



# Thesis Projects (MIE498 H/Y) 2018–2019

## Title/Topic:

Development of a Stochastic Dynamic Model for a Make-to-Order Production System

## Description:

The problem is described as follows. A limited number of expensive, high quality parts is required in a given time period with a strict deadline. No rework of a nonconforming part is possible. To meet the demand, and to avoid the penalty, batch production is considered. Batch sizes as well as the maximum number of batches which can be produced are limited. Examples include make-to-order military and aerospace industry contracts as well as just-in-time manufacturing orders. The problem will be formulated and solved using stochastic dynamic programming. The optimal production policy will be found and a numerical analysis will be performed to get insight into the structure of the optimal policy.

The project is suitable for one or several Industrial Engineering or Engineering Science students (UG thesis group project) who performed well in Probability, Statistics, OR and Production courses. Computer programming will be required to find the optimal number of batches and batch sizes for each production run and to perform sensitivity analysis.

**Note:** *In addition to the listed topic, topics in the areas of process/quality control and improvement, maintenance, reliability, production and inventory control, including theoretical problems in the stochastic OR area or engineering statistics for students considering graduate studies are possible. Interested students should contact Prof. Makis.*