

Information at UPC:

Tel.: +34 93 4017761
+34 93 4010948
Fax: +34 93 4016090

Information at UB:

Tel.: +34 93 4039075
+34 93 4021115
Fax: +34 93 4021118

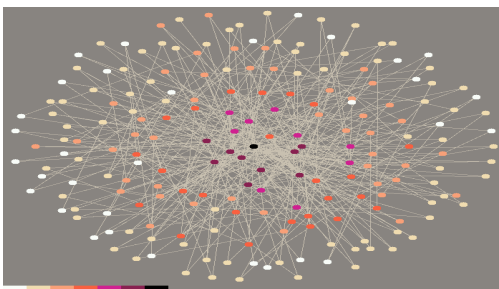
e-mail: masterFCiA@fa.upc.edu

<http://www.fa.upc.edu/masterFCiA/>

Coordinators :

Carme Miguel López (UB)

Juan Sánchez Umbría (UPC)



Departament de Física i
Enginyeria Nuclear



Departament d'Astronomia
i Meteorologia **DAM**

Estructura i
Constituents
de la Matèria

Departament de
Física Fonamental



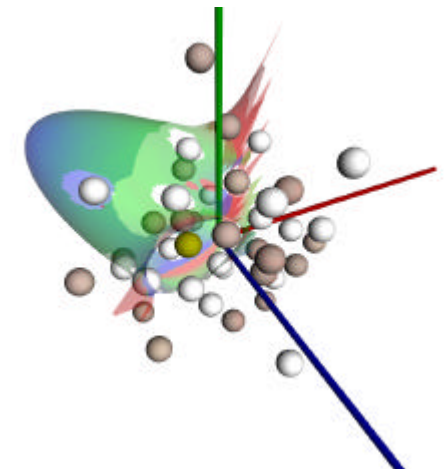
UNIVERSITAT POLITÈCNICA
DE CATALUNYA



MASTER'S DEGREE COURSE IN COMPUTATIONAL AND APPLIED PHYSICS

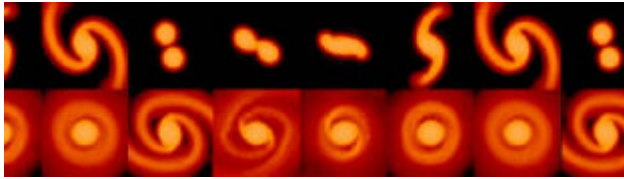
Technical University of Catalonia
University of Barcelona

2008/2009 academic year



Official master's degrees

<http://www.fa.upc.edu/masterFCiA/>



With original ideas on the cross-curricular approach and the methodology, this inter-university master-level course intends to offer the student advanced and modern education in the field of computational and applied physics, with particular emphasis on simulation, modelling, supercomputing and advanced experimental techniques.

Profile

Towards academic, professional and/or research work.

Beginning

September 2008

Number of credits and courses

One (60 ECTS credits), one and a half (90 ECTS credits) or two (120 ECTS credits) academic years according to student's previous education.

Type of teaching

Regular courses

Organization

Department of Applied Physics
Department of Physics and Nuclear Engineering
C/ Jordi Girona, 1-3. Edif. B4/B5. 08034 Barcelona

Faculty of Physics
C/ Martí i Franquès, 1. 08028 Barcelona

Participant Universities

Universitat Politècnica de Catalunya (UPC)
Universitat de Barcelona (UB)

Course Program

Subjects are grouped into three categories:

Introductory Courses:

Astrophysics and Cosmology (7.5 credits)
Continuum Mechanics: Fluids (7.5 credits)
Programming and Numerical Methods (7.5 credits)
Quantum Mechanics (7.5 credits)
Solid State Physics (7.5 credits)
Statistical Mechanics (7.5 credits)

Core Courses:

Computational Physics Specialization:

UB Part

Introduction to Computational Physics (5 credits) *
Molecular Dynamics and Monte Carlo Simulation (5 credits)
Statistics, Monte Carlo Techniques and Data Processing (5 credits)

UPC Part

Numerical Astrophysics (5 credits)
Numerical Methods in Dissipative Systems (5 credits)
Supercomputing and Parallel Programming (5 credits)

Applied Physics Specialization:

Experimental Techniques in Applied Physics (7.5 credits)
Phase Transitions (7.5 credits)
Physics of Materials (7.5 credits)

Elective Courses:

Computational Physics Specialization:

Astrophysics Profile:

Observational Techniques in Astrophysics (5 credits)
Space Sciences (5 credits)

Fluid Mechanics Profile:

Non-linear Dynamics and Hydrodynamic Instabilities (5 credits)
Applied Geophysical and Geomorphological Fluid Mechanics (5 credits)

Condensed Matter Profile:

Advanced Methods in Simulation (5 credits)
Complex Systems (5 credits)
Condensed Matter Physics (5 credits)

Complementary Courses:

Radiation Interactions and Transport (5 credits)
Finite Element Method (5 credits)
Econophysics: Estocastic Dynamics in Financial Markets (5 credits)

Applied Physics Specialization:

Acoustic Waves, Ultrasounds (5 credits)
Physics of Dielectric and Ferroelectric Materials (5 credits)

Curricular Designs

Students requiring only 60 credits:

Computational Physics:

20 core credits (10 from UB part + 10 from UPC part)
20 elective credits *
20 credits for the final Master Thesis

Applied Physics:

22.5 core credits **
15 elective credits **
22.5 credits for the final Master Thesis

Students requiring 90 credits:

Computational Physics:

25 introductory credits
20 core credits (10 from UB part + 10 from UPC part)
20 elective credits **
25 credits for the final Master Thesis

Applied Physics:

25 introductory credits
22.5 core credits **
17.5 elective credits **
25 credits for the final Master Thesis

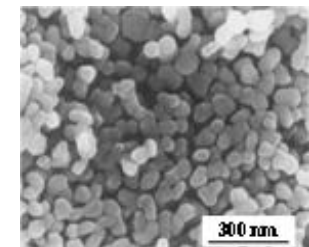
Students requiring 120 credits:

Computational Physics:

30 introductory credits
20 core credits (10 from UB part + 10 from UPC part)
40 elective credits **
30 credits for the final Master Thesis

Applied Physics:

30 introductory credits
22.5 core credits **
37.5 elective credits **
30 credits for the final Master Thesis



* Students who have studied the subject in the Degree in Physics are not able to register themselves in this course.

** Up to 10 credits can be followed as elective courses in other official masters.