**Università degli Studi della Basilicata**

**DIPARTIMENTO DI MATEMATICA, INFORMATICA ED ECONOMIA**

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|---|---|---|---|
| COURSE: **Physics 2** | | | |
| ACADEMIC YEAR: **2018-2019** | | | |
| TYPE OF EDUCATIONAL ACTIVITY: **Affine** | | | |
| TEACHER: **Prof. Francesco Fabozzi** | | | |
| e-mail: **francesco.fabozzi@unibas.it** | | website: **http://oldwww.unibas.it/utenti/gruppofisica/fisica_ita/ffabozzi_didattica.htm** | |
| phone: **0971.206166** | | mobile (optional): | |
| Language: **ITALIAN** | | | |
| ECTS: **6** (lectures) | n. of hours: **48** (lectures) | Campus: **Potenza**<br>Dept./School: **DiMie**<br>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 physics laws 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 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]

08/02/2019, 28/06/2019, 12/07/2019, 06/09/2019, 04/10/2019, 06/12/2019

SEMINARS BY EXTERNAL EXPERTS YES □ NO X

FURTHER INFORMATION

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