Course description for MATH 828: Classical and Modern Fourier Analysis II
Spring 2008

NAME OF THE COURSE: Classical and Modern Fourier Analysis II

SEMESTER: Spring 2008

INSTRUCTOR: Prof. Diego Maldonado

CREDITS: 3

PREREQUISITE: MATH 827 Classical and Modern Fourier Analysis I.

TEXT: There is no textbook required for the course as we will be using our own notes. However, the following texts are relevant to the course and they are recommended reading:

- *Fourier analysis* by Javier Duoandikoetxea (translated and revised by David Cruz-Uribe). American Mathematical Society, 2001.
- *Classical and Modern Fourier Analysis* by Loukas Grafakos. Pearson/Prentice Hall, 2004.
- *Harmonic analysis : real-variable methods, orthogonality, and oscillatory integrals* by Elias M. Stein. Princeton University Press, 1993.

INSTRUCTOR'S WEB PAGE: http://www.math.ksu.edu/∼dmaldona

TARGET AUDIENCE: Graduate students from physics, engineering, and mathematics who have taken a course on Real Analysis.

GOAL: To develop a sophisticated mathematical machinery that is tightly connected to both: *abstract fields* such as harmonic analysis in locally compact groups, representation theory, diffusion semigroups, and functional analysis; and to *applied fields* such as signal/image processing and partial differential equations.

DESCRIPTION OF THE COURSE: This course is the second part of the sequence MATH 827 and MATH 828 (Classical and Modern Fourier Analysis I and II). Along with standard theorems, the course will include topics on:

(i) singular integrals and the $T(1)$ theorem,
(ii) Muckenhoupt weights, weighted norm inequalities for singular integrals,
(iii) pseudo-differential operators,
(iv) real analysis in spaces of homogeneous type.

The course will also include historical references, current open problems, and connections of Fourier Analysis with other areas of Mathematics.

For more information, contact Prof. Maldonado at dmaldona@math.ksu.edu