Coordinator	UNIVERSITAT POLITÈCNICA DE CATALUNYA  Lluís Jofre (UPC) (ID 26)	
Ivolved institution	ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE; IMST	

Name of the course	**Compact antennas**	Type			
		M	D	A/D	A
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Place	UPC- Barcelona	Date: 6 - 10 June

Summary (2000 words)

The course deals with the modeling and design principles of small antennas for communications in mobile environments with emphasis on wideband, multiband and multi-element antenna geometries. The course includes the theoretical background, design principles, implementation aspects and measurement methods. The fundamental radiation principles and limits will be presented and discussed. The main analytical and numerical techniques will also be studied. The basic and the most successful models will be presented and studied. As a special case the principles of the fractal geometries and its application to the design of miniaturized devices as: fractal shapes, fractal loading and self-complementary antennas, superconductive resonators and filters. This will also allow going into the particular problems linked to terminal antenna measurement. The lectures will cover the following areas:

- Basic theory: Fundamental limits, Analytical methodologies, Simulation techniques, Design strategies, System aspects.
- Geometries and applications: Extremely small, wide and multiband and fractal geometries for mobile communications and sensing
- Measurement techniques: principles, gain-efficiency concept for small antennas, cavity techniques, open space techniques.

The participants will design antennas, with different analytical and software tools and asses their directivity, efficiency, and diversity performance with both experimental and computational methods. Some prototypes will be designed, implemented and measured, to check the validity of the methodology.

Structure of the course

Lectures	Experimental labs.	Computer exercises + Personal work	Total	Credits	Assessment typology
15	5	15	35	2	Attendance & exercises: 1 cr Special assignment: 1 cr

Teachers

Name	Organization	Title
Lluís Jofre	UPC	Prof.
Juan Manuel Rius	UPC	Prof.
A. Skrivervik	EPFL	Prof.
Juan R. Mosig	EPFL	Prof.
Dirk Manteuffel	IMST	Dr.-Ing.

Availability of dedicated structures

College rooms		Dedicated Labs		Classrooms		Computer rooms		Canteen	
Yes	Not	Yes	Not	Yes	not	Yes	Not	Yes	Not
	■	■		■		■		■	