**Assignment**

**Queuing**

**ISM-6436 Operations & Supply Chain Processes**

From our textbook\* execute problems 10 and 12 on p. 254 and problem 14 on p. 255. Use the queuing spreadsheet provided to answer all portions of each question.

From our textbook\* review the scenario presented in problem 19 on p. 256. Using the average arrival and service time data provided construct your own multi-server queuing simulation spreadsheet as demonstrated in the lecture video using Decision Tools @Risk. Test your simulated boarder inspection circumstance for the 1-server scenario presented, then expand to 2- and 3-server scenarios. For simulation output gather information on the average waiting time for a vehicle waiting in the queue for inspection, (i.e., do not include non-waiting vehicles in your average waiting time calculations). Design your simulation to collect this information with a sample of at least 300 customers.

Run your simulation for 500 iterations for each scenario. Show @Risk output graphs for each of these cases and compare the impact on vehicle waiting time between the three scenarios.

**Instructions:** Your deliverable will be a single functioning Excel spreadsheet with each problem on a separate worksheet page. The first three problems do not require simulations. For these you will use the templates provided in the file “6436 Queue Statistics Spreadsheet.xlsx”. The fourth problem requires simulation models be built enabled with @Risk functions. The deliverable will be a single spreadsheet file with separate worksheet tabs for the various problems. The file will be uploaded to Canvas by the assignment deadline stated on the Lesson Plan. Include a cover page for your file which lists your name and the names of any other group members deserving credit for this work. Group sizes may be no larger than 3, and only one group member need submit the final deliverable.

**Note:** When saving your spreadsheet file select the “No” option to the question “Do you want to save @Risk simulation results and graphs?” This will make your spreadsheet file much smaller and easier to manage.

\*Jacobs, F. Robert and Richard B. Chase, Operations and Supply Chain Management, 14th ed., McGraw-Hill Irwin, 2014.