



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Radiazioni Elettromagnetiche Non Ionizzanti

2021-1-F1701Q138

Aims

The course aims to provide the basis for understanding the environmental and health effects of the presence in the anthropic environment of radio frequency electromagnetic field sources

Contents

The course is divided into three essential sections:

Detailed program

1. Introduction to the topic - general overview
2. Macroscopic effects of currents on the human body
3. Review of electrodynamics and electromagnetism, electric induction, magnetic induction
4. Maxwell's equations

5. Broadcasting stations and antennas

6. Near field and far field

7. Examples of evaluation of the exposure of a target

9. Mobile telecommunications - evolution of the techniques: the five generations

10. Interaction of static and time-varying fields with the matter

13. Reflection and standing waves

14. Attenuation

15. Human body interaction with radiofrequency magnetic fields

16. Specific Absorption Rate or SAR

20. Attribution of carcinogenicity to EM to RF fields

Prerequisites

Knowledge of electromagnetism; general knowledge acquired during the first three-year of a technical-scientific faculty

Teaching form

conditioned by the current pandemic situation.

- VDC lessons

- viewing lessons uploaded on the course portal

- or with a mix, depending on the conditions that will occur and on / m<the instructions of the faculty

Textbook and teaching resource

Slides from the teacher; Classic electro-magnetism texts

Some more references

International EMF Project www.who.int/peh-emf/

WHO. Mobile phones - Fact Sheet N°193 revised October 2014

International Commission for Non Ionizing Radiation <http://www.icnirp.org/en/frequencies/high-frequency/index.html>

SCENHIR. Potential health effects of exposure to electromagnetic fields (EMF). European Commission, 2015 http://ec.europa.eu/health/scientific_committees/emerging/docs/scenih_r_o_041.pdf

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans - Non-Ionizing Radiation, Part 2: Radiofrequency Electromagnetic Fields <http://monographs.iarc.fr/ENG/Monographs/vol102/mono102.pdf>

[DIRETTIVA 2013/35/UE DEL PARLAMENTO EUROPEO E DEL CONSIGLIO del 26 giugno 2013 sulle disposizioni minime di sicurezza e di salute relative all'esposizione dei lavoratori ai rischi derivanti dagli agenti fisici \(campi elettromagnetici\) \(ventesima direttiva particolare ai sensi dell'articolo 16, paragrafo 1, della direttiva 89/391/CEE\) e che abroga la direttiva 2004/40/CE](#)

[RACCOMANDAZIONE DEL CONSIGLIO del 12 luglio 1999 relativa alla limitazione dell'esposizione della popolazione ai campi elettromagnetici da 0 Hz a 300 GHz](#)

Semester

March - June

Assessment method

Oral examination; the student has the right to submit a short paper relevant to the course subject as a topic for discussion at the opening of the examination.

Office hours

To be agreed, writing to

g.sgorbati@arpalombardia.it
