2009 NCTS Summer Course on Discrete Mathematics

NCTS 2009 暑期專題課程 (離散數學領域)

A summer course on Combinatorics

Goal:

This summer course will introduce several research topics in Combinatorics such as distance-regular graphs, interconnection networks, wireless networks, group testing, and Coxeter groups. New results in these topics will also be included.

Place:

Room 223, Science Building I, National Chiao Tung Univ.

負責老師/課程時間/內容

翁志文教授: **July 1**, 2009 (Wednesday), 10:30-12:00 and 13:00-14:30
Introduction to Distance-regular graphs (part I)
a) Definition,   b) Combinatorial arguments,   c) Bose Mesner Algebras

翁志文教授: **July 2**, 2009 (Thursday), 10:30-12:00 and 13:00-14:30
Introduction to Distance-regular graphs (part II)
d) Q-polynomial properties,   e) Balanced set conditions

陳秋媛教授: **July 8**, 2009 (Wednesday), 10:30-12:00 and 13:00-14:30
Generalized shuffle-exchange networks (GSEN)
a) Multistage interconnection network and GSEN,   b) How to route a message in GSEN
c) How to route a permutation in GSEN,   d) How to perform all-to-all communication in GSEN

陳秋媛教授: **July 9**, 2009 (Thursday), 10:30-12:00 and 13:00-14:30
Dominating set and its application to wireless networks
a) Wireless network and its graph model,   b) Graph problems that arise in wireless network
c) Dominating set, connected dominating set, independent set,
d) Approximation algorithm for dominating set problem

陳宏賓教授: **July 15**, 2009 (Wednesday), 10:30-12:00 and 13:00-14:30
Group testing with inhibitors
a) Introduction   b) Sequential algorithms   c) Nonadaptive algorithms

陳宏賓教授: **July 16**, 2009 (Thursday), 10:30-12:00 and 13:00-14:30
Group testing with mutually-obscuring objects
a) Single mutually-obscuring defectives,   b) Multiple mutually-obscuring defectives
c) Coin-weighing problems

翁志文教授: **August 12**, 2009 (Wednesday), 10:30-12:00 and 13:00-14:30
Coxeter Group associated with a graph (part I)
a) Definition,   b) Representations of Coxeter Groups,   c) Root systems

翁志文教授: **August 13**, 2009 (Thursday), 10:30-12:00 and 13:00-14:30
Coxeter Group associated with a graph (part II)
d) The centers of Coxeter groups,   e) Classification of finite Coxeter groups
f) Lit only sigma-games

陳秋媛教授: **August 19**, 2009 (Wednesday), 10:30-12:00 and 13:00-14:30
Minimum spanning tree and its application to wireless networks

陳秋媛教授: **August 20**, 2009 (Thursday), 10:30-12:00 and 13:00-14:30
Random graphs and their application to wireless networks

聯絡人
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Please note that the first meeting is on: July 1, 2009