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Course Description:
The first phase of the course will focus on CAD modeling applications, including parametric solid, direct, NURBS, and T-Splines. In the second phase reverse engineering hardware and software for 3D printing and 3D scanning will be addressed. The third phase will focus on downstream CAD applications, either rendering and animation or engineering simulation. In the final phase of the course teams will use these tools to work in collaboration on a product design project.

Software
Autodesk Fusion 360
Geomagic Design X
SketchBook Pro
KeyShot, Showcase, VRED
ANSYS Workbench 15
Alias & Rhinoceros
Inventor, SolidWorks, Pro/E

Hardware
Dimension SST 1200 3D printer
Z Corp 700 laser scanner
Wacom Cintiq 21ux interactive pen display
iPad Airs (15)
HP T1100ps 44” DesignJet Printer
Collaboration tables (4)

Assessment:
Fusion 360 assignments (6) 18%
Reverse engineering projects (2) 20%
Digital prototyping assignments (2) 12%
Written exam 10%
Product design project 40%

Course Goals:
1. Expand upon existing CAD skills using parametric and direct solid modeling.
2. Use T-Splines to develop sculpted, watertight geometry.
3. Understand the various capabilities and weaknesses of parametric solid, direct solid, NURBS, and T-Splines modeling.
4. Gain hands-on experience using 3D printing and 3D scanning.
5. Gain experience using digital prototyping tools used for visualization and simulation.
6. Promote collaboration between engineering and industrial design.
7. Use cloud-based CAD for collaboration.