Product Design

1. Idea -> Determine characteristics -> design -> test -> manufacture -> customer
2. Phases
   1. Research: inc knowledge of universe
   2. Tech Dev: application of research into new parts
      1. No accurate schedule (for inventing)
   3. Product Design: combining all new parts into one to prep for market
      1. Very predictable schedule– up to 10%
3. Idea/Char: House of Quality; TRIZ
4. Design/Test: Taguchi methods; FMEA
5. Manuf: DFM; DFA
6. FMEA – Failure Modes and Effects Analysis
   1. Every failure is preventable; so find every possibility of failure and how to mitigate
   2. Begin as early as possible
   3. All functions of a process step as an associated failure step
   4. Effects: impact on user, other parts, environment
   5. Probability and Severity scale (1-5); both are independent of each other
      1. Risk score = Probability \* Severity (≤ 6 = green)
   6. Mitigation Actions