

## **ECE 673: Simulation and Evaluation of Computer Systems and Networks**

- Instructor: C. Mani Krishna, KEB 309K.
- Text: S. Ross, *Simulation*, Academic Press.
  - An electronic copy can be accessed via the university library.
- Background: A strong background in probability theory is required at the level of ECE 603. This is a highly mathematical course and students are expected to have the mathematical maturity required. They should also be comfortable writing code in a common high-level language like C or python.
- Grading:
  - Two midterms, 27% each.
  - Final examination, 36%
  - Homework, 10%
- Coverage: (Not necessarily in sequence):
  - Markov chains.
  - Basics of queueing theory.
    - M/M/m, G/M/m, and M/G/1 queues: Busy period and waiting time distributions.
  - How to write a simulation program.
  - Random number generation
    - Common algorithms.
    - Quality tests for random number generators.
  - Variance reduction techniques:
    - Conditioning, stratified sampling, importance sampling, control variates.
  - Statistical validation techniques
    - Chi-square and Kolmogorov-Smirnov tests.
  - Markov chain Monte-Carlo methods (if time permits).