

IEGR 480: Product Design
Spring 2021 Semester; 3 credits; Lecture
Morgan State University
Department of Industrial & Systems Engineering

Catalog Description:

Dynamics of converting ideas to marketable products; The use of programming skills and numerical tools to support design/redesign of products, in a 3-D solid modeling computer workstation environment. Course covers the concepts from product idea to design and prototype development and production. Course involves numerous design experiments, and requires the team design and rapid production of prototypes. (Prerequisites: IEGR 363)

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Office Hours: Tue. & Thu. 1-4 PM. Others by confirmed appointments

<https://meet.google.com/tnb-yqbh-xcx>

Textbook:

- Dieter, G. E. and Schmidt, L. C., Engineering Design, McGraw Hill, 2009, ISBN: 0-07-339814-4.
- Ulrich K., Eppinger S. and Yang M. C., Product Design and Development, 7th Edition, McGraw Hill, 2019, ISBN10: 1260043657, ISBN13: 9781260043655

Software: Any solid modeling software; Autodesk Fusion 360 recommended
<https://www.autodesk.com/education/edu-software/>

Tutorials:

- Lars Christensen YouTube channel
<https://www.youtube.com/channel/UCo29kn3d9ziFUZGZ50VKvWA>
- Dr. Salimian IEGR 317 class – Spring 2021
<https://salimian.webersedu.com/courses/IEGR317/>

Website: <https://salimian.webersedu.com/courses/IEGR480N/>

Group: IEGR 480 (Google Groups from MSU email – restricted access)

Meeting: Tuesday and Thursday 9:00 – 10:20 AM using Google Meet
<https://meet.google.com/piw-guah-ctd>

Presentation: During Office Hours

Recordings: Shared drive (Google drive from MSU account – restricted access)

Goals for the Course:

1. To introduce a set of tools and methods for product design and development.
2. To create the awareness of the role of multiple functions in creating a new product (e.g. marketing, finance, industrial design, engineering, production).
3. Create the awareness of the need to coordinate multiple interdisciplinary tasks in order to achieve a common objective.
4. To reinforcement of specific knowledge from other courses through practice and reflection in an action-oriented setting especially manufacturing, ergonomics, engineering economy, quality control and project management.
5. To introduce the ethical issues related to product design.
6. To reinforce the need for teamwork and ability to finish the design on time using project management tools.

Topics Covered

- Topic 1. Introduction
- Topic 2. Development Processes and Organizations
- Topic 3. Product Planning
- Topic 4. Identifying Customer Needs
- Topic 5. Product Specifications
- Topic 6. Concept Generation
- Topic 7. Concept Selection
- Topic 8. Concept Testing
- Topic 9. Product Architecture
- Topic 10. Industrial Design
- Topic 11. Design for Manufacturing
- Topic 12. Prototyping *
- Topic 13. Robust Design *
- Topic 14. Patents and Intellectual Property *
- Topic 15. Product Development Economics *
- Topic 16. Managing Projects *

* Topics 12-16 will be covered if time permits.

Assessment: Projects & Presentations; Assignments; Exams; Reports, and abstract for paper; Class attendance and participation; On time work submission, Compliance with course guidelines; Volunteerism, helping other class participants, community of learning.

Grading: 20% - Assignments
25% - Exam 1
25% - Exam 2
30% - Projects and Presentations
A: 90 and above; B: 80-89; C: 70-79; F: below 70

Additional Information:

IEGR 480 course will be offered as a true product design course involving products to be designed, manufactured and tested alongside heavy research and hands-on lab work.

1. Students learn how to develop concepts for products on a systematic approach including research, feasibility study and engineering economic analysis.
2. Student will manufacture assigned products based on functional specifications provided by the instructor.
3. Student will design, manufacture, and test a product based on concepts presented by them and approved by the instructor based on problems identified by the instructor.
4. Students will present their work on a professional basis to a group of faculty convincing them of the merits of their design.
5. Students will write and submit abstracts for papers to be presented and published in a conference.