

MEE 499/590 – Inventive Design Syllabus

Room: LTC Studio, Tuesday and Thursday, 4:30 – 5:45 PM

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Undergraduate co-requisite: MEE 427L or 431L. The reason for this is the exposure to the “Product Realization Process” and the introduction to IDEAS.

Graduate co-requisite: None. You are expected to be knowledgeable on the process and geometric modeling (IDEAS) on your own.

Course Description: The goal is to provide a broad introduction to design. Design is an activity that transcends engineering. Good design results from the culmination of many inputs, using a process that inspires creativity, and seeking flaws in potential solutions. We design inventively by paying particular attention to brainstorming and prototyping. We spend time on methods of brainstorming, practicing them, and eliminating biases which hinder recognizing solutions. Prototyping then reveals the shortcomings of the design on paper. Specifically, the focus is on the development of toys and novelties that are mechanical in nature. Students work to envision, design and construct working prototypes. Activities include traditional and rapid prototyping, observing and appreciating the psychological aspects of play, taking field trips, analyzing toys, learning about the toy industry, and solid modeling.

Reference & Readings:

- **The Blockbuster Toy! How to Invent the Next BIG Thing** Gene Del Vecchio, Pelican Publishing Company
- The readings in this packet.
- A few additional readings will be distributed later in the semester, though not many.

Grading: Your grade is composed of scores on the following four elements: rubber novelty, toy prototype, journal, and class participation. Note that there are no individual homework assignments, quizzes or exams. Sometimes an environment of this maturity can pose problems. As such, we will help you stay on track by occasionally having in-class journal review. During this activity, you will be called upon to read an entry of our choosing from your journal for presentation and discussion in class. We plan on having one of these sessions every three to five lectures throughout the semester. References to the above readings are expected.

Admittedly, grading a course of this type is a challenge and relies on our appreciation for what you’ve accomplished. A significant way of doing this is through keeping a good journal. You should also consider the following equation:

$$time + effort + creativity = grade$$

Here’s a quick breakdown of the four elements:

Rubber novelty (20%) – You will brainstorm, sketch, solid model and rapid prototype a desk top novelty no larger than a 4” cube.

Toy prototype (40%) – You will brainstorm and prototype a functioning, reasonable looking mechanical toy.

Journal (20%) – More on this below.

Class participation (20%) – Attendance, tardiness, responsiveness, disruptiveness (don't let that cell phone ring!), contribution to in class exercises, and performance during in-class journal review.

Extra Credit (up to 5% additional) – Inevitably, students have a good idea for a toy that doesn't possess the mechanical component expected of the projects in this class. Students may self-select teams and pursue one additional project during the semester. Note this project can take many forms and does not need to be thought of as another plastic functional prototype.

Journals: The truth of the matter is that good design happens at a nonlinear pace. We can't rely on it to happen on schedule. Good design can be inspired by odd sightings, experiences, and relationships. To try and capture this, you are expected to keep a *design journal* as part of this class.

Journal entries can take many forms:

1. Required website “journal exercises”. There will be 3 or 4 of these a week of varying length. These will vary from making sketches to generating words to writing a couple hundred words.
2. Process book on your design projects. Every time your design teams meet, you should have your journal out. You should be jotting ideas down, keeping track of your brainstorming, making sketches and identifying tasks. Don't be afraid to write, respectfully, in another's journal as part of this.
3. Random, creative inspiration. Pose questions to yourself. Jot down something you learned or need to learn more about. Reflect upon experiences (a movie you have seen, a friend's new car, a ad you saw in a magazine, etc...) or anything that is (modestly) related to design. Note: more things may be related to design that you realized – if nature didn't produce it, it was most likely designed.

I'm sorry to impose a journal format on you, as your journal should be a truly personal expression. We need the format to allow us to assess your activities during the semester. Try to work chronologically, front-to-back. It is ok to return to an entry and add thoughts though. In fact, it is strongly encouraged!

So, for a journal entry of type 1, write the words “Type 1,” write down the assignment in your journal and put a clearly identifiable date on it. If you return to the question at a later time, that's great. Add your new thoughts with the date. If you want to add it later in your journal, just reference the earlier entry, “I am writing more about the assignment of January 18th.” Adding information like this is true for an entry of any type in your journal. Also note that if we discuss one of your journal entries during an “in-class journal review” you should go back and add something on the results of that discussion (and don't forget to date it!).

A journal entry of type 2 should be identified with the words “Type 2” and a date. Then, include anything you or your team accomplishes relevant to one of the several design projects this semester.

A journal entry of type 3 should be identified with the words “Type 3” and a date. Then, go to it!

Of course you will write in your journal. This is a journal: modest grammatical transgressions are not a problem, non sequiturs are ok, stream of consciousness is difficult to avoid. Just

remember that we will read it and need to appreciate your ideas. Feel free to tape (preferred method) or carefully glue (glue stick recommended) items in the journal. Pictures or sketches are encouraged to aid in expressing yourself. At certain points they will be required. You are strongly encouraged to use a digital camera or camera-phone as a resource. Print pictures out and include them!

Dates of Note:

January 25th Toys R Us field trip.
Depart at 4:30 PM. Return at 6:30 PM. I will have a van.

February 1st Geometric Modeling.
Start at 4:30 PM. Will stay until 6:30 PM to work (not required)

Late February or early March
Trip to BangZoom in Cincinnati
Depart at 4:30 PM. Return at 7:30. I will have a van.

February 24th Mid-Term Break
No Class

March 22nd Mid-Term Break
No Class

March 24th Mid-Term Break
No Class

May 3rd Final project(s) presentation.