# Spring 2015
# IET4451 Systems Simulation
# Course Syllabus for Traditional, Hybrid, and Online Classes

**Instructor:** Dr. Gregory L. Wiles
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**Office:** M 123
**Phone:** 678-915-7314
**Office hours:** See course website

## How to Contact the Instructor

The best way to reach me between class periods is using the D2L email. This way I will know what class you are in already. I will reply as quickly as possible to questions sent over e-mail. If you wish to meet with me in person, you can drop by my office during office hours. For online students, I am willing to meet with you privately with an ad-hoc Wimba live session or we can arrange an alternative method.

## Email Response Time

I commit to answering all emails within 24 hours from the time you first transmit the email, unless I let you know in advance of travel prohibiting me from doing so (or if I have an emergency). This short response time includes weekends and holidays. Instructions for e-mail format are found in the Start Here module, and are designed to increase efficiency of e-mail communication for all of us. At times I will send a mass email to the class or an announcement. This will be through Vista Email. I do not know your Yahoo or Gmail accounts so do not expect any mass emails to those accounts. CHECK YOUR D2L EMAIL & HORNET EMAIL ACCOUNTS FREQUENTLY!

## Course Description

Students use ARENA, a stochastic event-based PC based graphical simulation program to create virtual equivalents of real world processes. Students create and apply a series of simulation models to statistically analyze discrete and continuous systems in the areas of manufacturing, banking, retail, transportation, and others. Techniques such as sequencing, separation, batching, entity transfer, data collection, animation, process analysis, and process optimization is used to improve efficiency and effectiveness.

## Required References

*Simulation with Arena* (4e) by W. David Kelton, Randall P. Sadowski, David T. Sturrock, McGraw-Hill (2007) ISBN: 978-0-07-352341-5 Note: Arena software is required for this course and can be downloaded free from website (see below).

## Course Learning Outcomes

Upon successful completion, the student should be able to:

1. Apply probability and statistics concepts to perform input data analysis, random variable generation, and output data analysis in simulation models.
2. Model complex, real life industrial systems using computer simulation methods.
3. Build simulation models using advanced simulation software.
4. Appreciate the role that simulation models play as a decision support tool.
5. Communicate simulation results through written reports and verbal presentations.

## Course Prerequisites

IET4405 Operations Research-Concepts, Models, & Methods

## Desire2Learn (D2L) Course Web Site

This course has a D2L course web site for use by registered students. Any class handouts, slides, grades, announcements, and links will be available there, so please get in the habit of checking it often. To log in, go to: http://spsu.view.usg.edu. Your User ID is the same as your email prefix, and initial password is your email password. There are help links on the website or go to: http://spsu.edu/d2l/student/

## Course Schedule

This course will meet on the dates indicated on the Course Schedule as posted on the course homepage. For hybrid students, we will meet once a week physically in a classroom and the remainder of the week you are responsible for viewing video lectures and attempting suggested homework problems. For online students we will also meet once a week but virtually using a link to Blackboard Collaborate (transitioning from Wimba Classroom) located on the course home page. The remainder of the week you are responsible for viewing video lectures and any suggested homework problems.

## Attendance

1. All students are expected to attend all class sessions beginning with the first class session and continuing all the way through Final Exam Week.
2. Students who miss class for any reason are not exempt from the material covered during the class the student misses.
3. The instructor is not responsible for assisting students catch up on class material when the student is absent from class.
4. Your attendance will not directly impact your grade in this course unless you are absent for a Exam or if you fail to complete an Assignment on time.
5. It should be noted that students who attend class on a regular basis normally perform better on the Assignments and on Exams.
6. However, simply being present in class does not guarantee that the student will receive a high grade or a passing grade in this course.

## Course Deliverables

**Lab Reports (8)**

Labs will be written up as described below and can be handed in at the end of the next lab period (see Course Schedule for dates). <u>There are 8 labs but not all of them require a written report.</u> These labs will be typed in MS Word except for hand calculations and any computer printouts. Points will be subtracted for sloppy work as well as grammatical errors and spelling (refer to the grading rubric on the home page). All labs should have the following key parts/sections (Use Times New Roman size 12 double spaced):

1. **Cover Sheet -** The lab cover sheet will specify lab number, lab topic, and lab members' names (if lab members did not participate, *<u>leave their names off</u>*).
2. **Executive Summary (← use as title of section) -** This section should give the reader a basic understanding of the work done including purpose, statement of problem and major results. Its purpose is to give the reader an overview of your work and major results only and <u>should be complete enough to stand on its own</u> assuming the reader will not have time to read the complete report (Maximum of 1 page).
3. **Work Description (← use as title of section) -** This section should include what the assignment entailed and your approach. It should include quantitative results and should answer all specific questions asked. Your analysis and future improvements beyond the

immediate questions should be included here. Innovative thought beyond the average investigation and conclusions will improve your grade (Maximum of 3 pages).

**4. Attachments (← use as title of section) -** This section contains any necessary computer generated outputs from ARENA (this is optional since I will have your model to review). And any graphs and charts should also be in this section.

- When writing your lab reports, please make sure it can stand alone. In other words do not refer to the lab handout assignment like "the class assignment told me to measure the cost of the entity…." Or the professor said to do this…". Just state the requirement and how you came to your conclusions.

- *Take note: You will be treating each written lab report as a professional report as if you were presenting it to the owner of a company you have just "consulted" with. So show professionalism with no spelling errors.*

- Please label your *.doe file with your Team # - Lab # in the title (i.e. Team6-Lab4.doe). You may submit both the lab assignment document and the *.doe file through the D2L Dropbox feature. Missed labs will be accepted up to one week late with a 20 point deduction. Labs over one week late will receive a zero.

- *Helpful Hint:* Bring a thumb-drive with you to save your model and other output files. Sometimes trying to save to your network drive tends to fail.

**Exams (2)**

There will be two exams in this class covering the material you have learned. This is an **individual** effort with no help from anyone else. You can have access to all your lab reports, lab models, example models, and textbook to complete the exam. You are not allowed to IM each other or reuse any past exam models on your exam. You will be required to construct your own model during the time allotted with no help from anyone.

**Final Term Project (1)**

There will be a Final Term Project due at the end of the course. You will work with your same lab partners to complete. You will be required to find a **real work situation** in which to model, write up a report, and present in front of the class on the last day. **Please post your proposed real work situation to the Discussion Board before you begin work.** Many teams use their own workplace where there is a potential problem. Just be sure you get internal permission to proceed. Some proposed simulation solutions have actually been accepted and implemented by their companies.

## Grading Policy

| Component | Weight |
|---|---|
| Lab 1 | 6% |
| Lab 2 | 6% |
| Lab 3 | 6% |
| Lab 4 | 6% |
| Lab 5 | 6% |

| | |
|---|---|
| Lab 6 | 6% |
| Lab 7 | 6% |
| Lab 8 | 6% |
| Exam #1 | 16% |
| Exam #2 | 16% |
| Final Term Project | 20% |
| Total | 100% |

There is no extra credit offered for this course and no final exam.

**Calculators & Software**

You are welcome to use ARENA already installed on the computers in the M131 lab or you can bring in your personal laptop with ARENA loaded. If you are taking this course online you will need to download the free edition of Arena from Rockwell Automation website (http://www.arenasimulation.com/) or go to the D2L course homepage for a downloadable copy. For other work you may need access to a calculator or perhaps Excel (also available in the lab).

**Disruptive Behavior**

From the SPSU Catalog: "A faculty member reserves the right to remove any student from his or her course if the student's behavior is of a disruptive nature or if there is evidence of academic dishonesty." Disruptive behavior is any student behavior that the instructor believes is of a disruptive nature.

**Academic Dishonesty**

All of the following are examples of cheating:

1. To have another person take an essay for you or complete an assignment for you instead of doing the work yourself.
2. To copy the answers from another person and then submit those answers as your own.
3. To submit the work done by someone else as if you did that work yourself.
4. To copy/submit a lab model from someone outside your assigned group members.

All of the following are examples of plagiarism**:**

1. To copy the work done by another person and then submit that work as if you did it yourself.
2. To pass off as one's own the works or ideas of another person without giving proper credit to the other person.
3. To rephrase or reword or rearrange the work of another person without giving credit to the other person for the work that person did.

**Penalty**: Any type of Disruptive Behavior or Academic Dishonesty by a student may result in the student being expelled from the course and the student receiving a grade of "F" in the course. This grade of "F" will appear on the student's official SPSU transcript. If the student has a repeated history of either Disruptive Behavior or Academic Dishonesty at SPSU then the student may also be expelled from the University.

**Disability Statement**

"A student at Southern Polytechnic State University who has a disabling condition and needs academic accommodations has a responsibility to voluntarily identify him/herself as having a disability by scheduling an appointment with the Disability Services Coordinator as soon as

possible." (SPSU Catalog). Contact the Coordinator as follows: Kalisha Thomas, 678-915-7244, Building J, Room 253, kthomas2@spsu.edu.

**Professional Behavior**

All students are expected to abide by the professional ethical behavior standards published in the SPSU catalog. Also students are expected to do their own work on exams. If you have teammates working with you on labs or the final project not pulling their weight, let me know.