UNIVERSIDAD NACIONAL DEL SUR

BAHIA BLANCA	-	ARGENTINA

DEPARTAMENTO DE MATEMATICA

PROGRAMA DE: Local mean oscillations and sharp weighted inequalities	Curso / Seminario
	Posgrado

HORAS	PROFESOR RESPONSABLE
20	**Andrei K. Lerner**

Requisitos previos

Notions of Real Analysis

DESCRIPCIÓN

In this course we are going to prove a result establishing a pointwise estimate of an arbitrary measurable function in terms of its local mean oscillations adapted to a sparse family of cubes. In particular, this result allows us to get a pointwise estimate of a general Calderon-Zygmund operator in terms of very simple dyadic positive sparse operators. In turn, from this we obtain a short proof of the A_2 conjecture which says that the weighted $L^2(w)$ operator norm of a Calderon-Zygmund operator is controlled linearly by the A_2 constant of the weight w.

OBJETIVO

We will introduce the notions of median value and local mean oscillation, then dyadic cubes and sparse families. After that the main pointwise estimate of any f in terms of local mean oscillations. After that its applications. The main application is to C-Z operators. So, we will prove the A_2 conjecture with all details. After that, we show a similar application to the Littlewood-Paley operators.

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MOTIVACION O FUNDAMENTACION DEL CURSO

A_2 Theorem is one of the most important results in Real Harmonic Analysis in the last years. We believe extremedly positive that people that work or It is starting to work in that Area know about all details about such Theorem.

MECANISMO DE EVALUACIÓN

Present homework and exposition.

PROGRAMA

1- Class of Weights A_2. Muckenhoupt Weights. Properties

2- Mean Value. Local mean oscillations. Classical means and Rearrengements and different maximal functions

3- Dyadic cubes and Sparse families and Applications. Dyadic positive sparse operators

4- Calderon-Zygmund operator. Definition Properties and Estimates

5- Sharp weighted Estimates for Singular Integral Operators. A_2 Theorem, a simple Proof.

6- Littlewood-Paley Theory and Applications

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- Hytönen, T. P. *The sharp weighted bound for general Calderón–Zygmund operators.* Annals of Mathematics (2012)

- Andrei Lerner, *A simple proof of the A_2 conjecture;* Int. Math. Res. Not., 2013 (14) pags 3159-3170.

AÑO	PROFESOR RESPONSABLE	DIRECTOR DEPARTAMENTO
2014		