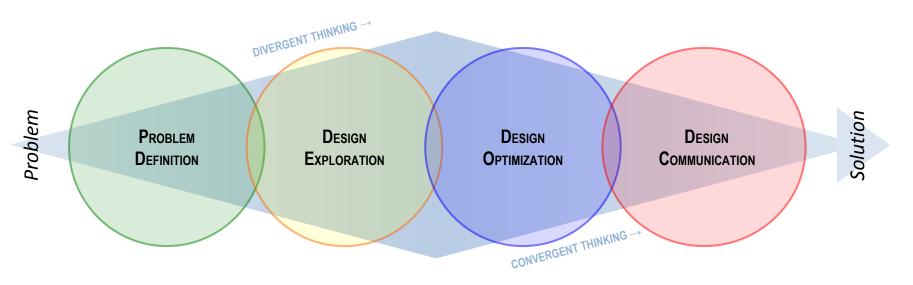
## 4-Phase Engineering Design Process



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# PROBLEM DEFINITION Define boundaries of problem: • Refine problem statement

Identify constraints & criteria

DIVERGENT THINKING -

### **DESIGN EXPLORATION**

Generate design alternatives:

- Brainstorm
- Model & experiment
- Select preliminary design

### **DESIGN OPTIMIZATION**

Develop and optimize selected design:

- Build, test, verify, & refine prototype
- Evaluate in light of trade-offs

CONVERGENT THINKING

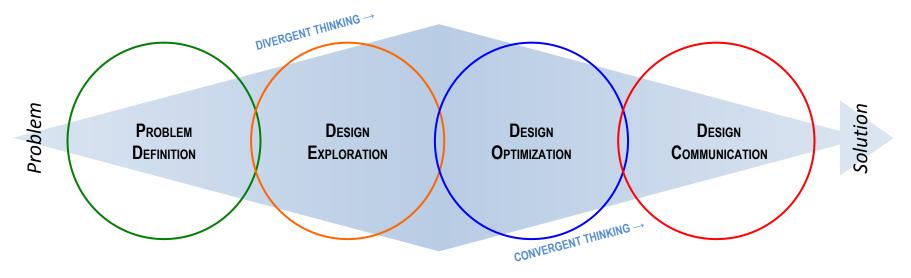
### **Design Communication**

Communicate final design to audience:

- Relate design details & rationale
- Justify tradeoffs
- Reflect on process

implement or iterate solution

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#### DIVERGENT THINKING -> PROBLEM DEFINITION **DESIGN EXPLORATION DESIGN OPTIMIZATION** Design Communication iterate solution implement or Define boundaries of Generate design Develop and optimize Communicate final problem: alternatives: selected design: design to audience: • Refine problem • Brainstorm • Build, test, verify, & • Relate design statement Model & experiment refine prototype details & rationale Identify constraints & Select preliminary · Evaluate in light of · Justify tradeoffs criteria trade-offs Reflect on process design CONVERGENT THINKING

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