DRIEI
PhD Program in Electronic and Computer Engineering
University of Cagliari, Italy

Course:	**Substrate Integrated Waveguide (SIW) Technology**
Instructor:	Prof. Maurizio Bozzi – University of Pavia
SSD:	ING-INF/02 – Electromagnetic Engineering
Credits / hours:	1 credits / 8 hours
Language:	English
Scheduling:	I semester, Jan-Feb,
Final Exam:	Project

Goal of the Course

The overall goal is to equip students or attendees with a solid understanding of SIW technology, its design principles, modeling approaches, and the potential of using new materials and fabrication methods. This knowledge can then be applied to develop advanced microwave and millimeter-wave circuits, components, and systems leveraging the benefits of SIW technology.

Prerequisites

Prior exposure to the fundamentals of electromagnetics, microwave engineering, and integrated circuit design would be highly beneficial for the participants to fully engage with the course content and actively contribute to discussions and hands-on activities.

Intersection with other courses at the University of Cagliari

There is no significant intersection with other courses offered in the PhD programme DRIEI and in the Master Degrees at UniCa.

Course Outline

1 – Basics of Substrate Integrated Waveguide Technology (2h)

Applications of integrated waveguides
Fundamentals of substrate integrated waveguide (SIW) technology
Operation principles of SIW structures

2 – SIW Components and Antennas (2h)

Compact and broadband SIW interconnects
SIW resonant cavities
SIW components
SIW antennas

3 – Numerical Modeling of SIW Structures (2h)

Full-wave simulation of SIW structures
Equivalent circuit models of SIW discontinuities

4 – New Materials: Paper, Plastic, Textile, 3D-Printing (1h)
Paper-based SIW components and antennas
Plastic-based SIW components and antennas
Wearable SIW structures on textile
3D printing of SIW components

5 – SIW Microwave Sensors (1h)
SIW cavity resonator sensors
SIW microfluidic sensors