

# OFFICIAL SYLLABUS

## OR 442 – OPERATIONS RESEARCH – SIMULATION

**Adopted – Fall 2015**

(This syllabus was developed by the School of Engineering.)

### ***Catalog Description***

Design of simulation models using a high level simulation programming language. Applications in production, inventory, queuing, and other models. Prerequisites: Stat 380 or IE 365 or OR 441 with a grade of C or better and knowledge of a programming language.

### ***Textbook***

Simulation with Arena, 5<sup>th</sup> edition, by Kelton, Sadowski, and Swets. ISBN: 978-0073376288 (optional) Discrete-Event System Simulation, by Banks, Carson, Nelson, Nicol. Prentice Hall, 2009. ISBN: 978-0136062127

### ***Course Outline and Topics***

Chapter 1: Introduction to simulation

Chapter 2: Fundamental simulation concepts

Chapter 3: A guided tour through ARENA

Chapter 4: Modeling basic operations and inputs

Chapter 5: Modeling detailed operations

Chapter 6: Statistical analysis of output from terminating simulations

Chapter 7: Intermediate modeling and steady-state statistical analysis

Chapter 8: Entity transfer (optional)

### ***Course Objectives***

The primary objective of this course is to provide industrial engineering students with knowledge and practices on how to use computer simulation methods in solving engineering problems that arise in various systems such as inventory systems, manufacturing and warehouse facilities, hospitals, service industries, computer networks, etc. A high-level simulation software package, ARENA, will be used throughout the semester. Additional topics covered include fitting distributions to data, random number generation, and statistical analysis of simulation output.

Students successfully completing this course will have the ability to:

1. Understand computer simulation (what it is, when to use it, how it works, what types of simulation, etc.)
2. Understand curve fitting and random number generation processes.
3. Model and program simulations using high-level commercial software SIMAN/ARENA for discrete event systems.
4. Interpret simulation data.

**Any instructor should cover all of the material specified, additional sections are optional.**