



UNIVERSITY OF BASILICATA STUDIES
DEPARTMENT OF MATHEMATICS, INFORMATICS AND ECONOMICS

COURSE: Physics 2			
ACADEMIC YEAR: 2017-2018			
TYPE OF EDUCATIONAL ACTIVITY: Affine			
TEACHER: Prof. Francesco Fabozzi			
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phone: 0971.206166		mobile (optional):	
Language: ITALIAN			
ECTS: 6 (lessons)	n. of hours: 48 (lessons)	Campus: Potenza Dept./School: DiMie Program: Mathematics	Semester: II

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The students

- *Will learn the fundamental laws of electric and magnetic phenomena*
- *Will learn the fundamental concepts of special relativity*
- *Will be able to describe the laws of electromagnetism by means of an adequate mathematical formalism*
- *Will be able to solve numerical problems on the topics presented in the lectures*

PRE-REQUIREMENTS

Notions provided in Physics 1 course.

SYLLABUS

Electrostatic laws (10 hours)

Electric charge. Electric interactions. Electrostatic field and its properties. Electric potential.

Conductors, capacitors, dielectrics (6 hours)

Electrostatic properties of conductors. Capacitors. Electrostatic in presence of dielectrics.

Electric current (6 hours)

Electrical conduction. Ohm's law. Electromotive force. Electric circuits.

Magnetic fields (6 hours)

Lorentz's force. Magnetic fields due to a current. Properties of magnetic fields. Force between current-carrying conductors. Magnetic properties of matter.

Electromagnetic induction (8 hours)

Electromagnetic induction. Induced electric fields. Displacement current. Self-induction. Alternating currents.

Electromagnetic waves (6 hours)

Maxwell's equations. Introduction to waves propagation. Planar electromagnetic waves. Energy transport and the Poynting vector. The spectrum of electromagnetic waves.

Elements of special relativity (6 hours)

Postulates of special relativity. Lorentz transformations. Relativistic mechanics.

TEACHING METHODS

Theoretical lessons.

EVALUATION METHODS

Pre-selective written examination followed by oral examination.

Only students reporting at least 18/30 in the written examination are admitted to the oral examination.

The final score is determined on the basis of the oral examination.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

Primary textbook:

Mazzoldi, Nigro, Voci

Elementi di Fisica – Elettromagnetismo

Publisher: Edises

INTERACTION WITH STUDENTS

The teacher receives students in his office:

- *On Monday, from 11:00 to 12:00.*



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- *By appointment.*

Students can contact the teacher by e-mail to make an appointment or to ask for informations related to the course.

EXAMINATION SESSIONS (FORECAST)¹

09/02/2018, 29/06/2018, 13/07/2018, 07/09/2018, 05/10/2018, 07/12/2018

SEMINARS BY EXTERNAL EXPERTS YES NO

FURTHER INFORMATION

¹ Subject to possible changes: check the web site of the Teacher or the Department/School for updates.