



COURSE: Numerical methods for fields and circuits			
ACADEMIC YEAR: 2017/18			
TYPE OF EDUCATIONAL ACTIVITY: Characteristic			
TEACHER: Raffaele Fresa			
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Language: Italian			
ECTS: (lessons e tutorials/practice) 9 (6/3)	n. of hours: (lessons e tutorials/practice) 78 (51/27)	Campus: Potenza School: Engineering Program: Computer and Information Engineering	Semester: II

#### EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course is devoted to familiarize the student with the main numerical instruments for the solution of engineering problems by the computer and to increase his capability to give a correct interpretation of the numerical results on the basis of the physical phenomenology.

#### PRE-REQUIREMENTS

The contents of mathematics, physics and electrotechnics courses

#### SYLLABUS

Errors and computer arithmetic  
Solution of non-linear equations  
Numerical methods for the solution of linear and non-linear systems  
Approximation of functions by interpolation  
Numerical integration  
Numerical solution of ODE systems.  
Formulations of electromagnetic models in terms of scalar and vector potentials.  
Numerical solution of electromagnetic models by FEM formulations.

#### TEACHING METHODS

Theoretical lessons, Classroom tutorials, Laboratory tutorials, Project works.

#### EVALUATION METHODS

Discussion of a project work, Oral examination.

#### TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- Lectures of Prof. Fresa.
- F. Trevisan, F. Villone, Modelli numerici per campi e circuiti, SGE Padova.
- S. C. Chapra, R. P. Canale, Metodi Numerici per l'Ingegneria, McGraw-Hill.

#### INTERACTION WITH STUDENTS

At the start of the course the students will receive lectures and other learning material.

Professor's office hour: Tuesday 10.30-11.30 in his office located on the fifth floor of the "Engineering school" in "Macchia Romana" Campus.

#### EXAMINATION SESSIONS (FORECAST)<sup>1</sup>

24/01/2018, 28/02/2018; 14/04/2018; 16/05/2018; 27/06/2018; 12/07/2018; 25/07/2018; 19/09/2018; 17/10/2018; 14/11/2018.

SEMINARS BY EXTERNAL EXPERTS YES  NO

#### FURTHER INFORMATION

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



Università degli Studi della Basilicata  
**Scuola di Ingegneria**

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