

MET-1261: PRODUCT IDEATION & DESIGN I

Cuyahoga Community College

Viewing: MET-1261 : Product Ideation & Design I

Board of Trustees:

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Academic Term:

Spring 2019

Subject Code

MET - Mech Eng/Manuf Ind Eng Tech

Course Number:

1261

Title:

Product Ideation & Design I

Catalog Description:

Introduction to product ideation and design process from development to production. Covers critical thinking, project planning, iterative processes, teamwork, and hand sketching. Additionally, learn contemporary design and development processes, identify customer needs, and design for manufacturing and production prototypes. Course emphasizes critical thinking skills and problem solving; students will transfer basic ideas to 2D representations and 3D prototype models.

Credit Hour(s):

3

Lecture Hour(s):

3

Requisites

Prerequisite and Corequisite

MATH-0955 Beginning Algebra or appropriate score on Math placement test.

Outcomes

Course Outcome(s):

Propose a solution to a given design problem by following the key elements of product development.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. Determine if the proposed solution is within the range of current skills and knowledge to evaluate and prioritize the project opportunities.
2. Research the selected product concepts by testing, surveying, measuring, interpreting, and summarizing the results.

Course Outcome(s):

Effectively identify customer needs, practice product ideation, design for manufacturing, prototyping, and industrial design methodology used to develop new products or resolve production-related issues.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. Determine what skills and knowledge are needed to identify the customer's needs
2. Investigate and identify relevant human problems that are in need of a successful product development solutions.

3. Search for and identify legacy solutions.
4. Develop initial design solution and clarify the problem that either builds upon past work or is unique.
5. Utilize basic knowledge of when to apply various prototyping techniques such as sketching and model making.

Course Outcome(s):

Effectively describe possible approaches to solutions using tools utilized in a professional environment, such as hand sketching, email, and focus reports.

Essential Learning Outcome Mapping:

Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

Objective(s):

1. Create hand sketches that visual representation concepts and ideas.
2. Create technical documents to convey ideas and concepts.

Course Outcome(s):

Communicate ideas verbally through professional presentations.

Essential Learning Outcome Mapping:

Oral Communication: Demonstrate effective verbal and nonverbal communication for an intended audience that is clear, organized, and delivered effectively following the standard conventions of that language.

Objective(s):

1. Present project ideas and solutions to others.
2. Accept and translate constructive criticism into actionable items and goals.
3. Provide constructive criticism of project ideas, solutions, and presentation techniques to others.

Methods of Evaluation:

1. Problem assignments
2. Technical Reports and Documents
3. Final project, including visual presentation
4. Quizzes and/or midterm
5. Final examination
6. Oral Presentation

Course Content Outline:

1. Introduction to design fundamentals
 - a. Definition of product development
 - b. Difficulties associated with product development
2. Contributions of the three functions used to develop products, marketing, design, and manufacturing
 - a. Introduction to product development and ideation process
 - i. Research
 - ii. Identify need (investigation)
 - iii. Focus groups
 - iv. Ideation
 - v. Design development
 - vi. Create prototypes
 - b. Identifying customer needs
 - i. Evaluation of customer problems
 - ii. Collect raw data, interpret, organize, evaluate, and summarize
3. Process for product planning, development, organizations
 - a. Product development processes
 - b. Product planning processes
 - c. Product development of organizations
 - d. Development of concepts
4. Generation of ideas/ideation and selection

- a. Define problems and clarify
 - b. Complete internal and external searches of data through focus groups
 - c. Define possible solutions
5. Importance and impact of ideation and design in product development
 6. Industry and professional uses of the product design process

Resources

Ulrich, Karl T. Eppinger, Steven D. *Product Design and Development*. 6th edition. McGraw-Hill Education, 2015.

B. Cuffaro, Daniel F. Blackman, Carla J. Covert, Darrell E. Page, Douglas. Nehez-Cuffaro, Amy. Laituri, David. Sears, Lawrence M. *The Industrial Design Reference + Specification Book*; 2013.

C. The Nueva School, Kim Saxe, and the Stanford d.School. *VIDA's Design Thinking Process – v3*. 2015.

Resources Other

Handouts specified by instructor.

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