Competencies: Demonstrates Understanding of Digital Fabrication Process
Key assignment: Understanding Digital Fabrication Techniques

Understanding Digital Fabrication Techniques
IE 4340 Project Management

Prerequisites:

- [Read About Additive Manufacturing](#)

- [Read About Subtractive Manufacturing](#)

- Max 3 pages text – diagrams don't count towards page count (**if I see 1/2 page diagrams with 1 paragraph of text, you fail!**)

When developing a prototype it's useful to consider the different tools available and the various processes used for producing different parts within a novel design. Prototype production for plastic parts typically falls into one of three categories: 3D printed parts (otherwise known as "additive" manufacturing), CNC machined parts (otherwise known as "subtractive" manufacturing) and injection molded parts (not covered in class).

Additive Manufacturing is usually a synonym for 3D printing and/or any process by which 3D objects are constructed by successively depositing material in layers such that it becomes a predesigned shape. Subtractive manufacturing is a process by which 3D objects are constructed by successively cutting material away from a solid block of material. Subtractive manufacturing can be done by manually cutting the material but is most typically done with a CNC Machine.

Deliverables

1. Describe in detail 1 of the 7 categories of additive manufacturing, i.e. VAT, sheet lamination, etc… Cite a different source using APA style, **DO NOT USE WIKIPEDIA OR THE WEBSITES ASSIGNED TO READ.** In the description briefly summarize history, techniques available, and a description of how the technology works. An example outline is shown below:

   Additive/Subtractive Manufacturing – Powder Bed Fusion (Chosen Category)

   -Paragraph on the history of Powder Bed Fusion

   -Paragraph on the commonly used techniques

   -Paragraph(s) on how Power Bed Fusion works in general terms (diagrams allowed)

2. Describe in detail 1 of the 5 categories of subtractive manufacturing, i.e. milling, drilling, broaching, etc… Cite a different source using APA style, **DO NOT USE WIKIPEDIA OR THE WEBSITES ASSIGNED TO READ.** In the description briefly summarize history, techniques available, and a description of how the technology works. An example outline is above.

3. Visit the FabLab, and detail the current additive & subtractive technologies (Show pics). Describe in detail the machinery, category, and pricing for each available type of machine. Show and tell, how your team has used additive & subtractive manufacturing in the semester project (show CAD diagrams).