Fourier Analysis/ Math 518 (Fall 2009)

Instructor: Ciprian Demeter

Office hours: Mon after the class (12.05 until 12.30), Mon 3.30-4.00, Tue 12-1

Class homepage: http://mypage.iu.edu/~demeterc/518/index.html

Textbooks used: I will provide complete notes. The course material will be drawn from multiple sources. The main source is the book by Elias M. Stein ”Harmonic Analysis (Real-variable methods, orthogonality and oscillatory integrals)” . Another source is the book by the same author entitled ”Singular integrals and differentiability properties of functions”. Another good reference is ”An Introduction to Harmonic Analysis” by Yitzhak Katznelson. I will have a copy of the first and third book available for consultation either in the lounge, or my office.

Course description: Topics will include: the Fourier series of functions on the torus, maximal and singular integral operators, the Littlewood-Paley decomposition and the square function, the space of functions with bounded mean oscillation, the Hardy space $H^1$, oscillatory integrals, the $TT^*$ method and applications to PDE (such as Strichartz estimates), the $T(1)$ theorem.

Grading: There will be a homework almost every week, consisting of 4 problems. It will be posted on the class homepage (most of the times, on Mondays). Homework will be due on Wednesdays, in class. Solutions will be also provided by me on Wednesdays or Fridays. No hw will be accepted after I give you the solutions.

Final grade: The grade for this class will be based only on homework. I encourage you to take some effort to write the solutions in an efficient, clean, elegant way. If you get half the total amount of points, you are guaranteed to get a B (or better)