Below is information about four Industrial Engineering simulation courses taught in recent years:

- **IE 580**: Systems Simulation, offered each Fall semester (usually by Prof. Lee)
- **IE 581**: Simulation Design and Analysis, offered most Spring semesters (usually by Prof. Hunter)
- **IE 680**: Advanced Simulation Design and Analysis, offered occasionally (previously by Prof. Wan)
- **IE 690**: Simulation Optimization, a new course first offered in Fall 2016 (by Prof. Hunter)

**INTRODUCTORY COURSE DESCRIPTIONS & PREREQUISITES**

- **IE 580 and IE 581**
  - Both courses are introductions to simulation of stochastic systems on digital computers; neither assumes the other as a prerequisite or co-requisite. Both courses may be taken for credit.
  - Both courses require the equivalent of the undergraduate IE courses in probability, statistics, and computer programming.
  - **IE 580** is the usual first course for IE students.
    - It emphasizes creating complex models of dynamic discrete-event systems using commercial simulation software. IE 580 helps with motivating the topics of IE 581, but is not a prerequisite.
    - **Most undergraduates taking only one course choose IE 580.** For students planning to take both IE 580 and IE 581, most students prefer to take IE 580 first.
  - **IE 581** is another first course.
    - It emphasizes the view of simulation as a statistical experiment, covering classic ideas about random numbers, random variates, input modeling, output analysis, and variance reduction, as well as methods for next-event simulation of dynamic discrete-event systems. Computer assignments are in MSEexcel and MATLAB. Commercial simulation software, including animation and visualization, is not discussed.
    - IE 581 considers simulation as a way of doing probability analysis by performing statistical experiments, so both probability and statistics are central to the course. Many IE 581 lectures contain Greek letters. A solid understanding of IE 230, IE 330, and IE 336 is sufficient, although many students have a deeper background.
    - IE 581 should be an easy course for any student who has taken IE 580 and has a good background in probability, statistics, and computer programming. Many students in IE 581 begin the semester weak in one of these topics. **If weak in more than one topic, then don't take IE 581.**
    - **IE 581 is not recommended for students who are concurrently enrolled in STAT 511.**

**ADVANCED COURSE DESCRIPTIONS & PREREQUISITES**

- **IE 680** considers the same topics as IE 581, but at an advanced level.
  - Lectures, journal articles, class discussion, presentations, project
  - Usually, IE 580 is not a prerequisite for IE 680.
  - Usually, IE 581 is a prerequisite for IE 680.
- **IE 690** Simulation Optimization is an in-depth course on selected topics in simulation optimization.
  - Intensive reading (journal articles) and writing or presenting will be required for all students, who should be somewhat mature in their ability to read and comprehend technical scholarly writing.
  - Students should have seen MA 341 Introduction to Real Analysis material or taken MA 504.
  - Usually, **IE 581 is a strictly enforced prerequisite for IE 690.** Students seeking an exception to this policy should contact me; usually exceptions are only granted to students who have taken at least the following three courses (or more): STAT 519, STAT 532, and MA 504.