

# HIGH PERFORMANCE ELECTRONICS

Instructor: Giancarlo Bartolucci

Course Format: 4 Hours Lecture

Period: Summer Semester

Language: English

## Recommended Previous Knowledge:

Good knowledge in network theory and circuit representations.

Knowledge on elementary engineering courses in physics and mathematics.

## Contents:

### INTRODUCTION

The theory of transmission lines. Definition and properties of scattering parameters. Impedance matching techniques. Microstrip and coplanar transmission lines. Overview of hybrid and monolithic microwave integrated circuits.

### HIGH FREQUENCY ACTIVE TWO PORT NETWORKS

Stability of two-port networks and microwave oscillators.

Basic principles of linear microwave amplifiers.

Non linear effects in high frequency memory-less amplifiers.

### HIGH FREQUENCY PASSIVE COMPONENTS AND CIRCUITS

Modeling of coupled transmission lines and design of directional couplers.

Branch-line, rat-race and Wilkinson dividers.

SPST switches, SPDT switches, and basic principles of microwave phase shifters.

## Learning Outcomes:

Learning the basic principles of high frequency electronics.

## Reading Resources:

I Bahl and P. Bhartia, Microwave Solid State Circuit Design, Wiley, New York, 1988.

K. Chang, Microwave Solid State Circuits and Applications, Wiley, New York, 1994.

Performance Record: Oral examination

Workload: 60 hours total

Further Information: <http://www.engineering-sciences.uniroma2.it/MENU/HOME/Home.html>

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