FAUL | 2018/2019 | MGG | 1º semestre

Teacher: Luís Mateus

| Week 1
21/Set – E & PL
27/Set – F & G | • Presentation of the course, URL and syllabus.
• Basic concepts about surfaces, their generation and classification.
Genesis
- Point, Line, Surface, Volume
Lines
- Tangent, Normal, bi-Normal, Curvature, Radius of curvature, Osculating circle, Torsion
Surfaces
Tangent plan, normal line, normal plan, normal section, main normal planes, main normal sections, Mean curvature, gaussian curvature
Geometric operations
Geometric transformations: Euclidean, affine, projective, topological, "baker" transformations
Intersections and tangencies between surfaces
Boolean operations
Surfaces classification criteria
Curvature
Order (quadric, cubic, quartic, …)
Type of generatrix (ruled / Curved; developable / non-developable)
Type of directrix (helicoids, …)
Movement of the generatrix (translation, revolution, elliptical revolution, sweep)
Topology (open / closed, equivalent to sphere, equivalent to torus, equivalent to circle, equivalent to an annulus, …)
…
Types of surfaces (classes)
Polyhedral (platonic solids, Archimedes solids)
Quadric
Revolution
Curved
Ruled \| developable
Ruled \| non-developable
NURBS
…

• Exercise 1 (weight: 1)
Consider the shape described in the class through measures and drawings (7.5cm X 7.5cm \| 10cm X 5cm \| 2.5cm). Build a physical model of that shape and bring it next class. Document the process with drawings and photos.

• Exercise 2 (weight: 5)
- From each of the previously defined surface classes, model two surfaces. Please notice that there are surfaces that can be included in more than one class. So, don't repeat surfaces between classes. |

	- For each surface perform an analysis of the curvature (mean and gaussian) using software Rhinoceros. - Do a report, in PDF, illustrating and describing the modelling process and the results obtained. - The delivery of the exercise (file *.3dm + *.pdf in a zipped folder named XXXXXXX_2.zip where XXXXXXX corresponds to your student number) should be done via <u>Wetransfer</u>: <u>>> until the 24h of 21/10/2018.</u>
Week 2 28/Set – E & PL 4/Out – F & G	• Group model (exercise 1). • Presentation and preparation of Rhinoceros environment (units, tolerances, visual modes, basic commands) * • Development of exercise 2 * Rhinoceros 5 or 6 can be downloaded and installed from https://www.rhino3d.com/download The trial version works for 90 days. It should be enough for the semester. After 90 days it still works but doesn't save.