

# ROBAFIS™ COMPETITION

## Examination rules

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<b>Edition</b>	<b>Evolution</b>	<b>Evolution</b>	<b>Date</b>
VD4	-	Initial version	01.07.2017

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## 1. OVERVIEW ON THE COMPETITION ORGANIZATION

### ART 1 - PURPOSE

The purpose of **ROBAFIS™** is to define, to develop, to realize and to operate a robot according to the requirements of the **ROBAFIS™ SPECIFICATION**. Systems Engineering and Project Management approaches supported by a relevant use of methods and tools are to be implemented.

### ART 2 – PARTICIPANTS

This competition is intended to students and members of associations or clubs of Universities in any engineering discipline (systems, electronics, software, mechanics, hydraulics, etc.) from License (L) level up to PhD level (European levels LMD).

### ART 3 – COMPETITION STAGES

The competition consists of different stages: registration, development and realization, free tests, configuration audit, operational validation and project presentation. Each of these stages is detailed in this hereby document “**ROBAFIS™ COMPETITION** – Examination Rules” through the articles 6 up to 11.

### ART 4 – TEAM AND RESPONSIBILITIES

The student applicants constitute a team under the responsibility of a project manager (a student) in charge of the group facilitation and a tutor (teacher), who is the contact point between the team and the **ROBAFIS™** Organizing Committee, in charge of the respect for the competition rules by the team.

The tutor and the project manager duties have to be assumed respectively by the same teacher and the same student from the registration stage up to the final phase of the competition.

The team constitution may change in terms of number and participants during the competition period. Nevertheless, it shall be composed of at least three students including the project manager.

During the final competition stage, three students at least including the project manager shall represent the team. They shall be accompanied by the tutor. These students should have participated to the whole development.

### ART 5 – APPLICATIONS LIMITATIONS

A university can enroll several teams provided that each team has his/her own project manager and his/her own tutor.

A university can register two teams at the most. The applicants will be selected provided that the registrations are done on time. The **ROBAFIS™** Organizing Committee reserves the right to limit the total of applicant teams to ten (validated registrations according to the order of application receptions).

### ART 6 – REGISTRATION STAGE

The teams’ registration has to be performed by an e-mail addressed to [robafis@afis.fr](mailto:robafis@afis.fr), using the appropriate registration form and completely filled up by the three students and their tutor.

The registration period is defined from *the 15<sup>th</sup> to the 30<sup>th</sup> of September 2017*.

All the teams, whether selected or not, will be informed by an e-mail addressed to the project manager and the tutor on *the 1st of October 2017* at the latest.



### **ART 7 - DEVELOPMENT AND REALIZATION PROTOTYPE STAGE**

At the end of the development stage, on *the 11<sup>th</sup> of November 2017* at the latest, each team shall deliver its DDP and, on *the 25<sup>th</sup> of November 2017* at the latest, each team shall deliver its DDC in accordance with the *ROBAFIS Reference Documents*.

As far as the robot prototype is concerned, the participants shall use exclusively the kit provided par AFIS. The kit will be sent on *the 14<sup>th</sup> of October 2017*.

The competition will take place, for the final stage, on *the end of November*.

### **ART 8 - FINAL (PART I) : AUDIT ON CONFIGURATION STAGE**

This operation will be performed in the presence of the project manager and the tutor of the concerned team, under the control of the jury who will check the conformance to the Design Folder and the reference Configuration Folder.

### **ART 9 – FINAL (PART II) : IN SITU TUNING AND VERIFICATION TESTS STAGE**

The team shall check, within 30 minutes, the whole assembling performed during the configuration audit. Then the robot will be considered ready to participate to the tuning tests and the in situ operational validation tests.

Next, each team will have access to the evaluation area during 30 minutes in order to perform freely in situ tuning tests and operational tests. These tests shall be performed without the presence of the public, but may be performed with the presence of the *ROBAFIS™* Organizing Committee members.

During the free tests, the team might modify the product configuration. The possible evolutions done on the robot shall be traced and commented during the project presentation.

At the end of this stage, the robot will be considered ready to participate to the operational validation. Waiting the operational validation the robot is stored in a closed area without permission to access.



### **ART 10 - FINAL (PART III) : OPERATIONAL VALIDATION STAGE**

The purpose of the validation stage is to evaluate on one hand the performances of the robot in operational conditions, and on the other hand the performances of the robot confronted with the other robots.

It is the key stage for the operational evaluation. It takes place as a championship. Each applicant team shall be successively engaged with three other applicant teams. The runs will be drawn.

For this purpose, two identical areas, which are representative of the environment specified in the specification are concurrently realized in order to welcome each team. The confrontation consists in testing the rapidity of the mission execution and the completeness of the functions reached by each robot, while comparing the robots that are put forward by each team.

The robot shall be designed for being able to perform the validation tests as defined in the specification.

### **ART 11 - FINAL (PART IV) : PROJECT PRESENTATION**

The presentation of the project to the jury is based on comments on the operational stage. Each team shall explain the reasons for success to the runs and an analysis of the difficulties or problems found during the evaluation. To do that, each team shall rely on the Development Folder. Each team shall present an overview of the project development that has been performed.

The duration of the presentation is 20 minutes at the most (10 minutes for the talk, 10 minutes for discussion with the jury).



## **2. DESCRIPTIONS OF THE KIT AND OF THE ROBOT PROGRAMMING TOOL**

### **ART 12 – KIT DESCRIPTION**

The robot shall be developed and realized only using the components of the kit that is provided by AFIS. The content of the kit is defined in the **ROBAFIS™** Specification. Neither addition (such as part, materials, sensor, glue, for instance) nor any modification of any component of the kit will be allowed.

Each team shall provide the AA/LR6 type rechargeable batteries which are required for the robot functioning.

### **ART 13 – REQUIRED BASIC SOFTWARE CONFIGURATION**

Each team shall have a laptop, with a compatible OS, an USB port and a Bluetooth connection, so that to be able to develop and upload the embedded software in the robot NXT module.

## **3. RESULTS - AWARDS**

The results will be communicated at the end of the competition, in the presence of representatives of Industrial and Education & Research communities from AFIS. An assessment and a brief presentation of the preliminary conclusions on educational scope of this competition will be done along with the results.

The overall result of the competition will be evaluated according to the following rule:

- 40 % is dedicated to the score that evaluates the quality of the Development Folder.
- 10 % is dedicated to the score that evaluates the configuration audit (final Part I stage).
- 40 % is dedicated to the score that evaluates the operational validation (final Part III stage).
- 10 % is dedicated to the score that evaluates the project presentation (final Part IV stage).

Rewards will be distributed to the teams who have participated to the complete competition.