



UNIVERSITÀ DI PISA
DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE
Dottorato di Ricerca in Ingegneria dell'Informazione

Doctoral Course

“Finite-element modeling for engineers”

Prof. Giovanni Pennelli

*Dipartimento di Ingegneria dell'Informazione,
Via Caruso 16, I 56122 PISA*

Short Abstract: The objective of the course is to give the basic principles of finite element modeling (FEM), which is one of the most powerful tools for the numerical solution of partial differential equations in complex domains. The course will not be very rigorous about the mathematical properties of the method, but it will principally deal with practical aspects of the resolution of partial differential equations applied to problems commonly encountered in the modern engineering. Several software for FEM simulations will be illustrated, and particular emphasis will be given to free software tools as FreeFEM and FENICS. During the course, large space will be given to practical examples by using a free FEM tool (as FENICS).

Course Contents in brief:

- Topic 1. Basic mathematical principles of the Finite Element Modeling.
- Topic 2. practical aspects of finite element modeling, applied to engineering problems: domain definition, meshing, boundary conditions.
- Topic 3. Software for FEM simulations: FreeFEM, FENICS, ...
- Topic 4. Example of the applications of FEM to practical problems, using FENICS.

Total # of hours: 16

CV of the Teacher

Giovanni Pennelli received its Ph. D degree in Electronics Engineering in 1997. After a period in the University of Glasgow as Research Assistant, he joined the University of Pisa (Dipartimento di Ingegneria dell'Informazione) in 2000, where he is actually Associated Professor, teaching Device Physics in the Course for the First Graduation in Electronic Engineering.

His research activity is focuses on the modelling, nanofabrication and characterization of advanced electronic nanodevices. He is author, or co-author, of more than 60 publications on high impact factor international reviews.

Room and Schedule

Room: *Aula Riunioni del Dipartimento di Ingegneria dell'Informazione, Via G. Caruso 16, Pisa – Ground Floor*

Schedule:

- **mid-October 2017**

The course "Finite-element modeling for engineers", originally starting on Sept. 15, will be deferred to mid-October for unexpected unavailability of the teacher. The new detailed schedule will be communicated very soon. The PhD program apologizes for this.