



FLL Indonesia Category

Rules & Scoring System



This document explains the rules and valid scoring system for *FIRST*[®] LEGO[®] League (FLL) Indonesia Category in Indonesian Robotic Olympiad 2016 (IRO2016). FLL Indonesia category is divided into 3 age groups: Elementary, Junior High, dan Senior High.

1. Participants, Materials, and Software

Participants

FIRST[®] LEGO[®] League (FLL) Indonesia is open for participants from:

- Elementary | (date of birth falls after 1 Januari 2004),
- Junior High | (date of birth falls on 1 Januari 2000 – 31 Desember 2003),
- Senior High | (date of birth falls on 1 Januari 1998 – 31 Desember 2000).

Each team consist of:

- 1 coach.
- 1-3 participants.

Materials

Anything LEGO[®]. All Equipment must be made entirely of LEGO-manufactured building elements in original factory condition (Except LEGO string and tubing may be cut to length).

- Component ownership label (if needed) may be put in hidden location
- Storage (such as cartoon, bucket, plastic bag, tool box, basket, etc) may be used only to store and carry equipment.
- It is not allowed to use paint, tape, lubricant, cable tie, etc.
- Controllers
 - You are allowed only one individual controller in any particular Match. The controller used are LEGO[®] Mindstorms[™] Education RCX, NXT or EV3. The controllers used are genuine Education Version. The committee will check the warranty seal indicating the set used is indeed Education Set. Checking will be done prior to the competition and during track trial the day before. Participants may use non-Education sets with a penalty cost of Rp. 500.000,- per controller.



- Battery
 - You are allowed up to four individual motors in any particular Match.
 - Battery used are NXT rechargeable battery or EV3 rechargeable battery. You may also use 6x AA Battery (Energizer brand only)
 - Changing battery during a match is allowed, but the time will not be paused.
- Sensor
 - The number of sensors used is not limited by the rules, but limited by the available port of the controller.
 - All LEGO sensor type may be used.
 - HiTechnic sensor are not allowed











Image	Name of sensor	Image	Name of sensor
	EV3 color sensor		NXT light sensor
	EV3 angle / gyro sensor		NXT touch sensor
	EV3 touch sensor		RCX light sensor
	EV3 ultrasonic sensor		RCX rotation sensor
	NXT color sensor		RCX touch sensor

Table 1: Eligible Sensors in FLL Indonesia

- Motor
 - Number of motors that may be brought or used is 4 (Four).
 - Only LEGO® Mindstorms™ motor is allowed.


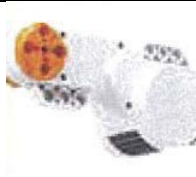


Motor image	Motor Name	Motor image	Motor Name
	EV3 large motor		NXT large motor
	EV3 medium motor		RCX mini motor

Table 2: Eligible motor in FLL Indonesia

- Cable
 - Only LEGO® cable WITHOUT any modification may be used.
 - LEGO® converter cable may be used.
- Software
 - Eligible Software are LEGO MINDSTORMS RCX, NXT, EV3 or RoboLab (any Education version).

2. Rules

Pre-Match Preparation

After getting to the Field, you have at least one minute to prepare. During this time only, you may...

- Ask the Ref to confirm that a Model or setup is correct.
- Calibrate light/color sensors on the Field outside Safety.

Hands Off

If something on the Field is not completely in Safety, you are not allowed to touch it except as specifically described in a Mission or Rule.

Workspace and Storage

- ON THE FIELD: Handling and storage of allowable things may extend out of Safety, into adjacent irrelevant Field space only if specific actions and locations are completely non-strategic.
- OFF THE FIELD: Equipment and Models are not allowed on the floor.

Launching

A proper Launch (or re-Launch) goes like this:

- Ready Situation
 - Your Robot and everything related to its next Autonomous period are arranged as desired and all completely contained within and under the limits of BASE.
 - The Ref can see that nothing in Base is moving, and that you're not touching anything.
- Robot activation method during launch:
 - The exact time to Launch is the beginning of the last word/sound in the countdown, such as "Ready, set, GO!"
- Robot activation method during re-launch:
 - Active: Reach with one hand and touch a button or signal a sensor to prompt a program.
 - Passive: Do nothing and allow a running program to resume.
- The properly Launched/re-Launched Robot is Autonomous until you Interrupt it.
- Every change completely outside Safety caused by the Robot stays that way.
- You are not allowed to cause anything to leave or even extend out of Base except by Launching/re-Launching.
- If you accidentally propel something out of Base, that's okay to recover immediately without disturbing the Field.

Interrupting

If you INTERRUPT the Robot, you must stop it immediately, then *calmly pick it up for a re-Launch *if there will be one. Here's what happens to the Robot and any Model it was transporting, depending on where each was at the time...

- Robot – Completely in Safety?
 - YES: Re-launch
 - NO: Re-Launch + Interruption Penalty.
- Model – Completely in Safety
 - YES: Keep it.
 - NO: Was it with the Robot during the most recent Launch?
 - YES: Keep it.
 - NO: Give it to the ref (out of play)

Stranding

If the UNINTERRUPTED Robot loses contact with something it was transporting, that thing must be allowed to come to rest. Once it does, here's what happens, depending on its rest location...

- Equipment
 - Completely in Safety: Keep it.
 - Partly in Safety: Take it completely into Safety + keep it + Junk Penalty (immediately logged on Ref's Sheet).
 - Completely outside Safety: Leave it as is.
- Model

- Completely in Safety: Keep it.
- Partly in Safety: Give it to the Ref (out of play). Exception to the bars, if any bar stop party in safety, you have to keep it as soon as it happens.
- Completely outside Safety: Leave it as is.

You may hand-recover unintended fragments from a truly broken Robot any time, with no Penalty.

Field Damage

If the Autonomous Robot separates Dual Lock or breaks a Model, Missions obviously made possible or easier by this damage or the action that caused it do not score.

End of Match

As the Match ends, everything must be preserved exactly as-is...

- If your Robot is moving, stop it ASAP and leave it in place.
- After that, hands off everything until after the Ref has given the okay to reset the table.

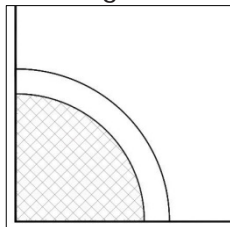
Scoring

- Scoresheet – The Ref recalls action and inspects the Field with you, Mission by Mission...
- If you agree with the Ref on all facts, you sign the sheet, and the score is final.
- If you don't agree, tell the Ref nicely. Refs can be wrong, and when they are, they want to know. If there is any lingering disagreement, the Head Ref makes the final decision.

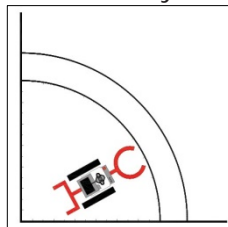
3. Definisi

D01 – Autonomous – A Launched Robot is said to be “Autonomous” – performing with no help

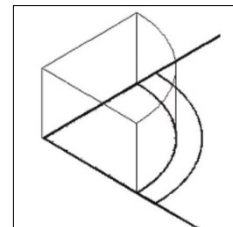
D02 – Base – “Base” is over the Field’s inner quarter-circle. It extends to the inner south and west Border Walls, but no farther, and has an invisible ceiling 12” (30.5cm) high. Base is important during Robot Launches/re-Launches only.



BASE FOOTPRINT



ROBOT “COMPLETELY IN” BASE



HEIGHT MATTERS DURING LAUNCH/RE-LAUNCH

D03 – Equipment – “Equipment” is everything you bring to a Match for Mission-related activity.

D04 – Field – The “Field” is the Robot’s game environment, consisting of LEGO Models on a Mat, surrounded by Border

Walls. The Field is held on a Table. For full details, see Field Setup.

D05 – Interruption – If you interact with an Autonomous Robot, that’s an “Interruption.” No longer Autonomous, the Interrupted Robot is not allowed to move or do anything.

D06 – Match – A match is when a team is running his robot to complete missions in the playing field.

- Matches: Time limit for Elementary is 90 seconds, Junior High is 120 seconds, and for Senior High is 150 seconds.
- Your Robot Launches from Base and tries as many Missions as possible.
- The Field is not reset for the purpose of multiple attempts.
- Re-Launches are allowed during the Match, but the timer doesn’t pause.

D07 – Mission – A “Mission” is one or more objectives worth points.

- Some must be visible at the END of the Match.
- Some must be performed in a particular way, and must be watched by the Ref AS THEY HAPPEN.

D08 - Model – A “Model” (often called a “Mission Model”) is any LEGO structure already at the Field when you arrive to compete. You don’t bring Models to the competition Field – they’re already there when you arrive

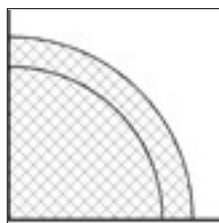
- You are not allowed to take Models apart, even temporarily.
- If you combine a Model with something, the combination must be loose enough that if asked to do so, you could pick the Model up and nothing else would come with it.

D09 – Penalties – A “Penalty” is a deduction from your final score due to a specific action that is allowed but discouraged. Penalty values are found in the Missions. There are two types of Penalty:

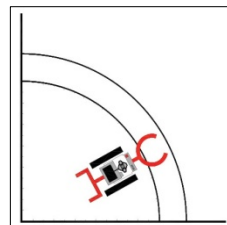
- Interruption Penalty – Caused by you Interrupting the Robot while it’s not completely in Safety.
- Junk Penalty – Caused...
 - immediately – by each piece of equipment the Robot strands partly in Safety.
 - At the end of the Match – by each piece of equipment still stranded completely outside Safety.

D10 – Robot – A “Robot” is a LEGO MINDSTORMS controller and all Equipment currently combined with it.

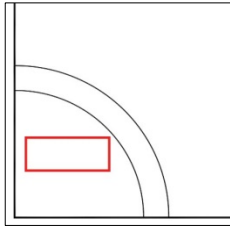
D11 – Safety – “Safety” contains Base, extends to the outer black arc, and has no ceiling.



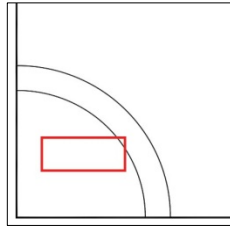
SAFETY FOOTPRINT



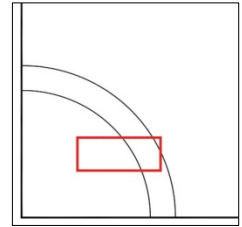
ROBOT “COMPLETELY IN” SAFETY



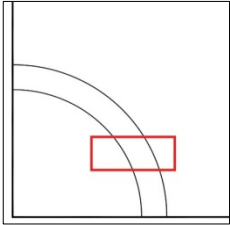
COMPLETELY IN BASE
COMPLETELY IN SAFETY



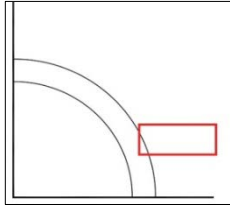
NOT COMPLETELY IN BASE
COMPLETELY IN SAFETY



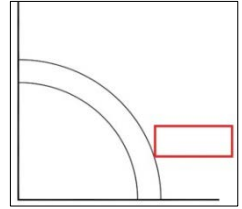
PARTLY IN SAFETY



PARTLY IN SAFETY



PARTLY IN SAFETY



COMPLETELY OUTSIDE
SAFETY