COURSE SYLLABUS

Course Number: COMP6340/6346
Course Title: NETWORK QUALITY ASSURANCE AND SIMULATION
Credit Hours: 3
Prerequisites: COMP4320 or ELEC 6220
Corequisite: none

I. Course Content/Objectives:
1. Objectives: At the conclusion of this course the student will have an understanding of theoretical and practical aspects of network simulation and quality assurance

2. Tentative Schedule and Outline of Course Content.

   Fundamentals of Simulation
   Lesson 1 Systems analysis
   Lesson 2 Types of data
   Lesson 3 Probability and statistics
   Lesson 4 Random variable distributions

   Random Variable Distributions
   Lesson 5 Continuous distributions
   Lesson 6 Discrete distributions

   Statistical Inference
   Lesson 7 Random sampling
   Lesson 8 Higher-order moments and moment generating functions
   Lesson 9 The distribution of random variables
   Lesson 10 Confidence intervals
   Lesson 11 Hypothesis testing
   Lesson 12 Distribution suitability

   Lesson 13 Exam Review
   Lesson 14 Exam 1

   System Modeling
   Lesson 15 Planning
   Lesson 14 Modeling
   Lesson 15 Validation and verification
   Lesson 16 Evaluation of random number generation
   Lesson 17 Experimentation

   Distributed Systems
Lesson 18 Overview of parallel and distributed systems
Lesson 19 Models for distributed systems and services
Lesson 20 Distributed databases
Lesson 21 Fault tolerance in distributed systems
Lesson 22 Implementing distributed systems

Wireless Network Performance (from Raj Jain)
Lesson 23 An Overview of Performance Evaluation
Lesson 24 Common Mistakes and How to Avoid Them
Lesson 25 Selection of Techniques and Metrics
Lesson 26 Measurement Techniques and Tools
Lesson 27 Types of Workloads
Lesson 28 Workload Characterization Techniques.
Lesson 29 Monitors.

Lesson 30 Exam 2 Review
Lesson 31 Exam 2

Resolution in Simulation
Lesson 32 Resolution, fidelity, and model simplification
Lesson 33 Decomposition
Lesson 34 Adjusting resolution dynamically

Modeling and Abstraction in Multilevel Simulation
Lesson 35 Multilevel abstraction
Lesson 36 Aggregation and deaggregation
Lesson 37 Architectural considerations
Lesson 38 & Lesson 39 Experimental Design (again from Raj Jain)

Distributed Simulation Considerations
Lesson 40 Decomposition of a simulation
Lesson 41 & Lesson 42 Time, clocks, and synchronization
Lesson 42 Logical process simulation
Lesson 43 Verification and validation revisited
Lesson 45 Final Exam Review

3. Textbook or assigned readings


Grading and Evaluation Procedures:

1000 points can be earned: 900+ = A, 800+ = B, 700+ = C, 600+ = D, < 600 = F

Exam 1 = 150 points
Exam 2 = 200 points
Final Exam = 250 points
3 projects = 100 points apiece
10 homeworks = 10 points each

III. Statement related to policies on unannounced quizzes and class attendance and participation.

There will be no unannounced quizzes and attendance will not affect the grade.

Accommodation Statement: Students who need special accommodations should make an appointment to discuss the Accommodation Memo during my office hours as soon as possible. If scheduled office hours conflict with classes, please arrange an alternate appointment time. If you do not have an Accommodation Memo, but need special accommodations, contact the Program for Students with Disabilities in 1244 Haley Center (844-2096 V/TTY).

Justification for Graduate Credit: This course requires knowledge of data networks, which are not covered until the senior year of undergraduate studies in the required course COMP4320 or ELEC6220.

11/6/01