

I discuss the recommended content of a first university course on discrete-event simulation at the senior/graduate level. Based on 17 years of teaching in the university and presenting more than 550 simulation short courses to 8000 people (college graduates), I strongly recommend that a university course on simulation focus primarily on simulation methodology (model validation, selecting simulation input probability distributions, and design and analysis of simulation experiments, etc.) rather than on how to use a particular simulation package. The instructor should, however, spend approximately three weeks teaching the fundamentals of a particular simulation package, so that student can build some modest-sized models.

I have seen numerous students in my simulation short courses (whose university course on simulation was primarily on a simulation package) who didn't understand the basic principles of how a simulation model works (event list, advancement of the simulation clock, etc.) or simulation methodology. The implication of this is that when a student graduates he/she is not prepared to actually carry out a real simulation study in the workplace. Furthermore, there is a good chance that the simulation package that they learn in school won't even be the one that is used at their company. It is relatively easy to learn how to use a simulation package on the job (all simulation-software vendors offer training courses on the use of their software), but it is much more difficult to learn what actually constitutes a successful simulation study.

The following is a recommended outline for a university course on simulation using the textbook *Simulation Modeling and Analysis* (Sixth Edition) by Averill M. Law. There should be a second (or reference) book on how to use a selected simulation package.

Topic	Chapter	Minimum Reading Assignment
Basic simulation modeling	1	Pages 1-39 (up to Section 1.4.7), Sections 1.5, 1.6, and 1.7, Appendices 1A and 1B
Review of basic probability and statistics (if appropriate for the students)	4	Pages 121-137 (up to 2nd full paragraph), Sections 4.5, 4.6, and 4.7
Modeling and analysis of more complex simulation models	2	Sections 2.1 and 2.2, Appendix 2A
Simulation software	3	Pages 89-100 (up to Section 3.5)
How to use a selected simulation package (approximately 3 weeks)	Secondary book on a simulation package	Two modeling assignments

Model validation	5	Pages 152-173 (up to Section 5.6), Section 5.7, Appendix 5A
Selecting input probability distributions	6	Pages 188-194 (up to Section 6.2.2), Section 6.2.2 (discuss the uniform, exponential, gamma, Weibull, normal, lognormal, and triangular distributions at a minimum), Section 6.2.3 (discuss the Bernoulli, discrete uniform, binomial, geometric, and Poisson distributions at a minimum), Section 6.2.4, Section 6.3 (correlation plot and scatter diagram), Section 6.4 (summary statistics, histograms, box plots, Examples 6.4 and 6.5), Section 6.5 (through Example 6.7), Section 6.6.1 (density histogram plots, frequency comparisons, distribution-function-differences plots, Examples 6.9 - 6.12), Section 6.6.2 (through Example 6.16), Section 6.7 (Student Version of ExpertFit is available at www.mhprofessional.com/Law-SMA6e), Section 6.11 (triangular distribution), Section 6.12 (Poisson process, nonstationary Poisson process)
Random-number generators	7	Sections 7.1 and 7.2, discussion of Mersenne Twister on pages 309-310
Generating random variates	8	Pages 326-329 (through Example 8.1), Section 8.3 (through exponential distribution), Section 8.4 (through discrete uniform distribution), Sections 8.6.1 & 8.6.2
Output data analysis for a single	9	Sections 9.1 through 9.3, Sections 9.4.1 (up to "Obtaining a Specified

system		Precision” with this latter topic being optional), 9.4.3, 9.5.1 (parts of interest), 9.5.2, 9.7, and 9.8
Student project (throughout the course)		Students in groups of 2 or 3 model and analyze a local organization, such as a bank, fast-food restaurant, or the student-union cafeteria.

Instructors who plan on adopting the book for use in a course can get an e-book copy by calling your McGraw-Hill sales representative or going to the website www.mheducation.com/highered (enter Simulation Modeling and Analysis, sixth edition). The website for the book is www.mhprofessional.com/Law-SMA6e, where a variety of teaching-support materials may be downloaded.