

MET-2060: PRODUCT IDEATION & DESIGN II

Cuyahoga Community College

Viewing: MET-2060 : Product Ideation & Design II

Board of Trustees:

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Academic Term:

Spring 2019

Subject Code

MET - Mech Eng/Manuf Ind Eng Tech

Course Number:

2060

Title:

Product Ideation & Design II

Catalog Description:

Build upon critical thinking and product development concepts introduced in Product Ideation & Design I. Develop solutions for real-world product design problems using hand sketching, 3D modeling, additive manufacturing, and other techniques. Also covers engineering principles as they apply to product design, development and manufacture.

Credit Hour(s):

3

Lecture Hour(s):

3

Requisites

Prerequisite and Corequisite

MET-1261 Product Ideation & Design I; and MATH-0955 Beginning Algebra, or appropriate Math placement score.

Outcomes

Course Outcome(s):

Develop a design solution, create a concept and describe in detail how to go about developing, refining, and bringing a solution into the physical world.

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. Provide an in-depth explanation of subtractive and additive manufacturing techniques, as well as a broad explanation of traditional prototyping techniques concerning product design.
2. Discuss the importance of the "elevator speech" and utilize this concept when describing ideation and any solution development.
3. Comfortably present concepts to a group via stand-up, PowerPoint, and renderings.
4. Efficiently turn constructive criticism into action, which results in faster solution development.
5. Organize and engage a focus or target group.

Course Outcome(s):

Communicate any aspect of the product design and ideation process to industry professionals and accept actionable constructive feedback.

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. Demonstrate the ability to present fully developed ideas using renderings, 3D models, physical prototypes, and articulate correct terminology.
2. Write technical documents and provide data analysis including spreadsheets and charts that effectively communicate solutions to design problems.

Course Outcome(s):

Utilize engineering economic principles to develop plans and analytics for product develop and manufacture.

Essential Learning Outcome Mapping:

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

Objective(s):

1. Define the principles of engineering economics.
2. Create a cost analysis spreadsheet.

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. Advanced design fundamentals
 - a. Challenges for developments
 - b. User-centered design solutions
2. Create project budget
 - a. Cost analysis plan
 - b. Cost analysis spreadsheet
3. Ergonomics and design
 - a. Develop and design product solutions with human factors in mind for comfort
 - b. Challenges for development
4. Identifying stakeholders
 - a. Recruitment of stakeholders
 - b. Potential impact of product design and development for stakeholders
5. Product design and development across disciplines
 - a. Intellectual property
 - b. Trade secrets
6. Entrepreneurship
 - a. Success and failure of start-up business
 - b. Differences in business ownerships: sole proprietorship, partnerships, corporations
 - c. Create business plan
7. Industry and professional uses of the product design process in manufacturing
8. Communication with industry professionals
 - a. Presentation of ideas
 - i. renderings
 - ii. 3D models
 - iii. Physical prototypes
 - iv. Clear verbiage
 - b. Technical documentation and data analysis

Resources

A. 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.

Resources Other

Handouts and materials specified by instructor.

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