**Need and Industrial Relevance**
Metallurgy is a preferred manufacturing process option for many components because of its ability to directly produce complex geometries with little or no need for post processing. Metalcastings, however, do have some requirements to enable design feasibility. If these requirements are not considered early enough in the design process, the option to produce the component as a metalcasting is lost. While it is theoretically feasible to redesign the component in the later design stages to accommodate metalcasting, this is often not plausible because of the time-to-market pressures.

**Project Goals**
Reduce overall design and procurement costs by increasing the use of metalcastings

**Objectives**
- Identify key design characteristics that eliminate or enable metalcastings
- Prioritize those characteristics that need to be addressed at conceptual design phase
- Develop e-design methods for identifying metalcasting design issues
- Enable metalcasting as a manufacturing option when it is the lowest cost option
- Eliminate the need to redesign a component as a casting
- Eliminate design delays for those components that do originate as a casting, but need to be modified
- Allow more innovative component designs that take advantage of the shape capabilities of casting

**Impact**
- Enable metalcasting as a manufacturing option when it is the lowest cost option
- Eliminate the need to redesign a component as a casting
- Eliminate design delays for those components that do originate as a casting, but need to be modified
- Allow more innovative component designs that take advantage of the shape capabilities of casting

**Project Duration**
- Task 1: Catalog design characteristics that make it feasible/infeasible as a casting (6 months)
- Task 2: Prioritize characteristics based on need at conceptual design stages (7 months)
- Task 3: e-design tools and testing (11 months)

**Proposed Budget**
$216,000: 2 graduate students plus travel to industrial partners.