

module title module code	level of module		year of study	semester/trimester when the module is delivered
RF Electronics and Antennas IES-B5	MSc level		1 st	SPRING semester
Name / e-mail of lecturer(s)	Weekly Hours	ECTS	module type (comp., opt.)	mode of delivery (face to face, distance learning)
Prof. Nikolaos STATHOPOULOS (nstath@teipir.gr) / Assist. Prof. Stelios MITILINEOS (smitil@teipir.gr)	Lect.	E- learning		
	4	2	9	elective
module web Page	http://ies.teipir.gr			
learning outcomes	<p>Upon the successful completion of the module students will be able to:</p> <ul style="list-style-type: none"> - Quote the basic subsystems of an RF transmitter and receiver communications system - Describe the functionality and design RF filters - Describe the functionality and design low noise and power amplifiers / design low noise amplifiers using PCB technology - Describe the functionality of an RF oscillator, a frequency up and down frequency converter, and design a frequency converter using PCB technology - Describe the functionality of antenna systems and match antenna loads to transmitter and receiver components - Design and develop an RF transmitter or receiver component including an analog filter, a low noise amplifier and a frequency down-converter. 			
prerequisites and co-requisites:	N/A			
recommended optional programme components	N/A			
module description	<p>The module aims at presenting the state-of-the-art in design and development of RF electronic systems and transmitting or receiving antennas. In this context, we present the basic-most subsystems of RF transceivers, including frequency converters, amplifiers, filters and antennas. In parallel, after a brief transmission line theoretical framework, basic RF electronic design principles are being taught. Finally, there is an introduction in antenna radiation mechanisms and their study from a component-equivalent point of view.</p> <p>There are the following module units:</p> <ul style="list-style-type: none"> ▪ RF transceivers ▪ RF filters ▪ Low-noise and power amplifiers ▪ RF oscillators 			

	<ul style="list-style-type: none"> ▪ Mixers, frequency up and down converters ▪ Antennas
recommended or required bibliography:	<p><u>Essential reading</u></p> <ol style="list-style-type: none"> 1. Balanis, C. A., <i>Antenna Theory: Analysis and Design</i>, Wiley-Interscience, 2005. 2. Balanis, C. A., <i>Advanced Engineering Electromagnetics</i>, Wiley, 2012. 3. Maas, S. A., <i>Microwave Mixers</i>, Artech House, 1993. 4. Razavi, B., <i>RF Microelectronics</i>, Prentice Hall, 2011. 5. Reinhold, L., and Bogdanov, G., <i>RF Circuit Design: Theory and Applications</i>, Prentice Hall, 2008. 6. Sedra, A. S., and Smith, K. C., <i>Microelectronic Circuits</i>, Oxford University Press, 2009. 7. Van de Roer, T. G., <i>Microwave Electronic Devices</i>, Chapman and Hall, London, UK, 1995.
planned learning activities and teaching methods:	Face to face lectures & e-learning
assessment methods and criteria:	Final exam (60%) Homework (40%)
language of instruction:	Greek & English