### SE402 – Computer-Aided Product Realization

### Fall Semester 2025

**Instructor:** Prof.Molly Goldstein 309 Transportation 300-8169 mhg3@illinois.edu

**Teaching assistant:** Simon Zhang (czhan106@illinois.edu)

### Credit: 3 (or 4) credit hours

### Meeting Times: Monday/Wednesday 3-4:20 Mostly in 316TB, and with announcement in 207 TB

**Prof. Goldstein Office hours and location:** Wednesdays 1-2pm in 207TB and by appointment. Simon and open lab hours will be posted on Canvas.

**Preferred method of contact:** My preferred method of contact is in-person during office hours or during class. I will also respond to email messages and can set up separate appointment times, but please keep in mind that I make take a full day to respond. Please include SE402 in the subject line of all emails.

### Course Description:

In the first half of the course students are introduced to a variety of design tools, including cloud-based, freeform CAD for modeling and design collaboration, 3D printing, 3D scanning and scan data processing, simulation for design engineers, and rendering and animation. Working in teams, students then use these digital prototyping tools to design and prototype a product or device.

### Text:

Required book: Creative Confidence: Unleashing the Creative Potential within Us All by Tom Kelley & David Kelley;

All other readings on CAD and design topics are assigned and posted on Canvas

### Tools:

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| --- | --- |
| Software | Hardware |
| Autodesk Fusion 360 | Dimension SST 1200, Elite 3D printers |
| Creaform VXelements | Creaform portable scanner (structured light) |
| Geomagic Design X | Collaboration tables (4) |
| Autodesk ReCap Photo | Newline 80” multi-touch display |
| Autodesk Netfabb |  |

### Assessment:

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| --- | --- |
| Fusion tutorials (FT) ~8 | 10% |
| Fusion assignments (FA) ~5 | 15% |
| Scan and print tutorials (ST) ~3 | 5% |
| Scan and print projects (SP) | 15% |
| Discussion posts | 10% |
| Product design project (DP) | 40% |
| Reading reflections (R) | 5% |

### 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 multidisciplinary collaboration between engineering and industrial design.
7. Use cloud-based 3D CAD for collaboration.
8. Build creative confidence as a designer.