



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

**Title/Topic:**

Optimal scheduling of repairs for several production facilities considering a single repair crew

**Description:**

The following problem will be considered. There are several production facilities at different locations and a single repair crew located at a repair depot. When the first failure occurs, the repair crew is sent to that facility to fix the problem. When the repair is completed, the repair requests from other facilities are updated and it is necessary to decide to which facility the repair crew should be sent. If there are no failures upon a repair completion, the repair crew travels back to the repair depot awaiting further requests. It is assumed that the times to failure as well as the repair times are random variables with given distributions. The costs include the travel costs (dependent on the distance travelled), repair costs (both fixed costs and cost rates per unit time), and the facility downtime costs due to lost production. The objective is to find the optimal repair schedule minimizing the total expected cost over a planning horizon.

The project is suitable for one or several Industrial Engineering or Engineering Science students (UG thesis group project) who performed well in Probability, Statistics and OR 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.*