Faculty of Engineering and the Built Environment
Department of Industrial Engineering
Building a Jica truck and playing a game of checkers
Competition Day – 4 August 2017

1. Introduction to Jica truck challenge

Students are expected to compete as schools in the contest of assembling a Jica truck where the best time record will go to the round robin game of checkers to determine the individual winner of the major prize from the school that thrived.

2. Assignment

Students are expected to receive material as specified in the bill of materials and assemble a Jica truck in time that beat all other participants so they will be able to progress to the next stage of the competition.

Bill of materials for Jica truck

Part no.	Part name	Quantity
1.	Wheels	4
2.	Base plate	1
3.	Seat	1
4.	Bumpers	2
5.	Door panels	2
6.	Side cab panels	2
7.	Dashboard	1
8.	Top (sealing)	1
9.	Exhaust	1
10.	Side V brackets	4

The objective of the task is to complete effectively the assembly of the truck before other groups, eliminating opponents in the competition.

3. Time:

In the lab, the time it takes for a group of three students to put together a Jica truck with practice and work structuring is currently five minutes.

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4. Evaluation:

Quality checks will be performed on the assembled truck to check if it has been well assembled, or loosely assembled to cut down on production time.

5. Introduction to playing checkers

This game is called checkers; it is played by two players. Each player begins the game with 12 pieces or checkers (Typically, one set of pieces is black and the other red), placed in the three rows closest to him or her. Basic movement is to move a checker one space diagonally forward. Called draughts in most countries, checkers has been traced back to the 1300s; though it may indeed, stretch further into history than that. Dubbed the game of kings, each student participating will require thinking deeply about each move they make if they intend to win the prize at the end of the competition.

6. Assignment

Students need to be very innovative in this classic versus game that requires intelligence, strategy and good problem solving skills. The board consists of 64 squares, alternating between 32 dark and 32 light squares. It is positioned so that each player has a light square on the right side corner closest to him or her. Each player places his or her pieces on the 12 dark squares closest to him or her. Each school is only allowed one participant so the schools can host a pre-selection tournament to decide their representative to participate in the knockout tournament where only the best strategic thinker will be rewarded with a price.

7. Material required

Game can be played on either one of two platforms, namely a computer or a classic chess/checkers board.

Bill of materials for checkers game/tournament with a computer

Part no.	Part name	Quantity
	Keyboard	4
	Monitor	4
	Mouse	4
	Desktop PC tower	4
	Tables	4
	Power supply (extensions)	4 (if multi-plugging is not available)
	Chairs	8

The objective of the game is to capture all of your opponent's checkers or position your pieces so that your opponent has no available moves.

8. Learning objectives

- JIT solutions
- Line balancing
- Continuous improvement
- Material management and handling
- Forecasting
- Decision making
- K.I.S.S principle

9. Procedure

I. Each player places his or her pieces on the 12 dark squares closest to him or her.

II. Black moves first. Players then alternate moves.

III. Moves are allowed only on the dark squares, so pieces always move diagonally.

IV. Single pieces are always limited to forward moves (toward the opponent).

V. A piece making a non-capturing move (not involving a jump) may move only one square.

VI. A piece making a capturing move (a jump) leaps over one of the opponent's pieces, landing

in a straight diagonal line on the other side.

VII. Only one piece may be captured in a single jump; however, multiple jumps are allowed on a single turn.

VIII. When a piece is captured, it is removed from the board.

IX. If a player is able to make a capture, there is no option -- the jump must be made.

X. If more than one capture is available, the player is free to choose whichever he or she prefers.

XI. When a piece reaches the furthest row from the player who controls that piece; it is crowned and becomes a king.

XII. One of the pieces which had been captured is placed on top of the king so that it is twice as high as a single piece.

XIII. Kings are limited to moving diagonally, but may move both forward and backward. (Remember that single pieces, i.e. non-kings, are always limited to forward moves).

XIV. Kings may combine jumps in several directions -- forward and backward -- on the same turn.

XV. Single pieces may shift direction diagonally during a multiple capture turn, but must always jump forward (toward the opponent).

XVI. A player wins the game when the opponent cannot make a move.

XVII. In most cases, this is because all of the opponent's pieces have been captured, but it could also be because all of his pieces are blocked in.

10. Suggested platform of preparation for event

Students can download an android app of checkers for the preliminary practice (school candidate selection tournament) so that when the event finally comes they are able to strategise ways to be the one outstanding individual to be selected, further emphasising certain principles of Industrial Engineering in Industrial leadership.

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11. Time

Each round of games played will take two minutes per match between two players.

12. Evaluation

I. A player wins the game when the opponent cannot make a move.
II. Winners proceed to the next level.
III. Only three participants are given the group elimination round, which determines the school that will participate in the prize giving and only one participant receives the main prize.

Suggested prize

Big surprise

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THESE ARE THE BASIC REQUIREMENTS FOR THE GAMES, OTHER ACTIVITIES OF THE GAME WILL BE INCLUDED LATER (COMPETITION DAY)

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