A. COURSE DESCRIPTION

Credits: 3
Lecture Hours/Week: 0
Lab Hours/Week: 0
OJT Hours/Week: *.*
Prerequisites: None
Corequisites: None
MnTC Goals: None

A hands-on course that uses the engineering design process to develop and manufacture a prototype for a unique product. Includes problem identification, brainstorming, defining specific customer needs and requirements, sketching potential product ideas that meet the requirements, using a decision table to settle on a specific product idea to pursue, creating a CAD model for the prototype, manufacturing the prototype, testing, and product assessment. Also included is the development of a design proposal, written and graphic documentation, and the ethical, environmental, social, and economic impacts of design solutions. Prerequisite(s): Junior status.

B. COURSE EFFECTIVE DATES: 08/01/2024 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Applications of 3D CAD and Manufacturing
2. Design Process
3. Decision Analysis
4. Application of Manufacturing Processes
5. Functional Analysis
6. Patent Research and Review

D. LEARNING OUTCOMES (General)

1. apply the engineering design process as a working member of a team in the development of a product.
2. write a design proposal for a unique product design.
3. apply scheduling techniques, such as Gantt Charts, in managing their projects.
4. conduct a patent search to ensure that a product design will not infringe on current patent rights.
5. incorporate various forming and separating processes in their project designs.
6. incorporate 3D manufacturing, such as machining or 3D printing, in their design projects.
7. apply their knowledge of 3D CAD and create assembly drawings, bill of materials, and orthographic and isometric views of their design projects.
8. apply the concept of human factors considerations in the engineering design process.
9. apply the concept of Design for Manufacturing, Assembly, Disassembly, Maintenance, and Sustainability in the engineering design process.

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None
F. LEARNER OUTCOMES ASSESSMENT
   As noted on course syllabus

G. SPECIAL INFORMATION
   None noted