Stat 362 Topics

We will have time for most of the following:

**Pseudo Random numbers**  generators, tests, Mersenne Twister

**Non-uniform sampling**  inversion, accept-reject, mixtures, tricks

**Vectors**  Gaussian, multinomial, $t$, Dirichlet, conditional & copula sampling

**Objects**  permutations, rotations, sub-samples, order statistics, matrices

**Processes**  Markov chains, Brownian motions, random walks, Chinese restaurant

**Correlation induction**  antithetics, common variates/coupling, stratification

**Improved analysis**  control variates, Rao-Blackwellization

**Improved generation**  importance sampling, splitting, Russian roulette, SAWs

**Markov chain MC I**  Markov chains, detailed balance, Ising, Metropolis-Hastings

**Markov chain MC II**  Gibbs sampler, slice sampler, hit and run

**Markov chain MC III**  adaptive Metropolis, tempering, perfect sampling

**Sequential MC**  Russian roulette, splitting, sequential importance sampling

**Multiple stratification**  Latin hypercubes, function anova, orthogonal arrays

**Quasi-Monte Carlo I**  discrepancy, Koksma-Hlawka, Halton

**Quasi-Monte Carlo II**  Sobol’, Faure, Niederreiter-Xing, lattices

**Randomized QMC**  Cranley-Patterson, scrambled nets, padding, Latin supercubes

**MC optimization**  Annealing, genetic algorithms, stochastic programming