COURSE: Methods and Techniques for Earth Observations

ACADEMIC YEAR: 2019/20

TYPE OF EDUCATIONAL ACTIVITY: Affine

TEACHER: Carmine Serio

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Language: Italian and English

ECTS: 9 (8 lessons and 1 tutorial/practice) n. of hours: (64 lessons and 12 tutorials/practice)

Campus: Potenza
School of Engineering
Program: Laurea Magistrale in Ingegneria Informatica e delle Tecnologie dell’Informazione

Semester: I

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

This course examines the basic of the interaction between radiation and matter in the Earth atmosphere. The main objective of the course is to provide theoretical fundamentals for face problems of Remote Sensing

The main knowledges provided are:
- Basic of Thermodynamics
- Basic of Optics
- Basics of Atmospheric Physics
- Fundamentals of Radiative Transfer.

The main skills obtained will be:
- To use advanced tools for Scientific Calculus.
- Skill in distinguishing and characterizing atmospheric processes
- To Evaluate and estimate geophysical parameters from remote sensing data.
- To analyze and process Satellite data
- Students will demonstrate they understand and manage basics concepts of Atmosphere Physics and in particular to understand basic concepts related to the remote sensing form different platforms, ground-based, airplane, satellite.
- Students will show they manage remote sensing methods and techniques.
- Students will reach a level of good independency in dealing with the diverse remote sensing techniques and how they apply to the Earth Observations.
- Students will reach adequate skill in exemplifying and showing Earth Observations methods and techniques to non-expert people.
- Students will acquire skills for self-learning about Earth Observations from the science literature and how to relate with more advanced courses.

PRE-REQUIREMENTS

The course pre-requirements are:
- Knowledge of Mechanics fundamentals Conoscenza dei concetti fondamentali di meccanica
- Knowledge of Electromagnetism fundamentals;
- Knowledge of Differential and Integral calculus fundamentals
- Knowledge of numerical analysis basics

SYLLABUS


8. Inverse problems: Retrieval of geophysical parameters. EOF (Empirical Orthogonal Function) Methodology.

TEACHING METHODS
The Course is organized as follows:
- Theoretical lessons (64 hh)
- Classroom tutorials (12 hh)

EVALUATION METHODS
Discussion of a project work and Oral examination.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL
- Lessons minutes.
- Textbooks:
  - D. Halliday, R., Resnick, J. Walker. Fondamenti di Fisica, Casa Editrice Ambrosiana, 2015 (Chapters 14, 18, 19, 32, 33, 34, 35 and 36)
  - K. N. Liou, "An Introduction to Atmospheric Radiation", Academic Pres. (Chapters 1, 2, 3, 4, 5 and 6)

INTERACTION WITH STUDENTS
Students are welcome during the professor’s office hours (Mondays from 15:00 to 18:00). Moreover the professor will be always available for the students after contact by e-mail.

EXAMINATION SESSIONS (FORECAST)
06/02/2020, 27/03/2020, 21/05/2020, 02/07/2020, 23/07/2020, 10/09/2020, 24/09/2020, 10/12/2020

SEMINARS BY EXTERNAL EXPERTS YES X NO

FURTHER INFORMATION

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