

Simulation (MN514/SC514)

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Components of the course:

- 1) Monte Carlo Simulation: How to model and analyze scenarios that involve uncertainty/randomness
- 2) Discrete Event Simulation/principles and a simulation language (ARENA)
- 3) Manufacturing planning and operational decisions (Focus on OEM/EMS (XXX) industry)
- 4) Simulation as a decision support tool: How to model, design experiments, analyze data, and come up with decision recommendations

Course objective:

- To go over some of the decision processes in planning and operation of manufacturing systems
- To describe how simulation can be used as a decision support system in planning and operation of manufacturing systems
- To introduce how to develop models for analyzing real-world production planning and operations decisions
- To discuss what are the “best” ways to design and perform simulation experiments
- To introduce how data from simulation should be interpreted to help make sound decisions (statistical data analysis)
- To introduce principles of discrete event simulation and a simulation language (ARENA)
- To introduce principles of Monte Carlo simulation

Text: *Simulation with Arena, (latest edition)* W. D. Kelton, R. P. Sadowski, D. A. Sadowski, McGraw-Hill, 200X

Simulation language : We will introduce a simulation language, ARENA. In the beginning of the course we will use EXCEL for some examples.

Complementary Texts:

1. *Simulation Modeling and Analysis*, by A. Law & D. Kelton, Mc Graw Hill , 3rd ed., 1999.
2. *Simulation*, Sheldon Ross, Academic Press, 3rd ed., 2002.