

## UNIVERSITA' DEGLI STUDI MEDITERRANEA DI REGGIO CALABRIA

<b>Subject Code</b>	<b>16546</b>
<b>Subject Name</b>	<b>Microwave Engineering</b>
<b>Professor</b>	<b>Dr. Giovanni Angiulli</b>
<b>Department:</b>	<b>DIIES</b>
<b>Degree course:</b>	<b>Electronic Engineering</b>
<b>Class:</b>	<b>LM29</b>
<b>Type of educational activity:</b>	<b>Connotative</b>
<b>Disciplinary Area:</b>	<b>Engineering Discipline</b>
<b>Scientific-Disciplinary Sector:</b>	<b>ING-INF02</b>
<b>Compulsory preliminary exams:</b>	<b>Electromagnetic Fields II</b>
<b>Course Year:</b>	<b>First</b>
<b>Semester:</b>	<b>First</b>
<b>ECTS:</b>	<b>6</b>
<b>Hours:</b>	<b>48</b>

### **Synthetic description:**

Electromagnetic Propagation and Radiation, Electromagnetic Scattering, Computational Methods for Electromagnetics

### **Acquisition of knowledge on:**

In this era of reliance on communication and information technologies, microwave engineering has become increasingly important. The course of microwave engineering has three overall objectives. First, it presents the advanced concepts and formulations of electromagnetic theory. Second, advanced mathematical techniques as Green's functions, integral equations and numerical linear algebra methods, are discussed. Third, new topics, such as Metamaterials, are covered.

### **Evaluation method:**

Written exam followed by an oral.

### **Student's independent work**

No homework assignments are provided

### **Detailed course program**

#### **Electromagnetic Propagation and Radiation**

Metallic and dielectric waveguides. Dispersion. Cavity and dielectric resonators. Wire and Planar antennas. Circuit models for electromagnetic propagation and radiation. Examples and applications.

#### **Electromagnetic Scattering:**

Scattering from metallic and dielectric bodies. Radar cross section. Green's functions. Periodic structures. Metamaterials. Examples and applications.

#### **Computational Methods for Electromagnetics:**

Finite Difference Time Domain Method. Method of Moments. Algorithms for the solution of linear system of equations.

### **Resources and main references**

Eom H. J., Electromagnetic Wave Theory for Boundary Value Problems, Springer, 2004;  
Zhang K., Li D., Electromagnetic Theory for Microwaves and Optoelectronics, Springer, 2008;  
Davidson D., Computational Electromagnetics for RF and Microwave Engineering, Cambridge, 2005