COURSE TITLE
PHYSICS 2
(Chemistry Bachelor)

Lecturer: prof. Benedetto Militello (e-mail: benedetto.militello@unipa.it)
Classroom site: Viale delle Scienze, Edificio 17, L. Sacconi Room

Credits (CFU) = **5+2**

COURSE PROGRAM

Face-to-face lectures (40 hrs, 5 CFU)
Classroom exercises (24 hrs, 2 CFU)

A short account of History of electromagnetism.

Electric charge. Coulomb's law. Electric field. Gauss' law. Electric potential. Unicity theorem (statement and consequences). Electric fields generated by electric charge distributions. Electric capacity. Dielectric materials. Electric fields in dielectric materials.

Moving charges and electric current: definition of current intensity. Direct current and current density. Electric resistance and Ohm's law. Kirchhoff's laws.

Lorentz force. Hall effect. Magnetic dipole. Magnetic fields generated by electric currents. Laws of Biot-Savart, Ampère, Faraday and Lenz. Magnetism in the matter: paramagnetism, diamagnetism and ferromagnetism. Inductance: self-inductance and mutual inductance. Alternating current and circuits.
Maxwell's equations.

Elettromagnetic waves: fields generated by an oscillating dipole (qualitative description), plane waves. Huygens' principle. Reflection and refraction. Simple optical tools: mirrors and lenses. Interference and diffraction. Definition of polarisation.

Textbooks:
Halliday - Resnick - Krane, *Fisica 2*, Ambrosiana
Further Readings: Amaldi – Bizzarri – Pizzella, *Fisica Generale – Elettromagnetismo Relatività Ottica*, Zanichelli