



Curso de Doctorado
Doctorado en Ingeniería Matemática—UCM
Doctorado en Investigación Matemática—UCM
Mención hacia la excelencia MEE2011-0021

José M. Arrieta and
Anibal Rodríguez Bernal
Universidad Complutense de Madrid

**Introduction to semigroup theory applied to
evolutionary equations**

Abstract

The purpose of this course is to present the basic concepts and techniques from semigroup theory that are used in the modern treatment of linear and nonlinear evolution equations.

The course is divided in five sessions of approximately 90 minutes each.

1. Semigroup theory: a unified view for evolution equations. Examples in ODE's and PDE's.
2. Semigroups and infinitesimal generators. Lumer-Philips and Hille-Yosida theorems.
3. Perturbations of generators and semigroups.
4. Applications to Heat, Wave and Schrodinger equations
5. Introduction to non-homogeneous problems.

Bibliography

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- 3.- E.B.Davies, "One parameter semigroups", London Mathematical Society Monographs vol. 15, Academic Press (1980).
- 4.- L. Evans, Partial Differential Equations, AMS (1998).
- 5.- Henry, D. "Geometric theory of semilinear parabolic equations", Springer-Verlag, 1981
- 6.- A.Pazy, "Semigroups of linear operators and applications to Partial Differential Equations", Applied Mathematical Sciences 44, Springer (1983).

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