



Programme of Course "Environmental impact of EM fields"

- Code: DT0183
- Type of course unit: Compulsory (Laurea Magistrale in Ingegneria delle Telecomunicazioni curriculum Comune)
- Level of course unit: Postgraduate Degrees
- Semester: 1

Number of ects credits: (Laurea Magistrale in Ingegneria delle Telecomunicazioni) 9 (workload 225 hours)

Teachers: Mauro Feliziani

1	<b>Course objectives</b>	The goal of this course is to provide the definitions, laws and regulations, and techniques for the study of electromagnetic field (EMF) safety and health effects. On successful completion of this module, the student should understand the fundamental concepts of EMF safety, electromagnetic field analysis and mitigation techniques of electromagnetic field sources at low and high frequencies
2	<b>Course content and learning outcomes (dublin descriptors)</b>	<p>Topics of the module include:</p> <ul style="list-style-type: none"> <li>• Electromagnetic fields review: low and high frequency fields, near and far fields, numerical and experimental techniques, shielding</li> <li>• Biological effects of electromagnetic fields: low frequency effects, high frequency effects, dosimetry</li> <li>• Laws and regulations: National and international laws, technical standards, recommendations and guidelines on EMF safety and health effects</li> <li>• Low frequency sources of electromagnetic fields: Power lines and systems, power electronics, electrified railway lines, electrical vehicles</li> <li>• Intermediate frequency sources of electromagnetic fields: wireless power transfer, industrial applications</li> <li>• High frequency sources of electromagnetic fields: Radio Base Stations and cellular phones, broadcasting systems, radars, personal communication systems, RFID, medical devices</li> </ul> <p>On successful completion of this module, the student should :</p> <ul style="list-style-type: none"> <li>• have profound knowledge of basic techniques in EMF safety, have knowledge and understanding of experimental, analytical and numerical techniques to assess EMF levels, understand and explain the meaning of EMF safety and health effects, understand the fundamental concepts of EMF safety and health effects</li> <li>• demonstrate skill in EMF levels assessment using commercial software tools and instrumentation, and ability to design mitigation techniques of EMF sources</li> <li>• demonstrate capacity for reading and understand other texts on related topics</li> </ul>
3	<b>Course prerequisites</b>	The student must know the basic notions of Electromagnetic Fields and Electrical Circuits
4	<b>Teaching methods and language</b>	Lectures and exercises <b>Language:</b> English
5	<b>Assessment methods</b>	Written and oral exam. Optional short report on hot topic