Continental Technical Competition 2019

Production Flow Optimization

Rules and regulation booklet

1. GENERAL ASPECTS

a. Target group

- The competition is addressed to all active students (including master programs) from technical faculties (Students in Economics Engineering, Mechanics, Transport, TCM, Quality, Mechatronics, etc.)

b. Competition team

- Formed by min 3 – max 4 students regardless the technical area of expertise

c. Competition description

- The teams participate in a car building competition based on Lean and Industry 4.0 principles.
- The Car Factory makes 1 model car and sales have skyrocketed. At this point, the factory is capacity-constrained and can sell every car you can make, given a high level of quality. Cost is a major issue as profit margins are currently too small
- The main objective of this simulation is to optimize the production flow by using specific Lean tools and methods, and Industry 4.0 principles to illustrate main differences between different production concepts.
- The competition will simulate a real model of a production line and the participants have to find the right approach to reach the settled target:
- We will do this through a series of **xx**-minute production runs (representing 1 week of production). The results will be compared through performance data we will collect after each round. Please review the Work Instructions in front of you thoroughly and build one (1) sample sub-assembly.

  Target:

  - Delivery xx- cars/ round
  - Quality: no rework, firm assembly
  - Time: 3 rounds each of xx min
  - Methods: Lean instruments applied and usage of Industry 4.0

Main Optimization Criteria:

- Waste reduction
- Cycle time
- Material flow - Micro logistic
- Line layout
- Visual management
- Workplace and process synchronization
- Production method
- Number of workplaces/ head count
- Technology

- If customer order is not fulfilled within the time given, finished goods to customer are not accepted.
- Make the following quality checks:

  - Use of correct parts.
  - Correct variant.
  - Correct assembly and tight fit of all parts

d. Line concept description/ process flow

- Assembly line structure - 6 (six) stations
  - Wheels assembly;
  - Bumper assembly;
  - Body assembly;
  - Visual inspection
  - Labeling
  - Packing

e. Competition rounds description

- For every pre-round the teams should prepare a presentation within the line concept;

  - **Round 1**
    - Max head counts
    - Any production methods
    - No time restriction (practical max 30 min)
    - Buffers between stations
    - “I” shape line concept

- Produce as many batches as you can. Pay attention to the product quality. A defect assembly may not be corrected but it must be put into the red bin.

- **Round 2**
  - Line balancing: reduced head counts (max 4) and assembly stations (no visual inspection station)
  - Pull production methods
  - Xx- time restriction
  - 5S implementation
  - Kamban/ Supermarket implementation
  - Layout improvement (at will)
  - Quality improvement

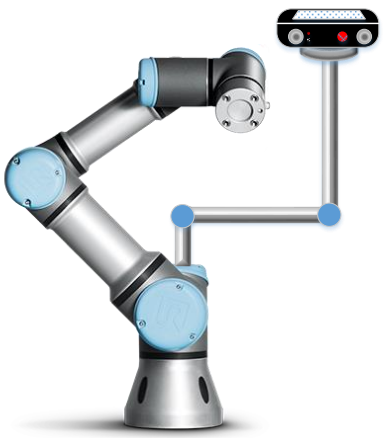
- **Round 3**
  - Line balancing: reduced head counts (max 3)
  - One piece flow production method
  - Xx- time restriction
  - Layout improvement: U-Shape line
  - Integration of CoBot and AGV

2. TECHNICAL Requisites (given by Continental)

a. Car assembly Kit

b. Assembly Line (tables , boxes, etc)

c. Co-Bot



d. AGV (automated guided vehicles)

Note:

- The robot/vehicle will be already programed and will be able to drive independently (no external intervention during the official attempt) on a designated area.

3. CONTEST RULES

- Each round is supervised by a referee;
- Each round is timed and it has specific rules defined;
- Number of produced cars will be counted;
- Each team will gain points according to a defined metric;
- Quality inspection is done by the customer;
- Parts shall follow the described process flow;
- Team are not allowed to communicate during the competition;
- Adjustments are only allowed between rounds.

Parts Handling:

- Parts shall be handled only on the workings station;
- Parts cannot be handled outside the working area;
- Dropped parts are considered scraps;
- Parts cannot be handled “in the air” they always have to touch the table;
- Warehouse position is fixed; one row material at a time should be supplied to the assembly line (e.g. 4 wheels at a time are allowed)

a. Preparation time

- 1 day before the contest, each team will be granted a preparation time

b. Competition

- The team with the **HIGHEST** number of points over all 3 rounds will WIN the competition

c. Appeals

- The appeals can be submitted to the organizers only when all the participants finished all the rounds

To discourage foul play, we reserve the right to add, remove or modify topics related to the Rules & Regulations also during the contest. It may happen that certain topics are not explicitly covered by the rules and regulations as they are now explained. Certain clarifications, questions, topics or restrictions may not be present in the rules and therefore they can be added during the contest or when the Contest Administrators see it fit and necessary.

4. Contact

If you have any questions feel free to contact us via e-mail on the following address:
technical-competition@continental-corporation.com

*all replies will be distributed to all participant teams