# Course: Math 4032 (Combinatorial Analysis) Spring '007

**Instructor** : Prasad Tetali, office: Skiles 126, email: tetali@math.gatech.edu
**Office Hours: Mon, Wed. 11am – noon; Thurs. 2:00 – 3:00pm**

**Course Outline**:

**Suggested Text books**:
**(1)** *Extremal Combinatorics : with applications in computer science*, by Stasys Jukna (Springer 2001). **(2)** *Combinatorics: Topics, Techniques, Algorithms* by Peter Cameron, (Cambridge University Press, 1996 (reprinted)).

Another good source: **(3)** *A Course in Combinatorics,*, by J.H. van Lint and R.M.Wilson. Cambridge University Press (Second Edition, 2001).

**Course Objective**.
• Introduction to advanced topics in combinatorics; to demonstrate the strength (and joy) of combinatorics when used in conjunction with other branches of mathematics such as analysis, probability and linear algebra.

**Topics include the following**: Most topics will be discussed for about a week.
Introduction to
• Extremal graph theory
• Extremal set theory
• Ramsey theory
• The Probabilistic Method
• Revisiting : Recurrence relations and Generating functions
• Permanents
• Entropy techniques and asymptotic enumeration
• (0,1)-matrices
• Hadamard matrices and Reed-Muller codes
• Projective and Combinatorial geometries
• Polya's theory of counting
• Linear algebraic methods
• Lattices and Mobius inversion

**General grading policy : Homeworks 20%, Tests 50%, Final exam 30%**

**Test 1**: February 7th **Test 2**: March 14th **Test 3**: April 18th

**No make-up tests will be allowed.**
Homeworks will be assigned, collected and graded on a regular basis. You are strongly advised to (attempt to) solve all the homework problems. **Late submission of HWs is discouraged with a penalty of 20%.**

**Suggestions**:
- Please feel free to ask questions at any time: before, after or during the class.
- Please make use of my office hours.
- Class participation and discussion is highly encouraged.