

Biomedical Engineering- Bachelor's Degree - University of Cagliari, Italy

Laboratory:	Microwave Sensors and Waveguides: Innovation in Non-Invasive Biomedical Monitoring.
Instructor:	Prof. Alessandro Fanti – University of Cagliari
Credits / hours:	1 credits / 10 hours
Language:	Italian
Scheduling:	April
Final Exam:	Written
Website:	

Goal of the Laboratory

Waveguide-based microwave sensors play a crucial role in monitoring essential physiological parameters such as body temperature, blood pressure, and body fluid composition. By transmitting and receiving electromagnetic signals, these devices detect variations in the dielectric properties of biological tissues, enabling accurate and non-invasive measurements. A particularly exciting aspect of this technology is its potential integration into wearable devices, allowing for continuous and real-time monitoring. This advancement opens new possibilities in digital health and telemedicine, providing innovative tools for tracking vital signs without bulky equipment or invasive procedures. The application of these sensors could revolutionize various fields, from preventive medicine to chronic disease management, enhancing patient quality of life and facilitating the work of healthcare professionals.

Prerequisites

Preparatory courses with content aligned to the topics covered include: Electromagnetic Compatibility and Technologies and Numerical Techniques for Image Processing in Clinical Applications.

Course Outline

- Introduction to Microwave Sensors.
- Electromagnetic Properties of Biological Tissues.
- Types of Microwave Sensors and Waveguide Structures.
- Signal Transmission and Reception Technologies.
- Integration with Wearable Devices and Telemedicine.
- Medical and Clinical Applications.