



COURSE: **Physics 2**

ACADEMIC YEAR: **2019-2020**

TYPE OF EDUCATIONAL ACTIVITY: **Affine**

TEACHER: **Prof. Francesco Fabozzi**

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website:

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phone: **0971.206166**

mobile (optional):

Language: **ITALIAN**

ECTS: **6** (lectures)

n. of hours: **48**
(lectures)

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 principles and laws of special relativity*
- *Will be able to solve numerical problems and answer to complex questions on the topics presented in the lectures*
- *Will be able to evaluate autonomously the correctness of the solution to a problem or of the answer to a question*
- *Will be able to describe the physics laws by means of an adequate mathematical formalism*
- *Will be able to study and elaborate autonomously 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 lectures

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 textbooks:

Mazzoldi, Nigro, Voci
Elementi di Fisica: Elettromagnetismo – Onde
Editore: Edises

Halliday, Resnick, Walker
Fondamenti di Fisica: Fisica Moderna
Editore: Casa Editrice Ambrosiana

Textbook for the preparation to the written examination:

Bruzzi
Esercizi di Fisica: Elettromagnetismo
Editore: Società Editrice Esculapio

INTERACTION WITH STUDENTS

The teacher receives students in his office:

- *On Friday, from 12:00 to 13:00.*
- *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

07/02/2020, 26/06/2020, 17/07/2020, 04/09/2020, 02/10/2020, 04/12/2020

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.