9TH INTERNATIONAL Abilympics BORDEAUX 2016

V33 CAD Industrial Design

Module 1

- **Measurements**
- **Modeling**
- **Assembly**
- **Animation**
- **Layout drawing**

Duration: 3 hours

- ***All personal documentation is subject to the jury's verification.***
- ***Contestants will not leave their work station without the authorization of a member of the jury.***
- ***Only prints bearing the contestant's name will be handed to him/her during the competition.***

NOTA: Every production must be conform to all ISO norms relating to technical drawing in mechanical construction.
The metric system will be used as reference.

Module 1:

Documents and equipment provided to each contestant:

- Presentation
- Text of the assignment
- Parts of the mechanism
- Evaluation criteria

- One **EP1**-**CAO-DAO-2016** computer file containing:
  - The files of the parts or assemblies forming the system.

- One tangible part: the mechanism's body.

Documents to hand over to the jury at the end of the competition:

Paper documents:

- Layout drawing of the assembly: Assembled_mechanism-XXXX

1A - **Measurements – Scaled sketch** (Duration: 20 minutes)

Objective: Freehand scaled sketch of a part.

Using the tangible part ("BODY") extracted from the mechanism and the usual measuring instruments (sliding caliper, ruler…)

- **Freehand sketching** of a scaled part on paper.

  - Measurement precision: 5/10th of a millimeter if measurable.
  - Free choice of views.
  - Complete scaling.
  - Functionality of the parts is left to each contestant's own interpretation.

Caution:

- **The part will be withdrawn by the jury at the end of this first step.**
- **The use of the modeling software will be authorized after 20 minutes.**

1B - **Modeling** (Duration 20 min)

Objective: Modeling a component using a CAD software.

Using the previously drawn sketch,

- **MODELING** the "BODY" part.
- **ASSIGN** a material to the part: EN-AW2017.
- **DISPLAY** the part's mass.
- **PRESENT** the results to the jury.

  - Save: "Part" file type.
  - Filename: Body-XXXX (XXXX = contestant number)

1C - **Assembly** (Duration 70 min)

Objective: Creating the digital model of the mechanism.

Using the model previously created and the pre-modeled parts provided with the annex:

- **COMPLETE** the assembly of the mechanism in an "extreme minimum" position.
- **COMPLETE** a longitudinal cross-section showing the inside of the actuator.
- **CREATE** a print screen and hand it to the jury.
  - Save: "assembly" file type.
  - Filename: Assembled_mechanism-XXXX (XXXX = contestant number)

1D - **Animation** (Duration 10 min)

Objective: Display the system in an operating state

Using the previously created digital model,

- **SET UP** a command showing how the mechanism functions between its extreme minimum and extreme maximum positions.

- **SAVE** the animation: "Animation" file type
  - Filename: Assembled_mechanism-XXXX (XXXX=contestant number)

- **PRESENT** the results to the jury.

1E – **Layout drawing** (Duration 60 min)

Objective: Completing the assembly drawing and its nomenclature

Using the digital model,

- **COMPLETE** on A2 format the layout drawing of the system, including:

  - A choice of views, cuts, sections and other views displaying a complete view of the system.
  - An identification of the parts.
  - A nomenclature.
  - An indication of the mechanism's maximum travel.
  - A title block containing at least the following information:
    - Name of the system
    - Scale
    - Projection symbol
    - Name of the contestant
  - Save: "drawing" type file.
  - Filename: Assembled_mechanism-XXXX (XXXX = contestant number)

NOTA:

- **The gear motor will not be included in the sections.**

- **PRINT** the layout drawing.

Evaluation criteria

Criteria		Sub-criteria	Scoring scale
1A	**Measurements**		Not evaluated
1B	**Modeling**	Completion	8
		Mass	2
1C	**Assembly**	Completion	20
1D	**Animation**	Conformity	4
		Quality	1
1E	**Layout drawing**	Completion	13
		Presentation	2
		TOTAL	**50**

Module 2

- **Modification of the mode of production**
- **Layout drawing**
- **Scaling**
- **Exploded view**
- **Realistic rendering**
- **Integration into a brochure**

Duration: 3 hours

- ***All personal documentation is subject to the jury's verification.***
- ***Contestants will not leave their work station without the authorization of a member of the jury.***
- ***Only prints bearing the contestant's name will be handed to him/her during the competition.***

NOTA: Every production must be conform to all ISO norms relating to technical drawing in mechanical construction.
The metric system will be used as reference.

Module 2

Documents and equipment provided to each contestant:

- One file composed of paper documents:

  - Modification of the mode of production
  - Layout drawing
  - Scaling
  - Exploded view
  - Realistic rendering
  - Integration into a composition
  - Evaluation criteria

- An **EP2-CAO-DAO-2016** computer file containing:
  - The **"Assembled system"** file in assembly mode, as well as the subassembly files and part files composing the system.

Documents to hand over to the jury at the end of the contest:

Paper documents:

- Layout drawing + body scaling: **MBody**-XXXX
- Layout drawing of the exploded view: **EV_Assembled system** -XXXX
- Composition: **Fiche_catalogue**-XXXX

2A - Modification of the mode of production (Duration: 30 min)

Objective: Modifying the modeling of a part after a change in its mode of production.

Using the *"**Assembled system**"* layout drawing, open the *"**Body**"* part file, contained in the *"**Fixed_parts**"* assembly

- **TRANSFORM** the “Body" part in a cast part.

  - Gravity die casting.
  - Aluminum alloy EN AB-21000.
  - Optimized shapes.
  - Prepare reinforcing ribs.

- ✓ Instructions
  - The part will be presented with a machined finish.
  - No drafts.

  - Save: “assembly” type file.
  - Filename: ***MAssembled system***-*XXXX* (XXXX = contestant number)

2B – Layout drawing (Duration: 15 minutes)

Objective: Defining the shapes of the part.

Using the previously created digital model:

- **ESTABLISHING** the layout drawing of the "Body" part on A3 format, including:

  - A choice of views, cuts and sections allowing for a complete and unequivocal definition of the part’s geometry.
  - A title block containing at least the following indications:

    - Name of the system
    - Scale
    - Projection symbols
    - Name of the contestant

  - Save: "Drawing" type file.
  - Filename: *MBody-XXXX* (XXXX = contestant number)

2C – Scaling (Duration: 45 min)

Objective: Scaling a part.

Using the previously created layout drawing:

- **SCALE** the machined surfaces of the "Body" part.

  - Dimensional scaling with tolerances
  - Shape specifications (with no indications of numerical value)
  - Position specifications (with no indications of numerical value)
  - Surface conditions
  - Any other necessary indication for production.

  - Save: "Drawing" file type.
  - Filename: *MBody-XXXX* (XXXX = contestant number)

- **PRINT** the layout drawing.

2D – Exploded view (Duration: 45 minutes)

Objective: Creating a document for customer service

Using the digital model (File ***MAssembled system****-XXXX)*,

- **CREATE** an exploded view of the system. The layout drawing of the exploded view will include:
  - An exploded view of the system.
  - A view of the system put together.
  - A title block containing the name of the system and of the contestant.

- Criteria:
  - Free choice of orientation
  - Same orientation for the exploded view and the assembled system
  - Free choice of scales
  - Parts in shade mode
  - Indications underlined

  - Save: "Drawing" type file.
  - Filename: ***EV_Assembled system***-XXXX (XXXX = contestant number)

- **PRINT** the layout drawing.

2E – Realistic rendering (Duration: 35 minutes)

Objective: Produce synthetic imaging of the assembled actuator.

Using the digital model (File ***MAssembled system****-XXXX)*,

- **ASSIGN a texture to each component** according to the indications in the following chart:

Etape	Pièce	Matériau	Observations	Couleur
1		Acier Acier Acier Acier Acier Acier Acier Acier Acier Acier Acier	Usiné Usiné Usiné Bruni Bruni Peint Usiné	
2	Scène			
3	Ombres			
4	Eclairage			

- ✓ **CREATE a quarter section view of the assembly** showing the inside of the system**.**
- ✓ Criteria:
  - Free choice of perspective
  - Size: 1024 x 768
  - Format: jpg/jpeg

NOTA:

The gear motor as well as all the full rotating parts will not be included in the quarter section view.

- Save: "Image" type file.
- Filename: ***MAssembled system****-XXXX* (XXXX = contestant number)

2F – Integration into a composition (Duration: 10 min)

Objective: Creating a document for the sales department

- **INTEGRATE** the previously created image into the manufacturer's brochure (file "Fiche_Catalogue.docx").
- **POSITION** and reorganize annotations.
    - Save: "WORD document" type file.
    - Filename: ***Fiche_catalogue***-*XXXX* (XXXX = contestant number)
- **PRINT** the document.

Evaluation criteria

Criteria		Sub-criteria	Scoring scale
2A	**Modification**	Completion	9
2B	**Layout drawing**	Completion	2
		Conformity	1
2C	**Scaling**	Dimensional	4
		Shapes and positions	2.5
		Others	5.5
		Presentation	1
2D	**Exploded view**	Exploded view	9.5
		System put together	1
		Indication	1
		Presentation	1.5
2E	**Realistic rendering**	Completion	6
		Quarter section view	2
		General aspect	2
2F	**Integration**	Presentation	2
		TOTAL	**50**

Abi wishes you a good competition!