Syllabus

instructor	year	semester	course number	course name	section
ILKYEONG MOON	2014	1	406.311	Simulation	

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Office Hours: Tuesday & Thursday 10-11a.m.

1. Course Description

The concept, theory, and application of simulation will be studied in this course so that students can analyze complex systems effectively in which mathematical analysis is not applicable. Computer logic, Monte Carlo Simulation, random number generator, methods for generating random variables, simulation using Excel and C language will be studied. In addition, we will use Arena language to model and analyze various systems. Input and Output Analyzers will be applied to perform various input and out analysis. Arena PAN and OptQuest will be used to analyze multiple alternatives and search for optimal solutions, respectively. A term-project is required to enhance the ability to solve real problems.

2. Required textbook

W. Kelton, R. Sadowski, N. Zupick (2014) Simulation with ARENA, McGraw-Hill, New York.

3. References

A. Law and W. Kelton (2007) Simulation Modeling and Analysis (4th edition), McGraw-Hill, N.Y.

B. Choi and D. Kang (2013) Modeling and Simulation of Discrete-Event Systems, Wiley, N.J.

4. Requirements & Grading

Midterm Exam (35%), Homework (15%), Coding Exam (15%), Final Term Project (35%)

4. Weekly Schedule

week	Contents	Homework
1	**Introduction of Simulation** Objective and Application of Simulation, Monte Carlo Simulation,	
2	**Introduction of Simulation** General Simulation Language and Special-Purpose Simulation Language, Method for Computing Statistics for Simulation, Simulation using Excel	
3	**Internal Logic of Simulation** Computer Logic, Time Advance Mechanism, Computer Representation of Discrete Event Simulation	
4	**Simulation using C Language** Flowcharting, Simulation using C Language	Homework 1
5	**Methods for Random Number and Random Variable Generation** Random Number Generator, Inverse Method, Various Methods for Generating Random Variables	
6	**Basic Modeling using Arena** Arena Basic and Advanced Modules, Terminating Simulation,	Homework 2
7	**Basic Modeling using Arena** Job Shop Modeling, Application of Logical Entities	
8	Midterm Exam	
9	**Intermediate Modeling using Arena** Nonterminating Simulation, Entity Transfer,	Homework 3
10	**Proposal Presentation for Term projects**	Term project proposal
11	**Intermediate Modeling using Arena** Balking and Reneging in the Queue, Batching, Holding Entities	
12	**Input and Output Analyze** Fitting Input Distributions, Various Statistical Analysis using Output Analyzer	Homework 4
13	**Process Analyzer & OptQuest** Analyzing Alternatives using Output Analyzer, Finding optimal solutions using OptQuest	
14	**Further Modeling Issues and Techniques** Modeling conveyers, Miscellaneous Issues	
15	**Arena Integration and Customization** Reading and Writing Data Files	
16	**Presentation for Term projects**	Term project report