## GENERATIVE AND GEOMETRIC MODELLING - 2019/2020 – 1st sem.

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# EXERCISE 1 (MiARQ – 4F)

28 of september 2019

## Title: *"Surfaces"*

### A. OBJECTIVES:

- Generalize the study of the geometric properties of surfaces understanding their parameters.
- To understand geometry as the support of form.
- To develop the fluency with Rhinoceros software and Grasshopper plugin.

### B. METHODOLOGY:

**1st STEP – Base surfaces**

- Consider the following surfaces:
    - Conical
    - Cylindrical
    - Spherical
    - Ellipsoid
    - Torus
    - Hyperbolic paraboloid
    - One sheet hyperboloid of revolution
    - Two sheet hyperboloid of revolution
    - Paraboloid of revolution
    - Ruled Helical surface (choose one)
- For each of the surfaces, model it using at least two different strategies.
- For each of the models, do a curvature analysis (mean and gaussian)
- Organize the file using appropriate layers and sublayers
- Use print screen to document your work and to illustrate your report
- The result of 1st step should be one *3DM file.

**2nd STEP – Definitions in GH**

- For each of the surfaces, program a definition in GH.
- For each of the surfaces, bake at least three examples.
- Organize your definition using groups and notes.
- The result of 2nd step should be one *3DM file with the baked solutions and one *.GH file.

**3rd STEP – Report**

- Do a report in PDF format with no more than 5 pages describing your work, including images.

## C. ELEMENTS TO DELIVER:

- Report in PDF format.
- One *.3DM file corresponding to que 1st step of the work.
- One *.3DM file and one (or more) *.GH file(s) corresponding to que 2nd step of the work.

## D. DELIVERY:

All the files should be zipped into one *.ZIP file according to the following notation

**XXXXXXXX_N.zip**

where:

**XXXXXXXX** corresponds to the student's number

**N** equals **1**.

**XXXXXXXX_N.zip** corresponds to the zipped folder where it was placed the files of the exercise.

The delivery limit date is the 25th of October. Send the files through Wetransfer.

## E. EVALUATION CRITERIA

- Schedule compliance.
- Report:
  - Quality of the report in terms of language.
  - Level and quality of description.
  - The maximum classification for the report is 3 points out of 20.
- Models and definitions:
  - Organization of the *.3DM file resulting from 1st step.
  - Level of development of 1st step.
  - Correctness of the modelling process of 1st step.
  - Organization of the *.3DM file resulting from 2nd step.
  - Correctness of the definitions in the *.GH file(s).
  - Organization of the *.GH file.
  - The maximum classification for the models and definitions is 17 points out of 20.