ME4182 & ME4723 (other disciplines welcome!)

Common Studio Session for Week #3

Date 09/22/2021

http://popin.it/xg6nim
Recap/Reminders

• ALL Links, SLIDES and VIDEOS are posted here: http://mecapstone.gatech.edu/students

• Visit http://mecapstone.gatech.edu/assignments to check your team’s reimbursement amounts
  • Reimbursement guidelines: https://mecapstone.gatech.edu/resources/reimbursement-guidelines/

• Expert support staff help available:
  • Kinsey Herrin, Sr. Research Scientist with interests in prosthetics, biomed device projects.
  • Mondays 3-4 pm in GTMI #401 or https://bluejeans.com/489459898/2989
  • Students are also welcome to email Kinsey.herrin@me.gatech.edu directly to schedule an appointment
Common Studio Topics

1. Course Overview, Projects, Teams and Bids, Communication
2. User needs / Engineering Design Specifications
3. Market research and Prior Art
4. Ideation, Concept Generation, Design Process
5. Industrial Design & Human Factors
6. Risk, Liability, Codes & Standards
7. Prototyping
8. Social, environmental, sustainability considerations
9. Analysis
10. Effective Communications / Plan for Expo
12. Forming a company

Associated deliverables and reports may be due in your section lab meetings
Thank You!

3. Ideation & Concept Generation

Overview of Methods

- Intuitive
  - Group Only
    - Brainstorming
    - Synectics
    - Progressive Methods
    - Sequential
    - 6-3-5 Method
    - Gallery Method
    - C-Sketch
    - Storyboarding
    - Affinity Method
  - Concept Generation Methods
    - Group or Individual
      - Morphological Analysis
      - Check Listing
      - Action-Verbs
      - Design Catalogs
      - TIPS (TRIZ)
      - Inversion
      - Forward Steps
      - Factorization & Combinations
      - Axiomatic Principles

- Directed (Logical)
  - PMI
    - K-J
  - Physical Effects
  - Solution Principles

Dr. Julie Linsey
Associate Professor
G.W.W. School of Mechanical Engineering

Redrawn from figure 10.3, Product Design
Discussion

1. Interdisciplinary Group #2 | F03-Prince William Sound Underwater Profiling Vehicle

2. Operation Omega | 004-Dia-Bot (Diagnostic Robot) Platform

3. TBD (The Better Designers) | 007-Exobiology Extant Life Surveyor (EELS) robot sampling system

4. Temporary_team_name | 009-Robotic ophthalmic camera in a kiosk for self-administered eye exam
Ideation & Concept Generation

• What are the functions that the design needs to satisfy? (Functional decomposition)
• How can those functions be accomplished (means)? (morph charts)
• What are your integrated concepts/initial design alternatives, and how do they map to these functions and means?
• How will you weigh customer desires vs. specific functional performance?
• How are your concepts informed by and influenced by prior art?

• What formal selection processes will you use to identify the promising concept(s) to be further explored?
• What feasibility analyses may be necessary for your concepts?
Thank You!

4. Industrial Design & Human Factors

Physical ergonomics
- How to design for the comfort and functioning of the human body
- Anthropometrics – measuring humans
- Physiology – how the body functions
- Bio Mechanics – study of the structure of the body from a mechanical view – forces and actions

www.thegrotesque.com

Prof. Wayne Li
Assistant Professor of Practice of Design and Engineering
Industrial Design
Industrial Design & Human Factors

• How do human factors impact your design problem?
• How will you explore human factors issues in your design process?
• What are the human interaction-points with your design problem? (from manufacture through to disposal)

• What Industrial Design considerations impact your design?
• How does visual hierarchy and language impact your design?
• How does branding factor into your design problem?

You may contact Prof. Wayne Li via email if you need more guidance on how you would apply this topic of Industrial Design to your project: wayne.li@design.gatech.edu
Flipped Class for Week #5

• Everyone review the slides and videos on “Sustainability” and “Social Impact Assessment” listed under week #5 on class schedule

• Need 4 teams to volunteer for a panel discussion on Ideation and concept generation. Each team will have...
  • 3 minutes to present their problem
  • 2 minutes to present how sustainability (societal or environmental) considerations inform and impact their design?
  • 5 minutes for Q/A and discussion by class