



Simulation for Decision Makers Syllabus

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1. Course description

This one-day training course is taught by experience simulation professionals and consists of an even balance of lectures and hands-on workshops. Here is how it breaks down:

Morning: The day begins with the simulation fundamentals. You will quickly see an example and learn why it is important to not overlook the dynamic and stochastic (random) aspects of a system during its analysis. Then you will learn how to use a simulation technique used during the conception of the first atomic bomb and named upon a famous gaming city: Monte Carlo Simulation. The morning ends with exercise on decision-making under uncertainty.

Afternoon: During the afternoon, you will be first presented real world simulation projects with a focus on how they helped decision makers. Then, you will learn the nuts and bolts of discrete event simulation and build your first simulation model using the Rockwell Arena Simulation Software.

2. Objectives

1. Understand why and when you need to simulate.
2. Being able to understand and analyse simulation results.
3. Have hands-on experience with simulation.

3. Methodology

- a. Short, straight to the point lectures about the topic's fundamentals. (33%)
- b. Real world examples. (33%)
- c. Hands-on exercises. (33%)

4. Documentation

The documentation is provided by SimWell at the beginning of the training.

- a. Training slides.
- b. Arena Basic Model Building manuals 1 & 2.

5. Reference books

- Kelton, Sadowski, Swets, *Simulation with Arena 5th Edition*, McGraw Hill, 2010
- Rossetti, *Simulation Modeling and Arena*, John Wiley & Sons, 2010
- Law, Kelton, *Simulation modeling analysis*, McGraw Hill, 2004
- Tayfur and Melamed, *Simulation Modeling and Analysis with Arena*, Academic Press, 2007
- Seppanen and al. *Process Analysis and Improvement*, McGraw-Hill, 2005
- McLaughlin and Hays, *Healthcare Operations Management*, Health Administration Press, 2008
- Chung, *Simulation Modeling Handbook – A Practical Approach*, CRC press, 2004
- Pegden, Dennis et al. *Introduction to Simulation Using Siman*, McGraw-Hill, 1995

6. Other useful resources

Arena website: www.arenasimulation.com

Simulation with Arena book website: <http://highered.mcgraw-hill.com/sites/0073376280/>

Simulation Modeling and Arena book website: www.coursesmart.com/9780470097267/

Arena group on Facebook: Rockwell Arena Simulation

Arena groups on LinkedIn: Arena Simulation

Arena Simulation Professionals

Arena Simulation Healthcare User Community

SMARTS file: C:\Program Files\Rockwell Software\Arena\Smarts

Arena examples: C:\Program Files\Rockwell Software\Arena\Examples

Risk Solver Platform website: www.solver.com

7. Course content

1. Simulation fundamentals.
 - a. Definition
 - b. Applications
 - c. Advantages and limitations
 - d. Simulation project methodology
2. Importance of variability in systems.
 - a. What is variability and where does it come from?
 - b. Eye opener example
3. Monte Carlo Simulation.
 - a. Monte Carlo Simulation before the invention of computers
 - b. Business examples and exercises adapted to the audience
4. Decision making under uncertainty.
 - a. Supply Chain design example
5. Introduction to Discrete Event Simulation.
 - a. Event calendar and implications
 - b. Common statistic distributions
 - c. Familiarisation with Arena
 - d. Build your first simulation model