Abstract: In the first part of the talk, as an introduction, the deterministic case will be discussed, i.e., the case of ordinary differential equations (ODEs). Some basic facts will be recalled. An especially simple case is that of homogeneous (i.e., autonomous) equations in one dimension. For these equations, existence and uniqueness of solutions will be described completely for arbitrary Borel measurable right hand side.

In the second part of the talk, one-dimensional stochastic differential equations (SDEs) will be considered, i.e., those driven by Brownian motion without drift and with time-homogeneous diffusion coefficient. It will be shown that these equations can be dealt with in a quite analogous way as homogeneous ODEs. The basic tool for this is random time change. Necessary and sufficient conditions for existence and uniqueness of solutions, required for the diffusion coefficient, will be given.

In the last part of the talk, several recent extensions will be discussed: SDEs with drift coefficient, SDEs with time-dependent diffusion coefficient, SDEs driven by stable processes, SDEs driven by general continuous local martingales, and, perhaps, SDEs with reflected solutions.

Host: Dr. Hiro Mukai

Monday, August 13, 2007
11:00 a.m. – 12:00 p.m.
Bryan Hall 305