UNIVERSIDADE FEDERAL DE SANTA CATARINA
CENTRO DE CIÊNCIAS FÍSICAS E MATEMÁTICAS
PÓS-GRADUAÇÃO EM MATEMÁTICA PURA E APLICADA

MTM510012 Distribution Theory and Sobolev spaces

Pre-requisite: MTM410029 Functional Analysis, Theory of measurement and integral of Lebesgue.

Weekly lesson hours: 06h

Discipline syllabus: The Function Space Tests. Density. Distributions in an open Ω of Rn. Derivation of distributions. Temperate Distributions. Fourier transform in L1 (Rn), S (Rn) and L^2 (Rn). Fourier transform of tempered distributions. Plancherel's theorem. The Sobolev Spaces W (Ω). Properties, Reflexivity, Separability, Dual. The Space W (Ω). Prolonging Operators. The Sobolev spaces Hs (Ω) and Hs (Ω), s real, Ω open subset of Rn. The Trace Theorem. Applications to Partial Differential Equations. Generalized Solutions and Existence and Uniqueness of Initial and Border Value Problems.

BIBLIOGRAPHIC REFERENCES

1. Medeiros, L. A., Miranda, M. M., Espaços de Sobolev, 2a. Edição, Instituto de Matemática, UFRJ, 2004.
2. Brezis, H., Analyse Fonctionnelle: théorie et Applicátions, Masson (1983).
3. Kesavan, S., Topics in Functional Analysis and Applications, Wiley (1989).

COMPLEMENTARY BIBLIOGRAPHY

1. Adams, R. A., Sobolev Spaces, Academic Press (1975).
2. Evans, L. C., Partial differential equations, American Mathematical Society, 2002.
3. Hörmander, L., The Analysis of Linear Differential Operators I, Distribution Theory and Fourier Analysis, Springer-Verlag, 2ed., 1990
4. Medeiros, L. A. , Rivera, P. H. Iniciação aos Espaços de Sobolev, IM-UFRJ, Rio de Janeiro (1977).
5. Renardy, M., Rogers, R.C., An introduction to partial differential equations, Springer-Verlag, 1993.