

Programma

- Guided propagation and waveguides.

Modal functions, waveguide eigenvalues and eigenvectors. Mode orthogonality.

Guided mode spectrum, mode expansion and power distribution.

Modal, intra-modal, polarization and waveguide dispersion.

Mode impedance.

Rectangular and circular metallic waveguide.

Measurement tools.

Microwave transmission lines, microstrip and stripline.

Microwave circuit theory. N-port circuits and two port junction.

Impedance, admittance and scattering matrices for passive circuits.

Passive microwave devices; terminations, couplers, attenuators, filters, hybrid junctions, magic T, circulators.

Resonators ; definition, resonant field and cavity modes. Losses and Q-factor

Microwave amplifiers. Gain, stability, noise.

Microwave antennas and plane wave spectrum.

Numerical methods for electromagnetism.

Attività d'esercitazione

Lab activity with numerical codes for the analysis of waves propagation in metallic waveguides

Modalità d'esame

Oral test

Propedeuticità

Propagazione Guidata, Antenne A

Testi consigliati

Collin R.E. Foundation for Microwave Engineering, Second Edition, Mc. Graw Hill, 1992.

Stracca G.B. Teoria e Tecnica delle Microonde, CLUP – Città Studi, 1991.